Summative Evaluation Report

NC Healthy Opportunities Pilots

31 March 2026

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

NC HOP
Medicaid Healthy Opportunities

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Executive Summary

Health, along with healthcare costs, is affected by many factors beyond medical care. As North Carolina began to implement initiatives aimed at "buying health," the Healthy Opportunities Pilots were established to test evidence-based, non-medical interventions for their direct impact on North Carolina Medicaid beneficiaries' health outcomes and healthcare costs, particularly in rural areas of North Carolina.

North Carolina's Section 1115 Medicaid Demonstration Waiver titled "North Carolina Medicaid Reform Demonstration" was approved to cover the period November 1, 2019, through December 9, 2024. One component of that Demonstration Waiver is the State of North Carolina's Enhanced Case Management and Other Services Pilot (ECM), which is more commonly referred to as the Healthy Opportunities Pilots (abbreviated as the 'Pilots' or 'HOP'). Owing to the national context of the COVID-19 pandemic and local context such as the delay in transition to Medicaid managed care, the Pilots did not begin providing services until March 15, 2022. Thus, the Pilots delivered services for less time during the demonstration period than intended when the Demonstration Waiver was submitted and approved.

This summative evaluation report analyzes data about Pilot activities. Pilot services commenced on March 15, 2022, and this report includes data regarding services through November 30, 2024. With CMS' agreement, the period of December 1 to December 9, 2024, will be evaluated as part of North Carolina's second Demonstration Period (approved to begin December 10, 2024), as ending on a calendar month better aligns with some evaluation metrics calculated on a calendar month basis. This report is specific to the Pilots and does not cover other elements of the 1115 Waiver. In addition to data from the time period when Pilot services were delivered, this report also makes use of data during the time period before Pilot services began, both to serve as a baseline for comparisons and as a time period in which preparations to deliver services, such as capacity-building activities, occurred.

The Pilots aim to test evidence-based, non-medical interventions for their direct impact on North Carolina's Medicaid and Children's Health Insurance Program (CHIP[a]) beneficiaries' health outcomes and healthcare costs, with the purpose of incorporating findings into the Medicaid program. As part of NCDHHS' commitment to promote the health of Medicaid beneficiaries, it sought to build a well-coordinated system that "buys health", as well as healthcare. In this effort, the Pilots require

[a] All references to Medicaid beneficiaries in this report are also inclusive of CHIP beneficiaries

Prepaid Health Plans (PHPs)[b] to cover federally approved, evidence-based interventions that address qualifying Medicaid beneficiaries' social needs in four domains: housing instability, transportation insecurity, food insecurity, and interpersonal violence/toxic stress. PHPs and their care managers are responsible for determining and monitoring eligibility for services and deciding which services beneficiaries will receive.

HOP services are delivered through innovative regional networks of community-based organizations and social services agencies (collectively called 'human service organizations' [HSOs]) to address needs across all domains. Each regional network is established, managed, and overseen by Healthy Opportunities Network Leads (NLs) (previously referred to as Lead Pilot Entities or LPEs). The NLs are the essential connection between PHPs, HSOs, and the state of North Carolina, along with clinical care teams when appropriate. NLs are local organizations embedded in the communities they serve. On May 27, 2021, following a competitive procurement process, NCDHHS announced the selection of three NLs to contract with the PHPs to develop, manage, and oversee a network of HSOs that provide pilot services to their eligible enrollees. This created three Pilot regions in North Carolina, each identified by its own NL: Access East, Inc.; Community Care of the Lower Cape Fear (CCLCF); and Impact Health. Access East and CCLCF were already established organizations within their communities, whereas Dogwood Health Trust created Impact Health to lead HOP implementation in its region of western North Carolina. The Pilot regions include a large proportion of rural communities.

Pilot services began with a phased launch—first offering food services on March 15, 2022, followed by housing and transportation services on May 1, 2022, and toxic stress and cross-domain services on June 15, 2022. Finally, interpersonal violence (IPV)-related services became available on April 5, 2023. The CMS approved evaluation design for the Healthy Opportunities Pilots included six Evaluation Questions covering different aspects of the Pilots. We summarize these six Evaluation Questions as: Evaluation Question 1 ("Effective Delivery of Pilot Services"), Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening and Connection to Appropriate Services"), Evaluation Question 3 ("Improved Social Risk Factors"), Evaluation Question 4 ("Clinical Outcomes"), Evaluation Question 5 ("Healthcare Utilization"), and Evaluation Question 6 ("Cost of Care").

[b] Most data in this report come from PHPs. An additional type of entity, Prepaid Inpatient Health Plans (PIHPs), were introduced later in the demonstration period. Data from PIHPs are also included in this evaluation, but we use the term "PHP" to refer to both types of entities for convenience.

Concerning Evaluation Question 1 ("Effective Delivery of Pilot Services") analyses, the state of North Carolina achieved its goal of establishing a multi-sector collaboration between the state, PHPs, NLs, HSOs, and healthcare systems. Pilot services were delivered effectively during the demonstration period. Through November 30, 2024, a total of 31,597 unique individuals were enrolled, and 691,504 services were delivered by 166 HSOs. Initial assessments of social needs were conducted promptly (most commonly right at the time of enrollment). Services typically began soon after enrollment—the median time for initial services to begin was 8 days. During the evaluation period, 86% of those who enrolled—27,141 out of 31,597 Pilot participants—received at least 1 invoiced service. Food services constituted the majority of services delivered—accounting for 84% of the unique services provided and 61% of the spending on HOP services. Invoices for services were paid in a timely fashion, with 61% of invoices paid within 30 days of service delivery, and approximately 80% paid within 45 days of service delivery. Interviews with HOP organizations (NLs, HSOs, and PHPs) highlighted the functioning of HOP's model. Interviews with PHPs emphasized that HOP engagement and enrollment were strengthened by flexible communication and collaboration across networks, care managers, and beneficiaries. However, service availability was challenging in some areas and for some service types. PHPs reported some limits to organizational capacity and the need to expand staff responsibilities to deliver HOP services. This highlighted the need for staffing strategies focused on care coordination and restructuring. Communication approaches were tailored to beneficiary needs, but PHPs reported that more work in improving communication related to engagement, education, and collaboration across the HOP network is needed. While PHPs used the NCCARE360 platform in varied ways to support collaboration, information management, and performance monitoring, there were limitations around functionality and data integration. PHPs emphasized the importance of user involvement in the design and testing of platform improvements. Interviews with NLs indicated continuous adjustments of staffing structures to meet evolving HOP needs, though perceptions of staffing sufficiency varied widely. Financial stability across NLs was influenced by HSO stability, payment timeliness, capacity-building funds, and external funding opportunities. NLs noted that enrollment and engagement were strengthened through community outreach, financial support for HSOs, and strong collaboration, while service delivery challenges centered on funding sustainability, the reimbursement model, technological limitations, and network adequacy. NLs used communication, network expansion, and targeted training to overcome service barriers and relied on varied communication strategies to keep partners informed, though more streamlined and inclusive communication pathways are needed. NCCARE360 was widely used and

valued for service coordination. However, they also offered suggestions for improvement of the NCCARE360 technology platform. Lastly, interviews with HSOs note the importance of regular communication across the network and with beneficiaries; adapting staffing to meet beneficiary needs; external financial support and capacity building funds; and the payment model. Further, HSOs identified that the collaborative network model facilitated success, and that Network Leads were invaluable in addressing HSO concerns and challenges. Regular, dedicated meetings with other HSOs also provided a benefit. Some identified challenges included administrative burden and limitations in resources and service network availability. NCCARE360 was seen as a necessary tool that was largely beneficial and utilized for referrals, invoicing, communication, and documentation. HSOs also suggested improvements to the NCCARE360 technology platform, particularly regarding invoicing functions, communication, and data accessibility.

Regarding Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening and Connection to Appropriate Services"), we found that the health-related social need screening rate was approximately 20% higher in Pilot compared with non-Pilot regions, even though screening was conducted by PHPs for Medicaid beneficiaries in all regions. However, screening rates were relatively low in both Pilot and non-Pilot regions, with substantial room for improvement. Further, we were unable to evaluate whether more individuals with positive screens were connected to services in Pilot regions, compared with non-Pilot regions, owing to lack of data regarding service connections in non-Pilot regions.

For Evaluation Question 3 ("Improved Social Risk Factors"), we found that needs were high around the time of Pilot enrollment, which likely reflects both the reasons for Pilot enrollment and the detailed need ascertainment that occurs at that time. Using interrupted time series analyses, we found that Pilot services reduced the total number of social risks, and the probability of reporting the specific risks of food needs, housing needs, and transportation needs, relative to estimates of what would have occurred had participants not enrolled in the Pilots. In contrast, we did not find evidence that IPV and/or toxic stress needs decreased with Pilot participation. However, there are important caveats to this finding. First, IPV-specific services were provided for less time than the other HOP services, and the reported prevalence of IPV and/or toxic stress needs was very low relative to other needs, which makes estimates more uncertain. Moreover, the nature of these needs may be such that they are disclosed only after sufficient rapport has been developed. This would tend to increase their disclosure over time.

When examining how different types of food, housing, and transportation services may affect needs, we did not find meaningful variation in the effectiveness of particular service types.

Regarding Evaluation Question 4 (“Clinical Outcomes”), we did not find evidence that HOP affected birthweight outcomes. We also did not find evidence that HOP lowered hemoglobin A1c or blood pressure, although these analyses were limited to a subset of Medicaid beneficiaries with data in the North Carolina Health Information Exchange, NC HealthConnex. In surveys, HOP participants strongly endorsed the idea that HOP was improving health and rated their program experience positively. Participant-reported outcomes related to healthy days and other aspects of health-related quality of life were consistent with meaningful improvements as a result of HOP participation, although there was substantial statistical uncertainty in many of these estimates, which precludes definitive conclusions. In interviews with HOP beneficiaries and beneficiary proxies, the majority reported positive experiences receiving HOP services. Some summarized their experiences as “a blessing” or “a total lifeline.” Beneficiaries thought the program provided options to meet their needs, along with a sense of security and reduced stress. However, some beneficiaries described challenges with strict program requirements and food delivery/quality issues. Many beneficiaries did not feel that changes to HOP were needed, but some offered suggestions such as increasing the variety of food options, more hands-on support for housing navigation, and more flexibility for healthy home goods. Beneficiaries emphasized a desire for streamlined processes, stronger operational functionality, and enhanced and expanded service offerings to better meet diverse household needs. Most HOP beneficiaries noted positive impacts of HOP on their health. As one beneficiary shared, "It's definitely changed my health in a very positive way. Because before I wanted to eat healthier, I didn't always know where to begin." Overall, beneficiaries expressed strong support for sustaining and expanding HOP, emphasizing the need for long-term funding, broader outreach, and continuity in care management to ensure continued access to services they consider essential and transformative.

Regarding Evaluation Question 5 (“Healthcare Utilization”) analyses, we found that Pilot enrollment tends to occur during a period of rising risk for adverse healthcare utilization. We found that Pilot participation was associated with decreased emergency department utilization, relative to what would have occurred in the absence of the Pilots—approximately 14 fewer emergency department visits per 1000 person-months. We also found evidence that Pilot participation was associated with fewer inpatient admissions, relative to what would have occurred in the absence of the Pilots—approximately 7 fewer per 1000 person-months. Regarding outpatient visits, as intended, HOP was associated with

greater outpatient utilization, relative to what would have occurred in the absence of the Pilots—approximately 76 more per 1000 person-months. Increases were particularly notable for well-child visits. On the other hand, we did not find that HOP affected prenatal and postpartum visits. It is noteworthy that prenatal care receipt increased in both HOP and non-HOP regions during the evaluation period, and was a focus for overall quality improvement for North Carolina Medicaid Managed Care plans during the demonstration period. Thus, the lack of differential improvement may have resulted from secular trends of overall increases in prenatal care.

For Evaluation Question 6 ("Cost of Care") analyses, we found that HOP was associated with lower healthcare expenditures. Considering both medical and direct spending on HOP services, we estimate that HOP was associated with, on average, -$231.22 (-$371.62 to -$90.83) less spending per member per month when averaged over a 32-month follow-up period (corresponding to the entire demonstration period). When also considering HOP administrative costs in addition to medical care spending and direct spending on HOP services, we estimate that HOP was associated with, on average, -$164.49 (95%CI -$311.67 to -$17.32) less spending per member per month (again averaged over a 32-month follow-up period).

Overall, the findings of this report support the underlying rationale of the Pilots, which is that addressing social risk factors can lead to improvements in health, healthcare utilization, and healthcare cost. Of course, there are important limitations to keep in mind when interpreting these analyses. The most important limitation is that receipt of services was not randomly assigned. Results could be biased by time-varying confounding: aspects of a participant's clinical or social situation that could have influenced enrollment in HOP, what services they received, and the likelihood that their situation would improve on its own. Other limitations include the possibility of regression to the mean, or model misspecification that could impact the results presented. However, we conducted numerous sensitivity analyses and robustness checks, which did not substantively alter the conclusions. The analyses in this report used several approaches to mitigate potential biases—particularly use of data from non-HOP participants (to help account for regression to the mean), regression adjustment (to help account for measured confounding), the use of data both before and after Pilot participation (to help account for time-fixed unmeasured confounding), and the use of contemporaneous data from other North Carolina Medicaid beneficiaries for many outcomes (to help account for potentially unmeasured time-varying confounding related to 'secular trends' or other factors that affect Medicaid beneficiaries separately from Pilot participation). Another limitation is that data quality issues could lead to erroneous estimates.

Data used for evaluation were often collected for other purposes (typically program implementation). However, administrative data were supplemented with primary data collection efforts, including surveying of HOP beneficiaries and qualitative interviews with both HOP beneficiaries and other key stakeholders.

In sum, we believe it is reasonable to conclude that the Pilots had an important impact on participants in the first demonstration period.

General Background Information

Health is affected by many factors beyond the medical care provided within a hospital or clinic. While access to high-quality medical care is critical, social and environmental factors are also important determinants of health.[1,2] A substantial body of research has established that having an unmet resource need—including experiencing housing instability[3], food insecurity[4], unmet transportation needs[5], and interpersonal violence (IPV) or toxic stress[6,7]—can significantly and negatively impact health and well-being, as well as increase healthcare utilization and costs.[1,8–11] Addressing those needs may improve health and healthcare utilization, thereby reducing healthcare costs. For example, research indicates that providing housing assistance to adults who have physical and/or behavioral co-morbidities and are experiencing homelessness decreases unnecessary use of hospital care and associated healthcare costs.[12–14] Similarly, reducing asthma triggers (such as replacing moldy carpets and broken air conditioners) in a child's home can reduce hospital visits and related costs.[15,16] Nutrition interventions have been associated with lower healthcare costs for food insecure individuals.[17,18] Notably, however, much of the research conducted to date has evaluated discrete interventions for specific, high-need populations, leaving unanswered critical questions regarding whether— and how—to scale and sustainably fund the integration of non-medical services into the healthcare system on a population-wide basis.

As such, the North Carolina Healthy Opportunities Pilots tested evidence-based, non-medical interventions for their direct impact on North Carolina Medicaid beneficiaries' health outcomes and healthcare costs during the first Demonstration Period of North Carolina's Section 1115 Medicaid Demonstration Waiver entitled "North Carolina Medicaid Reform."[c] This 1115 Medicaid Demonstration Waiver was approved to cover the period November 1, 2019 through December 9, 2024. The Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill ('the Sheps Center') was selected by The North Carolina Department of Health and Human Services (NCDHHS) Division of Health Benefits to evaluate one aspect of that Demonstration Waiver, the State of North Carolina's Enhanced Case Management and Other Services Pilot (ECM), now more commonly referred to as the Healthy Opportunities Pilots ('HOP' or the 'Pilots'), under External Evaluation Services Contract

[c] CHIP (Children's Health Insurance Program) beneficiaries are also eligible for Healthy Opportunities Pilots services and are included in the analyses of this report. We refer to "Medicaid" beneficiaries for convenience, but this is also inclusive of CHIP beneficiaries.

#30-2021-017-DHB. The ECM evaluation design approved by the Centers for Medicare & Medicaid Services (CMS) on August 15, 2019, is included as an Attachment. This report analyzes data about Pilot service delivery (which commenced on March 15, 2022) through November 30, 2024 (with CMS' agreement, the period of December 1 to December 9, 2024 will be evaluated as part of North Carolina's second Demonstration Period [approved to begin December 10, 2024], as ending on a calendar month better aligns with some evaluation metrics calculated on a calendar month basis). This report is specific to the Pilots and does not cover other elements of the 1115 Waiver. We also include data prior to the commencement of HOP service delivery for use as a baseline, and as a period in which preparatory activities, such as capacity building, occurred.

Planned implementation of the Pilots was affected by both the COVID-19 pandemic nationally and the delay of Medicaid managed care implementation in the state of North Carolina. This has meant that Pilot services were delivered for less time during the Demonstration Period than was originally planned.

HOP Program Overview: Buying Health with Regional Collaboration

North Carolina designed the Pilots to test evidence-based, non-medical interventions for their direct impact on North Carolina Medicaid beneficiaries' health outcomes and healthcare costs, with the purpose of incorporating findings into the Medicaid program. The Pilots require Prepaid Health Plans (PHPs) to cover evidence-based interventions that address four domains: housing instability, transportation insecurity, food insecurity, and IPV/toxic stress for a subset of Medicaid beneficiaries. PHPs and their care managers are responsible for determining who is eligible for services and which services they will receive.

HOP services are delivered through innovative regional networks of community-based organizations and social services agencies (collectively called 'human service organizations' [HSOs]) to address needs across all domains. Each regional network is established, managed, and overseen by Network Leads (NLs) (previously referred to as Lead Pilot Entities or LPEs). These organizations serve as the essential connection between PHPs and HSOs, along with clinical care teams when appropriate. Network Leads are local organizations, embedded in the communities they serve. On May 27, 2021, following a competitive procurement process, NCDHHS announced the selection of three NLs to

contract with the PHPs to develop, manage and oversee a network of HSOs providing Pilot services to their eligible enrollees (see **Figure 1**).

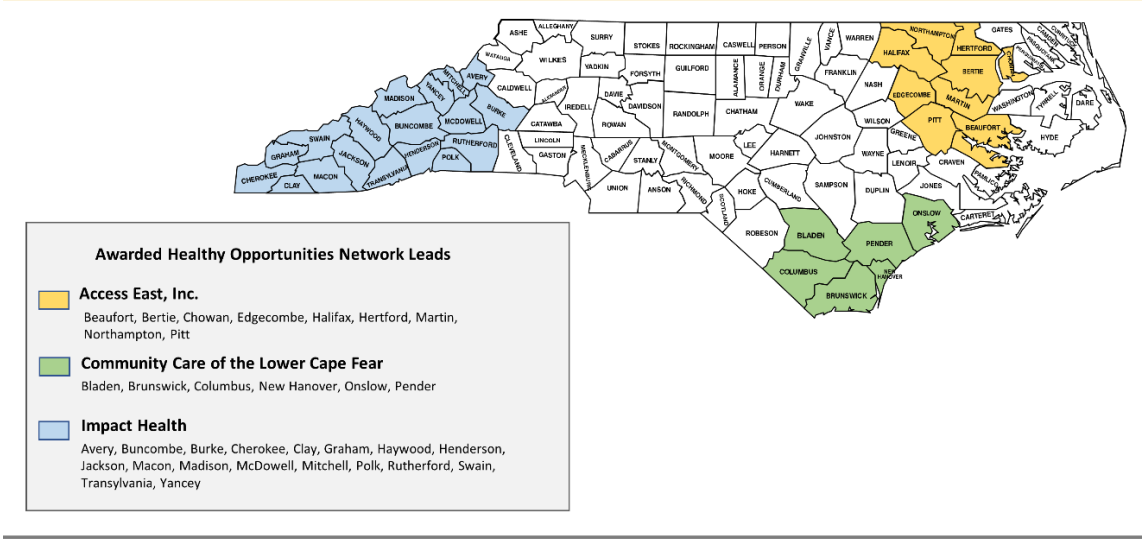


Figure 1. Pilot Regions (Source: NCDHHS)

Coordination among these entities, and the infrastructure necessary to support it, is intended to help address beneficiaries' non-medical needs in a way that conventional healthcare has not been able to do. Care managers providing coordination and monitoring of Pilot services can be embedded within PHPs, or within local Tier 3 Advanced Medical Homes (AMH) (which provide primary care) or their affiliated Clinically Integrated Networks (CIN). Relationships between entities are depicted in **Figure 2.**

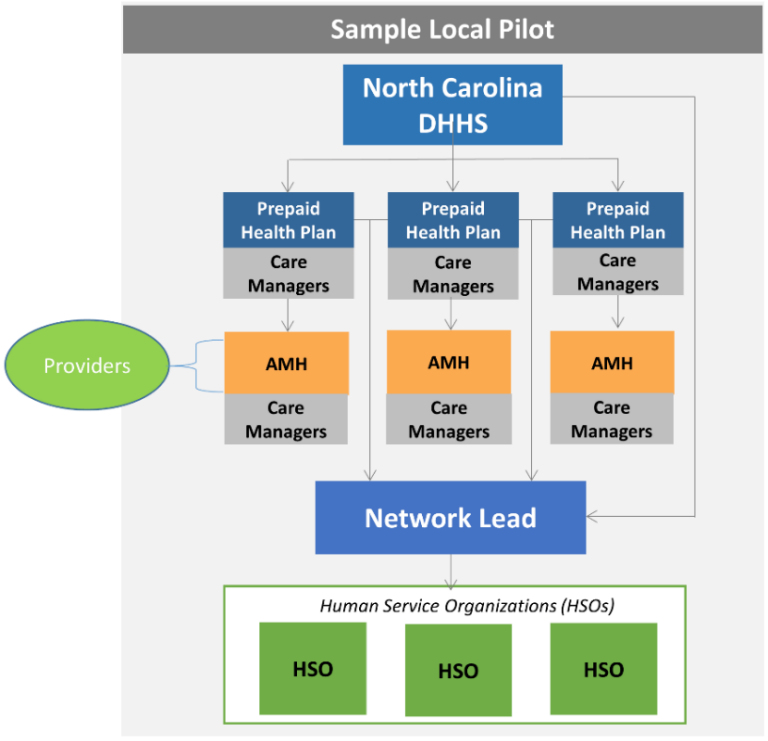
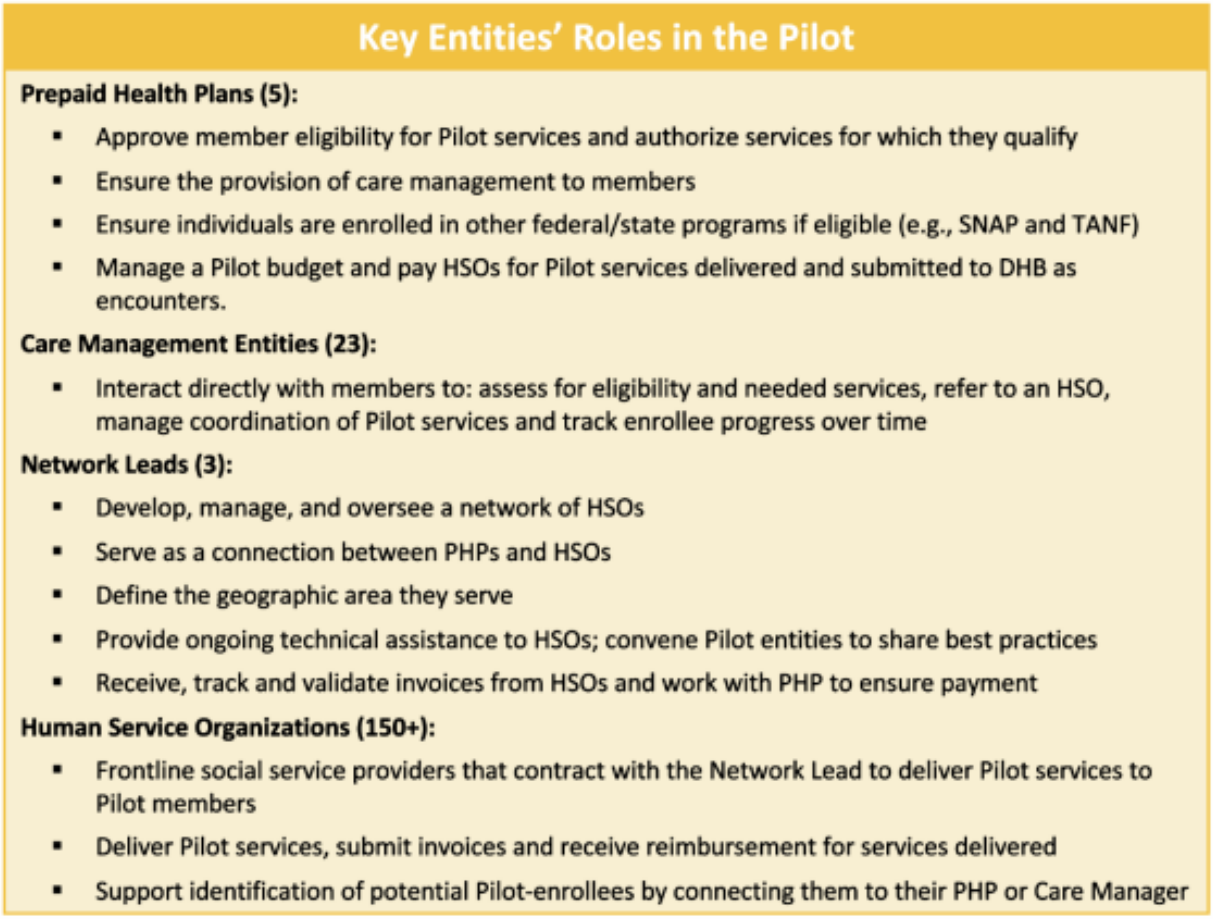


Figure 2. Schematic of Pilot Organization (Source: NCDHHS)

The primary responsibilities of the entities involved in delivering Pilot services across PHPs, Care Managers, NLs, and HSOs are depicted in **Figure 3**. Care Managers can be embedded within PHPs, or within local Tier 3 Advanced Medical Homes (AMH) (which provide primary care) or their affiliated Clinically Integrated Networks (CIN).

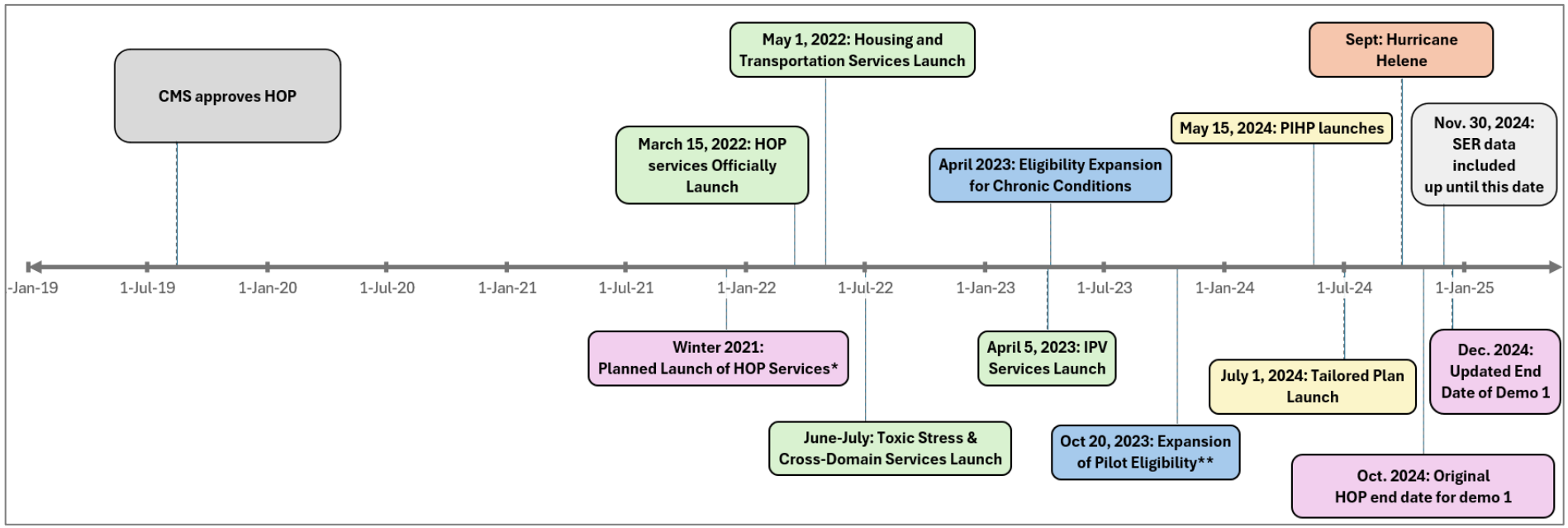


Note: SNAP (Supplemental Nutrition Assistance Program) and TANF (temporary Assistance for Needy Families)

Figure 3. Roles of Entities in the Pilots (Source: NCDHHS)

HOP Implementation Timeline & Services Domains

On March 15, 2022, delivery of food services launched in all three Pilot regions, followed by housing and transportation on May 1, 2022. Cross-domain and toxic stress services became available on June 15, 2022. Delivery of IPV-related services began on April 5, 2023 (**Figure 4**). Prior to May 15, 2024, HOP was only available to eligible beneficiaries enrolled in one of five Standard Plans.[d] On July 1, 2024, Behavioral Health and Intellectual/Developmental Disabilities Tailored Plans (Tailored Plans[e]) officially launched for NC Medicaid.[f] These plans (Alliance Health, Partners Health Management, Trillium Health Resources and Vaya Health) are Medicaid Managed Care health plans for individuals with severe mental illness, traumatic brain injuries, substance use disorder, and/or intellectual/developmental disabilities (I/DD). Additionally, these plan



[d] https://ncmedicaidplans.gov/en/nc-medicaid-managed-care-health-plans
[e] https://ncmedicaidplans.gov/en/tailored-plan-services
[f] https://www.ncdhhs.gov/news/press-releases/2024/04/10/july-1-launch-behavioral-health-and-intellectualdevelopmental-disabilities-tailored-plans

entities operate as Local Management Entities/Managed Care Organizations (LME/MCOs) for the Medicaid Direct population in need of tailored care management.[g]

Figure 4. HOP Timeline

Figure 4 notes: *COVID altered planned start date
**October 2023 Eligibility expanded to include intellectual or developmental disability (I/DD), traumatic brain injury (TBI), and clinical eligibility criteria for Tailored Care Management as qualifying criteria for adults, pregnant individuals, and children 0-20. https://www.ncdhhs.gov/1115-waiver-update-attachment-g2023/download?attachment

[g] https://medicaid.ncdhhs.gov/blog/2024/05/15/healthy-opportunities-pilot-launches-medicaid-direct-populations

For this reason, the volume of IPV-related services is lower than that of other service types, and evaluation regarding these services is more limited. Examples of Pilot services are presented in **Figure 5**. The Healthy Opportunities Pilots Fee Schedule, which provides a more complete description of the services, is provided as an attachment.

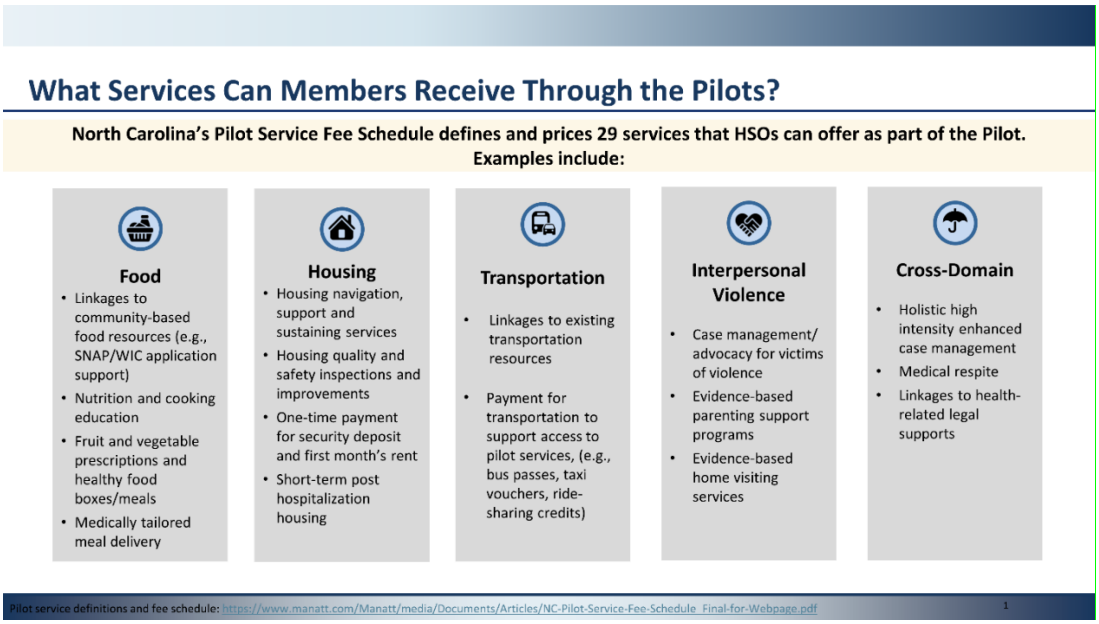


Figure 5. Example Pilot Services (Source: NCDHHS)

On March 21, 2023, North Carolina launched a separate pathway to receive one specific service to address food needs. This was a direct-to-consumer 'expedited enrollment' program that provided a fruit and vegetable prescription.

Populations Served: Health Needs & Social Risk Factors

The Pilots provide services for certain high-risk, high-need individuals who live in a Pilot region and meet criteria for physical/behavioral health and social risk factors. The physical/behavioral health criteria as approved in the Evaluation Design are presented in **Table 1**, and the health-related social needs that serve as social risk factors as approved in the 1115 Waiver revision are presented in **Table 2**. Over the course of the demonstration period, changes to these criteria have been made through waiver revisions. One change was that, in April 2023, the Pilots were approved to expand the list of chronic conditions that determine Pilot eligibility. That expansion added chronic mental illness, cancer, autoimmune disorders, and chronic liver disease as conditions that made individuals eligible for Pilot services.

Another change included the approval to allow intellectual or developmental disability, traumatic brain injury, or clinical eligibility for Tailored Care Management (North Carolina's Health Home Benefit, SP 22-0024) as clinical eligibility criteria for adults, pregnant individuals, and children aged 0-20.

Table 1. Physical/Behavioral Health Needs-Based Criteria at time of HOP Approval

Eligibility Category	Age	Needs-Based Criteria (at least one, per eligibility category)
Adults	≥21	• 2 or more chronic conditions. Chronic conditions that qualify an individual for pilot enrollment include: BMI over 25, blindness, chronic cardiovascular disease, chronic pulmonary disease, congenital anomalies, chronic disease of the alimentary system, substance use disorder, chronic endocrine and cognitive conditions, chronic musculoskeletal conditions, chronic neurological disease and chronic renal failure, in accordance with Social Security Act section 1945(h)(2). • Repeated incidents of emergency department use (defined as more than four visits per year) or hospital admissions (≥1 in past year).
Pregnant Individuals	Any	• Multifetal gestation • Chronic condition likely to complicate pregnancy, including hypertension and mental illness • Current or recent (month prior to learning of pregnancy) use of drugs or heavy alcohol • Adolescent ≤ 15 years of age • Advanced maternal age, ≥ 40 years of age • Less than one year since last delivery • History of poor birth outcome including: preterm birth, low birthweight, fetal death, neonatal death
Children	0-3	• Neonatal intensive care unit graduate • Neonatal Abstinence Syndrome • Prematurity, defined by births that occur at or before 36 completed weeks gestation • Low birth weight, defined as weighing less than 2500 grams or 5 pounds 8 ounces upon birth • Positive maternal depression screen at an infant well-visit
	0-20	• One or more significant uncontrolled chronic conditions or one or more controlled chronic conditions that have a high risk of becoming uncontrolled due to unmet social need, including: asthma, diabetes, underweight or overweight/obesity as defined by having a BMI of <5th or >85th percentile for age and sex, developmental delay, cognitive impairment, substance use disorder, behavioral/mental health diagnosis (including a diagnosis under DC: 0-5), attention- deficit/hyperactivity disorder, and learning disorders • Experiencing three or more categories of adverse childhood experiences (e.g. Psychological, Physical, or Sexual Abuse, or

Eligibility Category	Age	Needs-Based Criteria (at least one, per eligibility category)
		Household dysfunction related to substance abuse, mental illness, parental violence, criminal behavioral in household) • Enrolled in North Carolina's foster care or kinship placement system

Table 2. Social Risk Factors at time of HOP Approval

Risk Factor	Definition
Homelessness or housing insecurity	Homelessness, as defined in 42 C.F.R. § 254b(h)(5)(A), or housing insecurity, as defined based on the principles in the questions used to establish housing insecurity in the Accountable Health Communities Health Related Screening Tool or the North Carolina Social Determinants of Health (SDOH) screening tool.
Food Insecurity	As defined by the US Department of Agriculture commissioned report on Food Insecurity in America: • Low Food Security: reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake. • Very low food security: Reports of multiple indications of disrupted eating patterns and reduced food intake • Or food insecure as defined based on the principles in the questions used to establish food insecurity in the North Carolina Social Determinants of Health (SDOH) screening tool.
Transportation Insecurity	Defined based on the principles in the questions used to establish transportation insecurities in the Accountable Health Communities Health Related Screening Tool or the North Carolina SDOH screening tool.
At risk of, witnessing, or experiencing interpersonal violence	Defined based on the principles in the questions used to establish interpersonal violence in the Accountable Health Communities Health Related Screening Tool or the North Carolina SDOH screening tool.

Member Participation: Screening & Care Management

Outreach to Medicaid Managed Care members living in Pilot regions was led by PHPs and their care management teams, with support from NLs and HSOs. PHP Care Managers within HOP use the standardized Pilot Eligibility and Service Assessment (PESA) tool in NCCARE360, North Carolina's statewide resource and referral platform, to guide and document initial Pilot eligibility determination, service mix review every three months, and continuing eligibility determination every six months. DHHS leadership articulated a "no wrong door" approach (**Figure 6**) to support screening and connection to services using various referral pathways.

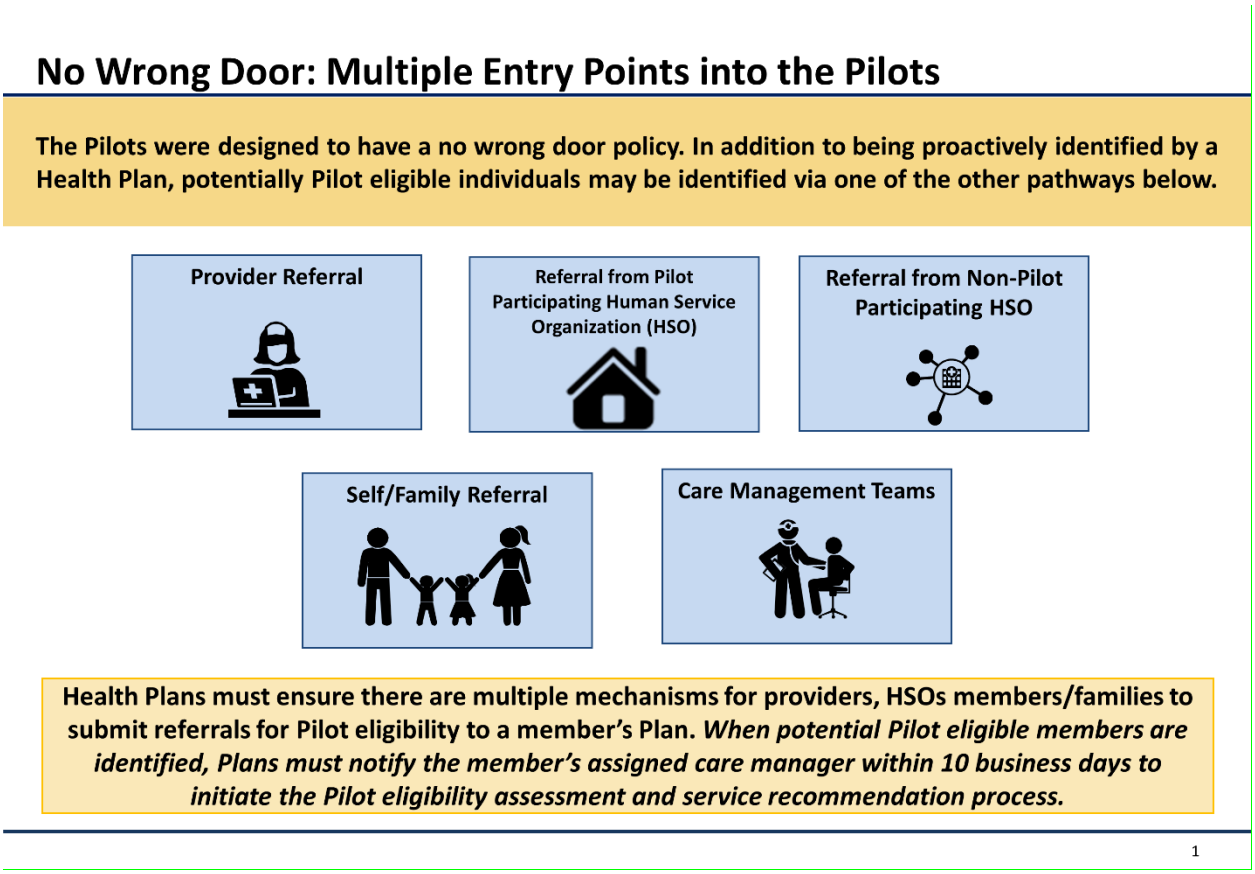


Figure 6. Entry into the Pilots (Source: NCDHHS)

The following Driver Diagram (**Figure 7)** provides a conceptualization of how HOP services may improve health.

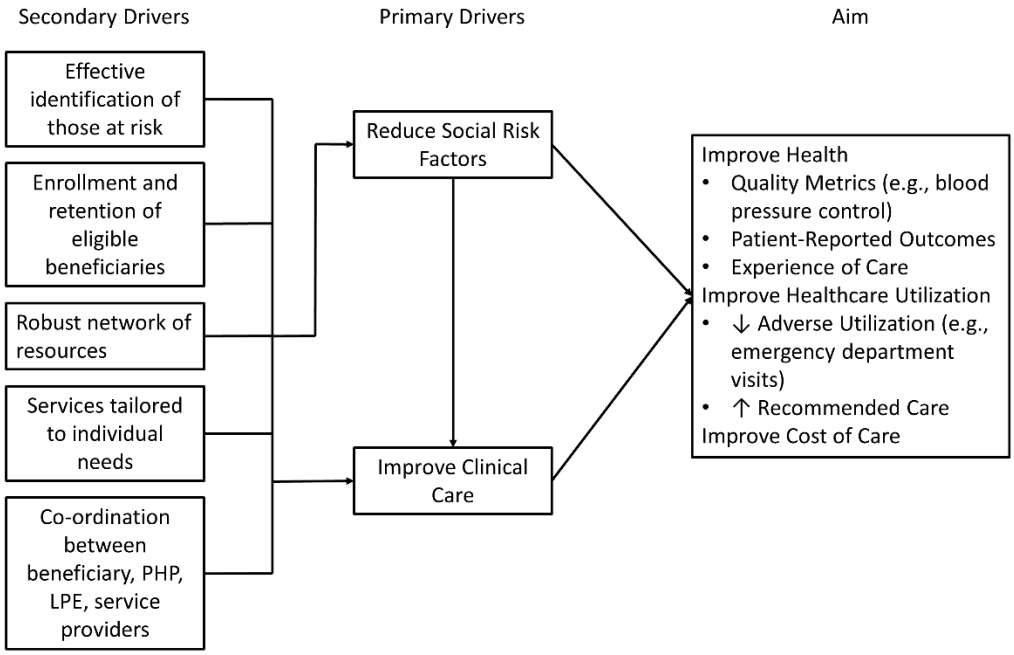


Figure 7. Driver Diagram

Evaluation Questions and Hypotheses

The state of North Carolina's overall goal is to improve North Carolina's Medicaid beneficiaries' health, healthcare utilization, and healthcare spending by building a well-coordinated system that "buys health," not just healthcare. Evaluating how well the Pilots achieve that goal involves evaluating specific questions related to program performance. Three key components of successfully achieving the goals of the Pilots, as outlined in the above Driver Diagram **(Figure 7)**, are identifying beneficiaries with social risks that affect health, enrolling them in the Pilots, and delivering services tailored to address those risks. Achieving these goals promotes the objectives of Titles XIX and XXI by helping to improve health for Medicaid and CHIP beneficiaries. This report describes analyses that break these pieces into the following Evaluation Questions and Hypotheses:

- Evaluation Question 1 ("Effective Delivery of Pilot Services") analyses relate to activities undertaken by NLs and HSOs to establish the necessary infrastructure, workforce, and data systems needed to effectively contract with and build the capacity of a network of HSOs, and to deliver Pilot services once established. Overall, Evaluation Question 1 analyses help test the hypothesis that NLs and HSOs will enable effective delivery of Pilot services.
- Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening and Connection to Appropriate Services") analyses relate to how the coordinated activities of PHPs, NLs, and HSOs facilitate screening for social risk factors/needs and connect a higher proportion of those with social risk factors/needs to services tailored to address these risks in Pilot regions, compared with non-Pilot regions lacking these coordinated activities. Evaluation Question 2 analyses help test the hypothesis that the Pilots will increase rates of Medicaid beneficiaries screened for social risk factors and connected to services that address these risk factors.
- Evaluation Question 3 ("Improved Social Risk Factors") analyses relate to improving the social risk factors that Pilot members experience, across all eligibility categories: adults, pregnant individuals, children ages 0 to 20, and the subset of children ages 0 to 3. Evaluation Question 3 analyses help test the hypothesis that the Pilots will measurably improve the qualifying social risk factors in participants.

- Evaluation Question 4 ("Clinical Outcomes") analyses relate to improving clinical outcomes that may plausibly be affected by the social risk factors that Pilot members experience, across all eligibility categories: adults, pregnant individuals, children ages 0 to 20, and the subset of children ages 0 to 3. Evaluation Question 4 analyses help test the hypothesis that the Pilots will measurably improve clinical outcomes in participants.
- Evaluation Question 5 ("Healthcare Utilization") analyses relate to improving healthcare utilization by addressing the social risk factors that Pilot members experience, across all eligibility categories: adults, pregnant individuals, children ages 0 to 20, and the subset of children ages 0 to 3. Evaluation Question 5 analyses help test the hypothesis that the Pilots will measurably improve healthcare utilization in participants. It is important to note that improved utilization could consist of both decreased utilization (e.g., improved health which would lead to the need for fewer emergency department visits) and increased utilization (e.g., improved attendance at preventive visits).
- Evaluation Question 6 ("Cost of Care") analyses relate to improving cost of care by addressing the social risk factors that Pilot members experience, across all eligibility categories: adults, pregnant individuals, children ages 0 to 20, and the subset of children ages 0 to 3. Evaluation Question 6 analyses help test the hypothesis that the Pilots will measurably improve cost of care. It is important to note that improving cost of care could include decreased total spending, similar total spending simultaneous with improvements in health, and even increases in some spending categories (e.g., increased use of recommended medications or preventive services). Thus, interpretation of Evaluation Question 6 results requires nuance. One goal of HOP was to improve health and thereby decrease the need for ED visits and inpatient hospitalization, which would tend to reduce spending. Other goals of HOP could tend to increase spending, however, such as increasing outpatient utilization and medication possession.

Methodology

Evaluation Design

The methodology to address evaluation questions is described briefly in this section, with more details in the subsequent 'Analytic Methods' section.

Evaluation Question 1 ("Effective Delivery of Pilot Services") is descriptive in nature, and so it does not involve comparisons or inferential statistics. Methodology for this evaluation question included descriptive statistics, qualitative analysis of in-depth interviews with individuals who work at HSOs, Network Leads, and PHPs. Names and email addresses of PHP, NL, and HSO staff members were provided to the evaluation team for the purpose of recruitment. After providing informed consent, a Zoom video interview was conducted. Open-ended, in-depth questions were posed during the interviews. Interviews reported in this document were conducted in 2024, to enable interviewees to reflect on experiences throughout the demonstration period. In addition, we also surveyed and conducted interviews with Network Lead and HSO staff members in 2022 (as they were preparing to deliver Pilot services). Since these results were previously in Rapid Cycle Assessment 1, they are not included in this report.

For Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening and Connection to Appropriate Services") analyses, we used a cross-sectional comparative design, comparing Medicaid beneficiaries in HOP regions to Medicaid beneficiaries outside of operating HOP regions, examining the entire demonstration period.

Evaluation Question 3 ("Improved Social Risk Factors") analyses used a within-participant interrupted time series design, evaluating the prevalence and number of health-related social risks as a function of time and Pilot participation. We also used a between-participant comparative interrupted time series (CITS) design, evaluating the prevalence of health-related social needs as function of time and receipt of specific Pilot services, comparing Pilot participants who used different services to address risk factors (e.g., a fruit and vegetable prescription vs. a food box).

Evaluation Question 4 ("Clinical Outcomes") analyses used multiple methods. These included two-period difference-in-differences models for outcomes related to birth weight, CITS analyses for outcomes related to hemoglobin A1c and blood pressure, and repeated measures regression models of longitudinal survey responses for participant-reported outcomes. For analyses of birth weight, hemoglobin A1c, and blood pressure outcomes, the analytic sample included both HOP participants and

a 'non-HOP' group of individuals living outside of counties eligible for HOP services, but who report social risks through state screening programs (and thus likely would have been eligible for HOP had they lived in HOP counties). The purpose of including the non-HOP group was to account for possible 'secular trends'—factors affecting Medicaid beneficiaries in North Carolina aside from HOP. Longitudinal surveying was conducted only among HOP beneficiaries; therefore, comparisons were made within participants. Evaluation Question 4 analyses also included qualitative analysis of in-depth interviews with HOP beneficiaries (or their proxies, in the case of younger children).

Evaluation Question 5 ("Healthcare Utilization") analyses principally used two methods. The first was CITS models, used to examine outcomes related to emergency department visits, inpatient admissions, and outpatient visits. The second was two-period difference-in-differences models, used to examine outcomes related to specific types of outpatient utilization (timely prenatal care, postpartum visits, and well-child visits), along with medication possession for children with asthma. These analytic samples included both HOP participants and a 'non-HOP' group of individuals living outside of counties eligible for HOP services, but who report social risks through Medicaid screening programs (and thus likely would have been eligible for HOP had they lived in HOP counties). The purpose of including the non-HOP group was to account for possible 'secular trends'—factors affecting Medicaid beneficiaries in North Carolina aside from HOP.

Evaluation Question 6 ("Cost of Care") analyses used two designs. To examine spending on medical care and direct HOP services for a specific individual, we used a CITS design that included both HOP participants and a 'non-HOP' group of individuals living outside of counties eligible for HOP services, but who report social risks through Medicaid screening programs (and thus likely would have been eligible for HOP had they lived in HOP counties). The purpose of including the non-HOP group was to account for possible 'secular trends'—factors affecting Medicaid beneficiaries in North Carolina aside from HOP. To examine HOP administrative and capacity building spending, we conducted descriptive statistics.

Target and Comparison Populations

For Evaluation Question 1 ("Effective Delivery of Pilot Services") analyses – which related to establishing the infrastructure necessary to deliver Pilot services and subsequent delivery of services, the target population was HOP beneficiaries and staff from organizations involved in HOP: HSOs, Network Leads, and PHPs.

For Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening") analyses—which related to comparisons of risk factor screening for those in the Pilot and non-Pilot regions—the target population was Medicaid beneficiaries in the Pilot regions and the comparison population was Medicaid beneficiaries in non-Pilot regions.

For Evaluation Question 3 ("Improved Social Risk Factors") analyses, which related to changes in social risks, the target population was Pilot participants. Given the design used to construct the non-HOP sample, explained in more detail in the 'Analytic Methods' section below, we were not able to make use of data from the non-HOP group for these analyses. For comparative effectiveness analyses, comparisons were made by comparing HOP participants who received one type of service to HOP participants who received different types of services.

For Evaluation Question 4 ("Clinical Outcomes") analyses, the target population was HOP beneficiaries. Except for outcomes derived from surveying, where data for non-HOP participants was not available, these analyses used data from a 'non-HOP' group of individuals living outside of counties eligible for HOP services, but who report social risks, to help account for possible 'regression to the mean' and 'secular trends'—factors that could have led to a change in outcomes not attributable to HOP. For analyses involving interviews and longitudinal surveys, the target population was HOP beneficiaries.

For Evaluation Question 5 ("Healthcare Utilization") analyses, the target population was HOP beneficiaries. These analyses also used data from a 'non-HOP' group of individuals living outside of counties eligible for HOP services, but who report social risks, to help account for possible 'regression to the mean' and 'secular trends'—factors that could have led to a change in outcomes not attributable to HOP. For comparative effectiveness analyses, comparisons were made by comparing HOP participants who received one type of service to HOP participants who received different types of services.

For Evaluation Question 6 ("Cost of Care") analyses, the target population was HOP beneficiaries. These analyses also used data from a 'non-HOP' group of individuals living outside of counties eligible for HOP services, but who report social risks, to help account for possible 'regression to the mean' and 'secular trends'—factors that could have led to a change in outcomes not attributable to HOP. For comparative effectiveness analyses, comparisons were made by comparing HOP participants who received one type of service to HOP participants who received different types of services.

Evaluation Period

The goal of this report was to evaluate the delivery of HOP services provided during the first 1115 Waiver Demonstration Period in North Carolina. For the purposes of this report, we have included services provided from March 15, 2022 (the start of HOP service delivery), through November 30, 2024. As described in the 'Analytic Methods' section below, many analyses include data from before the demonstration period to help establish pre-existing trends, which HOP may have changed. For these analyses, data can go back to January 1, 2021, approximately 1 year before HOP services began.

Evaluation Measures

Measures used are presented in **Table 3**.

Table 31. Measures Used in Summative Evaluation Report

Measure Name	Measure Description
Positive Screens for Unmet Social Needs	The percentage of beneficiaries who reported unmet social needs within NCCARE360 data within measurement period, reported by non-mutually exclusive categories of: • Food Insecurity • Housing Instability or Homelessness • Transportation Barrier • Experience Interpersonal Violence or Toxic Stress-related concern
Total Social Needs	Count of Unmet Social Needs (also referred to as risk factors or risks)
Positive Screens for Unmet Social Needs Connected to Services	The percentage of beneficiaries who reported unmet social needs within NCCARE360 data within measurement period, who received at least 1 invoiced service to address their needs
Rate of Screening for Unmet Social Needs	The percentage of Medicaid beneficiaries screened for unmet social needs from the health risk screening within measurement period
Number of Participants (Beneficiaries) Served	The total number of Pilot participants who received at least 1 invoiced Pilot service in the reporting period
Number Lost to Follow-up	The total number of participants lost to follow-up (could no longer be reached by care managers)
Number Withdrawn	The total number of participants who have withdrawn from the Pilots

Payment Completion	Percentage of completed payments made to HSOs
Payment Lag Time	Time from receipt of service to payment completion
Pilot Participants	Number of Medicaid members who enrolled in the Pilots
Dollars Paid	Dollar amount paid for Pilot services
Mean Payment Lag	Mean calendar days from HSO creating invoice to NL to PHP effectuating payment to HSO
Total Amount Invoiced	Total dollar amount invoiced for Pilot services
HSO Referrals	Number of referrals sent to human service organizations (HSO)
Services Invoiced	Number of services invoiced for during the assessment period
Mean business days from Pilot eligibility assessment to service delivery	Mean number of days between Pilot eligibility assessment and delivery of first invoiced Pilot service for those who enrolled in the Pilots
Low Birth Weight	The percentage of births with birthweight <2500g
Very Low Birth Weight	The percentage of births with birthweight <1500g
Birthweight	Birthweight in grams
Hemoglobin A1c	Hemoglobin A1c % for individuals with diabetes mellitus
Hemoglobin A1c < 9.0%	Indicator of Hemoglobin A1c < 9.0% for individuals with diabetes mellitus
Systolic Blood Pressure	Systolic blood pressure in mm Hg, for individuals with either hypertension or diabetes mellitus
Systolic Blood Pressure < 140 mm Hg	Systolic blood pressure < 140 mm Hg, for individuals with either hypertension or diabetes mellitus
Diastolic Blood Pressure	Diastolic blood pressure in mm Hg, for individuals with either hypertension or diabetes mellitus
Diastolic Blood Pressure < 90 mm Hg	Diastolic blood pressure < 90 mm Hg, for individuals with either hypertension or diabetes mellitus
Self-Rated Health Status	Self-Rated Health Status[19]
Healthy Days	Number of 'healthy days' reported in last month[19]
PROMIS Score	PROMIS health-related quality of life score[20,21]
Econ-QOL Score	Economic quality of life score[22]
Emergency Department Visits	Count of Emergency Department (ED) visits
Inpatient Admissions	Count of Inpatient Admissions for all causes, and for specific categories of Medical, Surgical, and Maternity admissions. Medical, Surgical, and Maternity admissions are categorized following

	NCQA HEDIS Measure Year 2023 methodology for the IPU metric.
Outpatient Visits	Count of Outpatient Visits
Prenatal Care	Timeliness of Prenatal Care. The percentage of deliveries that received a prenatal care visit as a beneficiary of the organization in the first trimester, on the enrollment start date or within 42 days of enrollment in the organization.
Postpartum Care	Postpartum Care. The percentage of deliveries that had a postpartum visit on or between 21 and 56 days after delivery.
Well Child Visits	Indicator of whether a well-child visit occurred in the following categories: between the ages of 0 and 15 months, between the ages of 0 to 30 months, and annually between the ages of 3 and 21. Annual well child visits between the ages of 3 and 21 are further divided into categories of ages 3-6, ages 7-11, and ages 12-21
Medication Management for People with Asthma	The percentage of members 5-18 years of age during the measurement year who were identified as having persistent asthma and were dispensed appropriate medications that they remained on for at least 75% of the treatment period, reported as rates for ages 5-11 and ages 12-18.
Total Cost of Care	Total PHP spending on services, per beneficiary per month. This includes both medical care (including pharmacy) costs and, for Pilot participants, invoices for Pilot services recorded in the Encounter Processing System (EPS).
Total Cost of Care + Administrative Spending	Total Cost of Care, as above, plus North Carolina Medicaid spending on ongoing HOP administrative payments to PHPs and NLs, made on quarterly or annual basis and related to the ongoing costs necessary to provide Pilot services.
Medical Care Spending	Total PHP spending on medical care (including pharmacy) costs, per beneficiary per month. This measure excludes HOP spending.
Capacity Building Spending	One-time payments made by North Carolina Medicaid to NLs (and subsequently dispersed to HSOs) that represent investments in local community organizations, not connected to caring for specific individuals in the demonstration period.

Data Sources

This evaluation used several data sources. Data regarding HOP operations came from the NCCARE360 platform. Data regarding NC Medicaid member characteristics and healthcare services use came from NC Medicaid administrative files—which includes both the member file that contained demographic information and encounters data (from the Encounter Processing System) that contained information for encounters that delivered specific medical care and Pilot related services. Encounters data is sometimes colloquially referred to as 'claims' data even after the transition to Medicaid managed care. Data cleaning and validation for NCCARE360 and NC Medicaid data was conducted by several organizations including HOP's technology vendor, NCDHHS, and the Sheps Center. The HOP technology vendor was competitively procured by the Foundation for Health Leadership and Innovation. In cooperation with NCDHHS, they developed the statewide NCCARE360 referral platform. This platform included core functionalities used for Pilot enrollment, tracking, referrals, and invoicing. Additional data sources, such as vital records data, were also used for specific purposes (e.g., use of birth certificate data to help determine pregnancy status). Data on hemoglobin A1c and blood pressure came from the North Carolina Health Information Exchange, NC HealthConnex. Data on social risks not contained within NCCARE360 came from NC Medicaid's Care Needs Screening report (report ID BCM026), provided by PHPs, which reports social risk screening attempts and screening results. Data on administrative and capacity building spending came from reports generated by NCDHHS.

Specifically for purposes of the evaluation, we also conducted primary data collection in the form of surveys administered to HOP beneficiaries. HOP beneficiaries were surveyed at three timepoints: soon after HOP enrollment (0-4 months after initial enrollment in HOP), approximately 6 months after the initial survey, and approximately 12 months after the initial survey. To complete these surveys, the survey team was provided names, age, Pilot region, sex, and phone numbers for HOP beneficiaries, as was provided at time of HOP enrollment. The survey team then conducted up to 5 outreach attempts to recruit beneficiaries (or caregiver proxies for children 1-12). Participants provided consent prior to completing the survey. Survey data collection occurred from June 15, 2023 through February 6, 2026. In addition, we conducted interviews with HOP beneficiaries or caregiver proxies and staff at organizations involved in HOP service delivery.

Analytic Methods

This section describes analytic methods used for each evaluation question along with considerations that led to their selection. For all analyses, the HOP group was defined as individuals who ever enrolled in HOP, using data from the HOP enrollment roster, which came from NCCARE360 data. Analyses followed the intention-to-treat approach in the sense that all individuals who enrolled in HOP were analyzed as being in the HOP group, regardless of whether they ever received HOP services or subsequently disenrolled from HOP. HOP enrollees were assigned an 'index date', defined as the date they enrolled in HOP. Unless otherwise specified, all available data on an individual, starting 12 months before their index date and extending to November 30, 2024, were analyzed.

As described in more detail below, when relevant and feasible, analyses also incorporated data from individuals who were not eligible for HOP on the basis of living in a non-HOP county, but who reported a social risk, and thus likely would have been eligible for HOP had they lived in a HOP region. Their index date was assigned as the date they first reported a social risk. HOP eligibility criteria include both clinical and social risk factors. While the required social risk factors are clearly documented in the Care Needs Screening (BCM026) reports, clinical eligibility criteria do not map neatly to ICD-10 codes or other available data, meaning that clinical eligibility criteria do not create a 'computable phenotype'. To address this, we created a clinical eligibility flag variable. To construct this variable, we reviewed all ICD-10 codes documented for HOP participants, and flagged those judged by a physician as potentially reflecting one of the clinical eligibility criteria for HOP. One way this variable could be used would be to exclude all individuals in the non-HOP group who do not have this flag. However, when applied to the HOP group, the sensitivity of this variable was not sufficiently high to justify its use in this manner. Therefore, it was used as an adjustment variable, rather than as an inclusion criterion, for analyses. This effectively stratifies analyses on the basis of the presence or absence of this criterion, facilitating 'apples to apples' comparisons. As with HOP participants, unless otherwise specified, all available data on an individual in the non-HOP group, starting 12 months before their index date and extending to November 30, 2024, were analyzed.

Evaluation Question 1 ("Effective Delivery of Pilot Services") analyses used descriptive statistics and qualitative analysis. Interviews with HOP organizations (HSOs, PHPs, and NLs) were audio-recorded with participant permission and transcribed verbatim, except for one interview that was not audio-recorded per participant request. That interview was manually transcribed as close to verbatim as possible during the interview. Identifiable information was removed from the transcripts before

analysis. Audio files and transcriptions were stored on the secure protected server available only to the evaluation team members. Transcripts were reviewed alongside the audio files for accuracy and completeness and were then imported into ATLAS.ti 24.2.1, a qualitative software program, to facilitate analysis. A direct form of content analysis was used to analyze the interviews.[23,24] The qualitative research team collaborated to develop a codebook based on the interview questions and notes taken during data collection. The initial codebook was pilot tested by independently coding a transcript, which led to fine-tuning concept definitions and revising decision rules. This process continued until replicability occurred across coders. The final version of the codebook (**Table A88**) was then applied to the remaining transcripts. Standard consensus coding guidelines were followed, where any emerging theme or discrepancy was captured and reconciled through discussion and consensus. Once the coded transcripts were reconciled, code reports were generated for each code and narrative summaries were written. These code summaries included a narrative description of the themes and sub-themes that emerged related to each code. Illustrative quotes were compiled into tables to highlight each theme.

Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening") analyses used descriptive statistics of program administration data and chi-squared tests for inference. Since the goal of these analyses was to assess screening prevalence as it occurred, adjusted estimates were not relevant.

For Evaluation Questions 3-6, our preference, when possible, was to produce difference-in-differences estimates that compared how outcomes changed after enrolling in HOP by incorporating information from both the pre-index period (that is, the period before HOP enrollment among HOP participants), and information on how outcomes changed among non-HOP participants from the pre-index to the post-index period. Using this information from non-HOP participants helps account for other factors, aside from HOP, that occurred during the same time and could affect evaluation outcomes, such as 'regression to the mean', the natural history of social risk and clinical conditions, and 'secular trends' such as other changes to North Carolina Medicaid, fluctuations in the COVID-19 public health emergency, and changes in macroeconomic conditions such as unemployment or inflation.

There are several ways to produce difference-in-differences estimates. Our preferred method, when feasible, was to fit comparative interrupted time series (CITS) models, and then use the fitted models to produce difference-in-differences estimates using predictive margins. Equivalent terms for CITS models are 'interrupted time series with comparison group' or 'controlled interrupted time series.' CITS models the overall level of the outcome, the trend (change in outcome over time) during the entire

period, the change in the level of the outcome that occurs at an 'interruption' point (in this case, the index date), and the change in the trend that occurs after the interruption point, relative to the trend that was modeled before. The CITS approach produces difference-in-differences estimates of the change in level and trend of outcomes in the sense that the change in level (and trend) for the non-HOP group (comparing the pre- and post-index period) can be subtracted from the change in level (and trend) for the HOP group (comparing the pre- and post-index period) to produce an estimate that 'differences out' both time-fixed characteristics of the HOP group and 'secular trends' that affect both groups. One advantage of this approach is that, unlike styles of difference-in-differences analyses that assume parallel trends in the pre-intervention period, the CITS approach directly models the trends in the pre-intervention period.[25–29] Estimates from the CITS approach can still be unbiased in the presence of non-parallel pre-trends under the assumption that both groups would deviate equally from their group-specific pre-intervention trends in the absence of the intervention, which we view as a less stringent assumption than the version of the parallel trends assumption that other approaches to difference-in-differences analyses make.

One requirement of the CITS approach is that both the pre-index and post-index time periods can be subdivided into a sufficient number of time periods for a trend to be stably estimated. Rules of thumb generally suggest that 5-10 time periods, both before and after the interruption point, are needed. For many outcomes used in this evaluation, this was feasible, and so the CITS approach was used. Other outcomes, discussed below, do not lend themselves as well to the CITS approach. In total, we used the CITS approach for outcomes relating to hemoglobin A1c, systolic blood pressure, diastolic blood pressure, emergency department visits, inpatient admissions, outpatient visits, total cost of care (including both medical care and direct HOP services spending), total cost of care plus HOP administrative spending, and medical care spending.

For analyses of some outcomes, CITS models were not possible, but incorporating information from the non-HOP group was still possible. In these situations, we fit 'two-period' difference-in-differences models, separating the time analyzed into pre-index and post-index periods, without modeling a trend within those periods. Using CITS was not possible in these cases because the time periods over which the outcomes were observed do not lend themselves to repeated observation as readily as some other outcomes. To illustrate the difference between these types of outcomes, consider the data structure for healthcare spending. For healthcare spending, the amount spent on an individual is observed every month, and so it was feasible to have multiple months observed both before and after

the index date, which enables estimation of a trend. Thus, healthcare spending was an outcome for which CITS analyses were feasible. But, as an example of a situation in which CITS would not work, consider the timely initiation of prenatal care. This outcome can only be observed once per pregnancy, and no individuals have 5-10 pregnancies in both the pre-index and post-index period, so the CITS approach was not possible. Outcomes for which standard two-period difference-in-differences analyses were used were: birthweight outcomes, timely prenatal care, postpartum visits, well-child visits, and asthma medication management.

Finally, in some situations, it was not possible to include data from the non-HOP group. This occurred primarily in two situations. The first was for outcomes related to social risks when evaluating the overall impact of HOP and had to do with how the non-HOP group was constructed. The non-HOP group consisted of individuals who likely would have been eligible for HOP but did not live in regions where HOP was available. To be included in the non-HOP group, this meant that an individual needed to report a social risk (and the date at which they first did this became their index date). However, this also means that, by construction, individuals in the non-HOP group did not report social risks prior to the index date, which throws off the estimation of changes between the pre-index and post-index period (since the pre-index level and trend are both fixed at 0, but then, by construction, increase at the interruption point, using data in this group would bias results in favor of HOP). We note that this issue only affects analyses related to social risks (because they are an eligibility criterion for non-HOP group inclusion). All other outcomes could take any value during the pre-index period, and so this issue does not affect the outcomes used for Evaluation Questions 4-6. Moreover, for Evaluation Question 3 analyses examining the impact of specific HOP services (e.g., one type of food service compared with another), comparisons could be made among HOP participants, and so CITS analyses could be (and were) used in those cases.

The second situation in which data from the non-HOP group could not be used is related to the outcomes collected by survey and interview for Evaluation Question 4. Due to data use agreements and institutional review board requirements around the ability to contact Medicaid beneficiaries, we were only able to contact HOP participants, and so surveys and interviews were not administered to individuals in the non-HOP group.

It is important to remember that a comparison group serves a different purpose in quasi-experimental analyses (such as CITS analyses or two-period difference-in-differences analyses) than in other types of analyses that rely principally on adjustment for measured factors to provide confounding

control. Because the 'first difference' in CITS and other types of difference-in-differences analyses (that is, comparing post-index to pre-index outcomes within a given group) inherently account for time-fixed factors, a comparison group is not needed to account for them, as it would be in analyses based solely on, for instance, outcome regression or propensity score methods.[30] Instead, the purpose of a comparison group in CITS and other types of difference-in-differences analyses is to account for time-varying confounding, such as changes after a social risk is identified, other changes to the Medicaid program, or macroeconomic conditions. This means that, unlike an analysis that relies solely on adjusting for observed characteristics, the comparison group in CITS and other types of difference-in-differences analyses is not expected to be exactly balanced, with regard to the intervention group, on all relevant pre-intervention characteristics (indeed, if that were expected, CITS or other types of difference-in-differences analyses would not be needed).[30] Instead, the key criteria for comparison group creation in CITS and other types of difference-in-differences analyses is that the group be expected to experience similar time-varying factors as the intervention group. Thus, for the purposes of this evaluation, we believe that NC Medicaid beneficiaries with social risks living outside HOP regions form a suitable comparison group.

The analytic methods for Evaluation Question 3 ("Improved Social Risk Factors") consisted of descriptive statistics and individual-level interrupted time series regression analyses. For individual-level interrupted time series regressions evaluating social risks associated with Pilot participation overall, regression models generally took the form[h]:

$$\mathbf{E}[\boldsymbol{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 Participation_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 TimeAfter_{ij}} + \boldsymbol{\beta_4 Covariates_{ij}}$$

Where 'i' indexes a unique individual observed on a particular day 'j'. 'E[Y]' represents the expected value of the outcome, participation is an indicator of whether an individual was participating in the Pilots on the date of observation, 'time' indicates the number of days relative to the participant's initial needs assessment, 'time after' indicates the number of days after the start of Pilot services, and 'covariates' represent a vector of adjustment factors. Unless otherwise specified, covariates adjusted for were: age, sex, race and ethnicity, disability status, index date, quarter of observation (to account for seasonality), rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), and an indicator of whether an individual, based

[h] Throughout the document, as a possible abuse of notation, we write model formulae in expected value format (given the use of generalized linear models) and with individual and time subscripts for clarity

on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment. Models were fit using regression models with response distributions appropriate to the outcome type (e.g., Poisson distribution for the total number of risks or binomial distribution for the probability of a particular need) and link functions appropriate to the response distribution (e.g., log link for Poisson distribution and logit link for binomial distribution). The purpose of covariate adjustment was to help strengthen the plausibility of the parallel trends assumption. Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the interrupted time series regression model, we created marginalized estimates of quantities of interest using the margins command in Stata. This approach is also termed marginalization, predictive margins, average marginal effects, recycled predictions for binary variables, or the parametric g-computation formula. We targeted an average treatment effect on the treated (ATT) estimand for these analyses.

For analyses of whether specific HOP services differentially reduced social risks compared with other services, we fit individual-level CITS regression models. These models generally took the form:

$$\begin{aligned}\mathbf{E}[\boldsymbol{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 ServiceStart_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 TimeAfter_{ij}} + \boldsymbol{\beta_4 ServiceType_{ij}} \\ + \boldsymbol{\beta_5 ServiceType_{ij}} * \boldsymbol{ServiceStart_{ij}} + \boldsymbol{\beta_6 ServiceType_{ij}} * \boldsymbol{Time_{ij}} \\ + \boldsymbol{\beta_7 ServiceType_{ij}} * \boldsymbol{TimeAfter_{ij}} + \boldsymbol{\beta_8 Covariates_{ij}}\end{aligned}$$

Where ‘i' indexes a unique individual observed on a particular day ‘j’. ‘E[Y]’ represents the expected value of the outcome, ‘service start’ is an indicator of whether the data point was observed before or after the start of the specific service examined, ‘time’ indicates the number of days relative to start of observation, ‘time after’ indicates the number of days after the start of the specific service, and ‘service type’ is an indicator of the specific service the individual received. The interaction terms allow for modeling of different intercepts and trends by service types. ‘Covariates’ represents a vector of adjustment factors. Unless otherwise specified, covariates adjusted for were: age, sex, race and ethnicity, disability status, index date, quarter of observation (to account for seasonality), rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), and an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment. The purpose of covariate adjustment was to help strengthen the plausibility of the parallel trends assumption. Models were fit using regression models with response distributions appropriate to

the outcome type (e.g., Poisson distribution for the total number of risks or binomial distribution for the probability of a particular need) and link functions appropriate to the response distribution (e.g., log link for Poisson distribution and logit link for binomial distribution). Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the regression models, we created marginalized estimates of quantities of interest using the margins command in Stata. We targeted an ATT estimand for these analyses.

The services of interest and their comparisons vary for different social risks. Within a service category, there are a variety of services that might meet an individual's need. Some of these services are not clear substitutes for each other (that is, they may be used in very different situations). However, others might plausibly substitute for each other, so questions of their comparative effectiveness in addressing social risks are relevant. For food services, we compared three types of services (combining some sub-categories for reasons of sample size): 1) a fruit and vegetable prescription, 2) a food box (large or small, for delivery or pick up), and 3) prepared meals (either a 'healthy' meal [for pick up or delivered] or a 'medically tailored' meal [delivered]). For housing services, we compared three types of services (combining some sub-categories): 1) housing navigation, support, and sustaining services, 2) essential utility set up, and 3) home remediation, safety and quality inspection, or accessibility and safety modifications. For transportation services, we compared two types of services: 1) health-related private transportation and 2) health-related public transportation. Sample sizes did not permit comparisons of IPV services. There were also some service types (e.g., move-in services within the housing category), where sample sizes did not permit comparisons. Within each category, we only compared individuals who had received only one type of service (e.g., only prepared meals or only a fruit and vegetable prescription), to permit 'clean' comparisons.

Analytic methods for Evaluation Question 4 ("Clinical Outcomes") varied across outcomes. For outcomes related to birthweight, we fit two-period difference-in-differences models, as the data structure with these outcomes was not amenable to fitting CITS models. The difference-in-differences regression models took the form:

$$\mathbf{E}[\boldsymbol{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 HOP_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 HOP_{ij} * Time_{ij}} + \boldsymbol{\beta_4 Covariates_{ij}}$$

Where 'i' indexes a unique individual observed on a particular day 'j'. 'E[Y]' represents the expected value of the outcome, 'HOP' is an indicator of whether an individual was a Pilot enrollee or not, 'time' is an indicator of whether the data point was observed before or after the index date (defined as the date of Pilot enrollment for Pilot participants and the date of a positive social risk screen for non-

participants), and 'covariates' represents a vector of adjustment factors. The interaction term allows for the relationship between time and the outcome to vary across Pilot and non-Pilot participants, which allows for a difference-in-differences estimate. The covariates adjusted for were age, sex, race and ethnicity, disability status, index date, rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment, and the difference, in days, between the outcome assessment date and the index date. Models were fit using regression models with response distributions appropriate to the outcome type (e.g., binomial distribution for the probability of a dichotomous outcome or gaussian distribution for a continuous outcome) and link functions appropriate to the response distribution (e.g., logit link for binomial distribution). Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the regression models, we created marginalized estimates of quantities of interest using the margins command in Stata. The purpose of covariate adjustment was to help strengthen the plausibility of the parallel trends assumption. We targeted an ATT estimand for these analyses.

For analyses of hemoglobin A1c and blood pressure (systolic and diastolic) outcomes, we fit individual-level CITS regression models. These models generally took the form:

$$\mathbf{E}[\mathrm{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 ParticipationStart_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 TimeAfter_{ij}} + \boldsymbol{\beta_4 HOP_{ij}} + \boldsymbol{\beta_5 HOP_{ij}} * \boldsymbol{ParticipationStart_{ij}} + \boldsymbol{\beta_6 HOP_{ij}} * \boldsymbol{Time_{ij}} + \boldsymbol{\beta_7 HOP_{ij}} * \boldsymbol{TimeAfter_{ij}} + \boldsymbol{\beta_8 Covariates_{ij}}$$

Where 'i' indexes a unique individual observed on a particular day 'j'. 'E[Y]' represents the expected value of the outcome, 'participation start' is an indicator of whether the data point was observed before or after the index date (defined as the date of Pilot enrollment for Pilot participants and the date of a positive social risk screen for non-participants), 'time' indicates the number of days relative to start of observation (up to 365 days prior to the index date), 'time after' indicates the number of days after the index date (up to November 30, 2024), and 'HOP' is an indicator of whether an individual was a Pilot enrollee or not. The interaction terms allow for modeling of different intercepts and trends by Pilot enrollment status. 'Covariates' represents a vector of adjustment factors. Unless otherwise specified, covariates adjusted for were: age, sex, race and ethnicity, disability status, index date, month of

observation, rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), and an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment. The purpose of covariate adjustment was to help strengthen the plausibility of the parallel trends assumption. Models were fit using regression models with response distributions appropriate to the outcome type (e.g., binomial distribution for the probability of a dichotomous outcome or gaussian distribution for a continuous outcome) and link functions appropriate to the response distribution. Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the regression models, we created marginalized estimates of quantities of interest using the margins command in Stata.

Evaluation Question 4 ("Clinical Outcomes") analyses also included survey data. Surveys relating to experiences with HOP and health-related quality of life were administered to a random sample of HOP participants at three time points: soon after beginning HOP, around 6 months after the initial survey, and around 12 months after the initial survey. Survey respondents were all asked the same questions regarding their ratings of HOP services and HOP's perceived impact on health. However, health-related quality of life items varied based on the age of the individual of interest, because the instruments are only valid for respondents in particular age ranges. For adults ages 18 years and older, our primary health-related quality of life instrument was the 4-item Measuring Heathy Days tool from the Centers for Disease Control and Prevention[19], which includes both self-rated health and questions about how many days, out of the prior 30, that individuals experienced poor physical or mental health, or that poor health interfered with activities. As a measure of health utility, we used the PROMIS-Preference (PROPr) tool[33–35], which yields an overall health utility ranging from 0 to 1 (perfect health), along with utility scores along 7 subdomains. Finally, we used a measure of economic quality of life called EconQOL.[22] These measures are all validated for individuals aged 18 years and older, but are not validated for individuals aged less than 18 years. For HOP participants aged 13 to 17 years, we instead used the PROMIS Pediatric Profile, reported by the individual, which has been validated in that age range and covers 6 health-related quality of life domains. For HOP participants aged 5 to 12 years, we used the PROMIS Parent Proxy Profile, which has been validated in that age range and covers the same 6 health-related quality of life domains as the PROMIS Pediatric Profile. In these cases, a caregiver proxy was surveyed, to provide information about the focal individual. For children aged 1 to 4 years, we used

the PROMIS Early Childhood Global Health scale, as a global measure of functioning. Here again, a caregiver proxy was surveyed, to provide information about the focal individual. For analysis, we compared responses over time, clustering by individual, but did not otherwise adjust results, as adjustments were not of interest given that comparisons were within the same individuals. We produced both unweighted estimates, and weighted estimates that used entropy balancing to produce weights that account for possible demographic differences between survey respondents and the overall HOP population (representativeness or selection weights) and to account for non-response at the 6-month or 12-month timepoint (non-response weights).[36,37] Qualitative data for Evaluation Question 4 analyses were analyzed similarly to qualitative data for Evaluation Question 1 analyses. Data collection and analyses procedures for these data are described in more detail in the Evaluation Question 4 results section.

Analytic methods for Evaluation Question 5 ("Healthcare Utilization") consisted of descriptive statistics, CITS analyses, and two-period difference-in-differences analyses, depending on the outcome analyzed. For analyses of emergency department visits, inpatient admissions, and outpatient visits, we used CITS models. We implemented this approach with regression models that generally took the form:

$$\mathbf{E}[\mathrm{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 ParticipationStart_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 TimeAfter_{ij}} + \boldsymbol{\beta_4 HOP_{ij}} + \boldsymbol{\beta_5 HOP_{ij}} * \boldsymbol{ParticipationStart_{ij}} + \boldsymbol{\beta_6 HOP_{ij}} * \boldsymbol{Time_{ij}} + \boldsymbol{\beta_7 HOP_{ij}} * \boldsymbol{TimeAfter_{ij}} + \boldsymbol{\beta_8 Covariates_{ij}}$$

Where 'i' indexes a unique individual observed on a particular month 'j'. 'E[Y]' represents the expected value of the outcome, 'participation start' is an indicator of whether the data point was observed before or after the index date (defined as the date of Pilot enrollment for Pilot participants and the date of a positive social risk screen for non-participants), 'time' indicates the number of months relative to start of observation (up to 12 months prior to the index date), 'time after' indicates the number of months after the index date (up to 12 months after the index date), and 'HOP' is an indicator of whether an individual was a Pilot enrollee or not. The interaction terms allow for modeling of different intercepts and trends by Pilot enrollment status. 'Covariates' represents a vector of adjustment factors. Unless otherwise specified, the covariates adjusted for were age, sex, race and ethnicity, disability status, index date, quarter of observation (to account for seasonality), rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), an indicator of whether a participant had had a 'triggering event', like an ED visit or inpatient admission,

that may have prompted enrollment in the three months before the index date, and an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment. Covariate adjustment was used to help further support the plausibility of the assumptions needed for CITS analysis.

Given high prevalence of zero values for many of the utilization outcomes, we fit two-part models. These models consisted of a logistic regression first stage model, which estimated whether there was any utilization or not, and a negative binomial second stage to estimate the quantity of utilization, conditional on there being any. We used negative binomial models as protection against overdispersion, but performed robustness checks with Poisson models and did not note meaningfully different estimates. Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the models, we created marginalized estimates of quantities of interest using the margins command in Stata. We targeted an ATT estimand for these analyses.

For analyses of whether specific HOP services differentially affected emergency department visits, inpatient admissions, or outpatient visits compared with other services, we fit individual-level CITS regression models. These models generally took the form:

$$\begin{aligned}\mathbf{E}[\boldsymbol{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 ServiceStart_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 TimeAfter_{ij}} + \boldsymbol{\beta_4 ServiceType_{ij}} \\ + \boldsymbol{\beta_5 ServiceType_{ij}} * \boldsymbol{ServiceStart_{ij}} + \boldsymbol{\beta_6 ServiceType_{ij}} * \boldsymbol{Time_{ij}} \\ + \boldsymbol{\beta_7 ServiceType_{ij}} * \boldsymbol{TimeAfter_{ij}} + \boldsymbol{\beta_8 Covariates_{ij}}\end{aligned}$$

Where ‘i' indexes a unique individual observed on a particular month ‘j’. ‘E[Y]’ represents the expected value of the outcome, ‘service start’ is an indicator of whether the data point was observed before or after the start of the specific service examined, ‘time’ indicates the number of months relative to start of observation, ‘time after’ indicates the number of days after the start of the specific service, and ‘service type’ is an indicator of the specific service the individual received. The interaction terms allow for modeling of different intercepts and trends by service types. ‘Covariates’ represents a vector of adjustment factors. Unless otherwise specified, covariates adjusted for were: age, sex, race and ethnicity, disability status, index date, quarter of observation (to account for seasonality), rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), an indicator of whether a participant had had a ‘triggering event’, like an ED visit or inpatient admission, that may have prompted enrollment in the three months before

the index date, and an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment. The purpose of covariate adjustment was to help strengthen the plausibility of the parallel trends assumption. We again fit two-part models with a logistic first part and negative binomial second part. Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the regression models, we created marginalized estimates of quantities of interest using the margins command in Stata. We targeted an ATT estimand for these analyses.

Within a service category, there are a variety of services that might meet an individual's identified need(s). Some of these services are not clear substitutes for each other (that is, they may be used in very different situations). However, others might plausibly substitute for each other, so questions of their comparative effectiveness for healthcare utilization outcomes are relevant. For food services, we compared three types of services (combining some sub-categories for reasons of sample size): 1) a fruit and vegetable prescription, 2) a food box (large or small, for delivery or pick up), and 3) prepared meals (either a 'healthy' meal [for pick up or delivered] or a 'medically tailored' meal [delivered]). For housing services, we compared three types of services (combining some sub-categories): 1) housing navigation, support, and sustaining services, 2) essential utility set up, and 3) home remediation, safety and quality inspection, or accessibility and safety modifications. For transportation services, we compared two types of services: 1) health-related private transportation and 2) health-related public transportation. Sample sizes did not permit comparisons of IPV services. There were also some service types (e.g., move-in services within the housing category, where sample sizes did not permit comparisons). Within each category, we only compared individuals who had received only one type of service (e.g., only prepared meals or only a fruit and vegetable prescription), to permit 'clean' comparisons.

As noted above, CITS requires a particular data structure—repeated measurements of the outcome in the pre-index and post-index periods. This makes it well suited for outcomes that can occur frequently (e.g., emergency department visits in which a person's emergency department visit use can be recorded on a monthly basis) but less well suited for outcomes that apply only to certain periods in people's lives (e.g., timely prenatal care). For outcomes where a CITS approach was not feasible, we used two-period difference-in-differences analyses in which there was a single pre-index and a single-post index period. For the Evaluation Question 5 ("Healthcare Utilization") outcomes, we used this

approach for outcomes of timely prenatal care, postpartum care, childhood well visits, and asthma medication management. The difference-in-differences regression models took the form:

$$\mathbf{E}[Y_{ij}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 HOP_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 HOP_{ij} * Time_{ij}} + \boldsymbol{\beta_4 Covariates_{ij}}$$

Where 'i' indexes a unique individual observed on a particular time period 'j' (where 'j' corresponds to the assessment window for the outcome of interest, e.g., the period in which initiation of timely prenatal care was assessed). 'E[Y]' represents the expected value of the outcome, 'HOP' is an indicator of whether an individual was a Pilot enrollee or not, 'time' is an indicator of whether the data point was observed before or after the index date (defined as the date of Pilot enrollment for Pilot participants and the date of a positive social risk screen for non-participants), and 'covariates' represents a vector of adjustment factors. The interaction term allows for the relationship between time and the outcome to vary across Pilot and non-Pilot participants, which allows for a difference-in-differences estimate. Unless otherwise specified, the covariates adjusted for were age, sex, race and ethnicity, disability status, index date, rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment, and the difference, in days, between the outcome assessment date and the index date. Models were fit using regression models with response distributions appropriate to the outcome type (e.g., binomial distribution for the probability of a dichotomous outcome). Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the regression models, we created marginalized estimates of quantities of interest using the margins command in Stata. The purpose of covariate adjustment was to help strengthen the plausibility of the parallel trends assumption. We targeted an ATT estimand for these analyses.

Analytic methods for Evaluation Question 6 ("Cost of Care") consisted of descriptive statistics, CITS analyses, and analyses of HOP spending reports produced by human services organization, network leads, prepaid health plans, and the North Carolina Department of Health and Human Services. We broke down cost analyses into separate categories including medical care spending (not including HOP services), direct HOP service spending, administrative and capitation payments related to HOP but not related to specific services received, and capacity building funds.

For analyses of healthcare spending, we used several outcomes to examine HOP's impact from different perspectives. Total cost of care outcomes are usually defined by incorporating all claims made for a specific individual in a specific time period. For this evaluation, we constructed the total cost of care outcome as the combination of medical care spending for a specific individual along with direct spending on HOP services for that specific individual. These types of spending all generate 'claims' data that are captured in the Encounters Processing System. The paid claim amounts were totaled on a monthly basis, to provide a per beneficiary per month outcome. Beyond this total cost of care outcome however, there are also administrative costs related to HOP operations that can be considered to provide additional perspective on spending related to HOP. These payments are made prospectively to PHPs and NLs based on contractual formulae rather than retrospectively based on services provided and so do not appear in claims data. They are also not specific to any given individual, and in a sense represent the cost of having the HOP program available to serve individuals when needed. To include these costs in the evaluation, we summed the administrative spending over the demonstration period and then created a monthly average by dividing the total administrative spending by the number of person-months under observation for the HOP group, beginning with the index month. This essentially added an equal amount of administrative spending to each person-month in HOP. Finally, to examine the impact of HOP on medical care specifically, we created an outcome that only considered medical and pharmacy spending, but did not include HOP services.

For analyses of healthcare spending using each of the three spending outcomes as described above, we fit CITS regression models that generally took the form:

$$\mathbf{E}[\mathrm{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 ParticipationStart_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 TimeAfter_{ij}} + \boldsymbol{\beta_4 HOP_{ij}} + \boldsymbol{\beta_5 HOP_{ij}} * \boldsymbol{ParticipationStart_{ij}} + \boldsymbol{\beta_6 HOP_{ij}} * \boldsymbol{Time_{ij}} + \boldsymbol{\beta_7 HOP_{ij}} * \boldsymbol{TimeAfter_{ij}} + \boldsymbol{\beta_8 Covariates_{ij}}$$

Where 'i' indexes a unique individual observed on a particular month 'j'. 'E[Y]' represents the expected value of the outcome, 'participation start' is an indicator of whether the data point was observed before or after the index date (defined as the date of Pilot enrollment for Pilot participants and the date of a positive social risk screen for non-participants), 'time' indicates the number of months relative to start of observation (up to 12 months prior to the index date), 'time after' indicates the number of months after the index date (up to November 30, 2024), and 'HOP' is an indicator of whether an individual was a Pilot enrollee or not. The interaction terms allow for modeling of different intercepts and trends by Pilot enrollment status. 'Covariates' represents a vector of adjustment factors. Unless otherwise specified,

the covariates adjusted for were age, sex, race and ethnicity, disability status, index date, quarter of observation (to account for seasonality), rurality of residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), an indicator of whether a participant had had a 'triggering event', like an ED visit or inpatient admission, that may have prompted enrollment in the three months before the index date, and an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment. Covariate adjustment was used to help further support the plausibility of the assumptions needed for CITS analysis.

Given the high prevalence of zero values and following recent CMS recommendations around economic evaluation for 1115 Waivers, we fit two-part models. These models consisted of a logistic regression first stage model, which estimated whether there was any spending or not, and a generalized linear model second stage to estimate the quantity of spending, conditional on there being any, with the form of the model selected after conducting a modified Park test.[38] Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] After fitting the models, we created marginalized estimates of quantities of interest using the margins command in Stata. We targeted an ATT estimand for these analyses.

For analyses of whether specific HOP services differentially affected healthcare spending compared with other services, we fit individual-level CITS regression models. These models generally took the form:

$$\begin{aligned}\mathbf{E}[\boldsymbol{Y_{ij}}] = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 ServiceStart_{ij}} + \boldsymbol{\beta_2 Time_{ij}} + \boldsymbol{\beta_3 TimeAfter_{ij}} + \boldsymbol{\beta_4 ServiceType_{ij}} \\ + \boldsymbol{\beta_5 ServiceType_{ij}} * \boldsymbol{ServiceStart_{ij}} + \boldsymbol{\beta_6 ServiceType_{ij}} * \boldsymbol{Time_{ij}} \\ + \boldsymbol{\beta_7 ServiceType_{ij}} * \boldsymbol{TimeAfter_{ij}} + \boldsymbol{\beta_8 Covariates_{ij}}\end{aligned}$$

Where 'i' indexes a unique individual observed on a particular month 'j'. 'E[Y]' represents the expected value of the outcome, 'service start' is an indicator of whether the data point was observed before or after the start of the specific service examined, 'time' indicates the number of months relative to start of observation, 'time after' indicates the number of days after the start of the specific service, and 'service type' is an indicator of the specific service the individual received. The interaction terms allow for modeling of different intercepts and trends by service types. 'Covariates' represents a vector of adjustment factors. Unless otherwise specified, covariates adjusted for were: age, sex, race and ethnicity, disability status, index date, quarter of observation (to account for seasonality), rurality of

residence, CDPS score[31] (Chronic Illness and Disability Payment System—a Medicaid specific risk adjustment algorithm incorporating both the presence of comorbidities and their association with healthcare utilization and spending), an indicator of whether a participant had had a 'triggering event', like an ED visit or inpatient admission, that may have prompted enrollment in the three months before the index date, and an indicator of whether an individual, based on ICD-10 codes in the prior 12 months, could be established to meet one of the clinical eligibility criteria for HOP enrollment. The purpose of covariate adjustment was to help strengthen the plausibility of the parallel trends assumption. We again fit two-part models with a logistic first part and a generalized linear model second part. Standard errors were robust to heteroscedasticity and clustered at the level of the individual, which is the level of treatment for these analyses.[32] Because several approaches to modeling cost outcomes may be reasonable[39–41], we conducted sensitivity analyses to test the robustness of the evaluation findings to model specification choices, in particular varying the assumed distribution of the conditional mean in the second part of the two-part generalized linear model, and relaxing assumptions of time trend linearity. After fitting the regression models, we created marginalized estimates of quantities of interest using the margins command in Stata. We targeted an ATT estimand for these analyses.

Within a service category, there are a variety of services that might meet an individual's identified need(s). Some of these services are not clear substitutes for each other (that is, they may be used in very different situations). However, others might plausibly substitute for each other, so questions of their comparative effectiveness for healthcare spending outcomes are relevant. For food services, we compared three types of services (combining some sub-categories for reasons of sample size): 1) a fruit and vegetable prescription, 2) a food box (large or small, for delivery or pick up), and 3) prepared meals (either a 'healthy' meal [for pick up or delivered] or a 'medically tailored' meal [delivered]). For housing services, we compared three types of services (combining some sub-categories): 1) housing navigation, support, and sustaining services, 2) essential utility set up, and 3) home remediation, safety and quality inspection, or accessibility and safety modifications. For transportation services, we compared two types of services: 1) health-related private transportation and 2) health-related public transportation. Sample sizes did not permit comparisons of IPV services. There were also some service types (e.g., move-in services within the housing category, where sample sizes did not permit comparisons). Within each category, we only compared individuals who had received only one type of service (e.g., only prepared meals or only a fruit and vegetable prescription), to permit 'clean' comparisons.

Finally, one element of HOP was capacity building payments made to NLs and distributed to HSOs. Unlike operating expenses, capacity building payments are analogous to infrastructure costs—one-off, rather than recurring, community investments not associated with specific care activities. Capacity building payments are meant to develop the ability of local communities to provide services, with 'returns' expected steadily over a number of years, even beyond the initial demonstration period. To understand the magnitude of capacity building spending in relation to spending on care during the demonstration period, we used estimates from analyses of HOP's impact on total cost of care plus administrative spending, and compared those estimates to observed capacity building payments.

Methodological Limitations

The results of the evaluation should be considered in light of several limitations. Overall, a key limitation is that delivery of HOP services was not randomized. Though an element of randomization (of service types) was initially planned, this was never implemented owing to the COVID-19 Public Health Emergency (PHE), and all data used in the evaluation are unrandomized. While the analyses use both study design and adjustment approaches to help overcome potential threats to validity, unmeasured confounding, including unmeasured time-varying confounding (particularly around the start of HOP enrollment, in which time-varying factors that led to enrollment may also influence evaluation outcomes going forward), remains a limitation. In addition, regression to the mean could affect study findings, although the use of data from non-HOP participants and regression adjustment to create more balanced outcomes around the time of the index date help account for this. Another limitation relates to data quality. Inaccurate entry of data used for analysis could influence results, and not all variables that would have been available, ideally, were actually available for analyses. As examples, NCCARE360 data did not contain data on the HOP eligibility category under which an individual enrolled (and so that had to be inferred from other data, which could lead to errors), nor did clinical eligibility map neatly to ICD-10 codes (and thus was not a 'computable phenotype'). Another limitation is that, though the evaluation analyzed the entire service delivery period, there were relatively few observations at longer times from the index date, as enrollment rates increased over the demonstration period. Further, if individuals lost Medicaid eligibility, data regarding their outcomes was no longer received from that time forward. However, this occurred rarely in practice (given continuous coverage requirements through much of the evaluation period), and such individuals were still included in the analysis up until the time of lost coverage. In addition, since such individuals were no longer covered by NC Medicaid, this does not affect results from the perspective of NC Medicaid.

It is important to remember that HOP is a complex intervention, with multiple components. Ultimately, it is difficult to disentangle quantitatively which elements of the HOP intervention were specifically responsible for changes in evaluation outcomes, or even if such a disentanglement is conceptually meaningful. Qualitative analyses do, however, shed some light on these issues.

A small number of outcomes initially planned to be evaluated could not be evaluated due to data limitations or changes during the evaluation period owing to changes in the underlying measure definitions used by the state of North Carolina. This particularly affected the Life Skills Progression

outcome, as this instrument was not, contrary to plans at the time the Evaluation Design was constructed, routinely administered to children during the evaluation period.

Another important data limitation is that some data were collected during the COVID-19 PHE. The COVID-19 PHE is known to have had complicated impacts on health and healthcare utilization, and thus data collected during this time may not be generalizable to the post-COVID-19 PHE period. However, we do not expect these impacts to be differential when comparing HOP participants to those in non-HOP regions who likely would have been HOP eligible had Pilot services been offered in their area. In our view, this reinforces the importance of analyses using data from Medicaid beneficiaries in non-HOP regions.

Some limitations are specific to particular Evaluation Questions. For Evaluation Question 1 ("Effective Delivery of Pilot Services"), the main limitations relate to the possibility of erroneous data entry within NCCARE360. Another limitation related to Evaluation Question 1 is that we do not receive individual-level data that specifies reasons for participants ending their Pilot participation, and so could not complete analyses related to participant reason for ending Pilot enrollment. In the evaluation design, we planned to analyze the number of participants who completed Pilot participation, withdrew from participation, or were lost to follow-up. We do receive information at the referral level regarding why a specific referral was closed, but this is different from why an individual may end participation in the Pilots overall.

For Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening and Connection to Appropriate Services") activities, the main methodological limitations relate to the possibility that screening data were not recorded, which could bias comparisons. Further, we were unable to complete analyses that entailed comparing Medicaid beneficiaries in the Pilot regions and the non-Pilot regions on connection to services to address social risks, owing to lack of data availability. Though screening responses were recorded, there is no central dataset recording connection to services, if any, made in response to positive screens in non-Pilot regions. This precludes comparison of rates of connection to services between Pilot and non-Pilot regions.

For Evaluation Question 3 ("Improved Social Risk Factors") activities, the main methodological limitation is that some analyses use within-participant comparisons, without an external comparison group. This means that regression to the mean is an important threat to validity for these analyses. The reason for this is that, by construction, social risks are guaranteed to be 0 at all times in pre-index period for the non-HOP group, which precludes their inclusion in quasi-experimental analyses (i.e., CITS or

difference-in-differences analyses) in which social risk factors are an outcome. As justified in the Evaluation Design, this was a known limitation. Moreover, by conducting an interrupted time series analyses, which models trends in the pre-index period in the HOP group, the approach is an improvement over a simple pre/post comparison that is more likely to be biased by regression to the mean. A second limitation is that if there is differential loss to follow-up (i.e., whether an individual completes a repeated assessment is correlated with whether their needs are or are not improving), this can bias results. For comparative effectiveness analyses, low use of some service types precluded comparative effectiveness analyses for those outcomes. Further, small sample sizes for some subgroups precluded some subgroup analyses that would have been conducted had sample size permitted.

For Evaluation Question 4 ("Clinical Outcomes"), the main methodological limitation relates to lack of random assignment to Pilot services. We attempted to mitigate this concern by using CITS and difference-in-differences analyses, comparing Pilot participants to Medicaid beneficiaries living in other counties who screen positive for the same social risks that would make them eligible for the Pilots if they lived in Pilot counties, which helps account for regression to the mean, the natural history of social risk and clinical conditions, and secular trends (i.e., changes that affect North Carolina Medicaid beneficiaries more broadly than the HOP program, such as macroeconomic conditions, changes in Medicaid eligibility criteria, and healthcare delivery changes related to other aspects of the 1115 waiver or evolution of trends in healthcare delivery). Together, these approaches provide protection against many forms of bias, but could still be susceptible to unmeasured time-varying confounding that occurred contemporaneously with HOP and differentially affected HOP participants. For example, the conditions under which social risk screening occurred may have been different in HOP and non-HOP regions. Other limitations include that, for birthweight outcomes, HOP enrollment occurred at varying times throughout a pregnancy, meaning that the full benefit of the intervention may not have been captured for individuals who enrolled later in their pregnancy. Moreover, because birthweight analyses analyzed live births, if HOP increased the probability that a pregnancy would result in a live birth, this could bias results if the resulting birthweight from such a pregnancy is lower than average, as might be expected physiologically. This would tend to understate the impact of HOP on birthweight outcomes, if any. For analyses of hemoglobin A1c and blood pressure outcomes, these relied on data from the North Carolina Health Information Exchange (NC HealthConnex), as we did not have access to quality metric data reported by PHPs. This means data are only available for a non-random sample of blood pressure and hemoglobin A1c observations made during the evaluation period. For participant-reported

outcomes collected by survey, surveys could not be administered to non-HOP participants as, unlike HOP participants who provide consent to be contacted for evaluation purposes, non-HOP participants did not provide such consent. Thus, analyses of these participant-reported outcomes do not have a comparison group. Moreover, the number of HOP participants who could be surveyed was low relative to the overall number of HOP participants, which results in greater uncertainty in estimating HOP's impact on survey outcomes. Low sample sizes generally precluded comparative effectiveness and subgroup analyses for Evaluation Question 4 outcomes.

For Evaluation Question 5 ("Healthcare Utilization"), the main methodological limitation relates to lack of random assignment to HOP services. We took several steps to mitigate this concern, including the use of individual-level CITS analyses (repeated measures within individuals), including both HOP participants and non-HOP participants consisting of Medicaid beneficiaries living in other counties who screen positive for the same social risks that would make them eligible for HOP if they lived in HOP counties. This approach helps account both for time-invariant characteristics of the individual, and for regression to the mean, the natural history of social risk and clinical conditions, and secular trends (i.e., changes that affect North Carolina Medicaid beneficiaries more broadly than the HOP program, such as macroeconomic conditions, changes in Medicaid eligibility criteria, and healthcare delivery changes related to other aspects of the 1115 waiver or evolution of trends in healthcare delivery). As stated above, these approaches provide protection against many forms of bias, but could still be susceptible to unmeasured time-varying confounding that occurred contemporaneously with HOP and differentially affected HOP participants. For example, the conditions under which social risk screening occurred may have been different in HOP and non-HOP regions. For comparative effectiveness analyses, low use of some service types precluded comparative effectiveness analyses for those outcomes. Further, small sample sizes for some subgroups precluded some subgroup analyses that would have been conducted had sample size permitted. For pregnancy-related visits and well child visits, HOP enrollment occurred at varying times throughout the assessment window, meaning that the full benefit of the intervention may not have been captured for individuals who enrolled later in the assessment window.

For Evaluation Question 6 ("Cost of Care"), the main methodological limitation relates to lack of random assignment to HOP services, which could lead to confounding that is not accounted for. We took several steps to mitigate this concern, including the use of individual-level CITS analyses (repeated measures within individuals), including both HOP participants and non-HOP participants consisting of Medicaid beneficiaries living in other counties who screen positive for the same social risks that would

make them eligible for HOP if they lived in HOP counties. This approach helps account both for time-invariant characteristics of the individual, and for regression to the mean, the natural history of social risk and clinical conditions, and secular trends (i.e., changes that affect North Carolina Medicaid beneficiaries more broadly than the HOP program, such as macroeconomic conditions, changes in Medicaid eligibility criteria, and healthcare delivery changes related to other aspects of the 1115 waiver or evolution of trends in healthcare delivery). As stated above, these approaches provide protection against many forms of bias, but could still be susceptible to unmeasured time-varying confounding that occurred contemporaneously with HOP and differentially affected HOP participants. For example, the conditions under which social risk screening occurred may have been different in HOP and non-HOP regions. For comparative effectiveness analyses, low use of some service types precluded comparative effectiveness analyses for those outcomes. Further, small sample sizes for some subgroups precluded some subgroup analyses that would have been conducted had sample size permitted. Finally, because administrative spending is not specific to a particular individual, incorporating it into the individual-level analyses we conducted requires an estimation method to allocate administrative spending to individual person-months.

Results

Evaluation Question 1

HOP Participants

In compliance with CMS guidelines[i] cells have been suppressed when counts were fewer than 11 or calculated values were determined using fewer than 11 values. Data used in this assessment covered the period March 15, 2022 to November 30, 2024.

Figure 8 details the number of beneficiaries within HOP regions who received social risk screening and their progression through HOP.

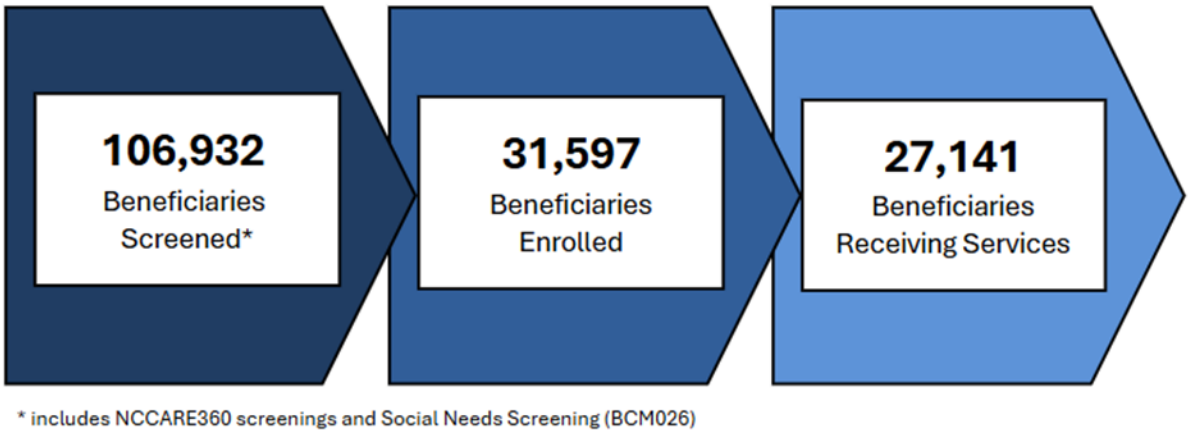


Figure 8. Medicaid Beneficiaries Screened, Enrolled, and Receiving HOP Services

Enrollment Measures of HOP Enrollees

A total of 31,597 participants enrolled in the Pilots during any point between March 15, 2022 and November 30, 2024, as reflected in NCCARE360 data. Of these, 31,084 were actively enrolled at the end of the reporting period. The number of total HOP participants does not include participants (<11) who

[i] https://resdac.org/articles/cms-cell-size-suppression-policy

were recorded as having enrolled in HOP through the NCCARE360 system, but did not have a record within the NC Medicaid Member file.

This section of the report provides data regarding aspects of Pilot service delivery. **Figures 9** and **10** depict HOP enrollment over the course of the demonstration period.

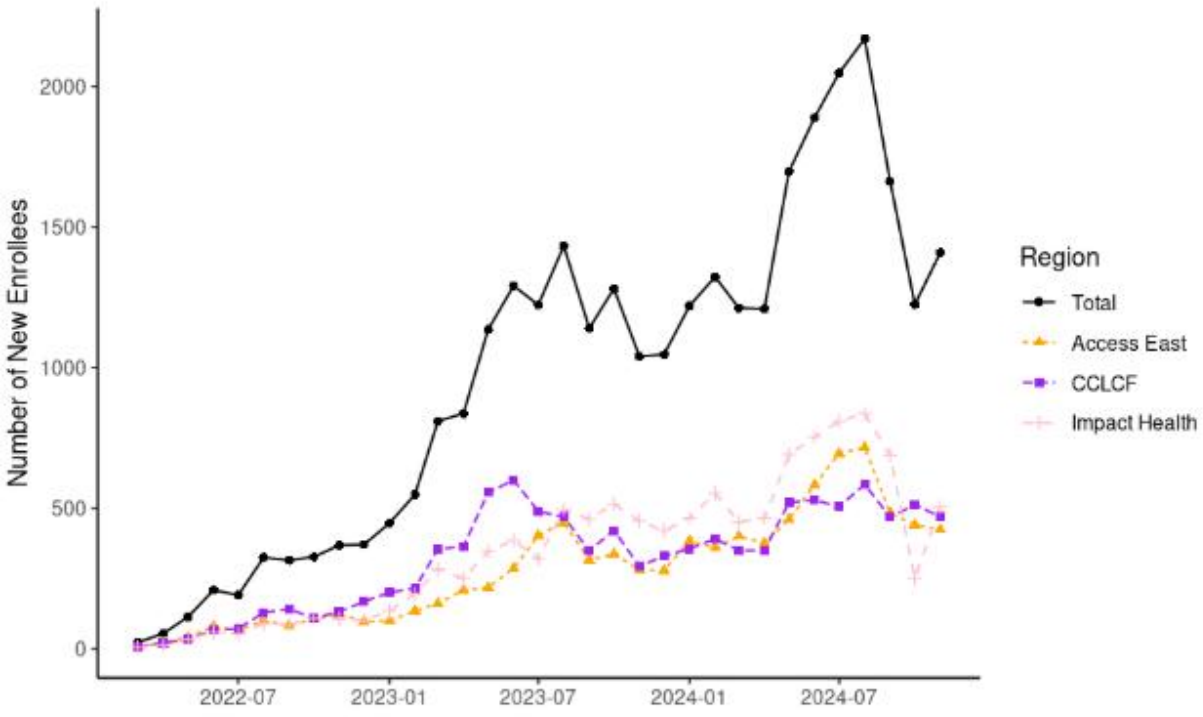


Figure 9. Enrollees per Month

Figure 9 Legend: Number of Pilot Enrollees per month, overall and by region.

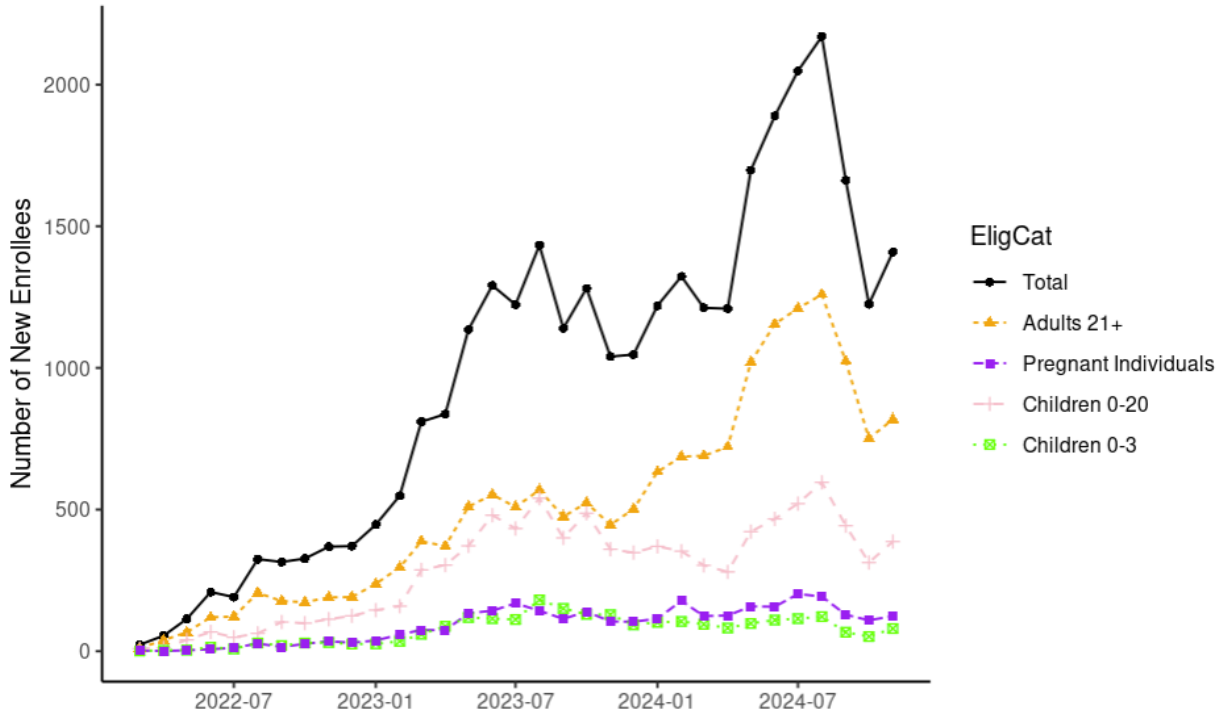


Figure 10. Enrollees per Month by Eligibility Category

Figure 10 Legend: Number of Pilot Enrollees per month, overall and by eligibility category.

Of the 31,597 individuals who enrolled in HOP, 9,266 (29.3%) were from the Access East region, 10,563 (33.4%) were from the CCLCF region, and 11,390 (36.0%) were from the Impact Health region. Region was calculated using the county identified in the Medicaid Member file. Only a very small number of HOP enrollees, 418, could not be linked to a HOP region at the time of HOP enrollment using data from the Medicaid Member file.

Enrollment by Prepaid Health Plan (PHP) is presented in **Table 4**. Enrollment into a PHP was determined using the PHP indicated in the Medicaid Member file during a participant's earliest enrollment. Beneficiaries who had ever enrolled in a Tailored Plan were assigned to the Tailored Plan population. Of note, Tailored Plans have fewer beneficiaries than Standard Plans and launched late in the demonstration period (July 1, 2024).

Table 4. Enrollment by Prepaid Health Plan (PHP) and Plan Type

	Total*		Standard Plan		Tailored Plan	
PHP	**Number**	**Percentage**	**Number**	**Percentage**	**Number**	**Percentage**
Medicaid Direct	1,340	4.2%	-	-	-	-
AmeriHealth Caritas North Carolina	4,758	15.1%	4,758	16.7%	-	-
Blue Cross and Blue Shield of North Carolina	7,758	24.6%	7,758	27.3%	-	-
Carolina Complete Health	1,887	6.0%	1,887	6.6%	-	-
Partners Health Management	106	0.3%	-	-	106	5.8%
Trillium Health Resources	906	2.9%	-	-	906	49.6%
UnitedHealthcare of North Carolina	6,003	19.0%	6,003	21.1%	-	-
Vaya Health	813	2.6%	-	-	813	44.5%
WellCare of North Carolina	8,026	25.4%	8,026	28.2%	-	-
Total**	**31,597**	**100.0%**	**28,432**	**100%**	**1,825**	**100%**

*This column contains row counts and percentages.

**This row contains column totals and percentages.

Enrollment by Pilot eligibility category is presented in **Table 5.** Based on eligibility criteria for the Pilots, there are four Pilot eligibility categories: adults 21+, pregnant individuals, children 0-20, and children 0-3. The data received from NCCARE360 do not permit deterministic assignment of Pilot participants to a Pilot eligibility category. For example, Pilot eligibility categories reported within NCCARE360 frequently indicated different eligibility categories for the same individual. Enrollees were eligible, but the specific category they should be assigned to is often unclear. Therefore, for purposes of analysis, we assign the categories in the following way. Pregnant individuals were identified using three methods: North Carolina Medicaid claims data, North Carolina Department of Public Health Vital Records birth certificate records, and finally NCCARE360 screenings data. If a Pilot participant was identified as pregnant during enrollment from any of these sources, they were placed in the pregnant individuals Pilot eligibility category. Next, for non-pregnant individuals, Pilot eligibility was determined by age at time of Pilot enrollment for age-based categories. The clearest impact resulting from the lack of consistent Pilot eligibility category assignment in NCCARE360 data is that young children may be misclassified. As described in Table 1, there are two possible eligibility categories for children under 4 (with differing clinical eligibility criteria), and the available data are not sufficient to distinguish between the two categories in some cases. This likely has little substantive impact on the interpretation of the report's findings, but should be understood transparently.

Table 5. Enrollment by Eligibility Category

	Total*		Standard Plan		Tailored Plan		Medicaid Direct	
Eligibility Category	**Number**	**Percentage**	**Number**	**Percentage**	**Number**	**Percentage**	**Number**	**Percentage**
Children 0-20	9,451	29.9%	8,735	30.7%	511	28.0%	205	15.3%
Children 0-3	2,431	7.7%	2,401	8.4%	17	0.9%	13	1.0%
Adults 21+	16,644	52.7%	14,384	50.6%	1,185	64.9%	1,075	80.2%
Pregnant Individuals	3,071	9.7%	2,912	10.2%	112	6.1%	47	3.5%
Total**	**31,597**	**100.0%**	**28,432**	**100%**	**1,825**	**100%**	**1,340**	**100%**

*This column contains row counts and percentages.

**This row contains column totals and percentages.

Demographic Comparisons of Pilot Participants and Medicaid Beneficiaries in Pilot Regions

We examined how the demographics of Pilot participants compared with the demographics of the overall Medicaid population in Pilot regions. For this comparison, we note that we would not expect Pilot participants to have similar demographics compared to Medicaid beneficiaries in Pilot regions, owing to eligibility criteria for Pilot participation. That is to say that applying eligibility criteria inherently includes some individuals and excludes others, meaning there is no reason to think Pilot participants would be demographically similar to all Medicaid beneficiaries in Pilot regions. Pilot participants are a specific subset of Medicaid beneficiaries selected based on their likelihood of benefiting from Pilot services.

We analyzed the NC Medicaid Member file to better understand demographics for both Pilot participants and Pilot counties. Region was determined based on county of residence at the time of enrollment for those enrolled in HOP. For Medicaid beneficiaries not enrolled in HOP, living in a HOP region was determined by whether their longest residency between March 2022 and November 2024 was in a HOP county or not. The total number of unique Medicaid beneficiaries in HOP counties from March 2022 through November 2024 was 740,600. Of the 31,597 individuals enrolled in HOP, virtually all (31,179) could be placed in a HOP region at the time of enrollment using data from the Medicaid Member file. Across all Pilot counties, 4.21% of Medicaid beneficiaries were enrolled in the Pilots.

Table 6 shows enrollment in the Pilots as a percentage of Medicaid beneficiaries in the Pilot regions.

Table 6. Enrollment Rate by Region

Region	HOP Enrollment Count	Percentage of ALL HOP Participants	Number of Medicaid Beneficiaries in HOP Regions**	Percentage of All Medicaid Beneficiaries Living in HOP Regions	Percentage of ALL Beneficiaries in Respective HOP Regions that are Enrolled in HOP
Access East	9,226	29.6%	184,390	24.9%	5.00%
CCLCF	10,563	33.9%	238,587	32.2%	4.43%
Impact Health	11,390	36.5%	317,623	42.9%	3.59%
Total	**31,179***	**100%**	**740,600**	**100%**	**4.21%**

* The Medicaid Member File indicated that for 418 beneficiaries they were not residing in HOP regions at time of enrollment.

**Residing in a HOP region was determined by whether the longest residency between March 2022 and November 2024 was a HOP county.

Statistics relating to the age (in years), sex, and race and ethnicity of Pilot participants and Medicaid beneficiaries in Pilot regions are shown in **Tables 7-8**, below.

Table 7. Age by Region*

Sample	Region	N	Min**	Median**	Max**	IQR (Q1, Q3)**	Mean	Std Dev
Enrolled in HOP	Access East	9,226	0	31	71	(14, 46)	31	19
	CCLCF	10,563	0	29	73	(12, 44)	29	19
	Impact Health	11,390	0	27	79	(10, 45)	28	20
	Total HOP* **	**31,179**	**0**	**29**	**80**	**(12, 45)**	**29**	**19**
All Medicaid Beneficiaries in Pilot Regions	Access East	184,390	0	23	99	(10, 47)	29	23
	CCLCF	238,587	0	23	99	(9, 43)	28	22
	Impact Health	317,623	0	24	99	(10, 47)	29	23
	ALL HOP Regions	**740,600**	**0**	**23**	**99**	**(10, 45)**	**29**	**23**

* Individuals aged greater than 99 years are excluded

** Values have been aggregated to reflect the average of 11 values around this measure to comply with cell suppression

*** The Medicaid Member File indicated that for 418 beneficiaries they were not residing in HOP regions at time of enrollment.

Table 8. Race, Ethnicity, and Sex by Region

		Access East		CCLCF		Impact Health		Total	
Sample	**Demographics**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
	*Race, n(%)**								

HOP Participants	American Indian	66	0.7%	138	1.3%	90	0.8%	294	0.9%
	Asian	25	0.3%	58	0.5%	54	0.5%	137	0.4%
	Black	7,429	80.5%	5,982	56.6%	2,288	20.1%	15,699	50.4%
	Hawaiian/Pacific Islander	<25	<0.3%	<50	<0.5%	<50	<0.5%	107	0.3%
	White	2,090	22.7%	4,997	47.3%	9,421	82.7%	16,508	52.9%
	Race Unknown	<11	<0.2%	<11	<0.1%	<11	<0.1%	23	0.1%
	Ethnicity, n(%)								
	Hispanic	208	2.3%	699	6.6%	1,029	9.0%	1,936	6.2%
	Non-Hispanic	8,944	96.9%	9,804	92.8%	10,263	90.1%	29,011	93.0%
	Missing ethnicity	74	0.8%	60	0.6%	98	0.9%	232	0.7%
	Sex, n(%)								
	Female	6,390	69.3%	7,026	66.5%	7,138	62.7%	20,554	65.9%
	Male	2,836	30.7%	3,537	33.5%	4,252	37.3%	10,625	34.1%
	Total	**9,226**	**100%**	**10,563**	**100%**	**11,390**	**100%**	**31,179**	**100.0%**
All Medicaid Beneficiaries in HOP Regions	*Race, n(%)*[*]								
	American Indian	1,818	1.0%	3,367	1.4%	8,819	2.8%	14,004	1.9%
	Asian	1,523	0.8%	3,504	1.5%	4,245	1.3%	9,272	1.3%
	Black	118,202	64.1%	70,290	29.5%	26,963	8.5%	215,455	29.1%
	Hawaiian/Pacific Islander	418	0.2%	1,221	0.5%	1,214	0.4%	2,853	0.4%
	White	67,978	36.9%	171,438	71.9%	285,618	89.9%	525,034	70.9%
	Race Unknown	1,251	0.7%	1,093	0.5%	1,310	0.4%	3,654	0.5%
	Ethnicity, n(%)								
	Hispanic	12,897	7.0%	28,964	12.1%	34,621	10.9%	76,482	10.3%
	Non-Hispanic	168,222	91.2%	205,859	86.3%	277,354	87.3%	651,435	88.0%
	Missing ethnicity	3,271	1.8%	3,764	1.6%	5,648	1.8%	12,683	1.7%
	Sex, n(%)								
	Female	104,666	56.8%	134,836	56.5%	176,613	55.6%	416,115	56.2%
	Male	79,713	43.2%	103,737	43.5%	140,995	44.4%	324,445	43.8%
	Sex Unknown	11	0.0%	14	0.0%	15	0.0%	40	0.0%
	Total	**184,390**	**100%**	**238,587**	**100%**	**317,623**	**100%**	**740,600**	**100.0%**

* A participant can report more than one racial group.

Demographics Comparison of Pilot Participants and non-HOP Group

Evaluation Questions 4-6 use Medicaid beneficiaries in non-HOP regions who reported social risks as a comparison group for CITS analysis to produce difference-in-differences estimates, as these individuals

likely experience similar 'secular trends' (conditions unrelated to HOP participation) as HOP participants. To identify the non-HOP group, the analysis started with looking at all beneficiaries who indicated a need and then filtering down to those who resided in a non-HOP region at the time of their first reported need. There were 271 individuals who reported a social need through the screening tool but that we were unable to locate in the member file to determine if they were in a HOP or non-HOP region.

Figure 11 shows across the entire Medicaid population how the analysis cohort was defined. The two boxes in orange: "Enrolled in HOP" and "Positive Social Need" represent the intervention and comparison cohorts, respectively.

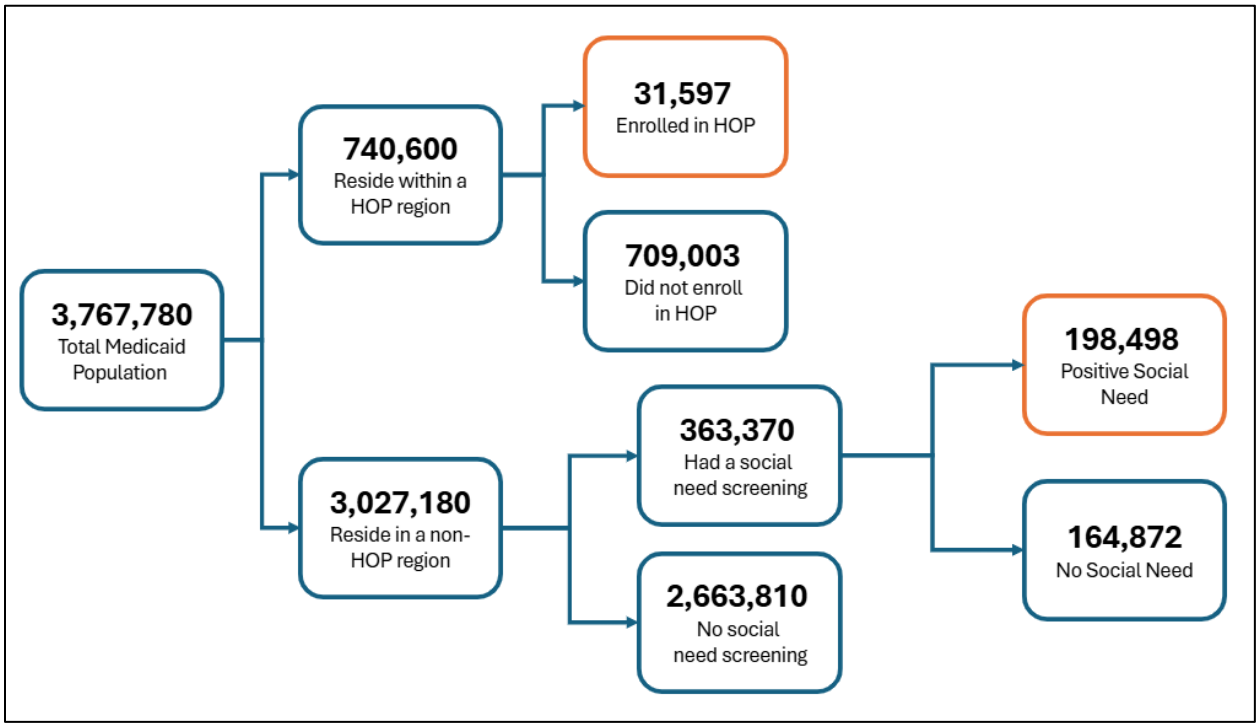


Figure 11. Cohort Construction

Table 9 presents a comparison of the demographic characteristics of HOP participants and Medicaid beneficiaries in non-HOP regions who reported social needs.

Table 9. Demographics for HOP Participants and Medicaid Beneficiaries in Non-HOP Pilot Regions Who Report a Social Risk

Variable	HOP	Beneficiaries in Non-HOP Regions Who Report a Social Risk	Overall	P-Value
n	31,597	198,498	230,095	
Age, median [Q1-Q3]	29.0 [12.0-45.0]	20.0 [8.0-38.0]	21.0 [9.0-39.0]	<0.001
HOP Region, n(%)				<0.001
Access East	9,226 (29.2)	(0.0)	9,226 (4.0)	
CCLCF	10,563 (33.4)	(0.0)	10,563 (4.6)	
Impact Health	11,390 (36.0)	(0.0)	11,390 (5.0)	
Non-HOP Region	418 (1.3)	198,498 (100.0)	198,916 (86.4)	
Medicaid Region, n(%)				<0.001
1	11,401 (36.1)	2,180 (1.1)	13,581 (5.9)	
2	33 (0.1)	43,404 (21.9)	43,437 (18.9)	
3	64 (0.2)	55,184 (27.8)	55,248 (24.0)	
4	157 (0.5)	50,452 (25.4)	50,609 (22.0)	
5	7,657 (24.2)	31,103 (15.7)	38,760 (16.8)	
6	12,270 (38.8)	16,175 (8.1)	28,445 (12.4)	
Missing	15 (0.0)	(0.0)	15 (0.0)	
Race, n(%)*				
American Indian	301 (1.0)	4,369 (2.2)	4,670 (2.0)	<0.001
Asian	137 (0.4)	5,901 (3.0)	6,038 (2.6)	<0.001
Black	15,972 (50.5)	82,370 (41.5)	98,342 (42.7)	<0.001
Hawaiian/Pacific Islander	107 (0.3)	673 (0.3)	780 (0.3)	.991
White	16,667 (52.7)	114,300 (57.6)	130,967 (56.9)	<0.001
Race Unknown	23 (0.1)	1,072 (0.5)	1,095 (0.5)	<0.001
Ethnicity, n(%)				<0.001
Hispanic	1,951 (6.2)	35,118 (17.7)	37,069 (16.1)	
Non-Hispanic	29,411 (93.1)	160,142 (80.7)	189,553 (82.4)	
Missing Ethnicity	235 (0.7)	3,238 (1.6)	3,473 (1.5)	
Sex, n(%)				<0.001
Female	20,840 (66.0)	122,937 (61.9)	143,777 (62.5)	
Male	10,757 (34.0)	75,561 (38.1)	86,318 (37.5)	
Rural Urban Continuum, n(%)				<0.001
1: Counties in metro areas of 1 million population or more	62 (0.2)	73,998 (37.3)	74,060 (32.2)	
2: Counties in metro areas of 250,000 to 1 million population	12,080 (38.2)	68,318 (34.4)	80,398 (34.9)	
3: Counties in metro areas of fewer than 250,000 population	8,800 (27.9)	13,544 (6.8)	22,344 (9.7)	
4/5: Urban population of 20,000 or more	2,953 (9.3)	25,862 (13.0)	28,815 (12.5)	
6: Urban population of 2,500 to 19,999, adjacent to a metro area	3,667 (11.6)	10,564 (5.3)	14,231 (6.2)	
7: Urban population of 2,500 to 19,999, not adjacent to a metro area	717 (2.3)	(0.0)	717 (0.3)	

Variable	HOP	Beneficiaries in Non-HOP Regions Who Report a Social Risk	Overall	P-Value
8: Completely rural or less than 2,500 urban population, adjacent to a metro area	1,690 (5.3)	4,601 (2.3)	6,291 (2.7)	
9: Completely rural or less than 2,500 urban population, not adjacent to a metro area	1,613 (5.1)	1,611 (0.8)	3,224 (1.4)	
99: Missing	15 (0.0)	(0.0)	15 (0.0)	
Urban/Rural, n(%)				<0.001
Rural	10,655 (33.7)	42,638 (21.5)	53,293 (23.2)	
Urban	20,942 (66.3)	155,860 (78.5)	176,802 (76.8)	

**A participant can be in more than one racial group*

Social Needs Assessment and Needs Identified

Out of 31,597 individuals enrolled in HOP, 114 individuals had no social needs assessments recorded in NCCARE360. The remaining 31,483 individuals who had at least one assessment recorded were used for the descriptive **Tables 10-15** below to present information on assessments made.

Table 10. Assessments Provided by Region

Enrollment Region	Assessments Count	Assessments Percentage	HOP Participant Count	HOP Participant Percentage
Access East	25,883	26.69%	9,206	29.24%
CCLCF	37,117	38.27%	10,534	33.46%
Impact Health	32,820	33.84%	11,329	35.98%
Non-HOP	1,155	1.19%	414	1.31%
Total	**96,975**	**100.00%**	**31,483**	**100.00%**

Table 11. Assessments Provided by Eligibility Categories

Eligibility Category	Assessments Count	Assessments Percentage	HOP Participant Count	HOP Participant Percentage
Children 0-3	7,639	7.88%	2,428	7.71%
Children 0-20	30,268	31.21%	9,431	29.96%
Adults 21+	49,771	51.32%	16,572	52.64%
Pregnant Individuals	9,297	9.59%	3,052	9.69%
Total	**96,975**	**100.00%**	**31,483**	**100.00%**

Table 12. Assessments Provided by PHP

PHP	Assessments Count	Assessments Percentage	HOP Participant Count	HOP Participant Percentage
Medicaid Direct - PIHP	4,084	4.21%	1,313	4.17%
AmeriHealth Caritas North Carolina	15,270	15.75%	4,749	15.08%
Blue Cross and Blue Shield of North Carolina	23,450	24.18%	7,753	24.63%
Carolina Complete Health	7,008	7.23%	1,885	5.99%
Partners Health Management – Tailored Plan	189	0.19%	105	0.33%
Trillium Health Resources – Tailored Plan	2,241	2.31%	885	2.81%
UnitedHealthcare of North Carolina	16,296	16.8%	5,994	19.04%
Vaya Health – Tailored Plan	1,273	1.31%	780	2.48%

WellCare of North Carolina	27,164	28.01%	8,019	25.47%
Total	**96,975**	**100.00%**	**31,483**	**100.00%**

The mean number of needs indicated in an assessment was 1.8. Food needs were the most common need indicated, followed by housing (**Table 13**).

Table 13. Assessments and Participants with Identified Needs

Identified Need	Assessments Count*	Assessments Percentage	HOP Participant Count*	HOP Participant Percentage
Food	78,132	80.57%	25,752	81.8%
Housing	65,960	68.02%	23,485	74.6%
IPV-related / Toxic Stress	2,873	2.96%	1,081	3.43%
Transportation	30,800	31.76%	11,595	36.83%

**Participant could indicate more than one need per screening*

Pilot participants reported two or more needs on more than half of assessments (60.65%) (**Table 14**).

Table 14. Needs per Assessment

Needs Indicated on a Screening	Count	Percentage
0	24	0.02%
1	38,140	39.33%
2	37,975	39.16%
3	19,669	20.28%
4	1,167	1.20%
Total	**96,975**	**100.00%**

Pilot participants had needs assessments in a timely fashion, with 99% of individuals assessed within the two-week window preceding Pilot enrollment (including the day of enrollment). **Table 15** provides further information on time to first assessment, in days. If an individual had an assessment recorded in NCCARE360 after the day of Pilot enrollment, their time to first assessment would be greater than 0. If an individual had an assessment recorded in NCCARE360 within the 14 days prior to and including the date of enrollment, we record the days to first assessment as 0. Thus, we would expect days from enrollment to first assessment to be near 0, on average. Days from enrollment to first assessment do not vary by HOP regions and PHP.

Table 15. Days from Enrollment to First Assessment

Region	N**	Min*	Mean*	Max*	IQI (Q1, Q3)*	% Assessed within 2 Weeks Prior to or on Day of Enrollment
Overall	31,483	0	0.21	236	(0,0)	99%

**Values have been aggregated to reflect the average of 11 values around this measure to comply with cell suppression*

***114 pilot participants do not have an assessment recorded in NCCARE360 and are excluded from the total 31,597 hop enrollees.*

Participants Served and Spending on HOP Services

We used all HOP claims from each participant's first HOP enrollment date to the end of the study period to determine services received.

A total of 27,141 participants received services through November 30, 2024. Out of 31,597 individuals enrolled in the Pilots, this means that 86% received at least 1 recorded service. Further, individuals enrolled during this demonstration period may have begun to receive services after November 30, 2024, which is not reflected in these data. **Tables 16-18** show connections to services by region, eligibility category, and PHP.

Table 16. Connection to Services by Region for Identified Needs*

Enrollment Region	Count of HOP Participants Connected to Services	Total Count of HOP Participants	Percentage of HOP Participants Connected to Services
Access East	8,073	9,226	87.5%
CCLCF	9,391	10,563	88.9%
Impact Health	9,335	11,390	81.96%
Missing	342	418	81.82%
Total	**27,141**	**31,597**	**85.90%**

Table 17. Connection to Services by Eligibility Category

Eligibility Category	Count of HOP Participants Connected to Services	Total Count of HOP Participants	Percentage of HOP Participants Connected to Services
Children 0-3	2,129	2,431	87.58%
Children 0-20	8,178	9,451	86.53%

Adults 21+	14,158	16,644	85.06%
Pregnant individuals	2,676	3,071	87.14%
Total	**27,141**	**31,597**	**85.90%**

Table 18. Connection to Services by PHP

PHP	Count of HOP Participants Connected to Services	Total Count of HOP Participants	Percentage of HOP Participants Connected to Services
Medicaid Direct – PIHP	768	1,340	57.31%
AmeriHealth Caritas North Carolina	4,138	4,758	86.97%
Blue Cross and Blue Shield of North Carolina	7,039	7,758	90.73%
Carolina Complete Health	1,642	1,887	87.02%
Partners Health Management – Tailored Plan	11	106	10.38%
Trillium Health Resources – Tailored Plan	428	906	47.24%
UnitedHealthcare of North Carolina	5,343	6,003	89.01%
Vaya Health – Tailored Plan	402	813	49.45%
WellCare of North Carolina	7,370	8,026	91.83%
Total	**27,141**	**31,597**	**85.90%**

Of the 27,141 participants who received services, 26,314 participants received services specific to their identified need (e.g., a food service for an identified food need). There was variation in the percentage of individuals who received a service depending on the type of need they reported **(Table 19)**. The following table shows the number of individuals who screened positive for different need types, and of those, the number who received a related service captured in claims within the same category as the reported need (e.g., reporting a food need and receiving a food service). A substantial proportion of individuals received services from categories that differed from the need type identified solely from assessments, which demonstrates that there may not be a simple linear mapping between reported needs and the services participants preferred to receive (**Table 20**).

Table 19. Services Received by Need

Service Type*	Total Participants Reporting a Need	Participants Reporting Need Who Received a Service in that Category	% Reporting Need & Received Service in that Category
Food	23,743	20,076	84.56%
Housing	20,944	14,692	70.15%
IPV-related / Toxic Stress	778	118	15.17%
Transportation	9,188	1,889	20.56%

**Cross-domain is not one of the need categories so the individuals who only received cross-domain services are not included here.*

Table 20. Needs Reported by Service Type

Service Type*	Total Participants Received a Service	Participants Receiving a Service Who Reported a Need in that Category	% Received Service & Reported Need in that Category
Food	22,682	20,076	88.51%
Housing	17,087	14,692	85.98%
IPV-related / Toxic Stress	256	118	46.09%
Transportation	2,869	1,889	65.84%

**Cross-domain is not one of the need categories so the individuals who only received cross-domain services are not included here.*

We calculated the cumulative number of unique HSOs that had provided at least 1 service with a paid invoice and the distribution of the number of services provided by these HSOs. NCCARE360 data included more detailed information on HSOs than claims and was used for descriptive statistics in **Table 21.**

Table 21. Services delivered by HSOs

Measure	Number of HSOs	Min	Median	Max	IQI (Q1, Q3)	Mean	Std Dev
Services Provided by HSO	166	1	803	58,927	(125, 3,291)	4,371	8,913

The median time for an initial service to begin was 8 days after HOP enrollment, and over 75% of the services were within 17 days **(Table 22).**

Table 22. Time from Eligibility to Service Dates, in Days

Measure	N	Min*	Median*	Max*	IQI (Q1, Q3)*	Mean	Std Dev
Eligibility to Service Date	27,141	0	8	663	(3,17)	19.6	41.9

**Value has been aggregated to reflect the average of 11 values around this measure to comply with cell suppression*

Figure 12 depicts the percentage of Pilots participants who had a HOP service claim in a given time period after Pilot enrollment. For example, over 85% of Pilot enrollees received a service in the first 30 days after enrollment and around 25% of Pilots enrollees were receiving services more than 360 days

after enrollment. Thus, while service receipt was highest in the 30 days following enrollment, a substantial number of Pilots participants continued to receive services even 12 months after enrollment.

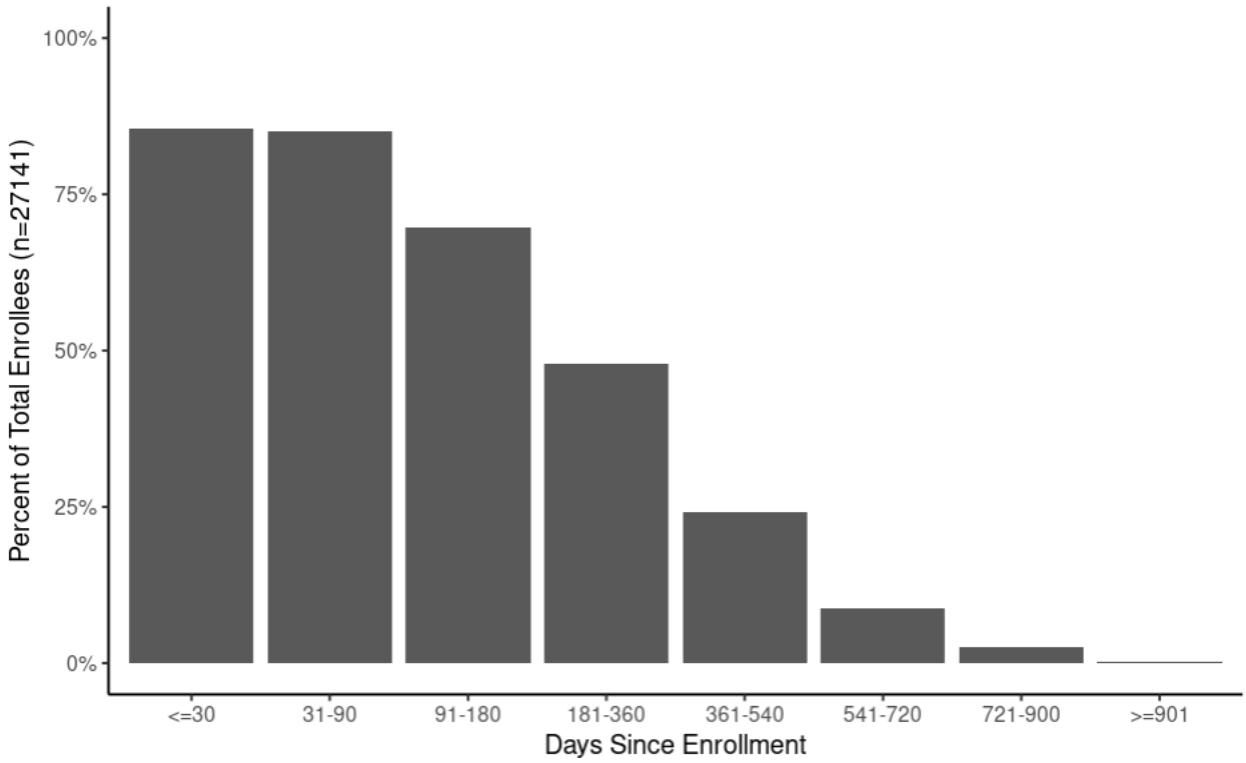


Figure 12. Percentage of Enrollees Receiving Pilot Services in Each Time Period Since Enrollment

Figure 12 Legend: This figure depicts the percentage of Pilot enrollees who received at least one Pilot service in the specified time periods following Pilot enrollment. For instance, over 85% of Pilot enrollees received at least one Pilot service in the 30 days after Pilot enrollment, and over 24% of Pilot enrollees received a service more than 360 days from enrollment.

To calculate the amount spent on HOP services, we used paid amounts from claims data. A total of 691,504 services were provided, for which the claim amount totaled $141,123,308.89.

Across 691,504 services, the mean paid amount was $204.08 per service and the median was $150.36 per service. The mean amount paid per enrollee was $5,199.44 and the median was $3,612.78 per enrollee.

Table 23 below provides more detail on number of services and spending on services by service type. Food services represent the bulk of delivered services and the majority of the paid amount, although housing services have higher amounts per service.

Table 23. Services Provided by Service Type

Service Type	Service Count	Service Percentage	Mean Amount Per Service	Total Amount	Amount Percentage
Cross-Domain	6,330	0.92%	$498.62	$3,156,293.29	2.24%
Food	579,179	83.76%	$148.24	$85,858,230.97	60.84%
Housing	91,599	13.25%	$532.87	$48,810,387.55	34.59%
IPV-related / Toxic Stress	1,593	0.23%	$161.34	$257,011.11	0.18%
Transportation	12,803	1.85%	$237.55	$3,041,385.97	2.16%
Total	**691,504**	**100.00%**	**$204.08**	**$141,123,308.89**	**100%**

Tables 24-26 describe service spending by region, eligibility category, and PHP.

Table 24. Services Provided by Region

Enrollment Region	Service Count	Percentage of Total Services	Total Amount	Percentage of Total Amount
Access East	174,516	25.24%	$33,993,894.82	24.09%
CCLCF	262,342	37.94%	$55,188,273.59	39.11%
Impact Health	247,535	35.80%	$50,210,553.5	35.58%
Non-HOP*	7,111	1.03%	$1,730,586.98	1.23%
Total	**691,504**	**100%**	**$141,123,308.89**	**100%**

* These represent individuals who were identified as not being enrolled in a HOP region at the time of their enrollment in HOP

Table 25. Services Provided by Eligibility Category

Eligibility Category	Service Count	Percentage of Total Services	Total Amount	Percentage of Total Amount	Mean Amount Per Service
Children 0-3	55,404	8.01%	$11,541,126.10	8.18%	$208.31
Children 0-20	216,728	31.34%	$45,641,712.58	32.34%	$210.59
Adults 21+	358,269	51.81%	$70,229,232.75	49.77%	$196.02
Pregnant individuals	61,103	8.84%	$13,711,237.46	9.72%	$224.40
Total	**691,504**	**100.00%**	**$141,123,308.89**	**100.00%**	**$204.08**

Table 26. Services Provided by PHP

PHP	Service Count	Percentage of Total Services	Total Amount	Percentage of Total Amount	Mean Amount Per Service
Medicaid Direct – PIHP	7,521	1.09%	$1,398,304.62	0.99%	$185.92

AmeriHealth Caritas North Carolina	109,012	15.76%	$21,886,741.7	15.51%	$200.77
Blue Cross and Blue Shield of North Carolina	193,407	27.97%	$38,747,794.99	27.46%	$200.34
Carolina Complete Health	42,951	6.21%	$9,112,339.25	6.46%	$212.16
Partners Health Management – Tailored Plan	42	0.01%	$19,259.24	0.01%	$458.55
Trillium Health Resources – Tailored Plan	2,307	0.33%	$442,068.44	0.31%	$191.62
UnitedHealthcare of North Carolina	125,126	18.09%	$26,551,018.78	18.81%	$212.19
Vaya Health – Tailored Plan	2,468	0.36%	$568,359.76	0.40%	$230.29
WellCare of North Carolina	208,670	30.18%	$42,397,422.11	30.04%	$203.18
Total	**691,504**	**100.00%**	**$141,123,308.89**	**100.00%**	**$204.08**

Payments

The following analyses for **Tables 27-28** present information about payments and the timeliness of these payments made for services. Services captured in NCCARE360 data were used for these two tables as claims only represent services paid for. As such, total number of services will vary in these tables. Around 61% of invoices are paid within 30 days, and about 80% are paid within 45 days.

Table 27. Invoices Submitted and Paid by PHP

PHP	Invoice Paid Count	Invoice Submitted Count	Percentage Paid
AmeriHealth Caritas North Carolina	110,035	116,039	95%
Blue Cross and Blue Shield of North Carolina	197,741	204,628	97%
Carolina Complete Health	50,290	53,498	94%
Partners Health Management - PIHP	455	514	89%
Partners Health Management – Tailored Plan	708	845	84%
Trillium Health Resources - PIHP	1,863	2,516	74%
Trillium Health Resources – Tailored Plan	5,939	7,812	76%
UnitedHealthcare of North Carolina	130,038	136,110	96%
Vaya Health - PIHP	1,465	1,750	84%
Vaya Health – Tailored Plan	4,266	4,507	95%
WellCare of North Carolina	223,085	232,805	96%
Missing	-	77	0%
Total	**725,885**	**761,101**	**95%**

Table 28. Time from Invoice Submission to Payment, in Days

PHP	N	Min*	Median*	Max*	IQI (Q1, Q3)*	Mean	Stan. Dev.
AmeriHealth Caritas North Carolina	110,035	7	34	770	(23,54)	45	43
Blue Cross and Blue Shield of North Carolina	197,741	3	22	730	(14,40)	32	36
Carolina Complete Health	50,290	7	22	844	(14,40)	31	37
Partners Health Management - PIHP	455	14	45	247	(28,73)	59	47
Partners Health Management – Tailored Plan	708	14	57	231	(36,78)	64	42
Trillium Health Resources - PIHP	1,863	9	31	179	(20,45)	41	31
Trillium Health Resources – Tailored Plan	5,939	9	29	201	(16,62)	41	31
UnitedHealthcare of North Carolina	130,038	4	25	748	(17,43)	34	30
Vaya Health - PIHP	1,465	11	23	190	(16,44)	36	31
Vaya Health – Tailored Plan	4,266	11	22	182	(16,42)	33	27
WellCare of North Carolina	223,085	10	20	867	(12,37)	28	28
Total/Overall	**725,885**	**2**	**24**	**887**	**(15,42)**	**33**	**36**

**Values have been aggregated to reflect the average of 11 values around this measure to comply with cell suppression*

Retention and Disenrollment

The majority of individuals who enrolled in the Pilots did not have an end date for their Pilot enrollment prior to the end of study period and were thus considered to be actively enrolled. We note that this is distinct from continued service provision. 513 individuals (1.62% of all Pilot enrollees) had an end date for the Pilots before Nov 30, 2024, and thus were considered disenrolled from the Pilots. **Tables 29-31** below present details of those who disenrolled from the Pilot by region, eligibility categories, and PHP.

Table 29. Disenrollment by Region

Enrollment Region	Number of Pilot Participants Disenrolled	Total Number of Pilot Participants	Percentage of Pilot Participants Disenrolled
Access East	115	9,226	1.25%
CCLCF	216	10,563	2.04%
Impact Health	161	11,390	1.41%
NA	21	418	5.02%

Total	**513**	**31,597**	**1.62%**

Table 30. Disenrollment by Eligibility Categories

Eligibility Category	Number of Pilot Participants Disenrolled	Total Number of Pilot Participants	Percentage of Pilot Participants Disenrolled
Children 0-3	26	2,431	1.07%
Children 0-20	158	9,451	1.67%
Adults 21+	280	16,644	1.68%
Pregnant individuals	49	3,071	1.60%
Total	**513**	**31,597**	**1.62%**

Table 31. Disenrollment by PHP

PHP	Number of Pilot Participants Disenrolled	Total Number of Pilot Participants	Percentage of Pilot Participants Disenrolled
Medicaid Direct	61	1,340	4.55%
AmeriHealth Caritas North Carolina	83	4,758	1.74%
Blue Cross and Blue Shield of North Carolina	90	7,758	1.16%
Carolina Complete Health	61	1,887	3.23%
Partners Health Management	<20	106	<20.00%
Trillium Health Resources	<20	906	<2.00%
UnitedHealthcare of North Carolina	58	6,003	0.97%
Vaya Health	48	813	5.90%
WellCare of North Carolina	94	8,026	1.17%
Total	**513**	**31,597**	**1.62%**

Qualitative Interviews with Organizations - 2024

The qualitative interviews with HOP organizations presented in this report occurred from May 20, 2024 to October 15, 2024. These interviews were with individuals who worked at HOP NLs, PHPs, and HSOs. There were 59 interviews conducted with 70 individuals across the three Pilot Regions (**Figure 1 and Table 32**). Among those who participated, 83% identified as women and 16% identified as men. Participants' ages were between 24 and 75 years old, with the mean age being 44 years old. Analysis of qualitative findings are broken down by organization type (PHP, Network Lead, and HSOs) in the following sections.

Table 32. Qualitative Interview Participant Demographics from HOP Organizations

Organization Type	Name or Region	# Participants Interviewed (N=70)
Prepaid Health Plan		
	AmeriHealth	2
	Carolina Complete Health	2
	Healthy Blue	2
	United Healthcare	2
	WellCare	2
Network Lead (Region)		
	Access East	7
	CCLCF	5
	Impact Health	5
Human Service Organizations (Region)		
	Access East	10
	CCLCF	18
	Impact Health	15

PHP Qualitative Findings

This section summarizes the results of in-depth interviews with participants who were designated representatives of PHPs within the North Carolina Healthy Opportunities Pilots (HOP) to understand how their organization carries out necessary activities and services associated with HOP.

PHP Qualitative Interview Purpose

The purpose of the interviews was to understand the experiences of the PHPs with HOP. Participants were asked to discuss their impressions of HOP; their engagement and involvement with HOP; staffing

and organizational capacity; service administration; communication strategies; and recommendations for effective delivery and expansion of Pilot services.

PHP Qualitative Interview Study Sample Recruitment

Participants recruited for this project were purposively selected based on their roles and responsibilities associated with HOP. Names and email addresses of individuals within the PHPs were provided to the evaluation team for the purpose of recruitment. For each name and contact information provided, three email contact attempts were made to invite the individual to participate in the evaluation.

PHP Qualitative Interview Data Collection Procedures

All interviews were conducted by a trained qualitative researcher who has extensive experience facilitating research studies involving patients, clinical professionals, and researchers. Interviews lasted on average 60 minutes. The semi-structured interview guide was developed collaboratively with the Principal Investigator and research team to elicit insights and descriptive details from the participants' perspectives (**Appendix A. Organization Qualitative Interview Guide; Table A88. Organization Qualitative Interview Codebook; Figure A1. ATLAS.ti PHP Code Applications**). Participants were offered a $20 gift card upon completing the interview; however, all participants declined based on company policy and/or other considerations.

PHP Qualitative Interview Participants

A total of ten participants were interviewed **(Table 32)**. Given this number of participants, demographic information is not reported to protect participant privacy, although these data were collected. Role types included managers/supervisors, auditors, analysts, and operations advisors.

PHP Organizational Capacity and Staffing Structure

Finding. **Budget constraints and financial instability limited staffing and organizational capacity.**

In the interviews, PHPs talked about how their organization's financial instability affected their HOP related staffing structure and their ability to complete HOP tasks (**Table A1**). Staffing varied across PHPs and Error! Reference source not found.some staff worked on HOP full time, while others had worked on HOP along with other roles **(Table 33)**. As a result, they described challenges with not having enough team members to manage high caseloads and not having adequate staff with the knowledge to handle certain HOP tasks. PHPs also noted the issues of service caps, spending regulations, and limited administrative budgets (**Table A2**).

> *We were told when this first started, the administrative amounts that they were giving to the PHPs was next to nothing. We had to absorb that ourselves. So I only had two FTEs to do this work, and it's not enough. There's a lot coming in. The care managers that are sending in the work, there's a lot of them. There could be 15, 20 of them among all the clinically integrated networks. And we have two full-time UM [utilization management] folks that came out of my existing staff that they were not backfilled because there's really no administrative budget for our folks to do this work.*

Table 33. Number of HOP Staff Reported by PHP

PHP	Number of Staff Reported*
AmeriHealth	20-25
Carolina Complete Health	6-7
Healthy Blue	25-30
United Health Care	11
WellCare	10

**Table 33 note: these are estimated numbers of staff reported by participants when asked how many staff help with HOP. It is unclear to the evaluation team if these are individuals entirely dedicated to HOP or not.*

Finding. **PHPs described budget limitations as leading to expanded staff roles and responsibilities.**

PHPs discussed how these staffing challenges impacted them and HOP (**Table A3**). They explained that staff had to take on additional roles and tasks not directly related to their jobs. In some cases, staff stopped enrollment and limited services.

> *Administratively, since we took a significant cut in funding for this next fiscal year, we're going to have to look at how can we absorb that. So there may be positions that do end up having to take on other functions, and it just is going to extend our time frames to do things.*

Finding. **PHPs described a need for staffing strategies that target care coordination and restructuring.**

PHPs focused on coordination and restructuring to address staffing issues. For example:

> *I think that there could be some sort of coordination happening more at the network lead level where they're kind of coordinating who takes on what services because that's another thing, [NCCARE360] doesn't give us a lot of insight into, say, "ABC company only does utilities, but this other organization does utilities and home remediations. And which counties do they do them in?" So they kind of have to learn that. But if somebody at the network lead or HSO level well, network lead level was able to say, "Oh, I've got the perfect person for that. Let's send them on here. You have an issue with your HSO. Let me take care of that." I just think that would be better if we could get some more care coordination going on at the network lead level to kind of take off the burden from the care management entities, including us.*

PHP HOP Engagement, Enrollment, and Services

Finding. PHPs reported that **increasing and maintaining HOP engagement and enrollment was facilitated by flexible communication and collaboration at the network, care manager and HOP beneficiary level.**

For PHPs, the ability to successfully increase and maintain HOP engagement and enrollment involved three main factors (**Table A4**). They talked about the need for network communication, engagement, and outreach and the importance of care managers' patience and efforts. An additional facilitator was problem solving skills and meeting HOP beneficiaries' needs.

> *We engaged with one of our participating HSOs and along with the department to initiate an expedited enrollment pilot. And within this pilot, the department allowed us some flexibilities outside of the standard enrollment process, which allowed us to have a more direct communication with eligible members that were identified by HOP. But that partnership, along with the participating HSO, it allowed us to outreach these members, enroll them for a standard benefit that is in HOP service, which was a food and vegetable prescription. And it allowed us to outreach honestly, a large, I would say, more than 50% of our enrollment is attributed to that effort because it allowed us to kind of work with that HSO and through their portal and through their process and kind of integrating our processes together, we were able to develop a text campaign that allowed us to outreach those members and to kind of give them that expedited enrollment, as stated by the name, into HOP.*

Finding. PHPs defined **success by the availability of services when needed and seeing health outcomes.**

Examples of successful stories for HOP shared by PHPs highlighted opportunities when things worked well in fulfilling a beneficiary's need. From their perspectives, HOP was successful when beneficiaries used the program for only as long as they absolutely needed it. Furthermore, the ability to see health outcomes for beneficiaries in real-time was an indication of success.

> *[When] members, where they stayed on the program only long enough until they didn't need it anymore because they got a new job and they were able to be insured and they were able to pay for rent and pay for their food, so they only used the program for as long as they absolutely needed it. That's what I call a success, and it wasn't because of anything we did except for provide them these things that they needed.*

Finding. **PHPs reported funding challenges that hindered beneficiary engagement, enrollment and service availability.**

Challenges and barriers that impacted PHPs' ability to efficiently and effectively provide HOP services were related to having enough funding to meet the needs of their beneficiaries (**Table A5**). PHPs noted that in addition to state funding cuts, they faced challenges from administrative burden and high administrative cost to misunderstandings of HOP as a program. Some mentioned dealing with housing domain issues, NCCARE360 platform limitations, lack of support or inconsistency from the State or department, and network adequacy in some of the counties.

> *I think it's just a concern that we're not going to have enough funding and that there won't be enough outlets to serve as those members, whether it's the food boxes or the bigger things, the housing. It's an epidemic that we're concerned about. And right now, it's just North Carolina. Who knows what's going to happen? Maybe it'll be, hopefully, eventually, across the country to help. But that is, I think, our big concern right now, if we can't provide those services. And with the most recent update about the funding cut, it's taken a big hit this week, and we are really concerned about having to not continue services or to slow the services, if you will.*

PHP Communication Strategies

Finding. **Communication strategies were reflective of the HOP situation and issues to be addressed**.

PHPs noted the need to use multiple communication strategies to meet their staff needs (**Table A6**). Internal communication strategies included Microsoft Teams, chat function, emails, chats and communications with network leads, regular or daily meetings, phone calls, care management platform, monthly meetings with clinical associates and delegated entities, and education with care management teams and provider teams.

> *So it depends on what the situation is. If it's a rather complicated need, then I will hop on a Zoom or Teams call with one or more individuals or both of them just so that they get educated at the same time. And we'll walk through the process together. And we actually did that when each new domain opened up. The very first two or three that came through for that domain each time--we would do them together as a team so that everybody saw the process from start to finish and we all learned together.*

Finding. **Effective communication strategies with HOP beneficiaries prioritized preferences and current needs.**

Communicating pertinent information about HOP with beneficiaries included multiple methods (**Table A7**). Strategies included distribution of paper cards with contact information, outreach from care managers, email, website, Member Advisory Committee meetings, member service telephone line, postal mail, telephone calls, texting, and communication from specialized teams (community engagement, marketing, beneficiary services).

> *Well, when we assess them for enrollment and we're getting ready to enroll, of course, we have their preferences for communication. We ask them that. Times, phone call, text, email. So it's really the member's preference. And we go by that.*

Finding. **HOP beneficiaries received ongoing communication and engagement from PHPs.**

Additionally, the frequency of communicating with HOP beneficiaries varied and was often described as "as needed" and based on the beneficiaries' needs. Participants noted that in the initial engagement, contact frequency was high, to help beneficiaries get set up and enrolled. Some noted it also depended on the beneficiary's ability to complete all of the tasks. However, once beneficiaries were engaged in services, check-ins may decrease in frequency, tapering down to monthly contact, with three and six months after enrollment being seen as key check-in points.

> *So our care managers are checking in almost monthly, if not more than that. They've made it very-- they make it very clear to each of the members we need to talk on an almost monthly basis just to make sure that the needs are still the needs. And if you need anything additional, we can provide that for you. So they are talking to the members at least monthly.*

Finding. **PHPs recommended strategies for enhancing HOP work that were multi-level and focused on education, information, and opportunities for engagement.**

PHPs discussed ways to enhance HOP work by combining communication strategies to reach their target audience effectively (**Table A8**). Their suggestions emphasized content, materials, HOP beneficiaries, and the communication process.

Content

- **Clarify misconceptions and challenges with HOP**
  I think there's a misconception about this program around the state. And I would go as far as to say through members, providers, PHPs, people within this industry that this is more so kind of a

free-for-all. If you're in need of something, you know this is it, then I think the information and the education that's being sent out about the program just needs to be changed a little bit. It is really for a specific population of people who are really needing it so I think it's just that piece of it that was a little disheartening because I think this program has a lot of great capabilities, but we also need to be very transparent and honest about the challenges and the things that aren't working within the program.

- **Clarify eligibility of HOP beneficiaries and the services rendered**
  I do understand that eligibility doesn't necessarily mean acceptance because the acceptance to some members, they may perceive that as access to other areas of their lives that they feel like they want to protect. So I think it would be very helpful to really help members understand particularly what those services or receiving those services means and to really help them to identify, I would say, some trust with the program and to really understand that we're here to help. I really think that that's important.

Materials

- **Create one centralized guidance document from the state with pilot changes**
  One of the things that we struggle with, and we've shared this with the department, is when the pilot changes, we don't have really a centralized document from the state. We get a bunch of guidance updates that make it very difficult to track when did this guidance change previously issued guidance or clarify previously issued guidance. And so we've asked the state, particularly so the service definition document, if there are guidance documents that enhance or clarify, that's not going in that document. It's living outside of that. So in terms of communicating requirements of the pilot, it feels very sporadic. And we've got, I'm going to exaggerate, 50 different guidance documents that we're trying to centralize and trying to track.

HOP Beneficiaries

- **Reinforce HOP phone numbers to increase the likelihood of recognition and responsiveness**
  I think that we do explain to them that they might not recognize the number, and we all know about spam, but we tell them when to expect that that HSO is going to try to reach out to them. So it will really benefit them to go ahead and answer that call or at least make sure their voicemail is set up and check your voicemail so that you can return the call… So we just reinforce that. So there's been some instances where they say, "Well, I haven't heard from anybody." And I'm like, "You won't recognize the number. You really have to have that phone ready and answer and check your voicemail."

- **Explore social media options for communication strategies**
  I know [our PHP] has Facebook. So through social media, members are also reaching. …. So we communicate very well.

- **Keep most recent information on beneficiaries**
  Kind of identifying what's the best method of reaching them. So for example, we try to-- the care management team, I would say, they really try to keep as most recent information on our members as possible. Of course, you do find that there are some, which, I think, is typical behavior. Some are quicker to respond to text versus email. Some are quicker to respond to text versus a phone call. But if that information isn't accurate, the department, they really do serve as

kind of our partner in ensuring that we do have the extra layer, I guess you could say, of that source of communication and information connecting us to our members because their information is a little more updated through their systems as well.

- **Enroll and make same-day referrals**
  We definitely saw that early on. Sometimes we saw those referrals "go cold" and now our process is CMs enrolling and making referrals same day for members to actually get the services. This is related to a gap in the process and changing that made improvements.

Communication Process

- **Consolidate communication strategies within the platform**
  I think if we could utilize those [texting capabilities] within the platform, I think having better communication with the members in the HSO, there was a way because I think part of the problem is you have to ask them their communication at certain points at the beginning, and then probably three and six months, you're going to follow up and say, have your communication preferences changed. When we talk about texting, that may be a part that maybe not everyone understands in the platform that there is that it's like a text capability, but it's not as enhanced as it could be. But if you think if you could communicate within that one platform and everyone knows what's going on, it'd probably lead to greater communication and effectiveness than somebody calling in and somebody texting and all these different forms of communication.

- **Create texting capabilities within the platform**
  I think based upon what I'm learning from our care management or population health, some of the strategies that they use to engage members are to send out push texts. And from what I understand, the state is not allowing that for health plans to engage members by text. And so that can be somewhat difficult. But I think that there was a pilot using text for HOP for the rapid enrollment project. And so I think that there is some possibility of us being able to expand that utility. But from a health plan, texting has not been permissible, so really would like it to be texting allowed or not allowed, doing something special for HOP. There's already enough little carve-outs that don't fit in the health plan operations. I don't know that that would be easy to navigate. Sometimes we can text you, but sometimes we can't. I can text you about how I can't text you about your appointments, that kind of thing, would be very challenging, so. But I mean, lots of people text. And I think that there's a need to kind of look at those from a Medicaid rule perspective.

- **Create one platform for the state, PHPs, and network leads to communicate and share documents**
  This is just me being a dreamer-- I wish there was a secure platform for the state and the PHPs and the network leads and even the HSOs to all be able to securely share program documentation and live updates at the same time because I think the miscommunication between emails, and I don't think emails always get to the right people, and then updates get made and then those updates aren't necessarily tracked in one place. I think it just kind of gets lost in the sauce.

- **Increase the number of HOP staff to meet the needs of HOP beneficiaries**

So to keep up with our members, I know it's hard because there's a lot of members and maybe not enough staff to kind of handhold our members to make sure that not only are they utilizing the services, but are they seeing the benefits, and are there other services that they need? So again, I think part of it is just funding. Part of it's just a heavy load. It's a lot to be able to make sure that we have the resources to do that for every member. But again, I think we just kind of-- we change the processes as we go. I know we just did an internal to get some more staff for [redacted] clinical team. So that I know will be helpful because now we have more coverage to support the members.

- **Create opportunities to engage different HSOs**
  What we see when that happens is because the member is enrolled and has a need, and there's no provider to refer them to. It's not necessarily a lack of communication or engagement with the member. The member desperately has expressed a need, and it's usually an immediate need. But they may not need services that are readily available in their county or their catchment. So the vast majority of members who do not have an authorized service but are enrolled are because there's not a provider available to meet their specific needs. … so I would really like to see something further develop so that we do know when there is an opportunity to engage a different provider, a new provider, or have the state get a little bit more flexible on who they allow to serve in what county.

- **Create more regional convening meetings**
  I do think that one communication strategy that I would love to see happen more are the regional convenings. Having those opportunities for all key players to be in one room and to kind of speak to their experiences. And in a lot of ways, learn and kind of connect from the experiences of the other players because what we see at the health plan level isn't necessarily the same as what the HSO levels are seeing. And sometimes we may have a perception of a process or an experience that may actually be impacted by the department, if that makes sense. Being able to really connect the channels and understand what our roles and what our impact to HOP really is, if that makes sense. And I think that the convenings that I have attended in the past, I mean, they really have been very beneficial. So I would love to see more of those happen.

PHP NCCARE360 Platform Utilization

Finding. **With different levels of training, preparedness, and experience, PHPs created multiple opportunities to use the NCCARE360 platform**.

PHPs reported mixed responses on how well the NCCARE360 training prepared them for using the platform (**Table A9**). While some noted the training was good and the helpfulness of having NCCARE360 job aids and user manuals, others felt the training was insufficient. Despite the differences in their preparedness and experiences, PHPs highlighted multiple ways in which their organization used NCCARE360 to manage operational tasks related to HOP service delivery and program management (**Table A10**). Key tasks included case management and utilization management, invoicing, service

authorizations, researching and resolving claims disputes, reporting and performance monitoring, identifying community resources, and communicating with HSOs and/or care managers.

> *So we use it for sending and receiving referrals, enrolling members, sending transitions of care. We can use it to message our HSOs. We use it for tasking. We actually get our reminders through tasks through [NCCARE360 platform] that helps us keep up with all the members that we've enrolled in when they need an assessment and a reassessment. We also use [NCCARE360 platform] for our non-HOP referrals. We have a non-HOP platform. We actually have a care management platform-- a utilization management platform and then a non-HOP platform that we can go out and seek referrals for members that we can't find services through HOP for or we also use it for non-HOP members. We use it for reporting, pulling numbers. There's a [NCCARE360 platform] insights dashboard that I'm still learning. I don't know it really well, but we are able to get demographics numbers pertinent to our health plan. And you can also see how you compare to other health plans. Without it, we would be non-existent. I mean, we use it all day, every day.*

Finding. **NCCARE360 offered a platform for centralized information management for collaboration, performance monitoring, and resource accessibility**.

According to PHPs, the advantages of utilizing NCCARE360 to manage HOP was the platform's centralized information management for collaboration, performance monitoring, and resource accessibility (**Table A11**). They noted benefits including having information centralized to one location, everyone having the same information, a supportive NCCARE360 technology vendor team, and centralized communication across HOP organizations (PHP, NL, HSO). PHPs also said it was a user friendly platform that was helpful for monitoring performance and utilization of HSOs and in identifying community resources.

> *I think it's a central location. Like I said, the information is there. It works. We know that the tracking works. We know from a clinical side, the member information is there, the interview notes are there. From that point, I like the look of it. I like that it's there. I like that I can get in there and get the story that I need for whatever I'm looking for. So it does work, and I think it's important that we have one centralized place that everything-- that we can all, whoever needs it, it's there and we all have the same information. So that is good. I think that if it was spread out or if we had other platforms that we were needing to look in, I think that that would definitely be a challenge.*

Finding. **PHPs reported that NCCARE360 platform functionality and feature limitations impacted data integration and usage.**

PHPs noted some difficulties in working with NCCARE360. PHPs talked about the effects of these limitations on data integration and alignment (**Table A12**). They highlighted the challenges including

time-consuming navigation experiences, frequent session timeouts, limited search and filtering functionality, and lack of control in data management. PHPs also noted the operational complexity due to multiple systems and data reliability challenges including data discrepancies between PHP and NCCARE360 platform systems, Medicaid claims system integration issues, payment system integration and data alignment issues.

> *But I know that the information is there. We can find it. It does just take quite a bit of looking around and time to find pieces that seem like you should be able just to get in, do a search. The search functions aren't the best. And the way that sometimes the members' names are entered are not consistent. So because we're having to really look through long lists of names, it's easy to miss things sometimes. So that kind of adds to the time-consuming piece of it. But otherwise, it functions, it works, the information is there. It's not as user-friendly as maybe it could be.*

Finding. **PHPs felt that NCCARE360 platform users should have a role in the design and testing of the platform to improve function and address gaps.**

PHPs felt it was essential to incorporate NCCARE360 platform user feedback to ensure the platform fits the needs of the organization. Specifically, they talked about issues that they experienced with NCCARE360 including lack of dispute resolution functionality, lack of family linking to prevent service duplication, lack of consistent communication and information across HOP organization roles, lack of visibility into authorization status, and tasking feature reassignment complications.

> *The other challenge is that they don't include health plans on their design and implementation. So they're happy to take our recommendations, but then they don't necessarily understand the genesis of that recommendation. And so they run off and create solutions that don't solve the problem. And so they implement things, and we get the job aid the day it implements, and we're scurrying about trying to change our workflows and update our SOPs, and the system's already live. And so we're not brought into testing of those changes. So we're told that they're coming, but we don't understand how it's going to work in real life until it launches. And so we've asked on multiple occasions to be brought into the design of it as well as the testing because we can tell you if it's not going to work. And so I don't know what we can do for that. But I think if [NCCARE360 platform] is truly going to be the platform that HOP continues to use, they have to expand their testing with key stakeholders and not just a file transfer, but a true operational platform and get feedback on that testing beyond their own internal workflows.*

Finding. **Insights on NCCARE360 platform limitations and capabilities can provide needed information for effective usage.**

Based on their experiences with NCCARE360, PHPs shared the insights they have gained (**Table A13**). They also mentioned that better understanding of system limitations, such as the lack of expedited

request management and limited visibility in monitoring turnaround times, would have allowed them to devise workarounds.

> *I think really understanding some of its limitations. I am somebody that I'm wondering, where's the reports? How do I get information out of here? How am I following? How am I monitoring? And knowing what some of those limitations are upfront would have been helpful rather than spend a lot of time trying to find it just to be told it doesn't exist or it's not something you have access to. That would have been really helpful from my position as a care manager, really understanding that as you're searching for HSOs, how many times you search before you realize that there's no HSOs available. There's not an easy-to-use system to make sure that before a care manager gets so far down the path of trying to make a referral, how can we find that out before? So some of those things, I think, would have been helpful.*

Finding. **Organizations new to the NCCARE360 platform can benefit from strong communication, partnerships, and patience.**

PHPs' advice for new organizations getting trained on the NCCARE360 platform focused on communication, utilizing resources like job aids, maintaining patience, and building strong partnerships (**Table A14**). They talked about the need to build strong relationships with HOP partners, asking questions and communicating with the NCCARE360 technology vendor team. Taking advantage of job aids and training information and immersing oneself and learning as you go were also mentioned. Practical advice like keeping an internal how-to document (SOP), tracking invoices, ensuring technological capacity, and having a knowledgeable point person was considered to be valuable advice for new organizations.

> *Ask questions. We call it the bubble people. In [the NCCARE360 platform], there's a little icon down at the bottom. If you have tech support or tech questions, reach out to the bubble people and ask your question. Anybody can ask a question. You don't have to go through a bunch of hoops to escalate a question.*

Finding. **PHPs recommended that the State should focus on clear communication and a central information repository.**

PHPs discussed how the state could better support training for new organizations using the NCCARE360 platform. Their recommendations included creating clear, accessible information repositories and dedicated spaces for questions (**Table A15**). Additionally, PHPs talked about creating an accessible central information repository and the need for shared clear, definitive, written communication regarding any policy and guidance changes to all relevant stakeholders. Other examples included a space

for HSOs to ask questions about system issues, a comprehensive onboarding checklist, and separate training environments for all stakeholders.

> *Programmatically, for the HOP pilot, one thing we've been asking for is a central information repository. There are so many guidance updates that are shared so it would be helpful to have all of the updated info in one place.*

PHP Final Thoughts and Considerations

Finding. **Strategies for effective delivery of HOP should be multi-level and include systems, community, education, services, and partnership components.**

Given their experiences with HOP, PHPs outlined what was essential to enable effective delivery of pilot services. Key components included a focus on the process and systems, community, education, services and partnerships (**Table 34, Table A16**).

Table 34. Key PHP Recommendations for Effective Delivery of HOP

System Level Strategies
Create a landlord system to help with housing challenges in HOP regions
Create one collective balance for utilities
Improve systems for documenting, invoicing, and billing
Provide set parameters on services per beneficiary or adjust capped allocation funding
Provide PHPs information on HOP's administrative and operational costs
Community and Educational Strategies
Pair communication and education together
Include more education and empowerment for people to take ownership of their own health
Understand the needs of the community
Service Strategies
Include guardrails around services to keep the program true to its purpose
Include HSO service delivery monitoring and tracking
Partnership Strategies
Expand to include more HSOs
Utilize existing partners to support this work
Rethink care management as care coordination
Get care managers more involved in working with beneficiaries
Help care managers thoroughly understand services
Refine the role of network leads
Build rapport and communication with all beneficiaries
Deepen partnerships with DSS offices

Network Lead Qualitative Findings

This section summarizes the in-depth interviews with participants who were designated Network Leads (NL) within HOP. Network Leads play a vital role in supporting the various stakeholders across the network. They "connect" all aspects of the Pilot by supporting HSOs and communicating directly with the State and HOP Administrators to ensure success of the network. There are three NLs currently part of the NC 1115 Waiver Healthy Opportunities Pilots: Access East, Community Care of the Lower Cape Fear (CCLCF), and Impact Health. Each NL that is part of HOP joined via a procurement process through a Request for Proposal (RFP). The NLs cover distinct regions of North Carolina **(Figure 1)**:

- **Access East**: Beaufort, Bertie, Chowan, Edgecombe, Halifax, Hertford, Martin, Northampton, and Pitt
- **CCLCF**: Bladen, Brunswick, Columbus, New Hanover, Onslow, and Pender
- **Impact Health**: Avery, Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, and Yancey

Network Lead Qualitative Interview Purpose

The purpose of the interviews was to understand the experiences of the Network Leads operating within HOP. Participants were asked to discuss their role within HOP; how their organization engages with other stakeholders involved in HOP; staffing and organizational capacity; service administration; communication strategies; and recommendations for effective delivery and expansion of Pilot services.

Network Lead Qualitative Interview Study Sample Recruitment

Participants recruited for this project were purposively selected based on their roles and responsibilities associated with HOP. Names and email addresses of individuals within the NLs were provided to the evaluation team for the purpose of recruitment. For each name and contact information provided, three email contact attempts were made to invite the individual to participate in the evaluation via Zoom interviews.

Network Lead Qualitative Interview Data Collection Procedures

A total of 17 individual Zoom interviews were conducted between May – June 2024. All interviews were conducted by a trained qualitative researcher who has extensive experience facilitating research studies involving patients, clinical professionals, and researchers. Interviews lasted on average 45 minutes. The semi-structured interview guide was developed collaboratively with the Principal Investigator and research team to elicit insights and descriptive details from the participants' perspectives **(Appendix A. Organization Qualitative Interview Guide; Table A87. ATLAS.ti Network Lead Code Application; Table A88. Organization Qualitative Interview Codebook).** Participants were offered a $20 gift card upon completing the interview.

Network Lead Qualitative Interview Participants

A total of 17 participants were interviewed. Given this number of participants, demographic information was collected but is not reported, to protect participant privacy.

NL Organizational Capacity and Staffing Structure

Finding. **NL adapted their staffing structure and roles in response to evolving HOP programmatic needs.**

Network Lead participants discussed their organization's staffing structure, with vital roles encompassing five categories: leadership, program management, finance, community engagement, and program analytics and compliance **(Table 35)**. Some participants noted that there have been few changes in staffing structure over time while others shared that it was necessary to increase staff and restructure and adjust assigned tasks and roles as HOP programmatic needs evolved (**Table A17**).

> *We've tried to really build a culture of responsiveness to say the only thing that's going to be consistent here is change. We have kept the member experience at the center of our staffing culture. And then right on the heels of that is the HSO experience. And so, if we recognize that the way we're staffed isn't meeting a need, we try to adjust.*

Table 35. Qualitative Interview Vital Roles at the Network Leads

Role Category	Role Types*
Leadership	Vice President, Administrators, Coordinator Managers, Executive Director
Program Management	Operations Directors, Program Managers/Directors (AKA: Care Council Lead)
Finance	Billing Specialists, Billing Manager, Accountants, CFO, Quality Improvement Coordinators, Invoicing Specialist

Community Engagement	Community Health Workers, Community Engagement Managers, Enrollment Care, Community Health Improvement Coordinators, Communications, Care Manager Liaison, Community Outreach, Care Navigators
Program Analytics and Compliance	Data Scientist, Data Quality and Logistics, Contracting, Compliance Officers, Compliance Managers, Compliance Specialists, Physical and Virtual Operations Staff

*Note: These are the roles mentioned in the interviews, but the meaning of each role may vary from organization to organization

Finding. **Perceptions of staffing adequacy varied widely both within and across NL organizations.**

While some participants felt well-staffed due to clear role structures, team expansion aligned with program growth, and balanced workloads, others reported staffing shortages driven by vacant positions, turnover, leadership transitions, and uncertainty about the waiver renewal and potential program expansion (**Table A18**). One participant highlighted the importance of contracting with external organizations to fill gaps in internal capacity.

> *So when I first started, I think I was the 11th employee of [NL]. I was the first billing employee. We had three community engagement-- well, really, two community engagement managers and a director of programs. We had an operations director, an accountant, and senior leadership. So that was basically it. We now have, I think, 25 employees. So we have a data quality area. We've grown too. We've added the care team, which helps with enrollments. I'm looking to add another billing staff, hopefully soon.*

Finding. **NLs reported that their financial stability is impacted by HSO stability, prompt payment, capacity building funds, and external community embedding, funding, and grants.**

While some NL interview participants noted that their organizations were in good shape or that they were unsure of the financial health and stability of their organization, others highlighted key factors that impact a network lead's financial status (**Table A19**): HSO stability, prompt payment, capacity building funds, and external community embedding, funding, and grants.

> *[External funder] provide us with additional funding. As the board approves it, we have to justify it and bring it to their board and their board approves it. But just having those two sources of income right now helps. And I know [de-identified], our executive director, is in talks and doing a lot to make sure that we have additional funding. I think both of our funding now is restricted, so looking for unrestricted funding. And one thing I'm doing is working on the charitable solicitation license in North Carolina, and then eventually in other states so that [NL] can apply for grants and receive unrestricted funding and also receive unrestricted funding or restricted funding from donors that might want to donate funds to go towards HOP or [NL] or other things.*

NL HOP Engagement, Enrollment, and Services

Finding. **NLs reported that increasing and maintaining HOP enrollment and engagement was driven primarily by community outreach initiatives, financial support for HSOs, and effective communication and collaboration.**

Participants identified a range of factors that helped facilitate enrollment, engagement, and provision of services to HOP beneficiaries. These included community outreach events and initiatives such as no-wrong door enrollment and beneficiary word-of-mouth, financial support for HSOs such as capacity building funds, and effective communication and collaboration among network lead staff, HSOs, and the community (**Table A20**). Additional facilitators included tools such as HSO audits or wellness checks, an effective service platform, adequate staffing, and clear program policies.

> *Help facilitate? I mean, obviously, capacity-building funds. A lot of training because like I said, a lot of these organizations are grant-funded, and they're used to getting a lump sum of money for a grant to do the work and not used to having to turn around an invoice to get reimbursement. We're talking a lot about scaling and getting organizations up to the capacity they can handle because, unfortunately, with some of the reimbursement models, you almost have to scale in order to be successful. So trying to help particularly smaller organizations be able to deliver more services to more people.*

Finding. **NLs reported key challenges in providing services to fulfill beneficiary needs including funding sustainability and the payment model, NCCARE360 platform limitations, network adequacy, and service availability.**

Participants identified several challenges that limited effective delivery of HOP services, with the most common being concerns about funding sustainability and payment models as well as limitations within NCCARE360 (**Table A21**). Additional challenges included gaps in network adequacy and service availability, especially in rural areas, along with administrative burden, uncertainty around the waiver renewal, beneficiaries' hesitancy to trust and ask for help, need for additional staff, and guidance inconsistencies. For the housing domain, challenges with authorization timeframes, shortages in available housing, and difficulty finding reliable contractors for housing repairs further complicated service delivery.

> *So with Medicaid expansion in the winter and then the prepaid inpatient health plans that just launched. And then with tailored plan coming, they need more startup funds in those windows as well. So it's not just that some of the fee or the services are unsustainable, it's that they keep having to sort of rapidly expand yeah and they don't get paid fast enough to be able to staff up.*

Finding. **Network leads relied on strong communication, HSO network expansion, and targeted training to overcome service barriers.**

Participants emphasized regular network communication and meetings, HSO network expansion to increase capacity, "bundling" services, and targeted training and coaching for HSOs as core strategies to address barriers. Additional approaches such as designating centralized HSOs to fill in service gaps and reduce service fragmentation, leveraging trusted, community-rooted expertise, utilizing external organizations, NL advocacy on behalf of HOP stakeholders, and community engagement have also helped to reduce barriers and improve service delivery (**Table A22**).

> *So for capacity, it's how to get more HSOs in, how to strategize HSOs that are already in the area. Like I said, some HSOs really want to grow. And those are easy to move into our high-need areas like [de-identified] County. We have some of our bigger HSOs there that can kind of fill that need. Other times we've suggested if an organization does food boxes and they also do nutrition case management, then maybe they put a pamphlet in with their food boxes of like, "Hey, we do this service as well," or maybe during their call with them, during talks, maybe they find out that they are pre-diabetic and they're like, "Oh, we have a service for that. We have DPP [Diabetes Prevention Program]." So it's kind of just like pushing their other services with members through word of mouth. And sometimes it works, but it's still not to the point that it needs to be for sure.*

Finding. **Financial strategies played a crucial role in helping organizations maintain capacity and sustain HOP service delivery.**

Network leads implemented several adaptive financial strategies to address financial barriers, including quick invoice turnaround times, additional funding opportunities and investing in stable physical infrastructure, provision of a vehicle repair coordination fee, revolving credit to increase HSO cash flow, tools to show real time HSO capacity, and strengthening organization capacity and sustainability (**Table A23**).

> *We've only funded five agencies with property support [supporting operating space for HSOs]. But I think that's been a really big game changer for some of our agencies. One of them is volunteer-led, so they don't have a lot of direct costs, like staffing. But stabilizing their physical space was a huge shift, and I think it's going to make them very sustainable. And then I do think that the regular convenings has been a huge boost to help people navigate the messiness of a Pilot and keep reinforcing. We have these incredibly talented folks doing this work all over the region. And sometimes it feels like you can't get it right because it's messy. And I think being around both of their partners saying, "It's okay. It actually is supposed to be messy. It's the only way we're going to figure this out." If we waited for it to be perfect, we'd be generations away from doing this work. But also being with their peer groups who are having the same struggles and recognizing that there's a collective approach.*

NL Communication Strategies

Finding. **Network leads utilize various means of communication to maintain regular communication with partners and share pertinent information about HOP.**

Participants described various communication strategies in which NLs collaborated and shared important information about HOP, from meetings and emails to printed materials and a dynamic directory (**Table A24**). **Figure 13** highlights the number of participants that brought up different communication strategies. With the use of multiple communication strategies, participants noted they were in regular contact with their HOP partners.

> *So we literally use all of the communication methods. We have a newsletter that goes out bi-weekly, anything important. We have a project coordinator named [de-identified], and she sends out a blast of updates and stuff. With my organizations, I check in with them mostly weekly, but some of our other ones, maybe bi-weekly. And I text them, email them, call them. So it kind of just depends on the organization, what their best method of communication is. And then, like I said, we have many of meetings. So we have a monthly all-hands meeting that's just like general updates. And then we have a food sector meeting for food updates and finance meeting. So there's a lot of opportunities for HSOs to know what's going on every month.*

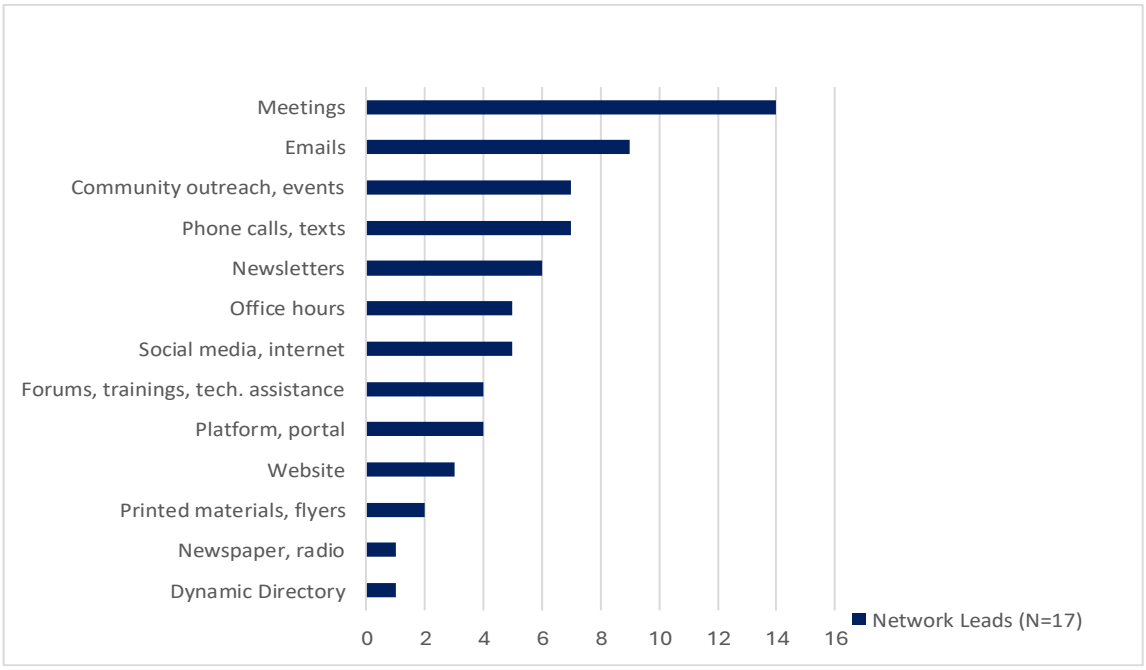


Figure 13. Communication Strategies Used by Network Leads

Finding. **Network leads created unique opportunities for HSOs to communicate and improve service delivery such as domain specific learning opportunities and HSO audits to ensure compliance.**

Of note, participants talked about how they created different opportunities to communicate important information about HOP. In some situations, this was domain specific conversations for HSOs to share best practices and lessons learned. In other situations, communication was integrated into HSO wellness checks, which are annual HSO audits that one network lead implemented to monitor HSOs (**Table A24**).

> *I know during the wellness check, that's one method. So what I'm communicating is more of processes or maybe guidelines on exclusion monitoring or conflict of interest. So what I do is I'll just draft all the guidelines and the documentations and good-to-know ideas or advice. And so I'll get those together. Our communication team reviews it for tone and plain language, and it's a lot of words, so we also try to simplify it to one page and then add pictures and make it colorful and then eye-catching and something that they can remember. And so I've done that with a good bit of compliance documentation. And there's different ways that I can get it out to the HSO. So during the wellness checks, I will share it with them.*

Finding. **NLs recommended strengthening communication pathways so they are more streamlined, inclusive, and timely would reduce delays, minimize misunderstandings, and improve coordination across the HOP ecosystem.**

Participants shared suggestions for additional communication strategies to further enhance HOP work (**Table A25**). They recommended filtering communication and updates to ensure information reaches those who need it most, accelerating the delivery of state-level guidance and policy changes, and providing direct communication from the state to all involved parties. Participants also highlighted the value of creating shared meetings for care managers and HSOs, establishing dedicated touchpoints for HSOs, and expanding communication methods to include texting for care managers, HSOs, and beneficiaries. Additional suggestions included increasing the number of care managers involved in HOP, involving the invoice team in all invoice-related decisions and communications, expanding outreach efforts, offering clear guidance on provided HOP services, and ensuring payers and insurance companies receive up-to-date information about HOP.

> *One of the issues that we hear a lot, that when the participants reach out to the different payers or whatnot, being that HOP is so new, a lot of them don't know anything about it more. So then we'll have people say, "I called and asked about the program and they don't know anything about it. And I was like, "Well, it's new so you might have to call back." And they called back and get a different rep. And then maybe that rep heard about it and was kind of new so then they can help. So I think it's just updating the insurance companies and making sure everybody is aware of what HOP is and what we do or how we can help and who's actually helping. I know that question comes up a lot, like, "I have*

> *Medicaid, so can I be a part of this program?" We're working through that right now with the care management plans. So just more education on it.*

Finding. **NLs reported that improving communication with HOP beneficiaries depends on clearer messaging, stronger coordination, and greater trust-building.**

When reflecting on how communication and connection with HOP beneficiaries could be improved, NLs highlighted that beneficiaries need more education about HOP at enrollment, including transparent explanations around the intent of intake surveys, preparing beneficiaries to answer HOP phone calls, a reference booklet to help beneficiaries understand how HOP works, and standardized communication materials to address beneficiary skepticism or anti-government concerns (**Table A26**). Suggestions also include stronger coordination across the HOP ecosystem by creating warm handoffs of beneficiaries from care managers to HSOs, direct communication from Medicaid to beneficiaries, more NL team involvement in State interactions, and collaboration with care managers. Additional ideas to strengthen communication with beneficiaries include incorporating a client feedback survey, offering a HOP phone service for beneficiaries, and ensuring beneficiaries feel valued and respected rather than observed and tested. To increase beneficiary connection to services, NLs also expressed interest in more transparency on the backend through access to NCCARE360 platform data and improved monitoring of beneficiaries who are not being connected to services.

> *So I feel like when you become a member of HOP, you should receive a booklet of some sort of how it works. I feel like we get a lot of calls of people not even knowing they have a HOP care manager. And I think since they're receiving a healthy food box, like that person is their person for help, and they don't know how to get in touch with their care manager or what have you. I feel like they should receive not a complicated booklet, but one of the specific benefits they know it's housing, food, transportation, and personal safety, but what does that mean? They don't realize housing could mean a utility assistance or home repair. But kind of just list out the most utilized. And then who is their person? You could have "who's your HOP care manager" and have a blank, and then they can have that filled in with the phone number and then who their caseworkers are per need because they don't realize we're going to have a different caseworker sometimes per need. And I feel like that gets very underutilized.*

NL NCCARE360 Platform Utilization

Finding. **While participants reported varied levels of preparedness and training experience with the NCCARE360 platform, it was utilized to manage and monitor service coordination and key operational processes for HOP.**

Participants shared different levels of preparedness and experience with NCCARE360 training, ranging from feeling well-prepared to relying on self-teaching or internal training. Some participants shared that training could be improved, noting the need for ongoing training as the platform is modified (**Table A27**). Despite varied levels of preparedness, participants used the NCCARE360 platform for referrals, invoicing, reviewing data and dashboards for tracking and reporting, compliance and performance monitoring, viewing HSO statuses, training HSOs using the NCCARE360 technology vendor demo site, troubleshooting with HSOs, completing pre-screenings, and for information tracking and communication (**Table A28**).

> *It is both a monitoring platform for us, meaning we check in to make sure that our HSOs are using it appropriately, documenting interactions with members, those sorts of things. So it shows up in that compliance space. Also, use it to gather data for reporting and meeting our metrics for the state in terms of counts and deliveries. And then we spend quite a lot of time in the billing space with it. So those are probably the three compliance and monitoring, evaluation, reporting, and billing.*

Finding. **NLs see value in utilizing NCCARE360 for managing HOP because it provides a centralized, user-friendly system for managing services and tracking outcomes.**

Participants described a range of benefits to using NCCARE360 for managing HOP. Platform features such as the strong closed referral loop system, chat support feature, Insights data dashboard, ability to see HSO notes and monitor HSO service status, and the simple, user-friendly interface were major advantages (**Table A29**). Participants also appreciated having all information centralized to one location, open communication with the NCCARE360 technology vendor team, and the elimination of paperwork. Additionally, NCCARE360 served as their only source of data, provided service tracking and accountability, and was the only tool available capable of managing HOP operations.

> *Well, it's nice to have all the services in a single secure platform. That part is really helpful. It's nice to be able to go in and see the notes in the cases because then I can kind of go back and look at the history if there's a need to support conversation with an HSO or a compliance issue. And the insights dashboard helps us track, as I mentioned, invoice data, and it kind of helps in that space. And like I said, just having that liaison there to kind of connect when we have concerns. It's nice to have a conversation versus just a ticket because when the ticket gets submitted, it goes off into the ether until somebody says, "This is what we'll be doing about that."*

Finding. **NLs identified NCCARE360 platform challenges that impact HOP operations, including issues around invoicing and administrative workflows, data access and reliability, platform functionality, and partnership dynamics with the technology vendor.**

Participants reported a wide range of challenges to working with the NCCARE360 platform, from technical limitations and system functionality issues to concerns about data and user experience (**Table A30**). Network Leads expressed frustration with the payment reconciliation process and described invoicing as administratively burdensome and not user-friendly, emphasizing the lack of clarity in invoice statuses and versions. Another major area of concern involved data access and reliability. Participants described data reliability challenges, difficulty getting data from the system, incomplete demographic data, data security concerns, and the lack of live, comprehensive data access for data-driven decision making. Moreover, participants reported functionality barriers including the inability to add notes to invoices, inability to archive resolved invoices, inability to reopen closed cases, inability to turn off services for select regions, inability to update referral description, lack of clarity and specificity in platform options, lack of dispute resolution functionality within platform, lack of family linking, lack of system alerts when HSO service provision status changes, lack of uniformity in information management, limited search and filtering functionality, limited visibility and access across user roles, inability to view HSO service notes, and privacy restrictions for sensitive services that limited care coordination. Participants noted that some platform limitations required external workarounds. Finally, several participants reported challenges around partnership dynamics with the NCCARE360 technology vendor. They described an adversarial relationship, slow implementation of requested system updates, sudden system updates without prior notice, and lack of end user involvement in design and testing of system updates.

> *I spend a lot of time on [the NCCARE360 platform] trying to pull information from the dashboards. And I find them to be just extraordinarily frustrating. There's no way for me to access any of the data that backs it. There's no way for me to pull down a view of the information to be able to manipulate it how we need it and want it. It's kind of just like, "Oh, [NCCARE360 technology vendor] decided that they want to show us this particular chart." And for us to get any other information out of it, we just kind of have to dig around. And it's extremely time-consuming. It's inaccurate at best. It creates so much room for human error. And time waste, it is insanely wasteful in my own personal time to get any amount of information takes hours, hours.*

Finding. **While some participants felt adequately prepared to use the NCCARE360 platform, other participants wished they had clearer upfront communication about the system's limitations and processes.**

Some participants felt well-prepared and supported and found the platform easy to use. Other participants shared that it would have been helpful to understand the platform's capabilities and

constraints upfront (**Table A31**). This included transparency around system limitations, more details on invoice processing, and understanding limitations around data access.

> *I guess maybe just knowing generally…of what [NCCARE360] has the capacity for and what it doesn't. Because I think back to when I did invoicing and stuff, I didn't realize that I had to track outside of the platform. So at first, I just tried to use NCCARE360 for it, and I was like, "Oh, this is problematic." So I think knowing at first what its capabilities are, and then what am I going to have to look outside for would be helpful.*

Finding. **NLs provided insights on how to build on the NCCARE360 platform's current capabilities to better manage HOP.**

Based on their experiences with the NCCARE360 platform, NLs offered helpful insights about the platform that emphasized the need for improved functionality, transparency, and user-informed design to support accurate data tracking, effective billing, and meaningful program evaluation (**Table A32**). Insights included the need to better optimize the NCCARE360 platform for billing; not having sufficient context to understand true service delivery; incomplete financial data that hinders payment reconciliation; lack of self-service reporting for payment discrepancies; the need to scale and shape processes with HSO input; the need for a Network Lead view; that data quality concerns reduce trust in system; that limited access to payer portals hinders support for HSOs; that NCCARE360 platform users should be involved in system development; and that issues like broad service categories and misaligned referrals created problems with service delivery.

> *I think [NCCARE360] is probably great for referrals. I just don't think it's a great platform for billing.*

Finding. **Organizations new to NCCARE360 can benefit from proactive learning, clear communication, and contextual understanding of both the platform and program requirements.**

NLs offered advice for new organizations getting trained on NCCARE360 (**Table A33**). This included engaging with available training resources, speaking up with concerns, taking notes, utilizing job aids, staying current with platform enhancements, utilizing the demo site, asking questions, conducting internal trainings for new HSOs, being patient, setting up open access to all relevant data, creating off-platform data and financial tracking for compliance and reconciliation, establishing dedicated administrative personnel for financial tasks, and ensuring in depth understanding of the HOP program.

> *I'd say use the training seminars that they have. [NCCARE360 technology vendor] has a training icon at the top, and it's pretty much a list of classes of anything that you want to learn or do [from*

NCCARE360 technology vendor]. They always make sure-- make sure they use those, attend the trainings, refer back to your job aids and your manuals

Finding. **NLs recommend that the State should focus on enhanced training relevance, accessibility, and alignment with real-world program use.**

NLs discussed how the state could better support training for new organizations using the NCCARE360 platform. Recommendations for state support are to include real users in the training; conduct training refreshers; simplify the onboarding and training for new HSOs; accommodate different learning styles; create opportunities for questions; enable live, unrestricted data access; have interactive, instructor-led trainings; use user feedback to inform best practice guidance; bridge the gap between platform training and program requirements; and conduct training around confidentiality and secure platform use (**Table A34**).

I mean, especially if we have expansion [of HOP services], the training for the new networks and the service providers within those networks, even the network leads because there will be new network lead staff members. We need to have in-the-seat training for them. In-the-seat training with scenarios, it can be virtual, but it needs to be in-the-seat with an instructor doing that training. And then also, at least once a quarter, they should host in-the-seat training for everyone. You can attend or not attend. If attendance drops way off, they can move to twice a year we do this. But going through a module is not enough when you're trying to learn a software. It's just not enough. You have to have scenarios. You have to have interaction. You have to have an opportunity to ask a question of a person. In a module, you cannot ask a question of a module…Especially if that is supposed to be the coordinating go-to tool for everybody to use, to track, monitor, and provide these services, it has to work right, and the people need to know how to make it work and how to do that correctly. And I just don't feel like we will be having as many questions about what people can see and what they can't see…those things wouldn't be happening if there was that initial training and then an opportunity to get additional training and be able to ask questions. I think that's the key.

NL Final Thoughts and Considerations

Finding. **NLs identified strong staffing and capacity, collaborative partnerships, adequate service and financial structures, reliable data access, and attention to geographic needs as essential foundations for effective pilot service delivery.**

Participants highlighted what they felt was essential to enable effective delivery of Pilot services in their region. Their reflections included thoughts and strategies on staffing and capacity, partnerships and collaborations, services, finances and reimbursement, data and information access, and geographical area (**Table 36**). Participant quotes further illustrating these ideas can be found in **Table A35**.

Table 36. NL Recommended Strategies for Effective Delivery of HOP

Staffing and Organizational Capacity
Consider scale and staffing when choosing network lead coverage areas
Provide ongoing capacity support to increase sustainability for organizations
Have existing NLs provide consultation and onboarding support for new NLs in case of expansion
Ensure adequate number of HSOs
Increase the number of care managers and community engagement managers
Partnerships and Collaborations
Foster strong communication among all key partners
Schedule cross-sector meetings to ask questions and get information across stakeholders
Use a buddy system to facilitate the learning curve with HOP
Create collaborative efforts across NLs
Find and partner with grassroots organizations
Do as much translational learning as possible
Share consistent communication
Create partnerships between NLs and new agencies
Service Strategies
Expand beyond Medicaid managed care
Roll out services in a phased approach
Continue HOP to help bridge the food gap for families
Data and Information Access
Make information and data accessible
Centralize certain mechanisms from the HSOs
Finances
Make sure invoice payment is timely
Build in financial stability and business financial literacy
Geographical Area
Tailor to each county or each area's specific and unique challenges and barriers
Provide more HSOs or other resources in rural areas

HSO Qualitative Findings

This section summarizes the in-depth interviews with HSOs within HOP. HSOs are community-based organizations or social service agencies contracted to deliver HOP services. They play a key role in delivering, tracking, reporting, and invoicing for HOP services delivered to HOP beneficiaries.

HSO Qualitative Interview Purpose

The purpose of the interviews was to understand the experiences of HSOs operating within HOP. Participants were asked to discuss their role within HOP; how their organization engages with other

stakeholders involved in HOP; staffing and organizational capacity; service administration; communication strategies; and recommendations for effective delivery and expansion of Pilot services.

HSO Qualitative Interview Study Sample Recruitment

Participants were purposively selected based on their roles and responsibilities associated with HOP. We aimed for representation of HSOs across the Pilot service domains: housing, food, transportation, and interpersonal safety and toxic stress and the three service regions: CCLCF, Impact Health, and Access East. Names and email addresses of individuals at the HSOs were provided to the evaluation team for the purpose of recruitment. For each name provided, three email contact attempts were made to invite the individual to participate in the evaluation via Zoom interviews.

HSO Qualitative Interview Data Collection Procedures

A total of 43 individuals were interviewed across 32 separate interviews. Eight of the 32 interviews were joint interviews in which we simultaneously interviewed 2-3 individuals from the same HSO. We spoke with participants from 23 unique HSOs. Interviews were conducted over Zoom between July – October 2024. All interviews were conducted by a trained qualitative researcher who has extensive experience facilitating research studies involving patients, clinical professionals, and researchers. Interviews lasted on average 50 minutes. The semi-structured interview guide was developed collaboratively with the Principal Investigator and research team to elicit insights and descriptive details from the participants' perspectives **(Appendix A. Organization Qualitative Interview Guide; Figure A2. ATLAS.ti HSO Code Application; Table 88. Organization Qualitative Interview Codebook)**. Participants were offered a $20 gift card upon completing the interview.

HSO Qualitative Interview Participants

A total of 43 participants were interviewed. Due to small cell sizes, demographic information is not reported to protect participant privacy. Interviewed HSO personnel were asked how many years their organization has been involved in HOP (**Figure 14**); the majority of interviewed HSOs had been involved for 2 or more years at the time of interviews. **Table 37** shows the number of interviewed HSOs by service domain, per NCCARE360 data.

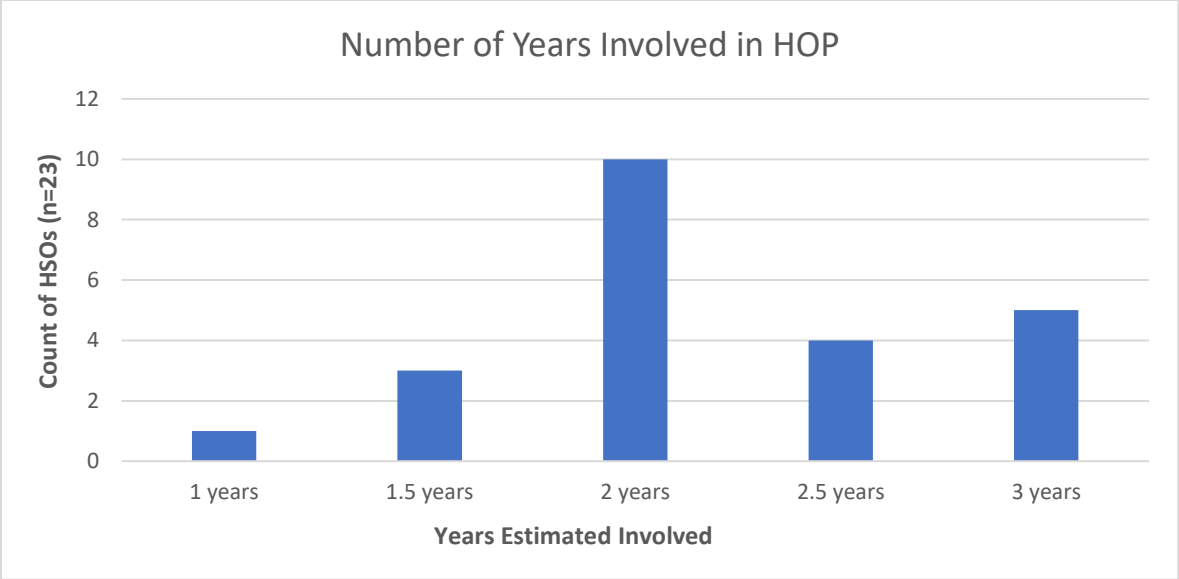


Figure 14. HSO Qualitative Interviews: How Long HSOs Have Been Involved in HOP

Table 37. Interviewed HSO Count by Service Domain per NCCARE360 Data

Service Domain	Number of HSOs providing service
Food	12
Transportation	10
Housing	11
IPV	7
Cross Domain	9

Note: Most HSOs offer multiple services, so they are counted across multiple domains.

HSO Organizational Capacity and Staffing Structure

Finding. **HSOs described various staffing structures that accommodated HOP programmatic needs.**

Within the interviews, HSO staff members discussed their staffing and any changes that occurred with their staffing structure over time. Some interviewed HSOs explained that their basic structure has not changed much over time, with staffing levels remaining the same as the beginning: "I don't think [staffing] has evolved. Our team has been the same since we got here." Alternatively, some HSOs expressed specific changes made to their staffing structure to accommodate HOP needs. These changes included hiring new staff for HOP; transitioning current staff into HOP roles; structuring staffing roles based on how HOP has affected service delivery; and bringing on volunteers.

> *As we've been able to grow and expand to new counties, we've had to hire more and more people. I started with just myself and two, excuse me, case managers in the area. And now I've been able to grow to six case managers that are on my team. So that's absolutely necessary.*

Finding. **Limited staffing capacity at HSOs caused service pauses.**

HSOs described having to pause services due to not having enough staff capacity to keep up with referrals. For example:

> *I think we're getting to the point that we are getting stable as long as we maintain a certain number [of referrals]. Now, we had to play catch-up, so we had to turn our services off to not take any other referrals. I had to make sure they cleaned the database off. One person left the organization, another one is on leave. So when I brought those new people, you got to get them trained. You got to let them know what's going on, and you got to fix the problems that were there before they got there…We have to open up our services and let people send us referrals, but I'm going to have to aggressively get it together because you're not going to want our services to be off long.*

Interviewed HSO staff members also brought up different staffing situations they have encountered with staffing their organization for HOP. This included: small and limited staff; the need for more staff; the importance of teamwork; and ensuring balance between staff and referrals.

> *We need more staff. There's definitely way more to be done than we have people to do it. And that includes our staff, and that includes tradespeople to hire to do the work. You can't just hire just anyone. We're very careful about making sure that the people that we hire to do services are going to be kind and non-judgmental and able to handle the situations that they're seeing.*

Finding. **HOP payment model and coordination fees support HSO financial stability.**

HSO staff that were interviewed were asked about their organization's financial stability as it relates to HOP. They noted the importance of the payment model and coordination fees.

> *The coordination fee works out for us because that's what we use it for is in case of things like that, providing for that kind of stuff. So it's a helpful little thing. I think the fees are good. I think they should add fees on the rent ones. It's just a lot of work. Not like we need more money. It's not about that. It's just about the work. I think a lot of HSOs would benefit from it.*

Finding. **External financial support and capacity building funds play a vital role in HSO financial stability (Table A36).**

> *In terms of looking back, we, like many organizations, although I think we were pretty well informed about how to anticipate needs that could have been funded by capacity-building funds. We ran out of those funds, and yet we are still doing all the things we need to do to be in compliance with our*

contract. So what that means today is that we're using other funds to go to HOP meetings and to do our HOP exclusion monitoring and all those things we have to do.

Finding. **Interviewed HSOs report financial stability.**

Of the 23 HSOs interviewed, 22 noted that their organization was in good shape, financially.

Okay. I believe when I was looking at the numbers, going over everything, that we're sustaining. So I know a lot of it does come from the food referrals that we receive, that it can actually help out in all the other domains. So it's like a constant or steady, especially with that. So that's what I can say as far as that is concerned.

Additionally, when asked about financial stability, three interviewed participants highlighted the importance of showing up for community members, for example:

But we're not really in it for the money part of it. We just want to help people. That's my boss's biggest-- one of her biggest goals is we want to help these people to where they're-- the whole goal is they're going to the hospital or the ER less or they're going to the doctor less. So whatever we're doing is hopefully working. We were supposed to do a certain kind of report for that.

HSO HOP Engagement, Enrollment, and Services

Finding. **HSO financial support is critical to HOP service delivery.**

Interviewed HSOs highlighted that both the external grant support and the support from the HOP program via capacity building funds allowed them to hire more people, increase services delivered, and retain reliable staff (**Table A37**).

We've increased our services over the last year and the amount of individuals and families that we're able to serve…So some of the factors that was influenced was [de-identified network lead] allotting additional funding startup costs so that we were able to purchase things that we would need for another person. Also, we was able to give the one person that was doing HOP for a long period of time for us, they were given a bonus. So that helped with retaining, I guess, maintaining a person that wanted to continue to do that role, kind of let them feel like they're valued in that sense.

Finding. **HSOs greatly value support from NLs to assist in addressing challenges, answering questions, and fielding requests to the State.**

Actually, the network at [Network Lead] is extremely helpful. And I mean individuals being able to call people or email people and have someone walk us through a difficult case or help us think of ways to approach a landlord or just what's happened with this invoice and why it's weird. It's a very personal service that they are providing, mediating between the payers and the clients. That's been just super helpful…We don't always take advantage of them, but the network meetings that happen monthly and the ones that happen domain-specific, those are super helpful also.

Finding. **HSOs reported that a collaborative community and network are essential to successfully providing services to HOP beneficiaries.**

Interviewed participants emphasized the overall importance of network connections with other HSOs, community leaders, volunteers, and external organizations (**Table A37**).

> *So I think I named some of those, but just the partnerships that we've created has helped that because I don't know how this program really would have ran with the amount of staff that we have if we would not have partnered with outside sources. So partnering with the partnerships that we have, the volunteers that we set in place, so that cut down on expenses as well overall. And so I think that will probably, I would say, and working of course, well Food Lion, that would be a partner too. So working with them close knit with everyone in the community.*

Participants talked about a variety of additional factors that contributed to success in providing services to HOP beneficiaries: the ability to manage pausing and starting referrals as well as expanding services; community outreach; flexibility of housing navigation; beneficiary intake interviews and proactive screenings; internal processes that promote programmatic function; the engagement of leadership; leveraging individual strengths; HOP program education to community; HOP trainings; innovative ways to provide services and providing services similar to organizations' non-HOP services; and understanding beneficiaries' diverse needs (**Table A37**).

HSO Barriers and Challenges for HOP Services

Finding. **HSOs reported that administrative burdens were challenging..**

> *And just the administrative, I say burden - and I do kind of mean it - it's been a lot. The administrative piece has been a lot more significant than we were originally anticipating. And that has been a little bit of a limitation on how many folks that we can serve because we have to make sure that we're staying compliant and want to do it right. But there have been times we've had to slow down and sit idle for a little bit on not taking new cases, just because it was just me working on it at one point.*

Finding. **HSOs reported areas where the current funding model was more challenging for them.**

Interview participants emphasized some challenges with the current reimbursement model and its connection to organization funding sustainability that impacts the ability to scale the program.

> *However, it's still a time-consuming and expensive service because that first month's rent security deposit, there's no coordination fee associated with that. So we're getting reimbursed at cost in order to provide that service, which is hard for an organization to really stay afloat if you're getting*

> *reimbursed. The costs later down the road with the reimbursement still being a little bit slower than it is for other programs. It can be difficult to provide that service as well.*

Finding. **HSOs reported that lack of clear and consistent guidelines could be barriers to delivering HOP services.**

HSOs described that at times lack of guidelines, changing guidelines, and grey areas caused challenges for their organization in meeting beneficiary needs:

> *I would say that the thing that's challenging about it is [the services], they're forever changing. And so when we have somebody who's gotten the service before and we get a new referral, that's been an issue. They don't understand the difference and that it is changing all the time. So that's been a little bit of a struggle, but other than that, most people are thankful for the help and it's been a great thing, so.*

Finding. **HSOs reported that limitations in resources and network availability created challenges.**

Interviewed HSOs identified that at times they run into issues with network and service availability, particularly in rural areas; and not having enough local resources to fulfill beneficiary needs. HSOs note that these challenges arise when: there aren't enough HSOs in a region to cover the need, especially in smaller, rural counties; the country-wide housing crises creates housing that is inaccessible due to cost and location; HOP resources do not always fully meet beneficiaries' needs; and HSOs lack the physical space or means to provide services to accommodate all referrals (**Table A38**).

> *It's harder in some of our… all the smaller counties just because of some of the counties that we work in. They're so small, there's no-- everything is a single-family home. And it makes it hard when there's no apartments, or duplexes, or townhomes to really help with the number of available houses in the area. So that has also become a challenge.*

> *But I think a lot of HSOs are really struggling with capacity. Their issue might be a different kind of capacity. Some HSOs might have problems with the financial capacity, some with what we have, which is you don't have enough people and manpower to cover all the referrals you're getting. And some are just-- they're so busy and everything else they do, it's a little harder to keep up with the program.*

Finding. **Lack of trust in HSOs and the HOP program can hinder service delivery.**

HSOs voiced that at times it can be a challenge to build rapport with beneficiaries and gain their trust in order to support them, for example:

> *What we've experienced through HOP is a lot of people are not trusting of the service. If they haven't been to our facility for services before, I think they're restrictive on what they want to tell us and talk to us about. And in fear that that might come back on them somehow. A lot of times we'll call, and the IPV client may even say that they're not an IPV at first. So we've had a lot of limits there, I guess you could say, as far as trying to break through those barriers. But eventually trust is built, and we seem to be able to get through to the client and have been able to help them with services, resources, and all of them's different I guess.*

Additionally, there is the step of getting outside organizations and landlords to trust the HOP program:

> *So there's a step there that maybe for rental situations, it needs to go to the landlord first before-- I mean, it does go to the landlord before we do anything, but before even the inspection, that this client has been referred to this program. The landlords don't know about the program, so they're suspicious of who we are.*

Additional challenges discussed related to the ability to adequately provide HOP services and efficiently function as a network include: balancing referrals to staffing ratio, issues with referral accuracy, and smoothing referral volume (high and low); managing member expectations and member education; misunderstandings of roles and responsibilities; new and changing documentation requirements; organization protocols that limit service delivery timeframe; issues with communicating with PHPs and issues with PHPs making the correct payments; communication challenges with care managers and also with beneficiaries; and needing more capacity building funds (**Table A38**). The table below (**Table 38**) highlights challenges discussed relating to service domains (illustrative quotes related to these themes can also be found in **Table A38**).

Table 38. HSO Challenges and Barriers Related to Service Domains

Food Domain	Transporting large quantities of food Capacity to store and handle fresh produce
Housing Domain	Coordinating and making rent payments Coordination challenges between HSOs Doing home repairs on rental properties Finding insured contractors willing to do intensive home repairs Housing availability & affordability barriers Housing quality & safety issues Members not meeting housing qualifications Move in and household support gaps
Transportation Domain	Limitations on and funding for vehicle repair Administrative burden on members HOP administrative burden on mechanics for vehicle repair The need for more separated distinctions in services for transportation domain Barriers with family needs and who the referral is eligible for Issues with members vehicles that complicate vehicle repair

IPV/ toxic-stress Domain	Care manager issues screening for legal issues related to IPV Some HSOs have additional IPV guidelines and regulations that increase administrative burden Higher acuity and needs of IPV/toxic-stress beneficiaries Beneficiary reluctance to express experiencing IPV
Cross-Domain	Variety in beneficiary needs and time required to assist them Emotional labor and strain on personnel

HSO Strategies for Addressing Service Barriers.

Finding. **HSOs felt keeping internal records was important.**

> *We've created a lot of internal tracking systems and whatnot that kind of talk to other softwares that we use just to be able to quickly pick up information about folks when we need it and being able to draw lists and exports and things like that. I think we've pivoted a lot internally.*

Finding. **NLs were invaluable in addressing HSO concerns and challenges.**

Interviewed HSOs illuminated the importance and value in having the support of NLs to address their concerns and challenges:

> *I will just add that the role of network leads have been really important to address some of the challenges. We're able to go to our network meetings about the need for-- when you convene, care managers [inaudible] to sort of be able to talk about what we do so that care managers are better aware of when to connect their members to legal. And so, I will say that network leads have been really important in helping us facilitate and addressing many of the challenges*

Finding. **Collaboration with other organizations, businesses, and individuals was critical to addressing service barriers.**

HSOs emphasized that an important asset of the Pilots is the ability to work with other organizations or individuals to improve service delivery:

> *And we are also working on developing relationships with more of our farmers because we do purchase most of our food from local producers. So we are building out our network of farmers that we can purchase from…So other HSOs are filling in for those that we are not able to serve right now.*

Finding. **Promotion of HOP services through community outreach improved referrals.**

Interviewed HSOs mentioned that getting out into the community and promoting the program helped improve referrals and inform the community.

> *What I've realized, especially in the very beginning, not many people, again, knew about it. So what we've done, I would say, was we would go to--because we're also out in the community. So we host*

> *our held events within the community, and we pushed out the rack cards and different things and promoted the service that way. Doctor's offices, informed them about it. Went to the social services or the health departments and informed them. Going to different areas since we were partnering with the mechanic shops and the food stores and landlords knew about it and all that. That's how we was pushing out the information to get their members or their clients that information. So I think that that would be beneficial is to market it.*

Some additional strategies to address barriers in service delivery (**Table A39**) included communicating regularly and sending follow ups with staff members, care managers, and beneficiaries; utilizing the NCCARE360 platform help desk for support; adjusting organization operations and revising administrative processes for efficiency; balancing staffing as well as referrals by demand; staying on top of referral dates and completed intake calls with beneficiaries. Moreover, HSOs worked to maximize their physical space and upgrade equipment; encouraged flexibility with beneficiaries; ensured they have Spanish-speaking staff; worked closely with landlords; and oriented beneficiaries to vital contacts they should be aware of. When at capacity, HSOs would pause referrals to ensure adequate service.

HSO Communication Strategies

Finding. **HSOs utilized various communication strategies for HOP.**

Participants were asked to describe the different types of communication strategies used to communicate important information about HOP to their beneficiaries and their strategies for communicating within their teams (**Figure 15**).

Communication Strategies with Beneficiaries	Communication Strategies with Teams
Email Home visits In-person meetings Vehicle signage to promote awareness in community Postal mail Routific, a routing software Social media platforms Telephone calls Texting Zoom meetings	ATCEM hub, a communication platform Chats in Teams Email Facetime In-person meetings Post-it notes Project management platform Spreadsheets Telephone calls Texting NCCARE360 Zoom meetings

Figure 15. Organization Interview Communication Strategies Used by HSOs

Finding. **HSOs emphasized the importance of trying multiple methods to reach beneficiaries.**

To communicate with HOP beneficiaries, HSOs talked about the importance of using multiple methods and selecting best methods based on beneficiaries' preferences. According to the interviewed participants:

> *All of them. Phone, email, text message-- … --in-person, a Zoom meeting. Yeah. Any way we can get in contact and have a meeting, there's no excuse. Let's get this done.*

With the use of multiple communication strategies, participants also noted they were in regular contact with their HOP participants. HSOs noted that key strategies to reach beneficiaries included: phone calls, texts, home visits, and connecting with care managers or NCCARE360.

Finding. **HSOs utilized multiple methods to communicate within their team.**

Similarly, HSOs talked about using multiple methods to communicate with their team. They highlight the importance of constant communication to connect and discuss any HOP needs. For example:

> *We have lots of forms of communication. [person 2] and I have a weekly call where we hop on teams like we hash it out. We are very well-versed with one another. We have lots of communication. If we're not talking every hour on the hour, we're constantly updating each other on clients or something like an interaction we have with the care manager, it's a constant flow of communication. If we're not on the phone, we're in person. If we're not in person, we're in a Teams call. We're always communicating in some way.*

Finding. **HSOs reported that dedicated meetings for HSOs and other stakeholders to come together was very beneficial.**

HSOs identified that the monthly meetings with other HSOs are a huge benefit for them and also voiced that expanding or adding meetings to include other stakeholders (the State, care managers, PHPs, etc.) could also be a big benefit for HOP.

> *Like I said, if the PHPs and the HSOs can get together and do some developmental strategic work, I think we could cut out a lot of things because there are things that they see that we don't and vice versa. And if we ever get a chance to come together and work on it, we could cut out a lot of the problems because we know exactly what to tell the state, "Well, this doesn't work. That does. This does. That doesn't. And we know firsthand."*

Finding. **HSOs reported that they desired more opportunities for direct involvement with the State.**

> *I think that the State, I just think it would be nice for them to be at some of the quarterly meetings as well. I know it seems like [de-identified NL] or the network lead is the bridge to them. But I think communication should not only go through them because when things are communicated, you don't necessarily know what's being communicated or what filter is going through. I think that Department of Health and Human Services honestly need to have more boots on the ground. And just that, hey, at least be at the quarterly meetings, at least actually hear what's going on with the Human Services Organizations as well.*

Finding. **HSOs emphasized the importance of frequently confirming contact information with beneficiaries.**

HSOs noted that discussing with beneficiaries expectations regarding receiving phone calls from organizations was important. HSOs also noted that it was important to ensure that beneficiary phone numbers are up-to-date, that call-screeners are not filtering out unknown numbers, and that their voicemail is set up and not full. Additionally, HSOs suggested regularly making sure beneficiary contact information is up to date.

> *When we call their phone, "This number has been disconnected," or we call the phone and, "This mailbox is full, you cannot leave a message." It leaves us now in a spot where we are not able to deliver the food because sometimes we have a good distance, sometimes we drive out for like 40-45 minutes to go deliver a food box.*

Additional suggestions to improve communication offered by HSOs include: create a platform outside of NCCARE360 for Q&As where stakeholders can go to ask and answer questions; add a Teams or text function to NCCARE360 to improve beneficiary and stakeholder communication; increase in-person and telephone communication with stakeholders; consider adding scheduled, automatic reports to be created and sent using NCCARE360 data; and schedule treatment team meetings for all HSOs involved in service delivery for a beneficiary. As it pertains to improving communication with beneficiaries, HSOs suggest providing hand-held translating devices or resources; discussing the HOP program with beneficiaries at enrollment or sending a HOP welcome letter to explain how services and referrals work; offering HOP beneficiaries an app or link to know when HOP activities or deliveries will occur to facilitate scheduling; and using “warm hand offs” to establish a trusting relationship with beneficiaries. **(Table A40).**

HSO NCCARE360 Platform Utilization

Finding. **Many HSO staff members expressed that they received good foundational training of NCCARE360 and also “learned by doing.”**

HSO staff members were asked about how well they felt the NCCARE360 training prepared them for using the platform. Of the interviewed participants, 18 said it was good foundational training that helped prepare them for how to navigate the platform. HSO staff also reported that while they recall receiving training, they learned most of how to navigate the platform by self-teaching and "learning by doing," some also noting that the platform had also changed since receiving the training.

> *It did. It prepared us. It was very-- you could go back and watch it if you needed to. If you have questions, they had somebody to answer your questions.*
>
> *Knowing me, though, and how my brain works, I got to get in there and start clicking around and getting used to it. So it was probably a good overview training, but it's over time that I've really had to just get used to the platform by just clicking around and trial and error.*

Further, interviewees voiced that Network Leads, the responsiveness of the NCCARE360 technology vendor tech support, the demo environment, and job aids and resources were helpful and supportive during their learning how to utilize the NCCARE360 platform. Additionally, some participants highlighted receiving peer-based, informal learning and training for the platform. Alternatively, a few participants mentioned there being limited access to training materials, that training was not tailored to their role, and that they felt training could use some improvement (**Table A41**).

Finding. **HSOs primary utilized NCCARE360 for referrals, invoicing, communication, and documentation.**

The majority of HSOs highlighted that their primary use of the NCCARE360 platform was for processing referrals and invoices, communicating, and documenting.

> *I'm in it right now. To be honest, I use it for everything. I'm in it every day, all day. It's a never-ending cycle. We receive so many referrals a day for every service. So I also use it for annotating or documenting when we communicate with a client, when we communicate with the case manager, when we communicate with our partners that are handling the services for the clients. So yeah, we use that platform very often.*
>
> *For everything, to accept referrals, reject referrals, invoicing, to check on the status of consumers, to communicate with the PHPs, care managers, update consumer information.*
>
> *So accepting and receiving referrals. We use it for invoicing. I use it to communicate with case managers to communicate with NCCARE360 tech team. So I use it to pull reports if I need to.*

Some participants noted that the NCCARE360 platform is the main tool for HOP operations. Additional uses of NCCARE360 that were mentioned include identifying care team members; monitoring referral progress; pulling reports; tracking claims and payments; accessing trainings; navigating resources beyond HOP; and general HOP beneficiary monitoring (**Table A42**).

Finding. **HSOs valued working with the NCCARE360 platform for its all-in-one, user-friendly system with centralized communication.**

HSOs responses highlighted that the NCCARE360 platform is an all-in-one system that assists in program tasks, centralizes communication and has transparent case visibility, while also bolstering a user-friendly interface.

> *I would say keeping everything in one place and being able to look at the participant's base sheet. And you can see under cases all the cases that they're working on with your organization or another organization that helps you stay up to date in the participant's care. And then also you're able to see documents that that participant may be working on with another organization. So really just cross-collaborating, I think, is definitely a benefit of NCCARE360 or [NCCARE360 technology vendor].*

Table A43 includes additional responses that highlighted a range of additional practical and operational advantages of the NCCARE360 platform: simplification of staff workflows; multi-user access with role-based permissions; comprehensive documentation of case history and service coordination; streamlined and efficient case transfers, referrals, and HOP member tracking; secure sharing and protection of sensitive information; real-time updates on enrollment and coverage status; and a useful demo environment. The ability to utilize the platform for invoicing, submit invoices for reviews, access payment/invoice status, and search the platform were also benefits. NCCARE360 also allowed HSOs to identify and connect with care managers and stakeholders; and improved the detail and clarity of service descriptions. Technical support from the NCCARE360 technology vendor was reliable and responsive to user input while also supporting error correction processes for HSOs.

Finding: **HSOs reported that primary challenges with NCCARE360 included invoicing functionality, communication with care managers, and reporting and data accessibility limitations.**

The primary challenges with the NCCARE360 platform identified by HSO staff were: communication challenges with care managers, difficulties and inaccuracies with invoices, and reporting and data accessibility limitations.

- **Communication challenges with care managers**
  There's a few things that I wish they would change. Like, I wish that you could communicate easier with care managers through the platform. That's been a struggle where we have to go search for their regular email, go to our regular email instead of being able to contact each other through the platform.

- **Difficulties with invoicing functions, inaccurate and unclear invoice status**
  I mean, it doesn't feel like a system designed for invoices. I think that it's a little hard for me to peel off the invoicing paradigm versus mechanism, but it's clunky. It has some tracking functions of where the invoice is and its movement between network lead and payer. But it's unclear how live those updates are. And it's often unclear who is-- sometimes we'll get something back with a comment. Who knows who it was that put that comment in?

- **Reporting and data accessibility limitations**
  We're not able to run reports. It's not as friendly. We're running reports. That is a huge drawback with this program. Keep in mind that we do have to submit capacity reports on a monthly basis. But if it wasn't for our internal reporting, then we would not be able to do that with efficiency and accuracy as well

Additional comments from interviewed HSOs relating to challenges with using the NCCARE360 platform included: confusion due to separate sensitive vs. regular service profiles; difficulty communicating with other HSOs; difficulty tracking and monitoring service delivery; frequent session time outs, system lags, technical issues and glitches; limited search filters; unreliable document upload functionality; system downtime disruptions; inconsistencies in documentation expectations and parent/guardian contact details for minors; inabilities to limit referral intake to existing clients or revisit rejected referrals; inadequate service category labels and details in referral notes; lack of notifications for invoice rejections; lack of advance notice for system updates; inconsistent visibility and access across stakeholders; inability to reopen closed referrals when needed; sensitive service reclassification leading to payment delays; and notes on sensitive service profiles not being visible to others (**Table A44**). Of note, 6 participants noted that they have not faced any challenges in working with the platform.

Finding: **HSO staff suggested additional information that could be provided about the NCCARE360 platform.**

Some areas where participants expressed that additional information could be beneficial are: more information about invoice processing and user roles and access levels; more reporting functions that provide lists of open, submitted, and closed cases; and increased clarity about the “notes” function (**Table A45**).

> *I think that as we learned about the user roles and started setting them up, it was then that we learned that we'd only get one or two people in certain roles. And not until someone had the role could we really see the differences in what that role could see versus the others.*
>
> *Well, it would have been helpful to know that nobody else could see your notes. So it took me a while to figure out why nobody was responding to me. So I feel like that would have been-- if it was brought to my attention a little more, I would have caught on to that. So maybe just that. That's the only thing I could think of.*

Finding: **HSO insights about the NCCARE360 platform indicate that platform usage requires clear workflows, strategic role management, and adaptability, while navigating communication tools and addressing challenges with data accuracy and manual entry.**

Participants provided the following insights relating to their experience with the NCCARE360 platform: be strategic with user roles/access and use individual logins for accountability and clarity; create a workflow checklist to monitor referral and service status and maintain independent record-keeping and financial tracking; be aware of multi-step invoice submission process; pull reports regularly; utilize live messaging feature for care team communication; and utilize contact preferences feature for quicker, safety-centered communication with beneficiaries. The "my networks" feature provided effective user and organization search function. Some challenges mentioned included difficulty identifying up-to-date care manager information and the need for manual county and zip code entry for referrals. Participants highlighted the importance of computer proficiency and remaining adaptable to change (**Table A46**).

> *That don't rely on [NCCARE360] solely. You are going to mess up. Don't rely on that for invoicing. You have to have a whole another set of accountability on your own to make sure that you actually receive the monies. It might say paid and you have not even received it. It might say that it hasn't been paid and it hasn't been updated and you have received that money. You cannot rely on NCCARE360 to-- on monies in and out of your agency. That's very important.*
>
> *I think what benefits us the most, and I may be totally wrong, but I like that we don't have to utilize [the NCCARE360 platform] for a lot of our information, like documentation, because we have our own platform that we use within the hospital setting that allows us a little more flexibility than what [the NCCARE360 platform] offers…[inaudible] documentation that I upload to them versus [the NCCARE360 platform] because if nobody else can see us, then the only thing we need to do is just accept and do submit referrals through there. I mean, there's no need for really for us to document in there if nobody can see what we're documenting except for us.*

Finding: **HSOs new to NCCARE360 can benefit from hands-on learning, leveraging available supports, and building confidence.**

Participants were asked to share any advice for new organizations getting trained on the NCCARE360 platform. Their advice highlighted the importance of hands-on learning, leveraging support, and building confidence (**Table A47**). Additional advice included learning by clicking around and exploring; using the training resources; utilizing the NCCARE360 technology vendor tech support; and asking questions. For organizations as a whole, they also voiced the value in connecting with experienced HSOs and NLs as well as establishing organizational policies and guidelines early.

> *I would say the same thing, just spending time on it and clicking different things. I feel like it's fairly intuitive. Once you're on it for a little bit or a couple of days, I feel like you start to get the hang of where everything lives. And yeah, yeah, I would say just spend time on it.*
>
> *I would say do those self-paced [NCCARE360 technology vendor] trainings. I think that's helpful too to get a baseline understanding of how the program works.*
>
> *Find a network HSO or find a network group that will be willing to give you some advice…find a HSO who is willing to work with you and you can ask questions and get your answers from somebody who has done it as well.*

Finding: **HSO recommendations for the State include calls for clearer guidance, more consistent training, and stronger systems-level support.**

Interview participant recommendations included calls for clearer guidance, more consistent training, and stronger systems-level support (**Table A48**). Additional recommendations included are included in **Table 39**.

Table 39. HSO Recommendations for the State

Topic	Recommendation
Training	• Include NCCARE360 platform training in HOP orientation checklist • Provide tailored, updated, and role-specific training • Support NLs as primary trainers and liaisons for HSOs • Centralize and update training materials to ease onboarding and reduce confusion for HSOs • Provide varying forms of training to accommodate different learning styles • Mandate submission of proof of self-paced training completion • Include training on platform visibility and access differences across HOP stakeholders
NCCARE360	• Improve and update the invoicing system • Support HSO side payment reconciliation tools for better tracking • Advocate for platform improvements and address technical issues

	• Require mandatory care manager contact fields in referrals to reduce delays
Communication	• Maintain regular meetings and open forums for support and issue resolution • Engage directly with HSOs to understand their unique needs
Program-specific	• Address rural community needs and implementation challenges • Establish consistent service requirements and guidelines across HSOs

HSO Final Thoughts and Considerations

Participants shared final thoughts regarding what they felt was essential to enable effective delivery of pilot services in their region, advice for other organizations that seek to do this type of work, and their recommendations for HOP to address service delivery barriers and challenges (**Table 40**). Illustrative quotes further elaborating on these strategies are presented in **Table A49**.

Table 40. HSO Recommendations for Effective Delivery of HOP

Essential Components for Effective Service Delivery
Adequate staffing
More participating organizations
Timely access to services
Standardization and consistency of service delivery across HSOs
Program standardization across networks
Equitable number of referrals allocated to HSOs
Regular communication with staff
Regular communication with beneficiaries
Regular communication with all partners
Updated beneficiary contact information and location
An understanding of different counties and rural situations
An understanding and willingness to meet beneficiaries where they are
Outreach and engagement in communities
Promotion and awareness of available services
NCCARE360
Recognition and awareness of established processes
Monitor HSO capacity
Availability of funds and financial support
Integration of the NCCARE360 platform with a route delivery or logistics software
Quick and timely payment
Advice For Other Organizations
Screen many beneficiaries
Form supportive network collaborations
Consider specific needs of rural vs urban communities in HOP planning

Go in with a genuine desire to help Be prepared Work in coordination with local partners to bring education and awareness to services Make sure the platform is established before services begin Make use of the training
Advice For HOP to Address Barriers and Challenges to Service Delivery
Offer a workaround for referrals to extend to parents Offer more options for gas card application Continue capacity building funds Have an accounting system to track and manage financial data Offer a different payment structure to reimburse HSOs Set up a department specific for HOP at PHPs Implement more Network Leads Offer a HOP emergency fund Offer a universal operator line Offer support and assistance for rural service providers Have a sufficient number of HSOs and staffing involved in HOP

Evaluation Question 2

The principal goal for Evaluation Question 2 ("Increased Rates of Social Risk Factor Screening and Connection to Appropriate Services") during this reporting period was to determine whether there was a greater rate of screening for social risks in Pilot regions, as compared with non-Pilot regions. We counted all screens conducted from March 15, 2022 to November 30, 2024 in the 'numerator' of the screening outcomes (e.g., a person with a recorded screening at any time between March 15, 2022 and November 30, 2024 would be counted as having been screened).

We found (**Table 41**) that a greater proportion of Medicaid beneficiaries were screened in Pilot regions (106,932 out of 740,600, or 14.4%) when compared with non-Pilot regions (363,370 out of 3,027,180, or 12.0%), chi-squared $p < 0.001$. This represents an approximately 20.0% increase in screening rates for Pilot regions compared with non-Pilot regions.

We also examined screening by Medicaid plan type. Among beneficiaries in Medicaid Managed Care Standard Plans (but never in Tailored Plans), a greater proportion were screened in Pilot regions (94,638 out of 491,173, or 19.3%) than in non-Pilot regions (334,950 out of 2,161,188 or 15.5%) (**Table 42**). This represents an approximately 24% increase in screening rates for Pilot regions compared with non-Pilot regions ($p< 0.001$). In analyses among beneficiaries who were ever in a Tailored Plan during the evaluation period, we also found that a greater proportion were screened in Pilot regions (9,843 out of 55,130, or 17.9%) when compared with non-Pilot regions (22,323 out of 186,700, or 12.0%) (**Table 43**). This represents an approximately 49% increase in screening rates for Pilot regions compared with non-Pilot regions ($p< 0.001$). A summary of screening by region is presented in **Table 44**.

Despite these differences however, a substantial proportion of Medicaid beneficiaries in both HOP and non-HOP regions did not have screening results recorded.

As described above in the methodological limitations section, we were unable to determine the difference, if any, in connections to services for positive screening between the Pilot and non-Pilot regions, owing to lack of data regarding services received outside of the Pilots.

Table 41. Comparison of Screening Rates in HOP Regions vs. Non-HOP Regions

Region	Screened		Total	P-Value
	Yes	No		
HOP	106,932 (14.4%)	633,668 (85.6%)	**740,600**	<0.001
Non-HOP	363,370 (12.0%)	2,663,810 (88.0%)	**3,027,180**	
Total	**470,302**	**3,297,478**	**3,767,780**	

Note: Counts of Medicaid beneficiaries in HOP and non-HOP regions reflect unique beneficiaries during the study period.

Table 42. Comparison of Screening Rates in HOP Region vs. Non-HOP Region for Beneficiaries Ever in a Standard Plan and Never in a Tailored Plan

Region	Screened		Total	P-Value
	Yes	No		
HOP	94,638 (19.3%)	396,535 (80.7%)	**491,173**	<0.001
Non-HOP	334,950 (15.5%)	1,826,238 (84.5%)	**2,161,188**	
Total	**429,588**	**2,222,773**	**2,652,361**	

Note: Counts of Medicaid beneficiaries in HOP and non-HOP regions reflect unique beneficiaries during the study period.
Percentages are row percentages
P-value compares screening rate in HOP and non-HOP regions

Table 43. Comparison of Screening Rates in HOP Region vs. Non-HOP Region for Beneficiaries Ever in a Tailored Plan

Region	Screened		Total	P-Value
	Yes	No		
HOP	9,843 (17.9%)	45,287 (82.2%)	**55,130**	<0.001
Non-HOP	22,323 (12.0%)	164,377 (88.0%)	**186,700**	
Total	**32,166**	**209,664**	**241,830**	

Note: Counts of Medicaid beneficiaries in HOP and non-HOP regions reflect beneficiaries during the study period.
Percentages are row percentages
P-value compares screening rate in HOP and non-HOP regions

Table 44. Screening Rates by HOP Region

Region	Percent with Screening out of All Medicaid Beneficiaries in Region	Percent with Screening out of All Medicaid Beneficiaries Tailored Plan in Region	Percent with Screening out of All Medicaid Beneficiaries Standard Plan in Region
Access East	15.26%	17.97%	20.21%
CCLCF	14.63%	19.66%	18.86%
Impact Health	13.82%	16.36%	19.01%

Note: Counts of Medicaid beneficiaries in HOP and non-HOP regions reflect unique beneficiaries during the study period.
Percentages are row percentages

Social needs assessments could be recorded in NCCARE360 (typically used for Pilot participants in HOP regions) or reported by the PHPs (contained in the Care Needs Screening report [BCM026]), which included data from both HOP and non-HOP participants in HOP regions, along with data from non-HOP

regions. **Table 45** details the number of needs reported in each assessment, from each of the two sources of assessment information. Only Care Needs Screening report records with a social screening response (positive or negative) from beneficiaries are included in the table. If there are two or more NCCARE360 screenings for the same beneficiary on the same day, they were counted as one assessment. This was also done for Care Needs Screening report screenings. Because NCCARE360 needs data are specific to individuals enrolled in HOP (who have at least one social risk as an eligibility criterion), assessments recorded in NCCARE360 contain more needs, on average. In all, including multiple assessments per individual, 791,929 assessments of social needs were made during the evaluation period.

Table 45. Needs per Assessment

Needs Indicated on an Assessment	Source: NCCARE360		Source: Care Needs Screening Report		Total	
	Count	Percentage	Count	Percentage	Count	Percentage
0	38	0.04%	356,721	51.48%	356,759	45.05%
1	39,303	39.69%	200,347	28.91%	239.650	30.26%
2	38,591	38.97%	79,521	11.48%	118,112	14.91%
3	19,925	20.12%	40,078	5.78%	60,003	7.58%
4	1,179	1.19%	16,226	2.34%	17,405	2.20%
Total	**99,036**	**100.00%**	**692,893**	**100.00%**	**791,929**	**100.00%**

Evaluation Question 3

The goal of Evaluation Question 3 ("Improved Social Risk Factors") analyses was to determine whether the overall burden of needs decreased with Pilot participation, along with determining whether the risk for specific needs decreased with Pilot enrollment.

Evaluation Question 3 ("Improved Social Risk Factors") analyses primarily used an individual-level interrupted time series approach that estimated a change in level (immediate change in needs as Pilot services began for an individual) and a trend (changes in needs over time as Pilot services were received by an individual). Data used for these analyses could have been recorded up to 1 year prior to HOP enrollment and continued through November 30, 2024. Needs assessments made up to and including the date of HOP enrollment were considered part of the pre-index period, and all assessments made after the date of HOP enrollment were considered part of the post-index period.

The interrupted time series analyses used regression models with robust standard errors clustered at the level of the individual to account for repeated assessments within individuals. We used a Poisson response distribution with a log link for analyses of the count of total needs and a binomial distribution with a logistic link for estimating the probability of a specific need. Unless otherwise specified, analyses adjusted for age, race and ethnicity, sex, disability status, index date, quarter of observation (to account for seasonality), an index of rurality of residence, CDPS comorbidity scores, and an indicator of HOP clinical eligibility. Because we fit non-linear models, we used predictive margins for inference after fitting the models.[25]

Total Needs

The mean number of needs reported by HOP participants on the index date was 1.7 overall, 1.8 for non-pregnant adults, 1.7 for children aged 0-20, 1.7 for children aged 0-3, and 1.7 for pregnant individuals. Interrupted time series analyses partition the impact of an intervention into a change in level and a change in trend. The estimated differential change in level attributable to HOP at the index date was 0.09 (95%CI 0.08 to 0.10, p<.0001), and the estimated differential change in trend attributable to HOP over the entire post-index period was -0.002 (95%CI -0.003 to -0.002, p<.0001) needs per day. These two estimates of the differential impact of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we use predictive margins to present what those differences translated to as differences in total needs at 3 time points: 6, 12, and 18 months after the index date (**Figure 16**), which show that HOP was associated with a significant decrease in total needs at each time point, compared with a counterfactual estimate of what the number of total needs would have been in the absence of HOP.

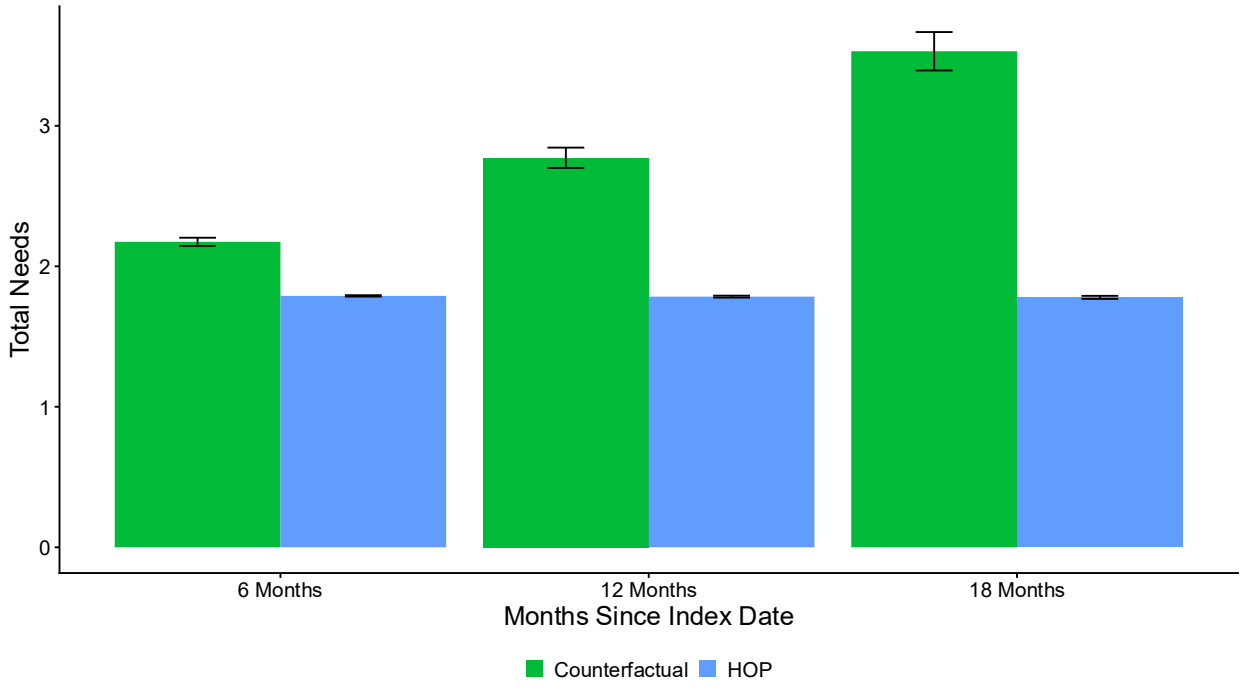


Figure 16. Estimated Total Needs Comparison

Figure 16 Note: Comparison of HOP to a counterfactual scenario in which HOP did not occur, with standard error bars.

Using marginal effects procedures and interrupted time series models, we examined estimates of HOP impacts on total needs for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities, focusing on the timepoint of 12 months after the index date. These estimates are presented in **Figure 17**.

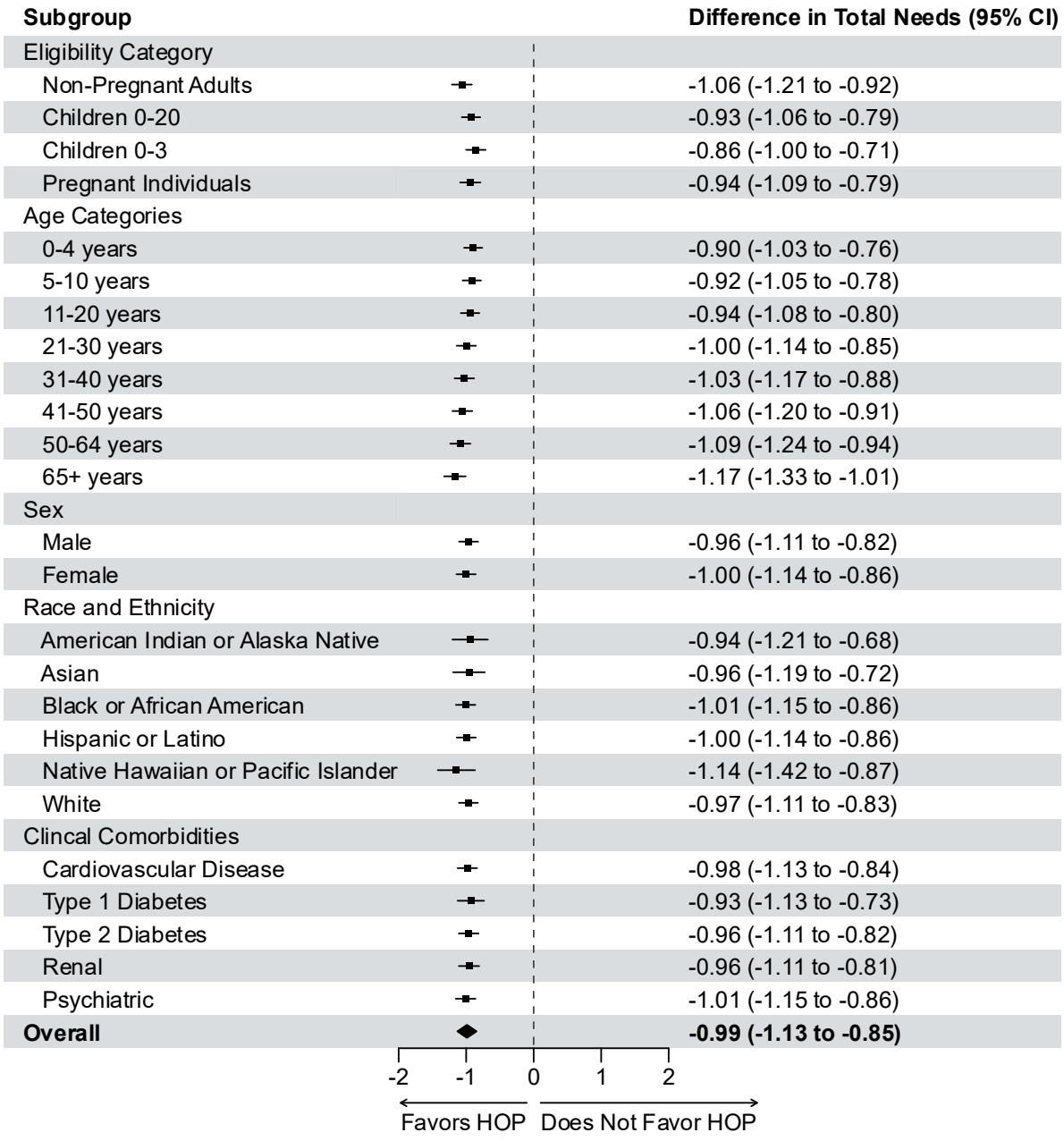


Figure 17. Estimated difference in total needs attributable to HOP

Figure 17 Note: differences by subgroups at 12 months after the index date

Food Needs

The mean probability of reporting a food need by HOP participants on the index date was 0.76 overall (that is, 76% of HOP participants reported a food need at enrollment), 0.77 for non-pregnant adults, 0.77 for children aged 0-20, 0.71 for children aged 0-3, and 0.68 for pregnant individuals. Interrupted time series analyses partition the impact of an intervention into a change in level and a change in trend. The estimated change in level attributable to HOP at the index date was 0.02 (95%CI 0.02 to 0.03, p<.0001), and the estimated change in trend attributable to HOP over the entire post-index period was -0.001 (95%CI -0.001 to -0.001, p<.0001) per day. These two estimates of the differential impact of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we use predictive margins to present what those differences translated to as differences in the probability of reporting a food need at 3 time points: 6, 12, and 18 months after the index date (**Figure 18**), which show that HOP was associated with significantly lower probability of reporting a food need at each time point, compared with a counterfactual estimate of what the probability of reporting a food need would have been in the absence of HOP.

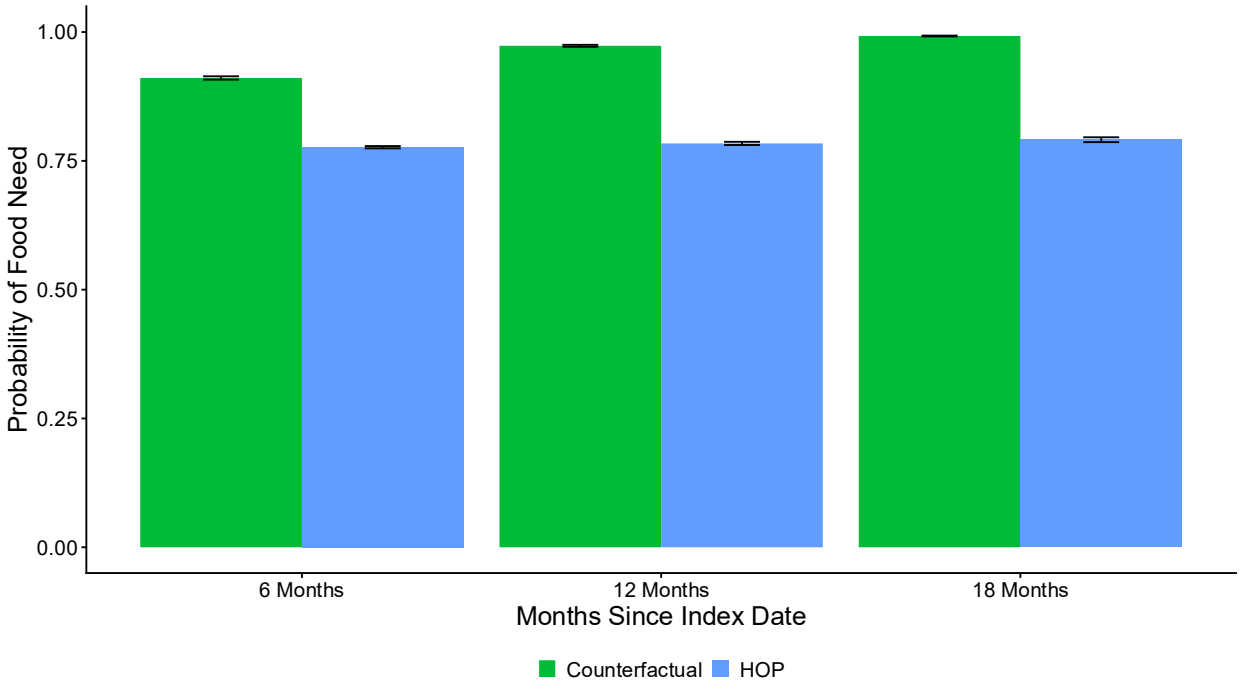


Figure 18. Probability of Reporting a Food Need

Figure 18 Note: Comparing HOP to a counterfactual scenario in which HOP did not occur, with standard error bars.

Using marginal effects procedures and interrupted time series models, we examined estimates of HOP impacts on food need probability for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities, focusing on the timepoint of 12 months after the index date. These estimates, quantified as a relative risk, are presented in **Figure 19**.

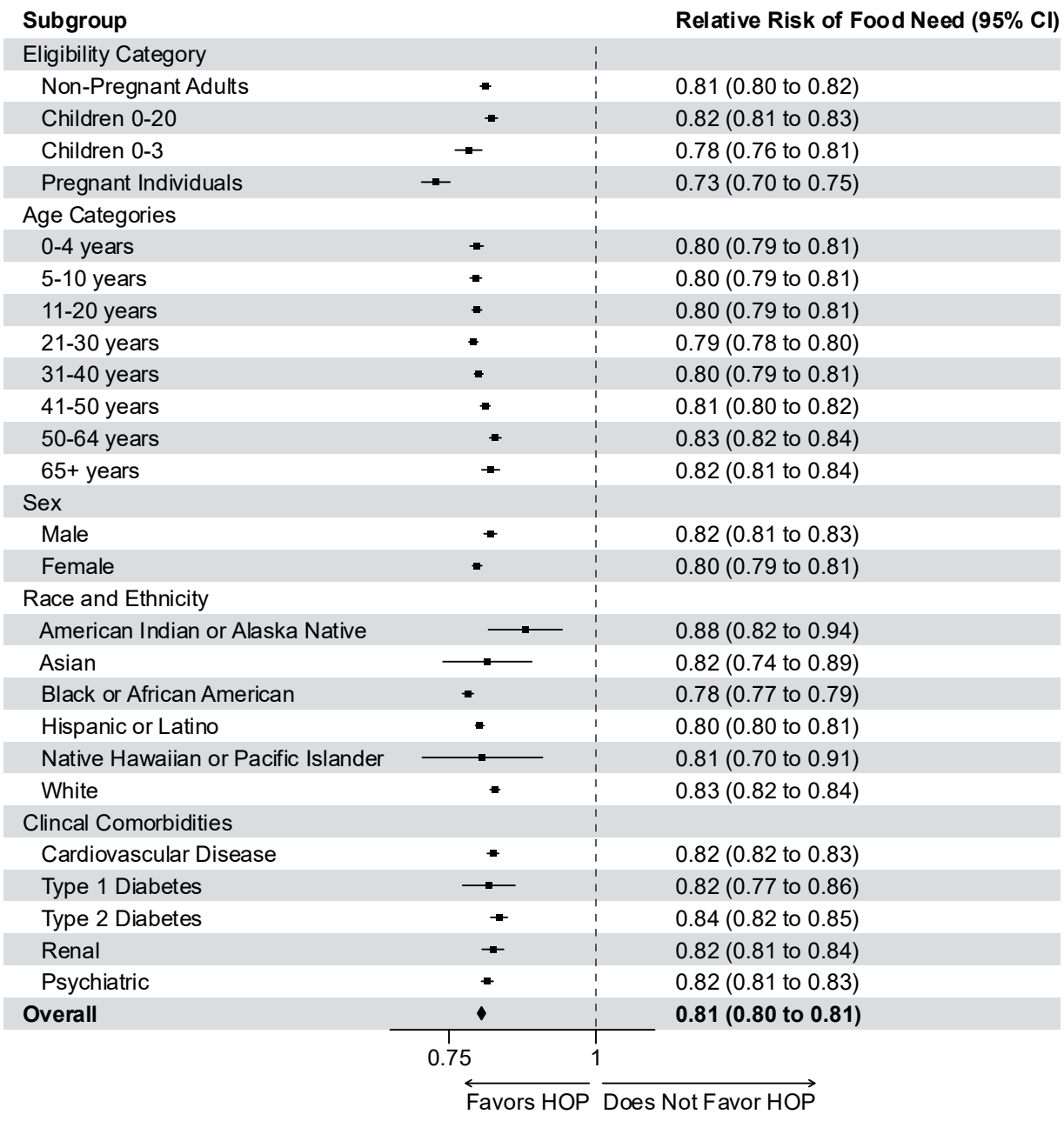


Figure 19. Relative Risk of Food Need Attributable to HOP

Figure 19 Note: Difference by subgroups at 12 months after the index date

Housing Needs

The mean probability of reporting a housing need by HOP participants on the index date was 0.66 overall (that is, 66% of HOP participants reported a housing need at enrollment), 0.67 for non-pregnant adults, 0.63 for children aged 0-20, 0.64 for children aged 0-3, and 0.74 for pregnant individuals. Interrupted time series analyses partition the impact of an intervention into a change in level and a change in trend. The estimated change in level attributable to HOP at the index date was 0.02 (95%CI 0.02 to 0.03, p<.0001), and the estimated change in trend attributable to HOP over the entire post-index period was -0.001 (95%CI -0.001 to -0.001, p<.0001) per day. These two estimates of the differential impact of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we use predictive margins to present what those differences translated to as differences in the probability of reporting a housing need at 3 time points: 6, 12, and 18 months after the index date (**Figure 20**), which show that HOP was associated with significantly lower probability of reporting a housing need at each time point, compared with a counterfactual estimate of what the probability of reporting a housing need would have been in the absence of HOP.

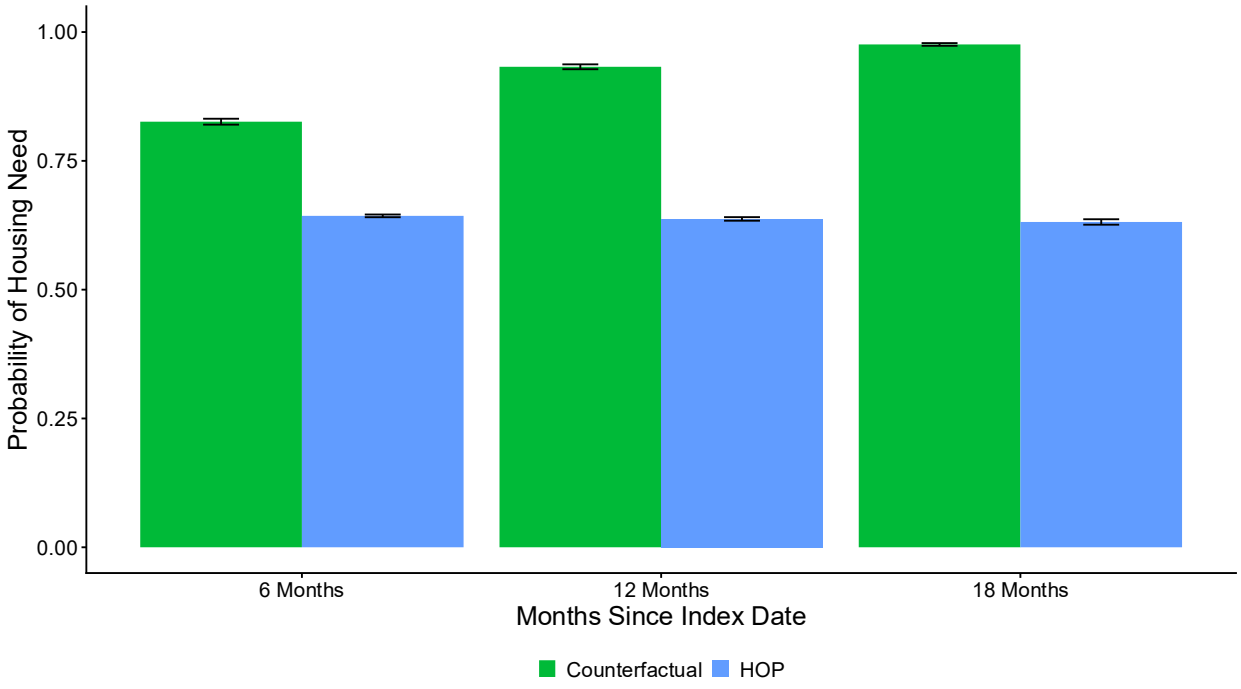


Figure 20. Probability of Reporting a Housing Need

Figure 20 Note: Comparing HOP to a counterfactual scenario in which HOP did not occur, with standard error bars.

Using marginal effects procedures and interrupted time series models, we examined estimates of HOP impacts on housing need probability for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities, focusing on the timepoint of 12 months after the index date. These estimates, quantified as a relative risk, are presented in **Figure 21**.

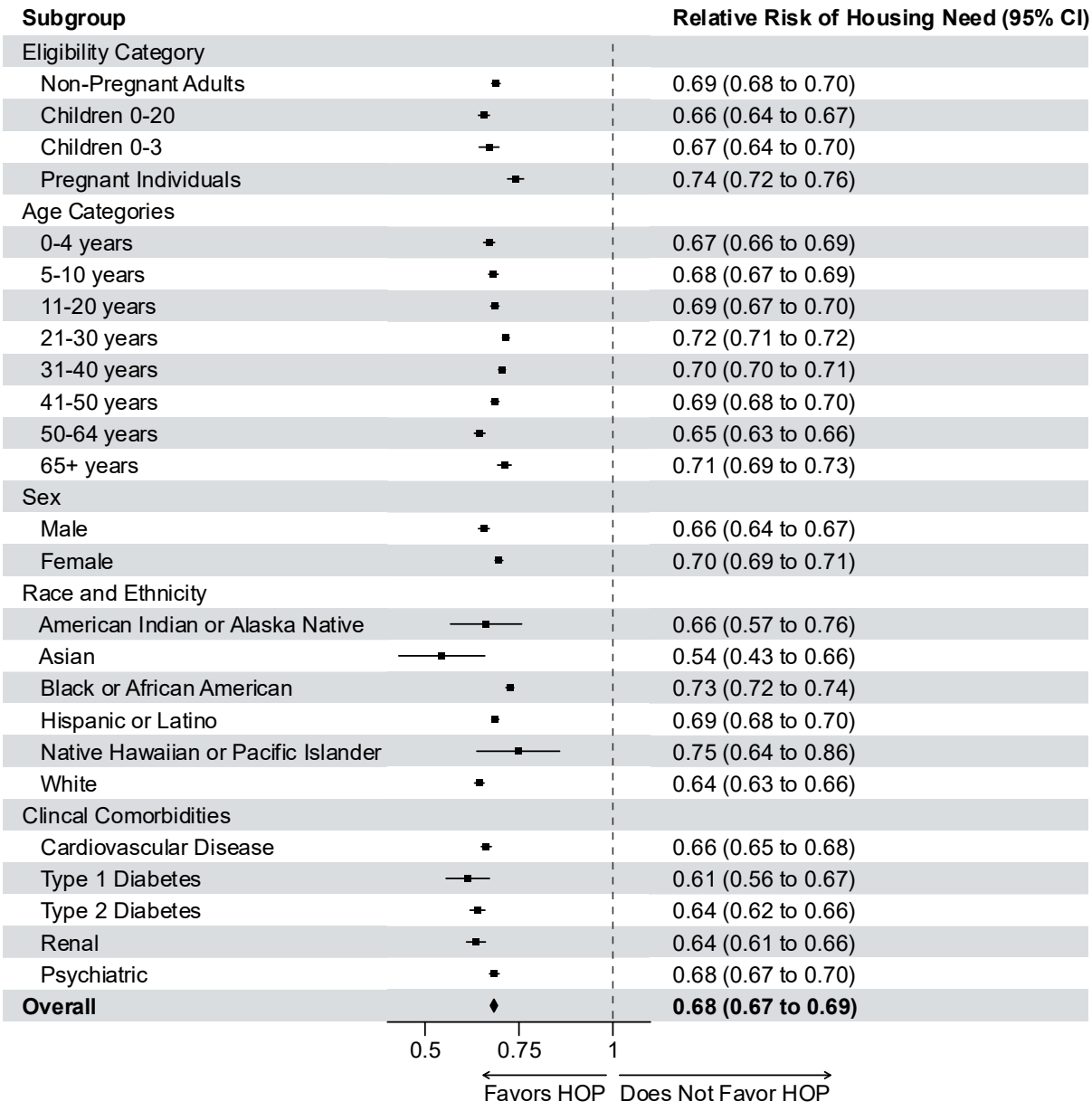


Figure 21. Relative Risk of Housing Need Attributable to HOP

Figure 21 Note: Differences by subgroups at 12 months after the index date

Transportation Needs

The mean probability of reporting a transportation need by HOP participants on the index date was 0.29 overall (that is, 29% of HOP participants reported a transportation need at enrollment), 0.32 for non-pregnant adults, 0.24 for children aged 0-20, 0.26 for children aged 0-3, and 0.29 for pregnant individuals. Interrupted time series analyses partition the impact of an intervention into a change in level and a change in trend. The estimated change in level attributable to HOP at the index date was 0.03 (95%CI 0.02 to 0.03, p<.0001), and the estimated differential change in trend attributable to HOP over the entire post-index period was -0.0006 (95%CI -0.0007 to -0.0005, p<.0001) per day. These two estimates of the differential impact of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we use predictive margins to present what those differences translated to as differences in the probability of reporting a transportation need at 3 time points: 6, 12, and 18 months after the index date (**Figure 22**), which show that HOP was associated with significantly lower probability of reporting a transportation need at each time point, compared with a counterfactual estimate of what the probability of reporting a transportation need would have been in the absence of HOP.

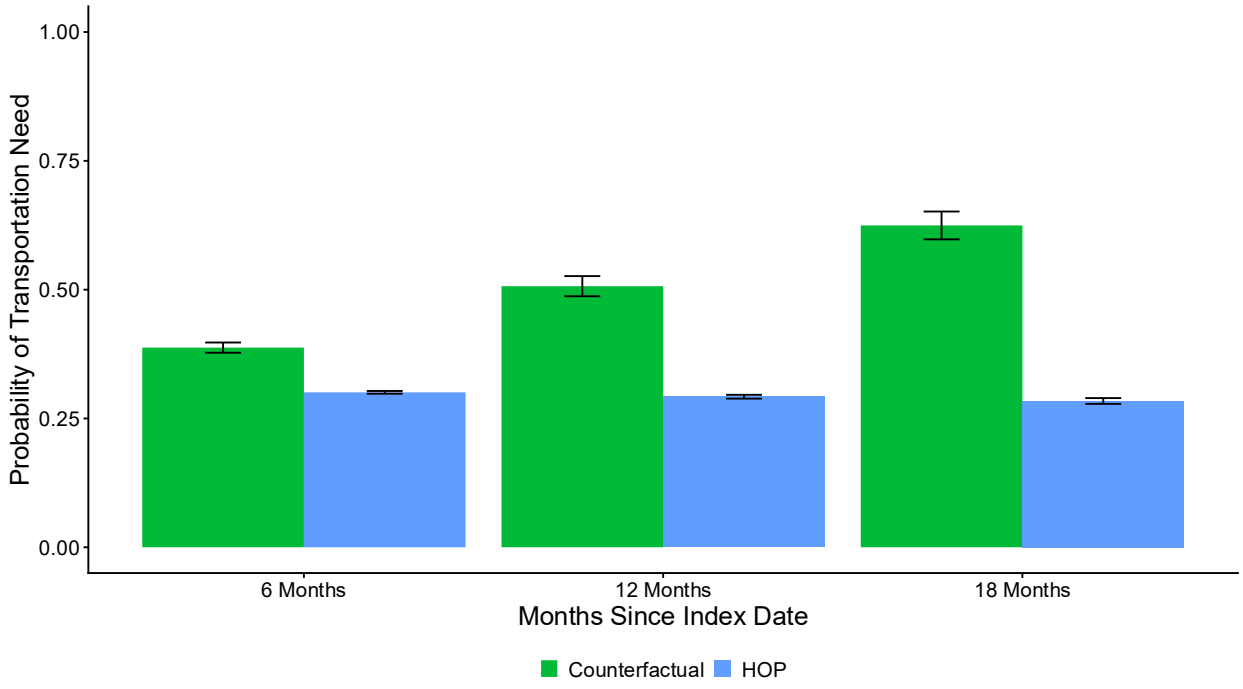


Figure 22. Probability of Reporting a Transportation Need

Figure 22 Note: Comparing HOP to a counterfactual scenario in which HOP did not occur, with standard error bars.

Using marginal effects procedures and interrupted time series models, we examined estimates of HOP impacts on transportation need probability for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities, focusing on the timepoint of 12 months after the index date. These estimates, quantified as a relative risk, are presented in **Figure 23**.

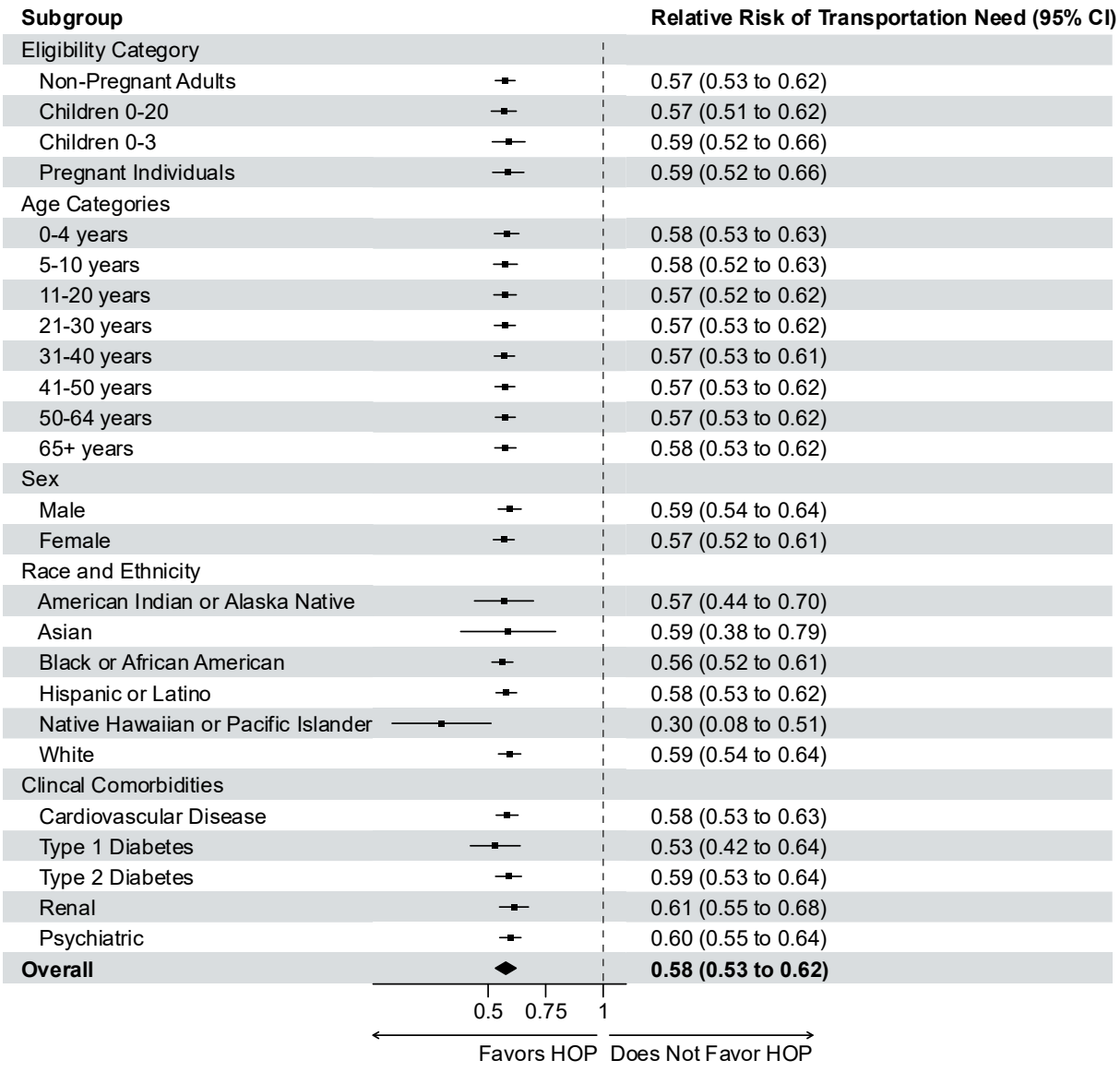


Figure 23. Relative Risk of Transportation Need Attributable to HOP

Figure 23 Note: Differences by subgroups at 12 months after the index date

Toxic Stress and IPV Needs

The findings for toxic stress and/or IPV-related needs analyses differed from those of the other needs in several ways. The probability of reporting an IPV need was substantially lower than that of other needs, which limited the number of cases for analysis and led to greater uncertainty in estimates, with wide confidence intervals. Further, as shown below, the probability of reporting an IPV need did not decline over time as it did for other needs. Although data in the Evaluation Question 3 section cannot shed light on why this might be, data from Evaluation Question 1, particularly qualitative interviews with HOP organization staff, suggest that it may be due to establishing rapport and trust with HOP workers over time that allows participants to feel more comfortable disclosing IPV needs as time goes on.

The mean probability of reporting an IPV need by HOP participants on the index date was 0.02 overall (that is, 2% of HOP participants reported an IPV need at enrollment), 0.03 for non-pregnant adults, 0.02 for children aged 0-20, 0.03 for children aged 0-3, and 0.03 for pregnant individuals. Interrupted time series analyses partition the impact of an intervention into a change in level and a change in trend. The estimated change in level attributable to HOP at the index date was 0.003 (95%CI 0.001 to 0.005, p=.003), and the estimated differential change in trend attributable to HOP over the entire post-index period was 0.00008 (95%CI 0.00002 to 0.0001, p=.01) per day. These two estimates of the differential impact of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we use predictive margins to present what those differences translated to as differences in the probability of reporting an IPV need at 3 time points: 6, 12, and 18 months after the index date (**Figure 24**), which show that the probability of reporting an IPV need was greater with HOP, compared with a counterfactual estimate of what the probability of reporting an IPV need would have been in the absence of HOP.

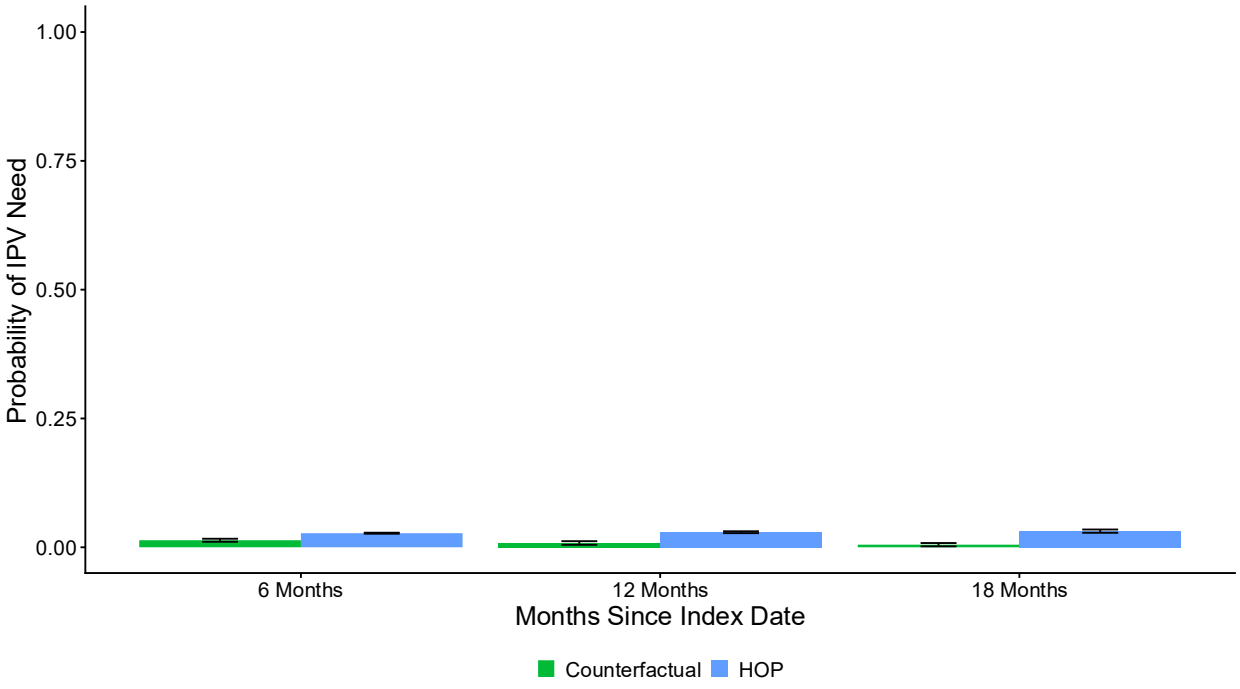


Figure 24. Probability of Reporting an IPV Need

Figure 24 Note: Comparing HOP to a counterfactual scenario in which HOP did not occur, with standard error bars.

Using marginal effects procedures and interrupted time series models, we examined estimates of HOP impacts on IPV need probability for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities, focusing on the timepoint of 12 months after the index date. These estimates, quantified as a relative risk, are presented in **Figure 25**. There were no significant differences, although the estimates were imprecise, with wide confidence intervals.

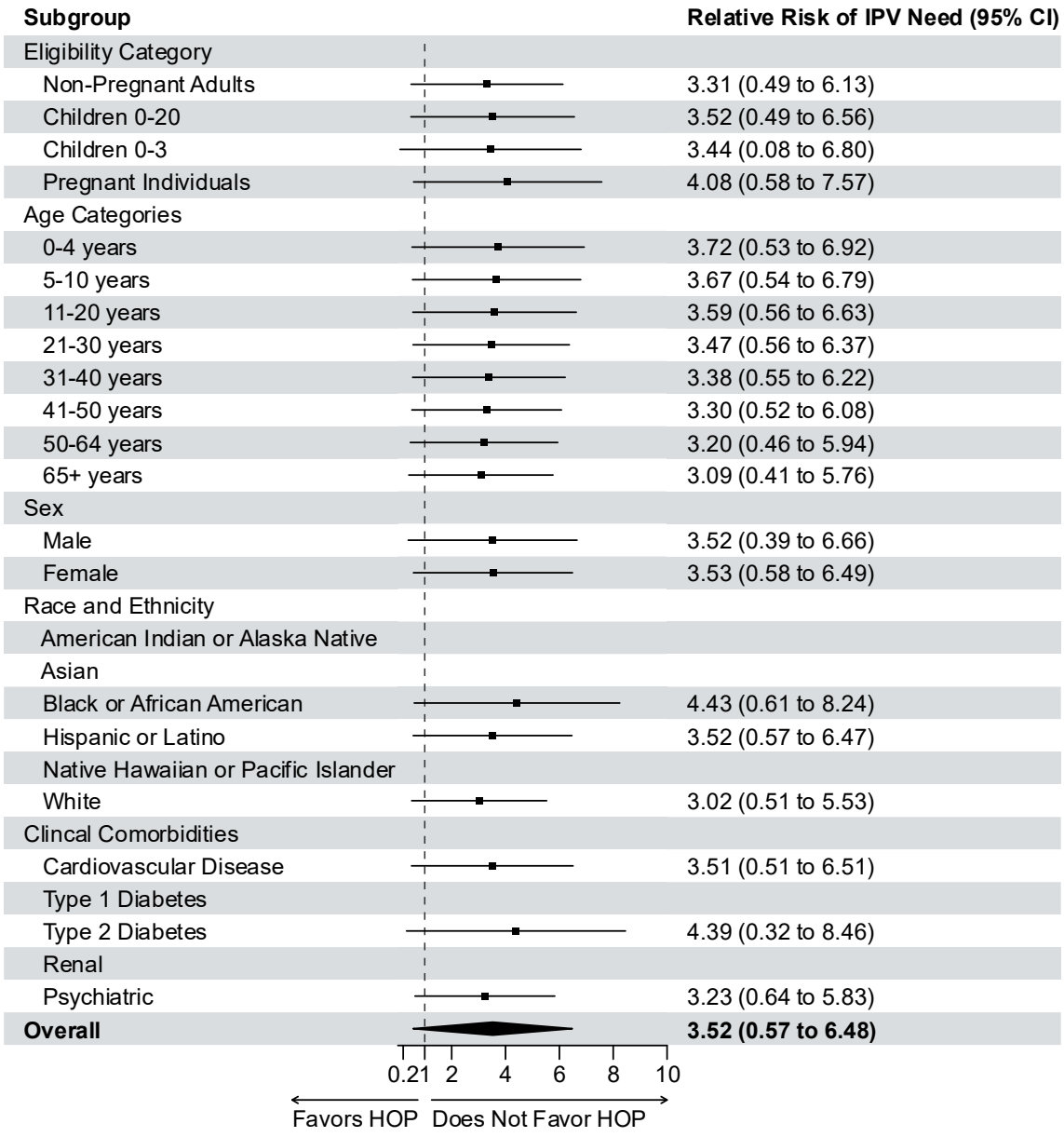


Figure 25. Relative Risk of Reporting IPV Need Attributable to HOP

Figure 25 Notes: Differences by subgroups at 12 months after the index date. Estimates for some characteristics, indicated with a blank row, could not be produced, owing to low sample sizes

Evaluation Question 4

The goal of Evaluation Question 4 ("Clinical Outcomes") analyses was to determine how clinical outcomes changed with Pilot participation. We examined several clinical outcomes, using different data sources. These included analyses of low birth weight, analyses of hemoglobin A1c (HbA1c) and blood pressure (both systolic blood pressure [SBP] and diastolic blood pressure [DBP]) for individuals with diabetes mellitus, analyses of blood pressure for individuals with hypertension, and analyses of participant-reported outcomes regarding mental health and health-related quality of life.

Low Birth Weight

We assessed three outcomes related to birth weight: low birth weight (weight < 2500g), very low birth weight (weight < 1500g), and birth weight in grams. For these analyses, we fit standard two-period difference-in-difference models, as these outcomes are not amenable to comparative interrupted time series analysis in this dataset. The unit of analysis was an 'episode' of pregnancy resulting in a live birth for singleton pregnancies, and individuals with data on more than one pregnancy could appear in the dataset more than once. We include all available pregnancies from 2021 (approximately one year prior to the start of HOP services) and through the end of the demonstration period. A pregnancy was categorized as occurring in the pre-index period if the delivery occurred before the index date; otherwise, it was categorized as occurring during the post-index period.

For the low birth weight and very low birth weight outcomes, we fit logistic regression models, adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and the difference, in days, between the birth date and the index date, with robust standard errors to account for possible repeated measures within individuals. After fitting these models, we used predictive margins to estimate the adjusted probability of the outcome under different scenarios. For the birth weight outcomes, we followed the same approach but fit linear regression models.

Overall, there were relatively few low birth weight and very low birth weight outcomes. In unadjusted results, the rate of low birth weight was 13.0% (423/3,260) in the HOP group in the pre-index period and the rate of very low birthweight was 2.4% (77/3,260). In the non-HOP group, the corresponding prevalences were 11.0% (1,284/11,686) and 1.9% (225/11,686). In the post-index period,

the rate of low birth weight was 13.6% (149/1,092) and very low birth weight was 1.7% (18/1,092) in the HOP group. For the non-HOP group in the post-index periods, the rates were 9.4% (1,285/13,726) and 1.2% (167/13,726). The results of the difference-in-differences analyses are presented in **Tables 46-48**. Overall, there was no evidence of HOP impacting birth weight outcomes. Given relatively small sample sizes, particularly in the post-index HOP group, conducting sub-group and comparative effectiveness analyses was not feasible for this outcome.

Table 46. Difference-in-Differences Results for Low Birth Weight

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.10	.11	.009 (-.02 to .03)	0.49
HOP	.13	.14		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, and an index of rurality of residence, CDPS comorbidity and expenditure risk scores, and indicator of HOP clinical eligibility, and the difference, in days, between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 47. Difference-in-Differences Results for Very Low Birth Weight

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.02	.01	.002 (-.01 to .01)	0.76
HOP	.02	.02		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, and an index of rurality of residence, CDPS comorbidity and expenditure risk scores, and indicator of HOP clinical eligibility, and the difference, in days, between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 48. Difference-in-Differences Results for Birth Weight (as continuous outcome)

	Pre-Index Mean, g*	Post-Index Mean, g*	Difference-in-Difference Estimate, g* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	3190	3185	-16 (-60 to 27)	0.47
HOP	3105	3085		

*Estimates, in grams, from predictive margins after fitting a linear regression model adjusted for age, race and ethnicity, disability status, index date, and an index of rurality of residence, CDPS comorbidity and expenditure risk scores, and indicator of HOP clinical eligibility, and the difference, in days, between the outcome

assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Hemoglobin A1c and Blood Pressure

For HbA1c and blood pressure analyses, we fit CITS models. The unit of analysis was an observation on a particular day, and individuals could appear in the dataset more than once. If more than one observation for an outcome was recorded on a specific day, we took the mean of the recorded values. We include all observations up to one year prior to the index and through the end of the demonstration period.

For the CITS analyses of HbA1c, SBP, and DBP as continuous outcomes, we fit linear regression models, adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and the month of observation (to account for seasonality), with robust standard errors to account for possible repeated measures within individuals. After fitting these models, we used predictive margins to estimate the adjusted probability of the outcome under different scenarios. For the outcomes of HbA1c < 9.0%, SBP < 140 mm Hg, and DBP < 90 mm Hg, we followed the same approach but fit logistic regression models.

To express results, we present difference-in-differences comparisons, derived from predictive margins after fitting the CITS models, comparing the outcomes at three timepoints (6, 12, and 18 months after the index date), if HOP had versus had not occurred (**Tables 49-58**).

For analyses of these outcomes, we only had access to a non-random subset of individuals who had HbA1c and blood pressure data available in the North Carolina Health Information Exchange (NC HealthConnex). 81% of individuals in the HOP and non-HOP groups who had qualifying diagnoses for hypertension had at least one BP value available in these data, and 54% of individuals in the HOP and non-HOP groups who had a qualifying diabetes diagnosis had an HbA1c value available in these data. Given the data limitations, it is difficult to draw definitive conclusions about HOP's impact on these outcomes. The point estimates are typically in the direction of a beneficial impact, but are relatively small in magnitude and imprecise, with confidence intervals that, in most cases, include the null.

Table 49. Difference-in-Differences Results for Hemoglobin A1c in Individuals with Diabetes

	Mean at 6 Months, %*	Difference-in-Difference Estimate at 6 Months, %* (95%CI)	Mean at 12 Months, %*	Difference-in-Difference Estimate at 12 Months, %* (95%CI)	Mean at 18 Months, %*	Difference-in-Difference Estimate at 18 Months, %* (95%CI)
Without HOP	7.53	-.06 (-.30 to .17)	7.51	-.04 (-.39 to .31)	7.47	-.02 (-.50 to .45)
With HOP	7.47		7.47		7.47	

*Estimates from predictive margins after fitting a linear regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 50. Difference-in-Differences Results for Hemoglobin A1c < 9.0% in Individuals with Diabetes

	Prevalence at 6 Months*	Difference-in-Difference Estimate Risk Ratio at 6 Months* (95%CI)	Prevalence at 12 Months*	Difference-in-Difference Risk Ratio Estimate at 12 Months* (95%CI)	Prevalence at 18 Months*	Difference-in-Difference Estimate Risk Ratio at 18 Months* (95%CI)
Without HOP	.79	1.02 (.96 to 1.08)	.79	1.02 (.93 to 1.11)	.79	1.02 (.90 to 1.14)
With HOP	.80		.80		.80	

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 51. Difference-in-Differences Results for Systolic Blood Pressure in Individuals with Diabetes

	Mean at 6 Months, mm Hg*	Difference-in-Difference Estimate at 6 Months, mm Hg* (95%CI)	Mean at 12 Months, mm Hg*	Difference-in-Difference Estimate at 12 Months, mm Hg* (95%CI)	Mean at 18 Months, mm Hg*	Difference-in-Difference Estimate at 18 Months, mm Hg* (95%CI)
Without HOP	130.7	-.37 (-1.40 to .66)	130.5	-.34 (-1.88 to 1.21)	130.4	-.30 (-2.41 to 1.82)
With HOP	130.3		130.2		130.1	

*Estimates from predictive margins after fitting a linear regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an

indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 52. Difference-in-Differences Results for Systolic Blood Pressure < 140 mm Hg in Individuals with Diabetes

	Prevalence at 6 Months*	Difference-in-Difference Estimate Risk Ratio at 6 Months* (95%CI)	Prevalence at 12 Months*	Difference-in-Difference Risk Ratio Estimate at 12 Months* (95%CI)	Prevalence at 18 Months*	Difference-in-Difference Estimate Risk Ratio at 18 Months* (95%CI)
Without HOP	.72	1.02 (.98 to 1.05)	.72	1.01 (.97 to 1.06)	.73	1.01 (.95 to 1.08)
With HOP	.73		.73		.74	

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 53. Difference-in-Differences Results for Diastolic Blood Pressure in Individuals with Diabetes

	Mean at 6 Months, mm Hg*	Difference-in-Difference Estimate at 6 Months, mm Hg* (95%CI)	Mean at 12 Months, mm Hg*	Difference-in-Difference Estimate at 12 Months, mm Hg* (95%CI)	Mean at 18 Months, mm Hg*	Difference-in-Difference Estimate at 18 Months, mm Hg* (95%CI)
Without HOP	78.7	-.21 (-.83 to .42)	78.6	-.27 (-1.21 to .67)	78.5	-.33 (-1.61 to .96)
With HOP	78.5		78.3		78.2	

*Estimates from predictive margins after fitting a linear regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 54. Difference-in-Differences Results for Diastolic Blood Pressure < 90 mm Hg in Individuals with Diabetes

	Prevalence at 6 Months*	Difference-in-Difference Estimate Risk Ratio at 6 Months*	Prevalence at 12 Months*	Difference-in-Difference Risk Ratio Estimate at 12 Months*	Prevalence at 18 Months*	Difference-in-Difference Estimate Risk Ratio at 18 Months*

		(95%CI)		(95%CI)		(95%CI)
Without HOP	.84	1.02 (1.00 to 1.04)	.84	1.03 (1.00 to 1.06)	.84	1.04 (1.00 to 1.08)
With HOP	.86		.87		.88	

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 55. Difference-in-Differences Results for Systolic Blood Pressure in Individuals with Hypertension

	Mean at 6 Months, mm Hg*	Difference-in-Difference Estimate at 6 Months, mm Hg* (95%CI)	Mean at 12 Months, mm Hg*	Difference-in-Difference Estimate at 12 Months, mm Hg* (95%CI)	Mean at 18 Months, mm Hg*	Difference-in-Difference Estimate at 18 Months, mm Hg* (95%CI)
Without HOP	133.1	-.82 (-2.05 to .40)	132.9	-.95 (-2.79 to .88)	132.8	-1.08 (-3.59 to 1.42)
With HOP	132.3		132.0		131.7	

*Estimates from predictive margins after fitting a linear regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 56. Difference-in-Differences Results for Systolic Blood Pressure < 140 mm Hg in Individuals with Hypertension

	Prevalence at 6 Months*	Difference-in-Difference Estimate Risk Ratio at 6 Months* (95%CI)	Prevalence at 12 Months*	Difference-in-Difference Risk Ratio Estimate at 12 Months* (95%CI)	Prevalence at 18 Months*	Difference-in-Difference Estimate Risk Ratio at 18 Months* (95%CI)
Without HOP	.68	1.03 (.98 to 1.07)	.68	1.03 (.97 to 1.09)	.68	1.03 (.94 to 1.11)
With HOP	.69		.70		.70	

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 57. Difference-in-Differences Results for Diastolic Blood Pressure in Individuals with Hypertension

	Mean at 6 Months, mm Hg*	Difference-in-Difference Estimate at 6 Months, mm Hg* (95%CI)	Mean at 12 Months, mm Hg*	Difference-in-Difference Estimate at 12 Months, mm Hg* (95%CI)	Mean at 18 Months, mm Hg*	Difference-in-Difference Estimate at 18 Months, mm Hg* (95%CI)
Without HOP	79.6	-.25 (-.98 to .47)	79.4	-.24 (-1.34 to .85)	79.2	-.23 (-1.72 to 1.26)
With HOP	79.3		79.2		79.0	

*Estimates from predictive margins after fitting a linear regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Table 58. Difference-in-Differences Results for Diastolic Blood Pressure < 90 mm Hg in Individuals with Hypertension

	Prevalence at 6 Months*	Difference-in-Difference Estimate Risk Ratio at 6 Months* (95%CI)	Prevalence at 12 Months*	Difference-in-Difference Risk Ratio Estimate at 12 Months* (95%CI)	Prevalence at 18 Months*	Difference-in-Difference Estimate Risk Ratio at 18 Months* (95%CI)
Without HOP	.82	1.02 (1.00 to 1.05)	.82	1.03 (.99 to 1.07)	.82	1.04 (.99 to 1.09)
With HOP	.84		.85		.85	

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and month, with robust standard errors to account for possible repeated measures within individuals.

Quantitative Surveying

We conducted a longitudinal, phone-administered quantitative survey of HOP beneficiaries (or proxies for children ages 1-12) to assess changes in participant-reported health outcomes, quality of life, and program satisfaction over time. Based on the availability of validated instruments for respondents of a particular age, there were 4 versions of the survey: one for adults (age 18 years and older), one for adolescents (age 13-17 years), one for the caregiver proxies of children age 5-12 years, and one for the caregiver proxies of children age 1-4 years. All surveys included the same questions about experience with HOP, but differed in items related to health-related quality of life.

We attempted to contact 1,298 HOP beneficiaries, of whom 335 beneficiaries completed the baseline survey. 183 beneficiaries completed the 6-month follow-up survey (54% follow-up rate), and 161 beneficiaries completed the 12-month follow-up survey (48% follow-up rate). All three Pilot regions were represented. The mean age at enrollment of HOP beneficiaries who completed a baseline survey was 20 years (SD: 17 years) (**Table 59**).

Table 59. HOP Survey Demographics

Demographic		**Baseline (N= 335)**	**6-month (N=183)**	**12-month (N=161)**
Survey Category				
	Children Age 1-4 Years Caregiver Proxy	68 (20%)	35 (19%)	37 (23%)
	Children Age 5-12 Years Caregiver Proxy	95 (28%)	>50*	>50*
	Adolescents Age 13-17 Years Self Report	17 (5%)	*	*
	Adults age ≥18 Years Self Report	155 (46%)	84 (46%)	68 (42%)
Region				
	Access East	112 (33%)	73 (40%)	55 (34%)
	CCLCF	>100*	>50*	>50*
	Impact Health	112 (33%)	48 (26%)	49 (30%)
	Undisclosed	*	*	*
Pregnancy Status				
	Pregnant	45 (13%)	26 (14%)	21 (13%)
	Not Pregnant	290 (87%)	157 (86%)	140 (87%)

*suppressed due to low counts

Across all survey versions, HOP was rated very highly both soon after starting HOP, about 6 after the initial survey, and about 12 months after the initial survey (**Figure 26-Figure 28**). 85% of respondents strongly or somewhat agreed that HOP improved health soon after beginning HOP, 89%, strongly or somewhat agreed about 6 months later, and 89% strongly or somewhat agreed about 12 months later. 91% of respondents rated HOP strongly or somewhat positively soon after beginning HOP, 92% rated HOP strongly or somewhat positively about 6 months later, and 93% rated HOP strongly or somewhat positively about 12 months later.

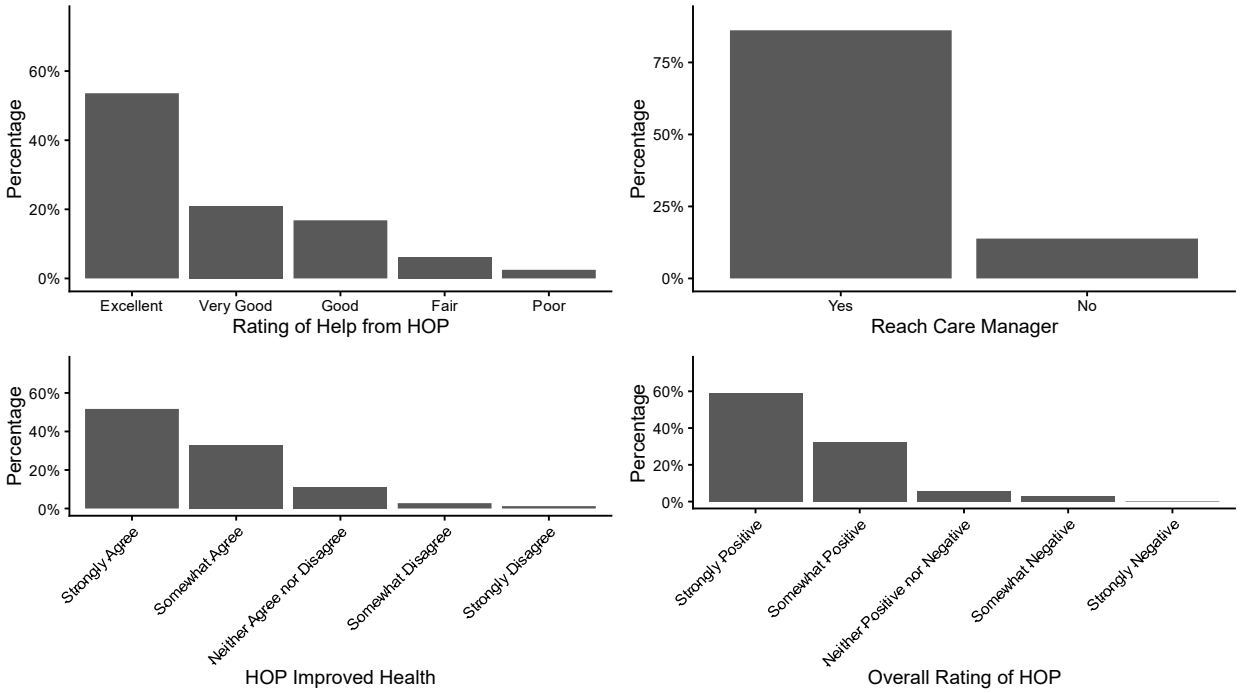


Figure 26. Participant Rating of HOP After Beginning HOP Services

Figure 26 note: Panel figure depicting the distribution of responses to survey items, soon after enrolling in HOP, asking participants to rate the help they received from HOP (top left), whether they are able to reach their care manager when needed (top right), whether they thought HOP improved their health (bottom left) and their overall rating of HOP (bottom right).

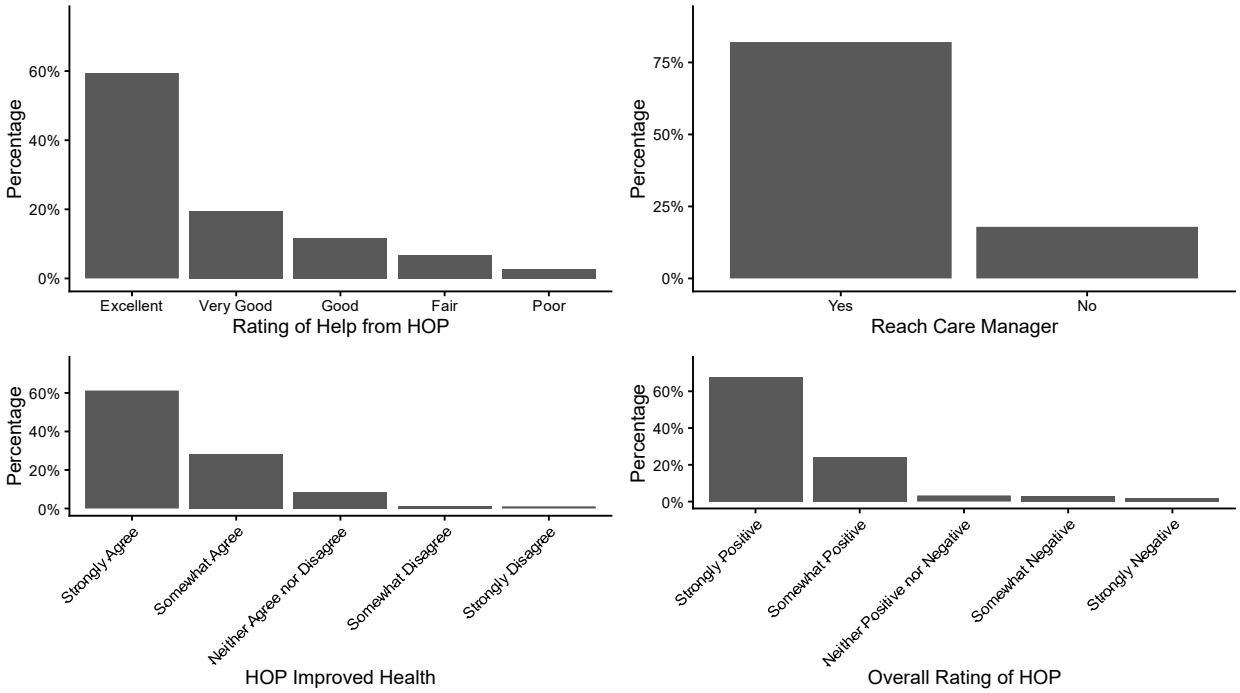


Figure 27. Participant Rating of HOP at 6 Months

Figure 27 note: Panel figure depicting the distribution of responses to survey items, approximately 6 months after the initial survey, asking participants to rate the help they received from HOP (top left), whether they are able to reach their care manager when needed (top right), whether they thought HOP improved their health (bottom left) and their overall rating of HOP (bottom right).

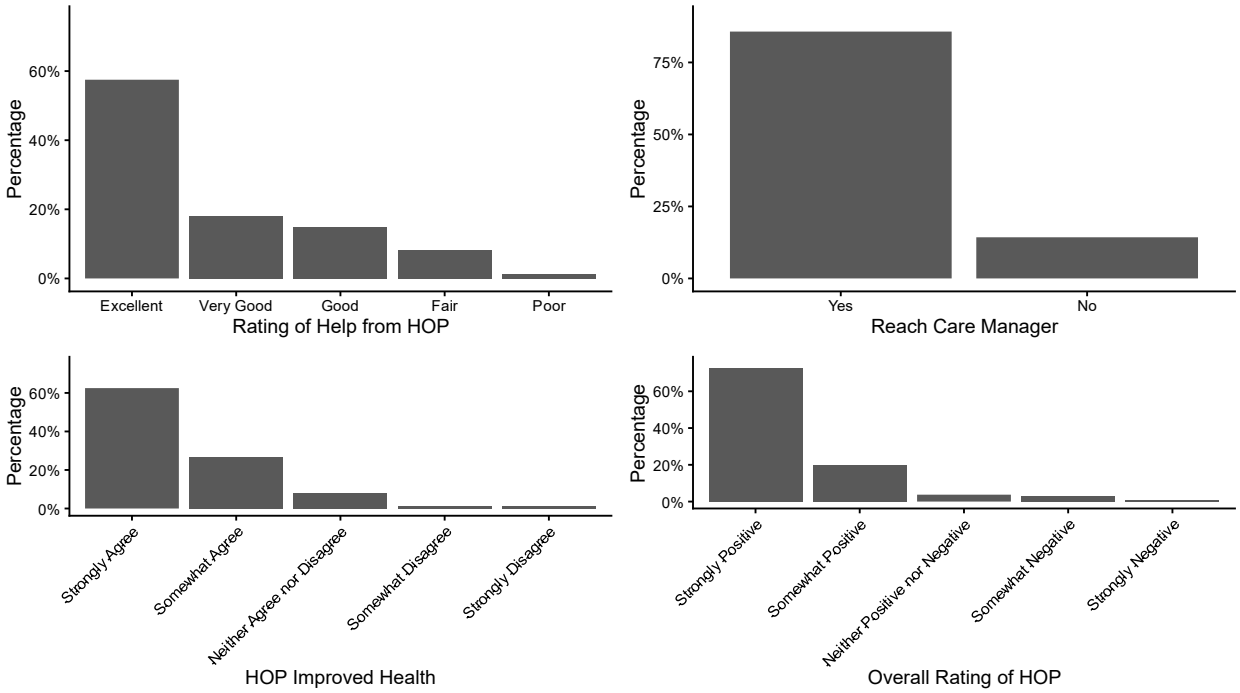


Figure 28. Participant Rating of HOP at 12 Months

Figure 28 note: Panel figure depicting the distribution of responses to survey items, approximately 12 months after the initial survey, asking participants to rate the help they received from HOP (top left), whether they are able to reach their care manager when needed (top right), whether they thought HOP improved their health (bottom left) and their overall rating of HOP (bottom right).

Adult Survey Responses

Among adult survey respondents, self-rated health was relatively low soon after beginning HOP and about 6 and 12 months later (**Figure 29**).

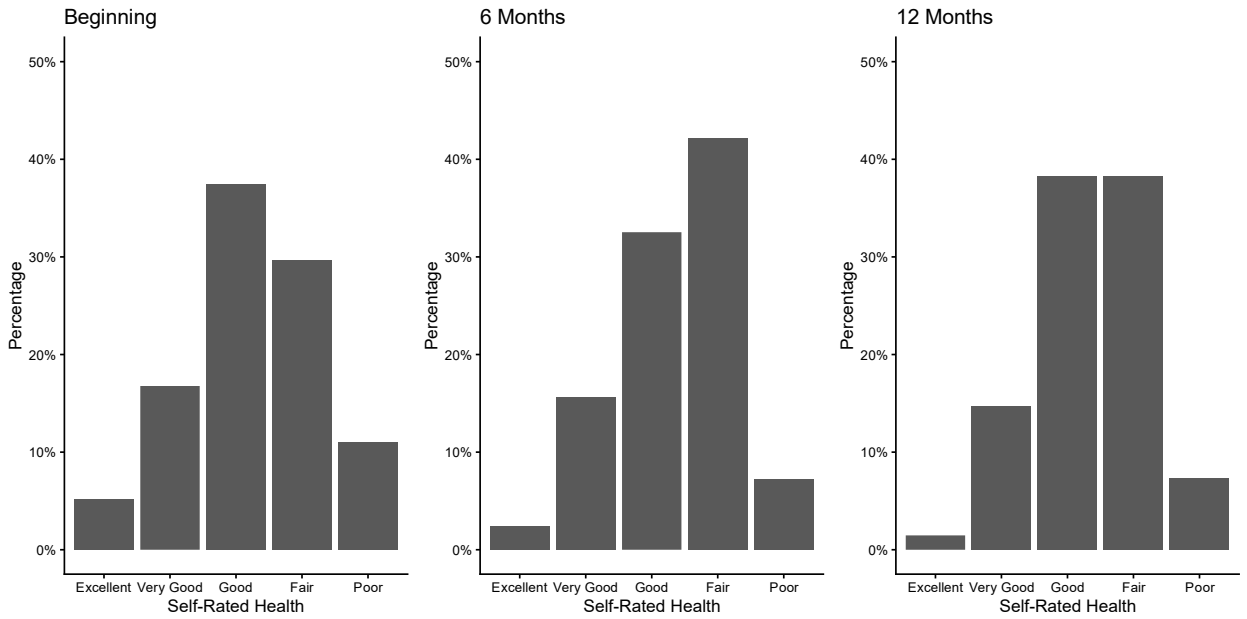


Figure 29. Self-Rated Health

Figure 29 note: Distribution of self-rated health responses soon after beginning HOP (left),6 months later (center), and 12 months later (right)

Point estimates of health-related quality of life indicators were generally better at 6 months and 12 months than around the time of starting HOP, and no indicators clearly worsened (**Table 60**). Improvements were particularly notable for both physical and mental health days, and days poor health interfered with activities.

Table 60. Unweighted Survey Responses for Adult Respondents

	Beginning	6 Month	12 Month	Comparison of 6 Month vs. Beginning	Comparison of 12 Month vs. Beginning
Days Physical Health Not Good[a]	14.22	11.85	11.34	-2.38 (-5.11 to 0.36)	-2.88 (-6.29 to 0.52)
Days Mental Health Not Good[a]	15.17	12.78	12.69	-2.39 (-5.26 to 0.48)	-2.48 (-5.41 to 0.45)
Days Poor Health	13.93	11.35	12.31	-2.58 (-5.79 to 0.64)	-1.62 (-5.23 to 1.99)

Interfered with Activities[a]					
PROPr[b]	0.31	0.33	0.31	0.02 (-0.02 to 0.06)	0.00 (-0.05 to 0.04)
Cognition Utility[b]	0.78	0.82	0.78	0.04 (0.01 to 0.07)	0.00 (-0.04 to 0.04)
Depression Utility[b]	0.74	0.79	0.76	0.05 (0.00 to 0.09)	0.02 (-0.02 to 0.07)
Fatigue Utility[b]	0.71	0.72	0.71	0.02 (-0.01 to 0.04)	0.01 (-0.03 to 0.04)
Pain Utility[b]	0.79	0.80	0.77	0.01 (-0.03 to 0.05)	-0.02 (-0.07 to 0.04)
Physical Functioning Utility[b]	0.71	0.72	0.72	0.01 (-0.04 to 0.05)	0.00 (-0.03 to 0.04)
Sleep Utility[b]	0.74	0.74	0.72	0.01 (-0.04 to 0.05)	-0.01 (-0.07 to 0.04)
Social Roles Utility[b]	0.78	0.79	0.78	0.01 (-0.04 to 0.06)	0.00 (-0.05 to 0.05)
Anxiety T-score[c]	60.18	58.79	60.99	-1.40 (-3.29 to 0.50)	0.80 (-1.60 to 3.21)
EconQOL T-score[c]	44.43	43.85	44.39	-0.58 (-2.24 to 1.09)	-0.04 (-1.82 to 1.74)

[a]Look back period is 30 days

[b]PROPr (PROMIS-Preference) is a health-related quality of life measure on a utility score scale. Utility scores range from 0 to 1, with 1 indicating perfect health. The PROPr score comprises 7 sub-domains (cognition, depression, fatigue, pain, physical functioning, sleep, and ability to participate in social roles), each of which also has its own utility associated with the specific subdomain

[c]The PROMIS anxiety scale and the EconQOL (Economic Quality of Life) scales are reported as T-scores, where 50 corresponds to the mean of the U.S. population and the standard deviation is 10. For the Anxiety T-score, higher scores indicate more anxiety. For the EconQOL T-score, higher scores indicate better economic quality of life

Analyses weighted to be representative of HOP enrollees and to account for non-response at 6 and 12 months (**Table 61**) had results similar to unweighted analyses, suggesting that differences between the survey sample and the overall HOP population do not explain the results observed.

Table 61. Weighted Survey Responses for Adult Respondents

	Beginning	**6 Month**	**12 Month**	**Comparison of 6 Month vs. Beginning**	**Comparison of 12 Month vs. Beginning**
Days Physical	14.56	11.84	12.94	-2.73 (-5.63 to 0.17)	-1.63 (-5.78 to 2.53)

Health Not Good[a]					
Days Mental Health Not Good[a]	15.39	14.33	13.17	-1.06 (-4.06 to 1.94)	-2.23 (-5.25 to 0.80)
Days Poor Health Interfered with Activities[a]	14.33	11.59	13.94	-2.74 (-6.20 to 0.73)	-0.39 (-4.68 to 3.90)
PROPr[b]	0.28	0.30	0.27	0.03 (-0.01 to 0.07)	0.00 (-0.06 to 0.05)
Cognition Utility[b]	0.76	0.80	0.74	0.04 (0.00 to 0.09)	-0.03 (-0.11 to 0.06)
Depression Utility[b]	0.71	0.77	0.73	0.07 (0.01 to 0.12)	0.02 (-0.04 to 0.08)
Fatigue Utility[b]	0.70	0.72	0.70	0.01 (-0.02 to 0.04)	0.00 (-0.04 to 0.03)
Pain Utility[b]	0.74	0.75	0.72	0.01 (-0.06 to 0.08)	-0.02 (-0.12 to 0.08)
Physical Functioning Utility[b]	0.69	0.70	0.70	0.02 (-0.03 to 0.06)	0.01 (-0.04 to 0.05)
Sleep Utility[b]	0.72	0.72	0.71	0.01 (-0.04 to 0.05)	-0.01 (-0.07 to 0.06)
Social Roles Utility[b]	0.75	0.79	0.76	0.03 (-0.02 to 0.08)	0.00 (-0.06 to 0.06)
Anxiety T-score[c]	60.79	59.64	62.27	-1.16 (-3.06 to 0.75)	1.48 (-1.10 to 4.06)
EconQOL T-score[c]	43.92	43.57	42.31	-0.35 (-2.47 to 1.77)	-1.61 (-4.11 to 0.89)

[a]Look back period is 30 days

[b]PROPr (PROMIS-Preference) is a health-related quality of life measure on a utility score scale. Utility scores range from 0 to 1, with 1 indicating perfect health. The PROPr score comprises 7 sub-domains (cognition, depression, fatigue, pain, physical functioning, sleep, and ability to participate in social roles), each of which also has its own utility associated with the specific subdomain

[c]The PROMIS anxiety scale and the EconQOL (Economic Quality of Life) scales are reported as T-scores, where 50 corresponds to the mean of the U.S. population and the standard deviation is 10. For the Anxiety T-score, higher scores indicate more anxiety. For the EconQOL T-score, higher scores indicate better economic quality of life Results are weighted to be representative of HOP participants and account for non-response (for 6 and 12 month results)

Adolescent Survey Responses

Among adolescents aged 13-17 years, point estimates of differences between the beginning of HOP participation and 6 and 12 months later were largely in favor of HOP, with the exception of depressive

symptoms at 6 months and the pain T-score at 12 months (**Table 62**). Improvements were particularly notable for the mobility and peer relationships domain.

Table 62. Unweighted Survey Responses for Adolescent Respondents

	Beginning	6 Month	12 Month	Comparison of 6 Month vs. Beginning	Comparison of 12 Month vs. Beginning
Fatigue T-score[a]	50.87	49.29	37.54	-1.58 (-8.89 to 5.72)	-13.33 (-18.64 to -8.02)
Anxiety T-score[a]	50.69	48.99	47.7	-1.71 (-7.69 to 4.28)	-2.99 (-10.76 to 4.77)
Depression T-score[a]	48.75	51.19	40.66	2.43 (-3.55 to 8.42)	-8.09 (-13.26 to -2.93)
Mobility T-score[a]	50.76	54.34	57.1	3.58 (-0.41 to 7.56)	6.34 (2.95 to 9.73)
Peer Relationships T-score[a]	44.28	51.63	53.58	7.34 (2.65 to 12.04)	9.30 (1.84 to 16.76)
Pain T-score[a]	51.04	51.06	48.16	0.02 (-7.03 to 7.08)	-2.88 (-7.90 to 2.14)

[a]Results are reported as T-scores where 50 corresponds to the mean of the U.S. population and the standard deviation is 10. Greater scores indicate 'more' of the focal construct. Thus, greater scores are worse for constructs of fatigue, anxiety, depression, and pain. Greater scores are better for constructs of mobility and peer relationships.

Analyses that were weighted to be representative of HOP enrollees and to account for non-response (**Table 63**) had results similar to unweighted analyses, with the exception of the fatigue domain at 6 months, suggesting that differences between the survey sample and the overall HOP population do not explain the results observed.

Table 63. Weighted Survey Responses for Adolescent Respondents

	Beginning	6 Month	12 Month	Comparison of 6 Month vs. Beginning	Comparison of 12 Month vs. Beginning
Fatigue T-score[a]	51.33	53.64	38.49	2.30 (-4.89 to 9.49)	-12.84 (-19.93 to -5.75)
Anxiety T-score[a]	52.75	47.71	51.18	-5.04 (-9.15 to -0.94)	-1.57 (-10.77 to 7.62)
Depression T-score[a]	49.68	51.17	41.72	1.49 (-1.03 to 4.00)	-7.96 (-11.77 to -4.15)

Mobility T-score[a]	49.59	53.59	57.10	4.00 (-1.88 to 9.88)	7.51 (3.72 to 11.30)
Peer Relationships T-score[a]	45.39	47.77	49.64	2.38 (-3.33 to 8.09)	4.26 (-5.70 to 14.21)
Pain T-score[a]	50.63	50.61	49.27	-0.01 (-7.02 to 6.99)	-1.35 (-6.94 to 4.23)

[a]Results are reported as T-scores where 50 corresponds to the mean of the U.S. population and the standard deviation is 10. Greater scores indicate 'more' of the focal construct. Thus, greater scores are worse for constructs of fatigue, anxiety, depression, and pain. Greater scores are better for constructs of mobility and peer relationships.
Results are weighted to be representative of HOP participants and account for non-response (for 6 and 12 month results)

Child Survey Responses

For reporting about children aged 5 to 12 years, point estimates of differences between the beginning of HOP participation and 6 months and 12 months were all close to 0 (**Table 64**).

Table 64. Unweighted Survey Responses for Parent Proxies of Children Age 5 to 12 Years

	Beginning	6 Month	12 Month	Comparison of 6 Month vs. Beginning	Comparison of 12 Month vs. Beginning
Fatigue T-score[a]	45.93	45.96	47.12	0.04 (-2.26 to 2.33)	1.19 (-1.54 to 3.92)
Anxiety T-score[a]	47.97	48.44	48.52	0.47 (-2.04 to 2.98)	0.55 (-2.36 to 3.45)
Depression T-score[a]	46.28	45.65	46.47	-0.63 (-2.82 to 1.55)	0.19 (-1.83 to 2.22)
Mobility T-score[a]	51.03	50.27	50.76	-0.77 (-2.80 to 1.27)	-0.27 (-2.54 to 2.00)
Peer Relationships T-score[a]	51.95	51.05	53.34	-0.90 (-3.72 to 1.91)	1.38 (-1.01 to 3.78)
Pain T-score[a]	48.51	48.01	46.55	-0.51 (-2.55 to 1.53)	-1.97 (-4.41 to 0.47)

[a]Results are reported as T-scores where 50 corresponds to the mean of the U.S. population and the standard deviation is 10. Greater scores indicate 'more' of the focal construct. Thus, greater scores are worse for constructs of fatigue, anxiety, depression, and pain. Greater scores are better for constructs of mobility and peer relationships.

Analyses that were weighted to be representative of HOP enrollees and that accounted for non-response (**Table 65**) had results similar to unweighted analyses.

Table 65. Weighted Survey Responses for Parent Proxies of Children Age 5 to 12 Years

	Beginning	6 Month	12 Month	Comparison of 6 Month vs. Beginning	Comparison of 12 Month vs. Beginning
Fatigue T-score[a]	46.59	46.81	45.70	0.22 (-2.55 to 2.99)	-0.89 (-3.71 to 1.93)
Anxiety T-score[a]	48.68	50.81	48.56	2.14 (-1.01 to 5.28)	-0.12 (-3.22 to 2.98)
Depression T-score[a]	46.52	46.64	46.61	0.12 (-3.38 to 3.62)	0.09 (-2.81 to 2.98)
Mobility T-score[a]	50.37	49.44	51.68	-0.93 (-3.96 to 2.09)	1.32 (-1.49 to 4.12)
Peer Relationships T-score[a]	51.99	50.51	54.58	-1.48 (-4.52 to 1.55)	2.59 (-0.29 to 5.46)
Pain T-score[a]	49.03	49.07	46.01	0.04 (-2.50 to 2.59)	-3.03 (-5.69 to -0.37)

[a]Results are reported as T-scores where 50 corresponds to the mean of the U.S. population and the standard deviation is 10. Greater scores indicate 'more' of the focal construct. Thus, greater scores are worse for constructs of fatigue, anxiety, depression, and pain. Greater scores are better for constructs of mobility and peer relationships.
Results are weighted to be representative of HOP participants and account for non-response (for 6 and 12 month results)

For reporting about children aged 1 to 4 years, the point estimate of the difference in global functioning between the beginning of HOP participation and 6 months and 12 months later did not reveal meaningful differences (**Table 66**) in unweighted analyses, and was similar in analyses weighted to be representative of HOP enrollees and to account for non-response.

Table 66. Unweighted and Weighted Survey Responses for Parent Proxies of Children Age 1 to 4 Years

	Beginning	6 Month	12 Month	Comparison of 6 Month vs. Beginning	Comparison of 12 Month vs. Beginning
Unweighted					
Global Functioning T-score[a]	44.26	46.49	42.35	2.23 (-0.82 to 5.28)	-1.91 (-4.72 to 0.89)
Weighted[b]					

Global Functioning T-score[a]	44.21	46.12	43.69	1.92 (-1.50 to 5.33)	-0.51 (-4.06 to 3.04)

[a]Results are reported as T-scores where 50 corresponds to the mean of the U.S. population and the standard deviation is 10. Greater scores indicate 'more' of the focal construct. Greater scores are better.
[b]Results are weighted to be representative of HOP participants and account for non-response (for 6 and 12 month results)

Qualitative Interviews with HOP Beneficiaries

This section summarizes in-depth interviews with beneficiaries or beneficiary proxies of the North Carolina Healthy Opportunities Pilots (HOP) to analyze beneficiary experiences with accessing and receiving HOP services and the impact on health and wellbeing.

A total of 83 HOP beneficiaries or beneficiary proxies were interviewed; 61% were parents or caregivers who served as proxies for beneficiaries, and 39% were beneficiaries interviewed directly. Illustrative quotes from proxy interviews are labeled "(PROXY)," and self-reported beneficiary quotes are labeled "(Beneficary)." Of the beneficiaries represented, 55% were female. Beneficiaries represented were aged 1 to 52 years (mean = 16 years; standard deviation [SD] = 15.6 years) (**Table 67**).

Purpose

The purpose of the interviews was to understand the experiences of beneficiaries receiving HOP services and whether HOP helped them improve their health. The interviews focused on several key areas that included experiences accessing and receiving HOP services; interactions with HOP providers and care managers; impact on health and wellbeing; impact on quality of life; ideas for sustaining and improving HOP; and perceptions of program fit and overall value to beneficiary life.

Study Sample Recruitment

Beneficiaries recruited for this study were purposively selected based on their Pilot region and age category. We aimed for balanced representation across the Pilot regions: Access East, CCLCF, and Impact Health. Names and phone numbers of beneficiaries enrolled in HOP were provided to the evaluation team for the purpose of recruitment. We selected those who were enrolled in HOP for approximately 6-18 months at the time of the interview to ensure they had sufficient program experience with HOP. Up to five contact attempts were made to invite beneficiaries or their caregivers to participate in the telephone interviews.

Data Collection Procedures

A total of 83 individuals were interviewed across the three HOP Pilot Regions. For HOP beneficiaries ages 1-12, a parent or caregiver proxy was interviewed (N=51). Interviews were conducted over telephone between June 2024 – November 2025. All interviews were conducted by trained qualitative

researchers. Interviews lasted on average 21 minutes. The semi-structured interview guide was developed to elicit insights and descriptive details from the beneficiaries' perspectives (**Appendix B. Beneficiary Interview Guide – Parent Proxy Participants; Appendix C. HOP Beneficiary Interview Guide – For Self-Report Participants**). Those who completed an interview were offered a $60 gift card.

Data Analysis

Interviews were digitally recorded with beneficiary permission and transcribed verbatim. Identifiable information was removed from the transcripts for the final report. Audio files and transcriptions were stored on a secure server available only to the evaluation team members. Transcripts were reviewed with the audio files for accuracy and completeness. Transcripts were imported in ATLAS.ti 24.2.1 to facilitate analysis. A directed form of content analysis was used to analyze data.[24] The qualitative research team collaborated to develop a codebook based on the interview questions and notes taken during data collection. The initial codebook was pilot tested by independently double coding two transcripts, which led to fine-tuning concept definitions and revising decision rules. The final version of the codebook (**Table A89**) was then applied to the remaining transcripts. To assure reliability and consistency in coding across all 83 transcripts, we incorporated multiple checkpoints of different coders independently double-coding selected transcripts. Coders reviewed coding decisions to ensure continued intercoder reliability and to address any discrepancies. Standard consensus coding guidelines were followed, where any emerging theme or discrepancy was captured and reconciled through discussion and consensus. Once the coded transcripts were reconciled (**Figure A3**), code reports were generated for each code and narrative summaries were written. These narrative summaries describe emergent findings related to each code. Illustrative quotes were used to highlight findings.

Table 67. Qualitative Interview with HOP Beneficiary Demographics

Demographic Category	N= 83
Age*	
1-4 (Proxy)	24
5-12 (Proxy)**	27
13-17	<11
18+	>10
Region*	
Access East	30 (36%)
CCLCF	25 (30%)

Impact Health	>20
Missing	<11
Sex	
Female	46 (55%)
Male	37 (45%)

*Some age and region categories suppressed given small cell counts
**Two beneficiaries who were between ages 13-17 are included in the 5-12 proxy category as proxy interviews were conducted in these cases

Beneficiary Experiences Receiving Support Services by HOP

POSITIVE EXPERIENCES WITH THE HOP PROGRAM

Finding. **Beneficiaries had positive experiences with HOP services and considered it a good fit.**

Beneficiaries were generally positive when discussing their experiences with receiving support services from HOP. They summarized their experiences in multiple ways presented in **Figure 30**. Additionally, they talked about how HOP was a good fit for them (or their child) and the positive impact it had on them in Tables **A50-54**.

It's been life-changing and it is a tremendous force of good in this world. (Beneficiary)

How Beneficiaries Describe their Positive HOP Experiences

"A blessing"
"Very satisfied"
"Quite favorably"
"Pretty content"
"It was a total lifeline"
"It's been more than expected"
"A positive reinforcement about the world around him"
"Life changing"
"Very helpful in our time of need"
"We had security"
"A really good experience"
"Wonderful"

Figure 30. How Beneficiaries Describe their Positive HOP Experiences

Finding. **Receiving HOP services helped beneficiaries meet their needs with flexibility and a sense of community.**

Beneficiaries discussed how HOP services met their individual needs by providing options and allowing flexibility to cover their expenses needed. They also talked about how HOP services provided a sense of security and reduced their stress. Beneficiaries noted their interactions with caring individuals who provided good communication and customer service to make HOP convenient and easy to use.

Well, HOP helped me a lot at some point in terms of-- especially in the beginning, when they were being really flexible and generous, and they were looking at-- it felt like they were looking at individual needs and open to helping with whatever you actually needed. (Beneficiary)

I think my favorite thing is the sense of community. It gives me the sense of, "I matter. My children are not just numbers, but they are a unique, valuable resource that the program is fostering." And that's really cool. (Beneficiary)

Finding. **Beneficiaries were able to meet their food needs with healthy options provided by HOP services.**

For beneficiaries, receiving healthy fruits and vegetables and foods that worked together was very helpful. They liked the recipes and ideas for creating new or easy to make meals. Some noted this generated a sense of surprise and excitement, creating a willingness to try new foods in the family. Additionally, beneficiaries noted the convenient food delivery and pick up services helped reduce their worries about the family being able to eat healthily.

Well, actually, [HOP helped] quite a lot because it was-- they gave us a recipe and all the ingredients. And of course, my son, [redacted], he enjoyed getting that once a week and then being able to fix that meal with me. It was kind of a fun family activity. (PROXY)

Everything has been - it's been more than expected, that's what I can say. The food is healthy as H-E-L-L and it's easier to-- It's actually easier to come up with a meal when I have all the stuff in front of me compared to having boxed food or something. (PROXY)

Finding. **Beneficiaries were able to meet their housing needs with services that covered rent, utilities, and repairs.**

In addition to food, beneficiaries talked about the value of HOP services to meet their housing needs. HOP provided them with housing assistance, rent, and utilities. HOP also provided them with some needed household items like cleaning products, and home repairs.

I like that it offers-- there's not any programs out there besides this one that I know of that will help with housing, things for your house, transportation for everything that it does. It's very well-rounded. Usually, a lot of times they'll just help with food or one bill. They usually don't help with housing or transportation. So it's nice to have it all in one spot. (PROXY)

I did like that there were options when it came down to the services that were provided as far as household goods that were needed for our particular situation. There was options out there. It just

> *wasn't just a set, like a standard-size type of thing. Everybody uses different things as far as cleaning products goes. Some things work better for us than probably other families. So I did appreciate the options that were given. (PROXY)*

Finding. **Beneficiaries were able to meet their medical needs with services that offered medical supplies.**

For some beneficiaries, receiving necessary medical supplies from HOP was considered very valuable. They highlighted supplies received included medication, household items like carpet cleaners, and humidifiers.

> *They sent us some-- because [redacted] has asthma, so they sent us some medical supplies a while back, and that was nice. (PROXY)*

> *I think they changed as far as providing carpet cleaning, help him breathe better because he is an active asthmatic. Then just helping me out with the household to make it safer for [redacted]. I have gotten humidifiers for him. So all of all, honestly, HOP has been a blessing to my home. (PROXY)*

Finding. **Beneficiaries were able to meet their transportation needs with services that offered reimbursement for gas mileage and car repairs.**

Beneficiaries discussed how HOP services met their needs by providing transportation services. They also highlighted additional services provided by HOP related to transportation, including reimbursement for gas mileage and car repairs.

> *I mean, the most welcome piece for me was to get the transportation reimbursement. I mean, we have seven children. I mean, that was huge because we immediately turned around and used it on food and going to the farmer's market, and all of that stuff (PROXY)*

> *I would say that it is amazing for people like myself who don't have transportation. They can help you get transportation places. The food box that I was receiving-- that I'm receiving, it was delivered directly to my door. Like I said, I don't have transportation, so I don't have to really worry about getting to the grocery store or if I was going to run out of food, I know, "Okay. I have this coming that day." Also, I'm on a fixed income. So it kind of helped me financially. It helped a lot financially. (Beneficiary)*

NEGATIVE EXPERIENCES WITH THE HOP PROGRAM

Finding. **Some beneficiaries felt HOP services became too strict and challenging to use.**

While many beneficiaries had favorable experiences, they also talked about challenges they faced. Beneficiaries summarized their negative experiences in different ways presented in **Figure 31.** They noted challenges or things that made it harder for them while receiving services and general difficulties with HOP or managing the services (**Tables A55-57**). A key issue mentioned by beneficiaries was the program's strictness and a lack of attention to beneficiary needs.

> *As the program went on, it started to get more and more strict. And it felt like the main objective of the people I was working with was to follow some sort of restricted rule and not get in trouble. … they didn't pay attention to my individual needs. (Beneficiary)*

Finding. **Beneficiaries encountered challenges with food service delivery schedules and damaged food boxes**.

Beneficiaries talked about the food delivery schedule requirements being a challenge for them and they noted having to be physically present for the delivery was an issue. Likewise, they described their experiences with food boxes being placed in less than ideal locations or boxes being delivered damaged.

> *Well, at first, the delivery was that you had to be home and they couldn't leave it, so that was kind of nerve-wracking because I work and I can't be home every day. And then they wanted someone to be there 18 years older, which my daughter was in school at the time. But luckily, I stay on my mom's property, so I stay right behind her, and she was always home-- she would always try to be home at a certain time to make sure that she was there to receive the packages for me. But one instance, she wasn't at home, and they wouldn't leave it, so I didn't get my food box that week. (PROXY)*

> *I don't know if it's FedEx that's delivering the stuff, but some of the boxes that I've been getting lately have been open or ripped up and stuff. So the eggs, they'll be broken. Some of the stuff like the grapes will be smooshed. So then the juices from there is running on the rest of the stuff so I'll have to clean everything because it'll be sticky, stuff like that. So I don't know if it's them. I don't know who it is, but they need to be more gentle with-- --delivering the stuff so that the boxes won't get damaged and stuff (PROXY)*

How Beneficiaries Describe their Negative HOP Experiences

"Not well"
"Very frustrating"
"Up and down and rocky"
"Getting more and more strict"
"Enrollment was annoying"

"Never heard anything back"
"Just very poorly"
"Kind of touch and go"

Figure 31. How Beneficiaries Describe their Negative HOP Experiences

Finding. **Beneficiaries found the lack of variety and inconsistency of items in the food boxes to be challenging.**

Beneficiaries discussed the challenges they faced with the food boxes including a lack of variety with the items from box to box. Others noted that the items they received were not consistent, which made it difficult to plan meals. Furthermore, beneficiaries mentioned that some of the items they received in their boxes were items they did not want or would not eat.

> *So it'd be one week, I may get eggs, and then I may not get any eggs. So I may get meat this week and not-- and I did reach out because I was wondering what that was about, because I was going from getting like a pack of legs, two rolls of turkey, and two rolls of ground beef, and then some frozen vegetables to getting none of that and just canned goods. So definitely some consistency-- which I know people donate that stuff, or stores or whatever. So they have to give out what they can get. But I just think if that's someone's only source of food, it needs to be some type of consistency. Or let someone know like, "This week you won't have meat," because I was kind of depending on that for a while. (PROXY)*

> *And don't get me wrong, I am very grateful for the meat that they sent, but it was always the same chicken legs all the time. … It was never anything different. It was always chicken legs. And my son's like, "Mommy, I'm sick of chicken." And I'm like, "I know buddy, but we got to do what we got to do." (PROXY)*

CHANGES TO IMPROVE THE HOP PROGRAM EXPERIENCE

Finding. **Many beneficiaries expressed satisfaction with the support they received and did not report any suggestions for change.**

Beneficiaries were asked about their experiences receiving HOP support services, what changes they would recommend, and how the program could better fit beneficiaries' needs. Twenty-nine

beneficiaries reported no suggestions for improvement, stating that HOP met their needs as is (**Table A58**).

> *No, because I haven't had any problems. Everything was well, I guess the coordinator reached out like she was supposed to do every few months. Delivery was always on time or consistent. And food and everything was great. Definitely did help. I really miss it. Like I said, I really don't have anything. I mean, I had a great experience. I don't think I would change anything. (PROXY)*

The remaining beneficiaries shared insights into how HOP could better meet their needs and enhance service delivery. Responses highlighted four key areas for improvement: enhancing existing services (**Table A59**), strengthening communication (**Table A60**), improving program functionality (**Table A61**), and expanding service offerings (**Table A62**).

Finding. **Beneficiaries recommended enhancing existing HOP services to better meet their needs and increase convenience.**

Many beneficiaries suggested improvements to current HOP service offerings to better meet their needs and ensure services are more convenient and tailored (**Table A59**). Suggestions included offering diverse food box options, implementing a food preference questionnaire for food boxes, providing suggested recipes with food boxes, and offering grocery cards to purchase fresh, healthy foods. Others emphasized service logistics such as simplifying paperwork for gas mileage reimbursement, improving hands-on support for housing navigation service, allowing more flexibility for the home goods service, offering flexible/on-demand transportation support, and offering alternative transportation during car repair services. A few beneficiaries also noted a need for improved delivery practices such as safe and careful delivery of home goods and food boxes to prevent damage and subsequent food waste and the potential value of implementing a tracking system for food box deliveries.

> *I think as far as the food choices, I think that they should maybe kind of provide different food choices each week or something because every week you get the same food. So maybe if the choices were a little bit like, this week you get this or the next week you get that, I think that would probably be kind of good instead of being the same thing and then people have a whole bunch of that same one thing. (Beneficiary)*

> *For the transportation, it was a little bit difficult having to write everything down, having to remember to write everything down, where I went and how many miles it was and things like that. So maybe making it digital or something like that. (Beneficiary)*

Finding. **Beneficiaries emphasized the need for clearer, more consistent communication to better understand available services and how HOP can meet their needs.**

Beneficiaries indicated that improved communication from care managers, service providers, and the HOP program would help them better understand available supports, service processes, and how HOP can effectively address their individual needs (**Table A60**). Suggestions include improving communication from care managers and service providers, providing a clear introduction to HOP and transparency about service processes, providing a resource to help beneficiaries understand available services, and increasing community outreach to raise awareness of HOP. Additionally, some beneficiaries emphasized allowing care managers more time to understand beneficiaries' specific needs.

> *I would expect a little better communication with the caseworkers because, at one point in time, I wasn't able to reach my caseworker for like two weeks. (Beneficiary)*
>
> *I think that the HOP offered a lot more than we were really aware of. I did speak to a woman one day, and she said that y'all can help with housing, transportation, and all that. And I think that wasn't very clear to me for a long time. So maybe a little more information about the program to people. A nice brochure or something like that would be helpful. (PROXY)*
>
> *I think it's just as far as the program goes, it needs to be the key things, I think, are to listen to people's needs and not try to fit everybody into a formula, one. Two, there needs to be some sort of better organization and accountability for how they treat people and just to keep things consistent and streamlined. (Beneficiary)*

Finding. **Beneficiaries identified structural and operational changes to strengthen HOP program functionality and operational efficiency.**

Beneficiary feedback highlighted structural and operational changes that could make the program more sustainable and effective (**Table A61**). Suggestions included extending service window timeframes, allowing more frequent access to rent or utility assistance, increasing support and ensuring manageable caseloads for care managers, expanding HOP to additional insurance agencies and rural counties, and conducting background checks on partnering HSOs to ensure professionalism. Beneficiaries also recommended reducing eligibility restrictions, implementing automatic referral renewals to prevent service disruptions, increasing funding for the program, and in many cases, reinstating or permanently establishing HOP services.

…or more timeframes because there were other things that they were trying to help my family get. But because the window of opportunities to help the families in need is so short, they couldn't get everything done. So once you sign up-- I had just moved into my home. So my caseworker was great because she was trying to help me get as much as I could through the program. And she had got me approved for furniture. But because you only have a month of a window of working with that caseworker through the Medicaid program, I couldn't receive my furniture. You only have a certain window. So you have one caseworker, but each family only has a month to receive their services. And if you need an extension, they'll give you another month. But the furniture programs or utility assistance, that does take verification that can be up to two, three weeks. So if it's not done within those timeframes, you don't get the service. So I was told I couldn't. I don't know if other families could, but I was told I couldn't, that it was a one-time thing. (PROXY)

Oh, yeah, they did help with my light bill one time. They just told me to send over what I needed to. And I did. And the next thing I know is that my bill was paid a few days later. The only thing I would change is the number of times someone is able to use it because I was told I was only able to use it once. And I don't know if that was due to me being employed or what, but yeah. I would just change a number of times. (PROXY)

Finding. **Beneficiaries expressed a desire for HOP to expand its service offerings to better address a broader range of household, health, and family needs.**

Beneficiaries recommended adding new support services to address broader needs beyond the current scope of HOP (**Table A62**). Suggestions included assistance with additional household expenses (e.g., car insurance), childcare and after-school support, and assistance with school supplies and tutoring for children. Beneficiaries also requested additional nutrition and health services such as physical activity programs and incentives, a community website featuring exercise resources and healthy recipes, provision of toddler formula or vouchers for formula purchases, option to receive meal kits, health goal setting with HOP care managers, nutrition education classes, doula services and/or postpartum mental health support, and socio-emotional learning classes for parents. Additional recommendations included financial literacy education, support for children with learning disabilities, gas cards, covering costs for over-the-counter supplements, and establishing emergency eviction prevention services.

Only thing I probably would say is possibly expanding versus just utility help. There's times where people might need help on car insurance or different things that people actually need, especially after the hurricanes, like car repairs, just simple stuff, household stuff. I think they should broaden it a little bit more…just more broadening what they help with-- more with, like I said, car repairs. There's a waiting list, I think, for that. If they could just open that up a little bit more-- just not even send car repairs, maybe gas for your car, get to appointments. And I don't even know if that's-- they might actually have that already. I just never asked. So that could be something that's already in

> *place. Or just car insurance, just kind of brought in a little bit. And maybe instead of just the electric bill, water bill, gas bill, or other bills that you may have. (Beneficiary)*
>
> *Possibly helping with aftercare could be really handy. My daughter's school has an aftercare program that we pay for, but that could really help parents make more money…and something like aftercare assistance would be great. (PROXY)*

Overall, beneficiaries' suggestions reflect a desire for enhanced flexibility, clearer communication, and expanded support options, underscoring the importance of efforts to ensure HOP continues to meet the needs of its beneficiaries.

HOP Support Services

ACCESSING HOP SERVICES

Finding. **Beneficiaries accessed HOP services through multiple ways, including Medicaid, community referrals, healthcare and social service staff, and care managers, reflecting a strong "No Wrong Door" approach.**

Beneficiaries were asked about their experiences accessing HOP services. The HOP program works diligently to support a "No Wrong Door" approach for beneficiaries to access services. **Table A63** outlines how beneficiaries reported accessing services. Some individuals mention initiating access by calling Medicaid or that Medicaid initiated the process with them; others learned about the program from their community before reaching out to access. Other modes of support in accessing services that beneficiaries mentioned included: care manager or coordinators, hospital staff, healthcare professionals, social services, and the HOP Network Leads. Additionally, beneficiaries aged 13-17 note their parents handling the process of accessing services.

> *Yeah, it was through his school, the guidance counselor at his school referred us for it. And then when they called, I had to answer questions and then turn in things to show what-- or prove, I guess, what we were saying, so. But it was really easy. Everybody was really communicative. So it wasn't a difficult situation. (PROXY)*
>
> *The process for me to access HOP Services was easy. The referral was placed on my behalf, and a representative reached out to me within a few days of that referral being placed. It was pretty easy to get the service started. (Beneficiary)*

Finding. **Clear information, consistent care manager support, and assistance with application and service coordination facilitated beneficiaries' enrollment in and access to HOP services.**

Beneficiaries highlighted the following facilitators that supported them during the process of enrolling and accessing HOP services: Assistance with HOP application and coordination of services; the support of HOP personnel; consistency with care manager/care coordinator; and having information provided on the enrollment process and/or what services were available (**Table A64**).

> *Having direct contact to my care coordinator instead of a general team. Just knowing that I had one-on-one access to the same person who had my file, who knew what was going on. Having that consistency instead of having to start new with someone. Being able to stay with the same person the entire time. That's been very helpful since she has been wonderful since the beginning. (Beneficiary)*

Finding. **Barriers such as communication issues, process inconsistencies, service delays, personal challenges, and disruptions from Hurricane Helene impacted effective and efficient service delivery.**

Beneficiaries discussed multiple barriers that impacted their ability to effectively and efficiently access HOP services (**Table A65**). Communication challenges; Hurricane Helene; cumbersome service process and lack of consistency; lack of timely service delivery or services not being finalized; and personal barriers in ability to use HOP were noted by beneficiaries as providing challenges in accessing and obtaining services.

> *The food boxes is good, but the communication with them helping me get my house safely is not good. They've been trying to [fix the] windows since May… My case manager, he just disconnected his number abruptly from his number. I can't reach out to him. The other lady, I tried to reach out and call her to get more information. She never answered the phone nor would return my calls. So I don't know. (Beneficiary)*

Most beneficiaries reported experiencing no barriers in accessing HOP services **(Table A66)**.

> *The process was actually very smooth. It wasn't a headache at all. It was actually very well with communication and reaching out. It seems like as soon as the application and stuff was processed through Medicaid and they was referring us to them, everything kind of stayed on the forefront of being reached out, talked to, communicated with as far as what services will and will not be provided, so. (Beneficiary)*

INTERACTIONS WITH SERVICE PROVIDERS

Finding. **Beneficiary interactions with service providers were largely positive and supportive, indicating successful implementation of HOP network.**

Beneficiaries were asked about their experiences with service providers and care managers. Beneficiaries commonly reported supportive and positive interactions with service providers and care managers and no issues contacting their care manager (**Table A67**).

> *I liked that I could reach the care management provider whenever. And she was quick to answer or get back to me if I had any questions. (Beneficiary)*

> *It was really easy. Everything was streamlined, and it felt like you never can-- when you're going through a crisis or an emergency or something like that, it feels like you don't have anywhere you can really go for help. But I felt like, "Okay, I have an issue here." And I could call them and they*

would be on it. They had a plan for it. And once things got going, it was-- there wasn't any going through the cracks. They had multiple people following up on it and getting stuff accomplished. (PROXY)

But a few times I've been up and one time, the girl prayed with me before she left. Yeah. Another time, the guy was checking on me from after the storm [hurricane Helene], trying to ask me just checking on the family and my baby, making sure we had enough water. He was saying if I needed any water, he could go get some and bring it back to me. Very helpful because we didn't have any water. And then when we got our water back, we still was under a boil advisory. Like if the water was still bad, you can't give an infant that water. And he actually brought me water back. He did. (Beneficiary)

Finding. **Beneficiary satisfaction is impacted by challenges experienced with service providers, such as inconsistent communication.**

Beneficiaries noted some challenges with service providers such as communication barriers and lack of consistency with care managers; issues getting in touch with HOP personnel and not knowing who to contact; as well as general negative interactions **(Table A67).** Additionally, there seems to be a lack of consistency across care managers, where some beneficiaries report receiving contact information for their care managers and others struggling to know who to contact or who their care manager even is. Specifically, a few noted not knowing who their care manager was or how to contact them when asked if they could reach their care manager if needed.

I had no idea who my care manager is or my caseworker is, to be honest (PROXY)

HOP EXPECTATIONS OR GOALS

Finding. **While many beneficiaries reported having no specific expectations or goals when enrolling in and accessing HOP services, others entered the program with clear aims related to improving their social and economic well-being.**

Beneficiaries were asked to describe any expectations or goals they had when enrolling in and accessing HOP services. Expectations and goals highlighted by beneficiaries included obtaining housing assistance, increasing food access, improving financial security, improving health, and relieving stress (**Table A68**).

It was mainly to get housing. The apartment we were living in when I started applying had mold really bad. And the apartment complex knew about it, but the property management changed. In a six-month period, there was four different managers. So it just felt like we were never getting

anywhere. And so it was to mainly get out of there and get into somewhere new because I wouldn't have been able to afford to do it by myself (PROXY)

I wanted to use the HOP program as a stepping stone to secure my family back to where we was. And I can say that that's exactly what it did for me. It gave me a chance to get financially secure again. So I'm grateful. (PROXY)

USE OF EXTERNAL SUPPORTS

Finding. **Beneficiaries often supplemented HOP services with additional resources from external organizations.**

Many beneficiaries talked about the need for external support from organizations outside of HOP to manage their needs. About one-third reported not receiving any external support while approximately two-thirds mentioned seeking external support (**Figure 32**). They talked about a wide range of organizations that provided them with assistance. Their responses are illustrated in **Table A69**.

No [external supports used], because the HOP program gives you everything that you need. That's why I said I wish you could-- I wish I could get it forever because it's so amazing…You can't even explain that feeling of relief that you feel knowing that you have that kind of help coming to you. (Beneficiary)

We get EBT and we get WIC. But there are six of us. And with everything being as expensive as it is now, it's not always enough. (PROXY)

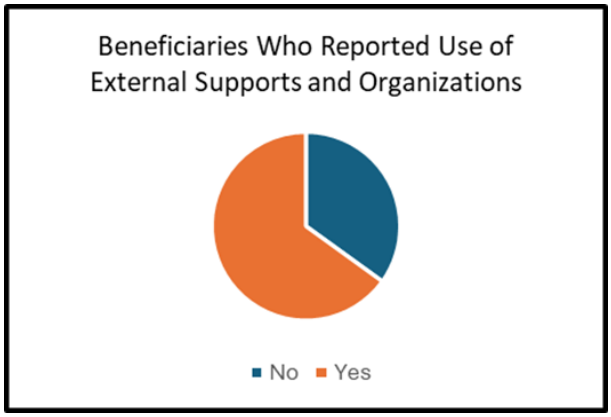


Figure 32. Use of External Supports and Organizations

Finding. **Beneficiaries received external support from local and national organizations.**

Beneficiaries who reported accessing external organizations outside of HOP to manage their needs mentioned a range of local and national organizations. Their list of external supports and organizations is presented in **Figure 33**.

> *Yeah. WIC, Food Stamps, like I said, the Circle of Security thing. Let's see. What else have we been getting into? Oh, this child subsidy. I use the child subsidy to get him into a Montessori Daycare. (PROXY)*

Finding. **Beneficiaries found themselves waiting on external support to meet their needs.**

Of note, two beneficiaries talked about their experiences applying for but not yet receiving any external support.

> *I applied some food stamps, but that hasn't worked out very well. (Beneficiary)*

> *We're supposed to get summer SNAP, but that has yet to show up. I don't know. Besides that, no. That's the only thing I think that we are getting soon. (PROXY)*

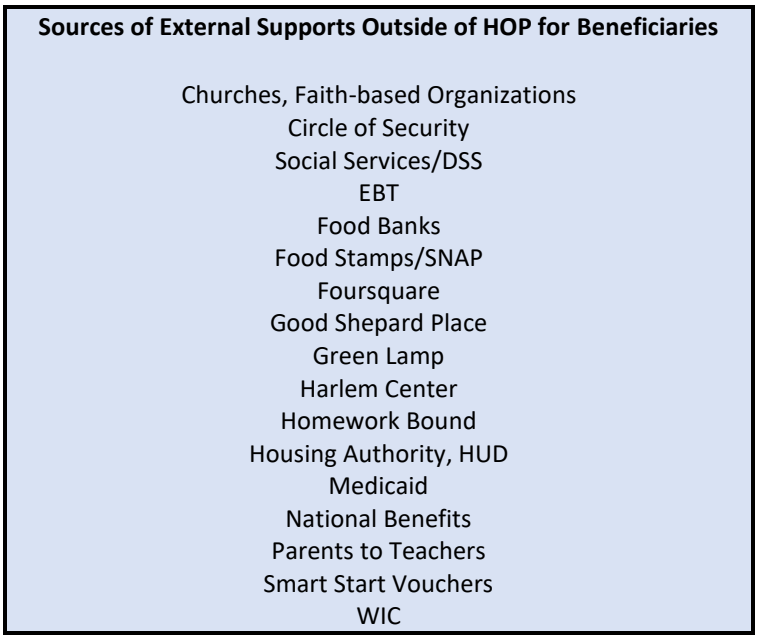


Figure 33. Sources of External Supports Outside of HOP for Participants

HOP Impact on Health and Well Being

SERVICE IMPACT ON HEALTH

Finding. **Beneficiaries found the support and reliability of the program to have a positive impact on their health and well-being.**

Beneficiaries were asked how, if at all, HOP services impacted their health or general well-being. Most noted positive impacts (**Table A70**). These positive impacts include improved financial stability; improved mental health and stress levels; weight loss; ability to get off medications and general positive improvements to overall health; healthier and safer home environments; increased access to healthy food and increased nutrition and food literacy; as well as ability to get to medical provider appointments.

> *It's definitely changed my health in a very positive way. Because before I wanted to eat healthier, I didn't always know where to begin. But it's like, "Hey, we know that these staples are coming in." So almost like a guideline of, "Okay, here's some new grains that you haven't tried before, like farro."… I never even heard of that. It is absolutely delicious. And so I figured out different ways to modify my diet. So instead of having a processed bread, I can introduce more whole grains. And so I'm no longer a prediabetic. My cholesterol has been going down. I just feel better. (Beneficiary)*

> *I mean, we've been able to ensure that we have food in the home because I can't get food stamps…It's hard to keep enough food in the house for the month a lot of times. And I mean, now when you go to the grocery store and you spend $100, you don't even come out with half of the items that you used to come out with five years ago… So this program has just really helped me to have that comfort of knowing that, well, hey, at the end of this month, I know I'm going to have some food this month. That's really been the biggest impact for my kids, is just making sure that they have something to eat. (PROXY)*

One beneficiary mentioned participating in HOP was time consuming and felt that it was detrimental to them:

> *I think in the negative, I spent a lot of time trying to advocate for myself. It got distracting. I think it distracted me from furthering myself in other ways to get better. I kept going down dead ends. And I get sort of obsessive. And so if I'm going to make a shopping list, I'll be up till 2:00 in the morning for five nights in a row, like trying to get it perfect and right and research everything and make sure I'm finding the thing that works with us. And so that happened several times where I spent a lot of time trying to make sure that I wasn't making mistakes with shopping and stuff like that. And then just to turn out to be nothing, that was kind of a detriment to me moving forward in life, I think. Just the rejection and the disorganization and that kind of thing. (Beneficiary)*

When asked if participating in HOP impacted health or wellbeing, some individuals mentioned there not being much change (**Table A71**):

Nothing really changed. I mean, like I said, I had a dehumidifier before they actually gave us one. They just kind of gave us a more expensive one. But nothing has really, I mean, got worse or got better. It's kind of been the same as far as his health. (PROXY)

No. Didn't change it necessarily. It's just food. (PROXY)

FILLING THE HOP GAP

Finding. **Adjustments and planning were personal strategies beneficiaries used to fill the HOP gap.**

When beneficiaries were asked if/how they would fill the need if they no longer received HOP services, they highlighted a variety of strategies at the individual and community levels which are presented in **Table A72**. Individual strategies included making adjustments and new plans, dipping into resources, or putting money aside for expenses. They also discussed seeking employment, working extra hours or shifts, and focusing on saving what is currently available.

I would have to be very strategic. I would have to be really strategic in how I use my food stamps. I'll just have to factor in how to continue to upkeep having the fruits and veggies even once the box stops. (Beneficiary)

Just based off my resources, I have to put some money aside for cash and food stamps. I only get $23 from food stamps, so that goes towards it. But then, I have this thing called National Benefits through my insurance. And so that allows me to purchase a little, extra groceries with that. So it's just trying to meet my needs as best as I can because everything is just so expensive. (Beneficiary)

Finding. **Outreach and community connections were broader strategies beneficiaries used to fill the HOP gap.**

Beyond individual level strategies, beneficiaries also focused on outreach and community connections as strategies to help them if HOP services were no longer available. Their strategies included talking to their case manager for assistance, asking family and friends for assistance, or reaching out to supplemental assistance programs, food pantries, or food banks.

It does happen because I know [HOP is] not going to last forever. But yes, my caseworker did give me resources outside of just HOP. (Beneficiary)

I would just have to try to reach out to friends and family to try to help [me with] things that we needed [and ask for] help. (PROXY)

I've had some other recommendations, which we do with these SNAPS, right now-- EBT services. The prices of everything is so high. Sometimes it just isn't enough because I do work full-time, so I don't receive the full allotment (PROXY)

Finding. **Without HOP, beneficiaries were unclear about how they would meet their needs.**

Beneficiaries talked about the important role of HOP, and several noted they would not have known what to do if they did not receive these services needed.

No, [I don't know what we would do] because like I said, we took on four grandkids, and my husband had a six-way bypass. He's trying to get his disability right now, but he doesn't have it. And all we survive on is $1,149 a month. (PROXY)

Every now and then, they'll pay my bill whenever I don't have the money. And I'm not sure [now what I would do] because I don't know many other organizations that will help with a light bill. (Beneficiary)

Finding. **Without HOP, beneficiaries would find it challenging to provide healthy meals, safe housing, and transportation for their families**.

Beneficiaries were also asked about things that might be hard to keep doing or take care of if HOP services stopped. These challenges included keeping up with prices for expenses like groceries and gas, providing healthy meals, safe housing, and transportation. Additional specific examples shared by beneficiaries are presented in **Table A73**.

It would just definitely put more of a strain on life. But in particular, just keeping up with the price of groceries and stuff, the price of everything and the gas and things like that. We end up driving more than what the reimbursement. Yeah. And it's okay. [inaudible]. We are still thankful, so it's still super helpful. But yeah, if we didn't have that, it would just be-- yeah, it would be more of a strain. (PROXY)

I'm spending money now on food. Today, I wasn't able to get their school clothes and school stuff that they're needing for school because I had to buy groceries instead. And so it's things like that are creeping up now more and more often. (PROXY)

PERSONAL GOALS AND CHANGES

Finding. **Beneficiaries have varied, diverse goals and desired life changes.**

Beneficiaries were asked if they had any goals or changes they were making or wished to make related to their (or their child's) life, health, or overall wellbeing. Some noted having no personal goals or changes they would like to make and the most common goals related to wanting to maintain or achieve

a nutritionally diverse diet and increase or begin exercising **(Table A74).** Additional goals included changes to career and education; achieving financial stability; achieving a new, healthier living environment; improved asthma; improved mental health; increasing sleep; weight goals; engaging with supportive therapies; and generalized improved health and well-being **(Table A74)**.

> *I want to be able to fix my diabetes, get it more controlled, learn some nutritional ways. Because medicines, they always make me feel groggy and terrible. I want to learn how to eat better so I can live a long life, watch my children grow up, them become grown, get married, have kids on their own. That's something that I want to see. I don't want to die before that (Beneficiary)*
>
> *I mean, yeah, I would like to-- I mean, as for fitness and stuff, just want to get more fit for my kids and myself, things like that. (Beneficiary)*

Finding. **Expanding HOP services and service duration could help beneficiaries achieve their personal health and wellbeing goals.**

When asked what HOP could do to help support in making these changes, the most common response was that credit or financial assistance with additional health and well-being related supplies and services would support their personal goals and stability (ex: assistance with daycare costs, money for supplements and vitamins or gym memberships). Beneficiaries also noted that extended service duration; regular check-ins and communication; and more active choice in food box items could better support beneficiaries' personal health and wellness goals (**Table A75**).

> *One of the economic barriers, I can't afford to go to a gym. And being in a rural area, we've got gyms, and yeah, there's outside, but right now, it's 28 degrees outside. I have asthma, so going out and doing things in the cold triggers my asthma. If I'm inside, I can breathe just fine. But at home, I'm limited to what I can do because my space is very small, and I have low ceilings. So if there's a way to connect to some sort of exercise program or I know our medical system here, they have gyms. So even if it was just a discounted membership, just some sort of connection within the community. Because when you're involved in the community, that helps keep you motivated. And so adding the communal aspect could be helpful too. (Beneficiary)*

Some beneficiaries also noted general appreciation for the program and how it has helped them work toward their identified personal goals and changes for their health and well-being. They talked about the food services, home goods, and general removal of stressors as aiding in their ability to make personal goals and changes (**Table A76**).

> *No. Y'all did amazing. Just the fruit, the veggies, the notes. Y'all helped him change his eating habits and his drinking habits. So I would say y'all did great. (PROXY)*

Well, I was just going to say, as a result of the HOP program, just taking away the stressors of affording life in a way, it's almost like, "Okay, I've had this reset." So now that I'm through my busy season at the end of the year, I can definitely just take a breath and be like, "Okay. I have my sweatpants on. I'm going to do yoga today."…So yeah, it enabled me to say, "Okay, now that's handled. Now I can focus on this." (Beneficiary)

They had actually sent us some pillowcases for his bed (to help with asthma). They were pillow protectors, anti-allergen pillow protectors. That was really, really cool. I forgot about that. (PROXY)

HOP Impact on Home and Family Life

NEW BASIC NEEDS CHALLENGES

Finding. **Some beneficiaries experience ongoing basic needs challenges despite HOP intervention.**

Beneficiaries were asked if they were experiencing any new challenges related to meeting their basic needs. They note ongoing needs-related insecurity/instability. The findings include challenges with complex, overlapping needs relating to food, housing, and transportation insecurity. For some beneficiaries, these challenges intersected with individual and community level impacts following Hurricane Helene (**Table A77**). Some beneficiaries highlighted that they were experiencing difficulties meeting their basic needs after they stopped receiving HOP services. Some beneficiaries noted not experiencing any new challenges in meeting their basic needs.

> *We were put up for eviction because my job had cut all our hours down, and I had lost my food stamps prior to my hours getting cut down because of the money I was making. So yeah, we were up for eviction. HOP…couldn't give me any money or anything. They just sent me out a bunch of resources…So, I just had to get out and get another job and try to work before we-- we got three days before we was evicted (PROXY)*
>
> *Like I said, the last week of the month is always pretty much a struggle [now that HOP services paused], so kind of. That was just a big role, [HOP] played a big role in making sure I knew I'd be all set with that food coming every week. It kind of, you know, got us through that last ending of the month. (PROXY)*

Finding. **Beneficiaries most commonly relied on HOP services and external supplementary supports and services as a means to overcome basic needs challenges.**

When beneficiaries were asked how they overcame challenges impacting their ability to meet their basic needs, the most common response was that HOP services helped fill gaps in their basic needs (**Table A78**). Other strategies included relying on family or community; attempting to access new external social services or utilizing available services for support; making adjustments in life to save money; and simply paying what they can, when they can **(Table A78).**

> *[HOP] kind of helped me feel better. It helped me to lighten the load, like you said, with transportation and housing and stuff. It helped me to lighten the load. Everything is so high, so that was kind of like, "Okay. I can more so focus on my bills and my children because the food portion is taken care of." (Beneficiary)*

IMPACT OF LIFE STRESSORS

Finding. **While life stressors did not affect most beneficiaries' use of HOP services, some beneficiaries experienced stressors that limited their capacity to engage fully with HOP services or advocate for their needs.**

Beneficiaries were asked about any life stressors they may have faced and whether they had an impact on the participant's ability to take care of themselves or access HOP services. Most noted that life stressors did not affect their use of HOP services. However, some identified life stressors that affected their ability to engage with HOP services or advocate for themselves, even when supports were available (**Table A79**). This included caregiving responsibilities that limited capacity to access HOP support, participant burden and frustration in engagement of services, Hurricane Helene disrupting access to HOP services, and health-related stressors that interfere with daily functioning.

> *I would say for myself, just a little bit, being a single mom, those services were there and sometimes I was not able to get to the place where I would make phone calls and try to get the things I need just from the house being so chaotic at times. But once I did get some time to reach out and things, it was definitely a relief for the services that were provided. (PROXY)*

IMPACT OF HEALTH OR COMORBIDITIES

Finding. **Beneficiaries reported chronic health conditions and comorbidities that affected their daily lives, including physical, behavioral health, and mobility related issues.**

Beneficiaries were asked about any health problems that impact their day-to-day life. Identified health issues and comorbidities included asthma, behavioral health issues, diabetes, physical ailments/mobility issues, high blood pressure, food allergies, chronic nerve pain, eczema, fibromyalgia, perimenopause, POTS, preeclampsia, pulmonary stenosis, rheumatoid arthritis, sickle cell disease, and vitamin D deficiency (**Table A80**).

Finding. **Although health problems did not affect most beneficiaries' use of HOP services, some experienced situational challenges that occasionally hindered full utilization.**

Beneficiaries were asked whether any health problems affected their ability to use HOP services. Responses reflected a range of experiences, from no impact at all to modest or situational challenges limiting full utilization (**Table A81**). These situational challenges included dietary restrictions and food sensitivities that affected food box utilization, health needs that shaped service use, physical limitations posing challenges with carrying heavy food boxes, and hospitalizations disrupting service use.

> *The only difficulty is sometimes getting the 25-pound box inside. Thankfully, I've got folks nearby who can help get it in. That's the only difficulty I've had. (Beneficiary)*

> *Well, just last week, he was in the hospital from having a pain crisis. So if he's hospitalized for a whole week, we basically miss getting the box and end up having to give it away to somebody or something like that because we're not even home. And, you know. And hate for it to go to waste. (PROXY)*

IMPACT OF CAREGIVER ROLE

Finding. **With varied responsibilities, caregiving demands limited some beneficiaries' ability to engage with HOP services.**

Beneficiaries were asked about any caregiver responsibilities that may have impacted or affected any of the HOP services they received. Beneficiaries reported a range of caretaking responsibilities, from having none to being the primary caretaker of children, parents, spouses, and pets (**Table A82**). Some beneficiaries described how caregiving burden limited their ability to engage with services while others reported that caregiving responsibilities did not impact HOP service utilization (**Table A83**).

> *I would just ask that they kind of help to take the reins with getting things done and not kind of putting them on the parent to do because, to be honest with you, we couldn't find the time to get them done. And that made everything kind of fall to the wayside. And yeah, we just didn't really get to really - how do I say this? - take advantage of all the different things that HOP offered. (PROXY)*

Finding. **HOP services positively supported beneficiaries' caregiving responsibilities by reducing household burdens, easing food related stress, and enhancing overall family wellbeing.**

Beneficiaries described a range of positive impacts that receiving HOP services had on their caregiving responsibilities (**Table A83**). Many reported that food assistance helped caregivers fill household food gaps. Others noted that HOP supports reduced caregiving-related worry among children and that the human connection offered by services providers supported family well-being. In addition, beneficiaries reported that HOP services provided a safe environment for the family and reduced household burden, which allowed for more parent-child time.

> *…because I do have three kids, so it definitely helped out, especially towards the end of the month because I'm pretty sure everyone else runs low. And so that pretty much helped us along with the food and stuff for the last remaining of the week. (PROXY)*

HOP Sustainment and Takeaways

HOP SUSTAINABILITY

Finding. **Beneficiaries want HOP services to continue with increased, sustainable funding.**

Most beneficiaries expressed interest in sustaining HOP services because they found the program to be valuable. Beneficiaries shared their personal advocacy efforts in contacting elected officials to fund the HOP program. Of note, one beneficiary emphasized the importance of transparency in funding mechanisms and program outcomes in dispelling misinformation and encouraging policy advocacy to sustain services **(Table A84).**

> *I would increase funding to this program, knowing all of the things that it does. And I really think that this program will make a difference long-term in a lot of people's lives. (Beneficiary)*
>
> *So I do think misinformation is a great problem... If you're giving them information like, "Hey, this program is funded through this. It came into being through this bill. Here, you can contact your representative to tell them to continue to support it because you've been directly impacted." I think that's one way that this can work on a local grassroots level to encourage people to stand up for the things that benefit them because of everything that they get that helps them. And again, it's not ignorance. It's misinformation, disinformation, and not understanding where the resources are actually coming from and who is fighting for them and supporting that. (PROXY)*

Finding. **Beneficiaries want to expand HOP enrollment and awareness through improved outreach to increase utilization.**

Beneficiaries believe that public awareness of HOP is low. They identified strategies to increase HOP enrollment through outreach partnerships with trusted organizations and by making information accessible online and in community sites such as WIC offices and clinics. Of note, one beneficiary suggested streamlining enrollment with Medicaid eligibility (**Table A84**).

> *Keeping the process to get enrolled easy. I guess providing the information about the resources that you have available on websites and Facebook or emails or flyers so that more people will know what they provide. (PROXY)*
>
> *The involvement of community groups, like we saw with ours, I think is incredibly helpful, especially when you're reaching rural communities like ours where we don't have as many services and things of that nature. (Beneficiary)*

Finding. **Service continuity strategies to sustain HOP in the long-term involve consistent case management to connect beneficiaries to services they value.**

Beneficiaries noted that retaining and expanding the duration of existing valued services and adding new services could sustain the positive impacts of the HOP program. Specifically, beneficiaries suggested that HOP services be expanded to include direct financial assistance to address ongoing needs, employment and benefit navigation support to meet work requirements, and housing assistance to reduce homelessness. For many beneficiaries, effective service connection depends on clear, consistent communication and high-quality case management. Specifically, this would require ensuring beneficiaries have the resources needed to maintain services they receive, supporting beneficiaries' financial stability and smooth program exits, and ensuring communication with case workers is clear and the quality of support is consistent **(Table A84).**

> *I would like to keep the part where the caseworker helps the families with budgeting, with food prepping, with savings. Well, I can't say for everybody else's, but my caseworker actually went above and beyond because she even started looking at buying houses or mobile homes, rent-to-own programs. She was really trying to get me financially stable to no longer need the services. And that's the best part to me because everybody can't be on HOP forever. But if you can use it and get better, then it'll be available for somebody else. (PROXY)*
>
> *Definitely, communication is a big one. Making sure that it's open and that all the care managers are able to talk with all the clients and connect them to the right place. (PROXY)*

HOP PROGRAM VALUE

Finding. **HOP was viewed by beneficiaries as valuable, transformative, and essential for addressing financial, health, and housing challenges.**

When beneficiaries were asked whether they found HOP worthwhile, the vast majority reported that the program was worthwhile or extremely worthwhile, using language such as "life-changing," "a blessing," and "a lifeline" **(Table A85).** Beneficiaries shared that HOP helped them navigate financial hardship, health challenges, food insecurity, and housing instability. Many beneficiaries reported recommending HOP to others and expressed strong hopes that the program would continue or be reinstated, highlighting its value to individuals, families, and communities **(Table A85).**

> *I just hope that people who are working within this program understand that it's so worthwhile. It does help lift people out of poverty and give them the tools. And when you've had either*

> *medical conditions or you're like me who's dealt with abuse, then it's like a lifeline. So I am grateful and I'm happy to share and advocate for this for other people too. (Beneficiary)*
>
> *Oh, very worthwhile. I mean, it's been a blessing to our lives… This is a small town, and we don't have a lot of access. We have one grocery store, and you can ride this town in less than five minutes. And a lot of homes are run down and lack of jobs, it's hard to get repairs done and healthcare for some people. (PROXY)*

Finding. **Features such as essential needs support, stress reduction, responsive care management, health and financial benefits, and ease of participation made HOP worthwhile.**

Some beneficiaries further elaborated on specific program components and experiences that made their participation worthwhile **(Table A86).** This included that the program met essential needs and reduced life stressors, offered supportive and responsive care managers, improved health, provided financial relief, and was easy to participate in.

> *I don't know where I would be if that wasn't offered to me. I don't know if I'd still be sleeping in my car trying to make ends meet or what. So I mean, overall, other than the knickknacks that I dealt with and encountered, I'm very grateful for the HOP program and everything that it stands for. (Beneficiary)*
>
> *Like I mentioned earlier, the program has changed my life for the positive as far as my health through the food program. I'm now thinking about produce in different ways. And so, I'm eating better. My ceiling and wall are fixed, so I have a healthier environment. I'm just so, so, super incredibly grateful for all these healthy opportunities. (Beneficiary)*

Evaluation Question 5

The goal of Evaluation Question 5 ("Healthcare Utilization") analyses was to determine how healthcare utilization changed with Pilot participation. We evaluated three types of healthcare utilization to help answer Evaluation Question 5: emergency department visits, inpatient admissions (total, and also subcategories of medical, surgical, or maternity related), and outpatient visits. We further evaluated several types of appropriate utilization specifically relevant for particular clinical populations. These include attending prenatal care visits and attending postpartum visits for pregnant individuals, and attending well-child visits for children 0-15 months, 15-30 months, and 3-21 years of age, broken down into subcategories of 3-6 years of age, 7-11 years of age, and 12-21 years of age. We also examined asthma medication possession for children with asthma as a form of appropriate healthcare utilization.

We note that interpreting utilization results requires nuance. Some types of utilization, such as emergency department (ED) visits and inpatient admissions, can reflect worsening health and thus would ideally decrease (although ED visits and inpatient hospitalization often are appropriate medical care and the goal is not to make needed care more difficult to access). On the other hand, outpatient visits, and in particular preventive services like prenatal, postpartum, and well-child care, may be generally underutilized and thus increasing use would be desirable.

Evaluation Question 5 ("Healthcare Utilization") analyses used two main analytic approaches. For the ED visit, inpatient admission, and outpatient visit outcomes, we conducted individual-level comparative interrupted time series analyses. We examined utilization on a monthly basis for up to 12 months before the index date, and for all months after the index date up to Nov 30, 2024 (the end of the study period).

The use of the comparison group helps protect the analyses from certain types of bias, such as regression to the mean or 'secular trends' (social conditions that affected Medicaid beneficiaries more broadly and were co-occurring with Pilot participation, but are not an effect of the Pilots themselves). The CITS analyses allow for a type of difference-in-differences estimate of HOP's impact, in the sense that they compare utilization before and after Pilot participation among Pilot participants and account for changes in utilization in the non-HOP group (which cannot be attributable to HOP). The non-HOP group consisted of Medicaid beneficiaries who screened positive for social risks (an eligibility criterion for Pilot enrollment) but who lived in counties not covered by the Pilots and so did not participate in the Pilots. These individuals should be subject to similar secular trends as Pilot participants. These analyses

were centered around an index date (the date of Pilot enrollment for the HOP group and the date of first reporting a social risk during screening for the non-HOP group).

To account for repeated assessments within individuals, all Evaluation Question 5 analyses used robust standard errors clustered at the level of the individual. Given high numbers of observations with 0 utilization in a given month, we fit two-part models with a logistic component estimating whether there was any use of a particular type, and a negative binomial component estimating the quantity of use conditional on there being any. We used negative binomial models to account for possible overdispersion, but as a robustness check we also fit Poisson models which produced nearly identical results. Analyses adjusted for age, race and ethnicity, sex, disability status, index date, quarter of observation (to account for seasonality), an index of rurality of residence, CDPS comorbidity scores, an indicator of HOP clinical eligibility, and pre-index utilization to help account for the presence of a 'triggering event' (e.g., an ED visit that prompts HOP enrollment). Because we fit non-linear models, we used predictive margins for inference after fitting the models.[42]

The second main analytical approach was standard two-period difference-in-differences analyses. These were used for outcomes where the type of outcome did not lend itself to CITS analyses. This approach was used for the prenatal, postpartum, well-child visit, and asthma medications outcomes, which do not occur as a time series in the way ED visits, inpatient admissions, and outpatient visits do.

Healthcare Utilization Measures

Emergency Department Visits

The unadjusted mean number of ED visits per beneficiary per month over the entire study period was 0.07 (SD: 0.35). For the HOP group the mean was 0.11 (SD: 0.44), and for the non-HOP group the mean was 0.07 (SD: 0.33). In the HOP group, for non-pregnant adults it was 0.14 (SD: 0.50), for children aged 0 to 20 it was 0.06 (SD: 0.30), for children aged 0 to 3 it was 0.11 (SD: 0.39), and for pregnant individuals it was 0.17 (SD: 0.54).

Figure 34 presents the unadjusted mean number of ED visits (with 95% confidence intervals) per 1000 person-months for those who enrolled in HOP and the non-HOP group, before and after the index date (month 0). Given the decreasing numbers of observations with increased follow-up times, uncertainty is greater at later timepoints.

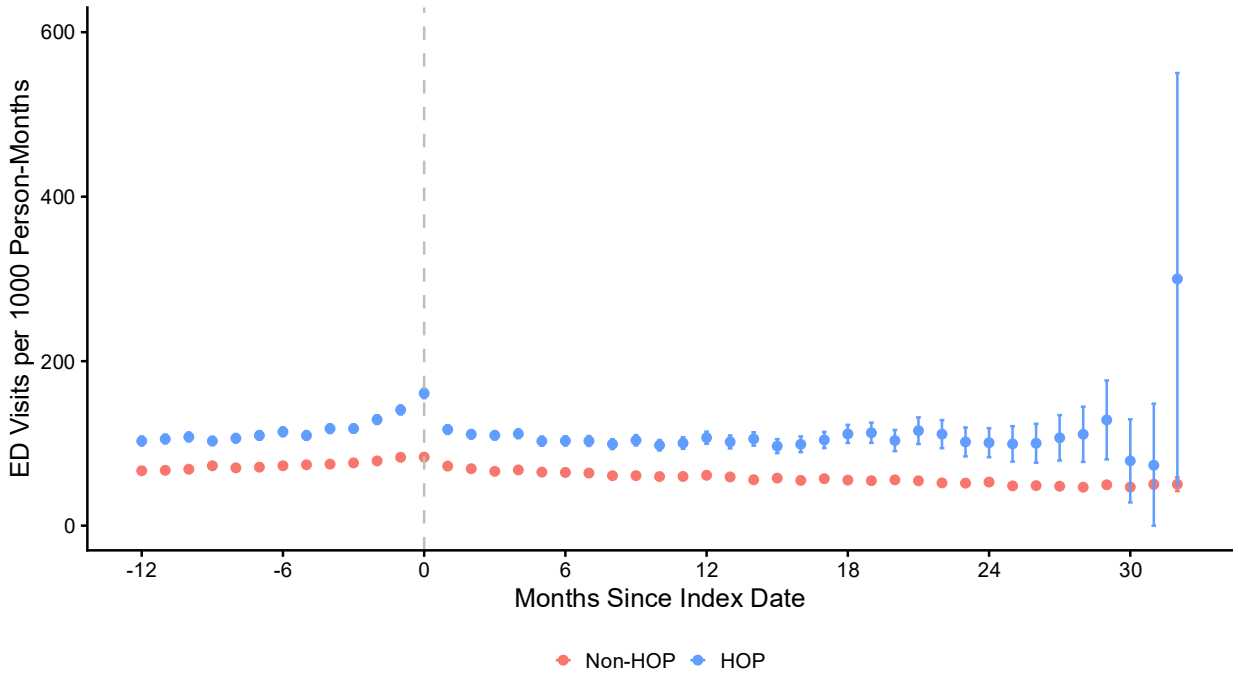


Figure 34. Unadjusted Mean ED Visits per 1000 Person-Months, with 95% Confidence Intervals

Figure 35 presents the unadjusted mean number of ED visits per 1000 person-months (with 95% confidence intervals) by eligibility category.

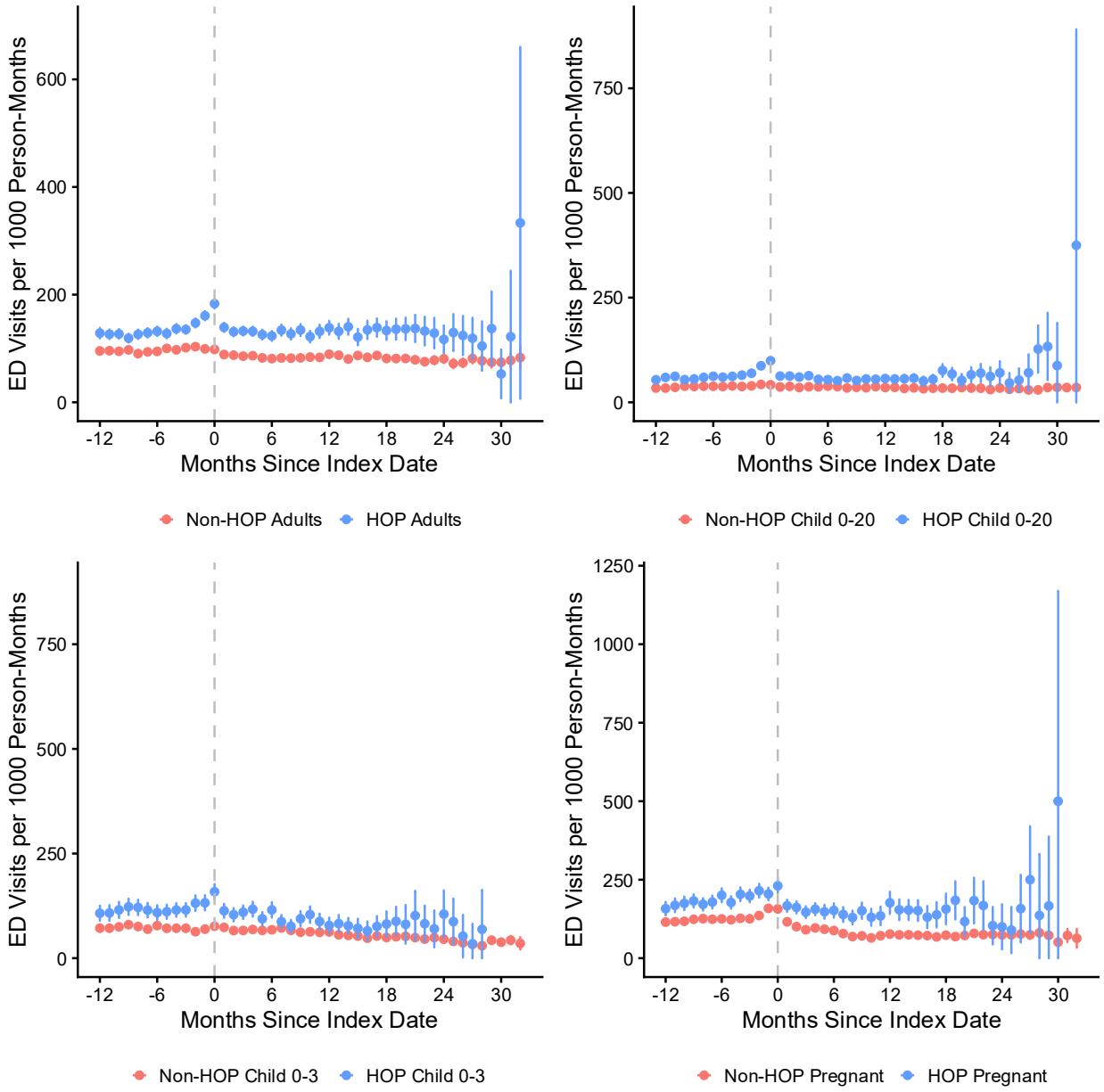


Figure 35. Unadjusted mean ED visits per 1000 person-months by eligibility category, with 95% confidence intervals

Comparative interrupted time series analyses partition the impacts of an intervention into a change in level (intercept of a regression line) and a change in trend (slope of a regression line). The estimated differential change in level attributable to HOP at the index month was -0.0002 (-0.0032 to 0.0028, p = 0.90), and the estimated differential change in trend attributable to HOP over the entire post-index period was -0.0013 (95%CI -0.0019 to -0.0007, p<.0001). These two estimates of the differential impact

of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we present what those differences translated to as monthly differences averaged over the entire follow-up period.

Table 68 presents estimates of HOP's impact on ED visits. These results are estimates of the differences in monthly ED visit utilization that are attributable to HOP enrollment, relative to a counterfactual situation in which HOP enrollment did not occur. For emergency department visits, we estimated that, in the absence of HOP, there would have been 70.8 ED visits per 1000 person-months across all HOP participants. Overall, HOP was associated with reduced ED visits overall (approximately 13.8 fewer visits per 1000 person-months).

Table 68. Estimate of HOP Impact on Monthly ED Visits

Eligibility Category	Visits per 1000 Person-Months in Absence of HOP (95% CI)	Differential Visits per 1000 Person-Months Attributable to HOP Enrollment (95% CI)
Overall	70.8 (68.8 to 72.8)	-13.8 (-19.8 to -7.8)
Non-Pregnant Adults	95.5 (92.2 to 98.8)	-19.3 (-27.4 to -11.2)
Children 0 to 20 years of age	38.6 (37.5 to 39.7)	-8.1 (-11.4 to -4.8)
Children 0 to 3 years of age	66.5 (64.8 to 68.3)	-13.5 (-19.0 to -8.0)
Pregnant Individuals	102.0 (99.0 to 105.0)	-20.5 (-28.9 to -12.1)

Notes: Results represent marginalized estimates from the comparative interrupted time series analysis. Visits per 1000 person-months is an estimate of how many ED visits per 1000 person-months would have occurred in the absence of HOP, and thus can be understood as a baseline for counterfactual comparisons. Differential visits per 1000 person-months represents an estimate of how many fewer (or more) visits than baseline occurred owing to HOP. Thus it is an estimate of the HOP impact on this outcome. Estimates were produced by applying marginal effects procedures to the comparative interrupted time series models.

Figure 36 presents estimates of the difference (with 95% confidence intervals) between ED visits per 1000 person-months observed under HOP and under a counterfactual scenario in which HOP did not occur, using the same CITS models and marginalized estimates. Values below 0 indicate lower utilization with HOP, and values above 0 would indicate greater utilization with HOP, relative to HOP having not occurred.

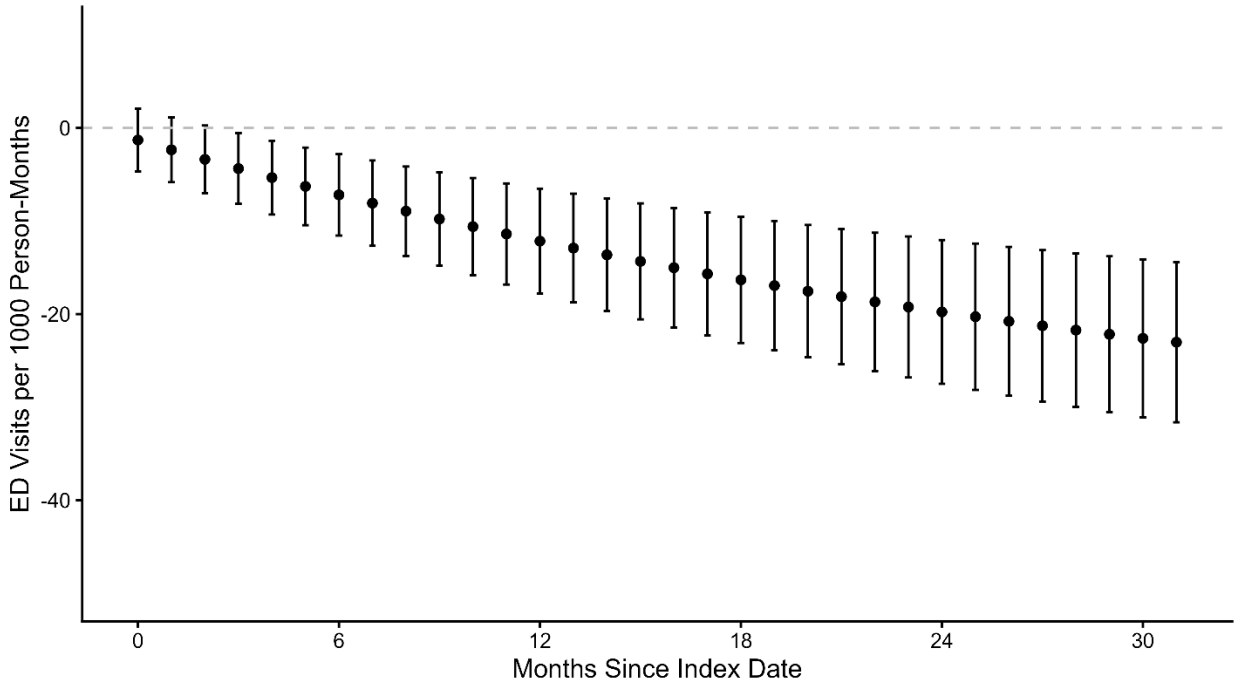


Figure 36. Estimated difference in ED visits

Figure 36 note: Estimated difference per 1000 person-months, with 95% confidence interval under HOP, compared with counterfactual scenario in which HOP did not occur.

Using marginal effects procedures and CITS models, we examined estimates of HOP impacts on ED visits for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities. These estimates are presented in **Figure 37**. Overall, estimates of HOP impact were generally greater for groups with greater baseline levels of ED visits.

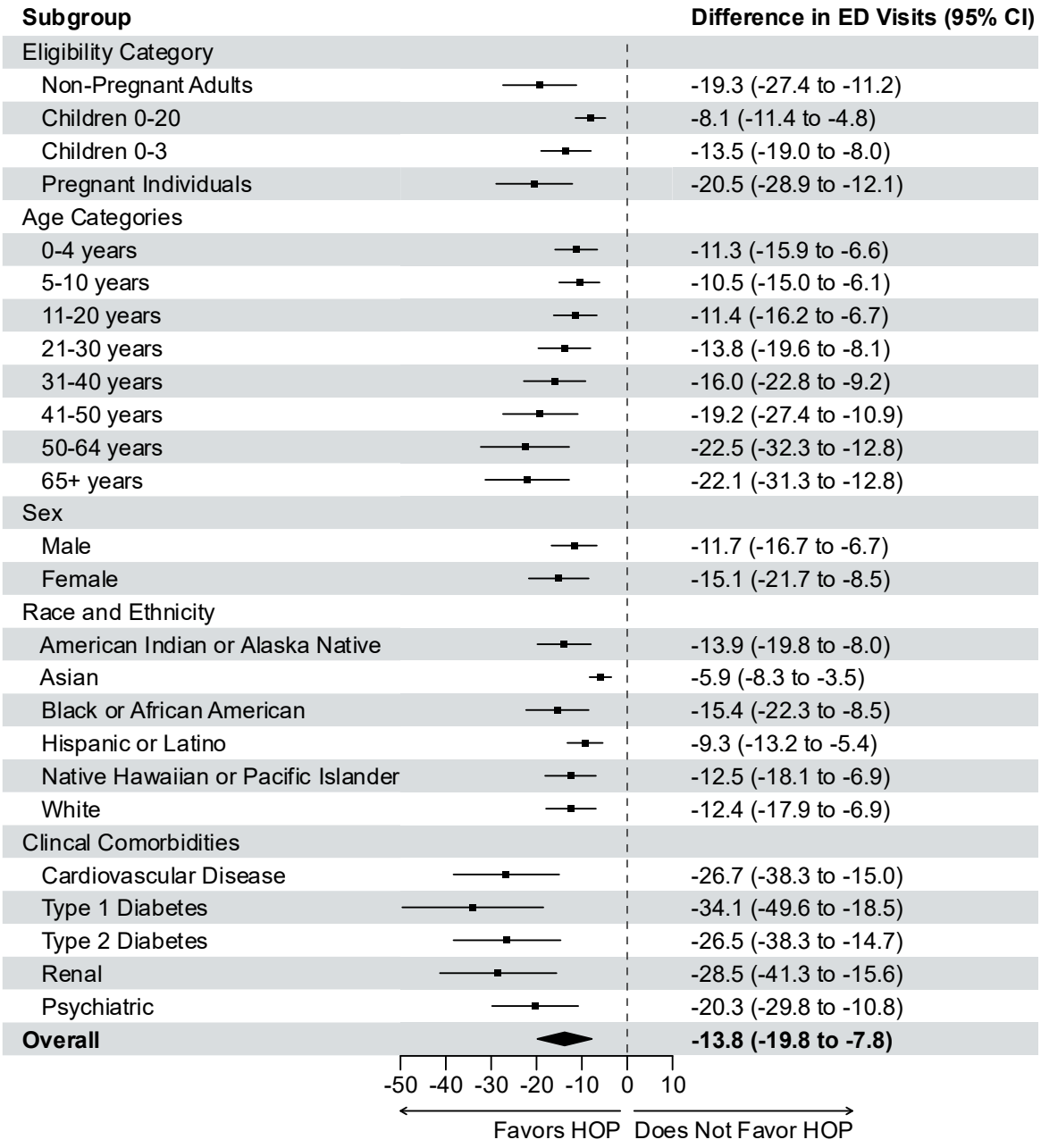


Figure 37. Estimated differential emergency department visits per 1000 person-months

Figure 37 note: Findings attributable to HOP, differentiated by subgroups

We conducted comparative effectiveness analyses (**Table 69**) that examined whether different HOP interventions were associated with varying impacts on ED visits. We examined these within categories of HOP interventions, using the most commonly provided intervention as a reference category. Some

intervention categories were rarely used, and thus we could not estimate comparisons for them. We also did not estimate comparisons for individuals who received more than one type of intervention within a given category (e.g., two types of housing interventions), as it would be difficult to know what intervention to attribute any difference to.

For the comparative effectiveness analyses, we again fit CITS models, but this time the models were only among HOP participants and thus compared how different services impacted outcomes. We express results as a relative difference in outcomes at 6 months (results were similar at other time points). To estimate this, we first calculate ratios of the level of outcomes at 6 months divided by the level of outcome at baseline, within a given intervention type, to estimate the relative impact of a given intervention on the outcome. We then divided that by the same ratio estimated for the reference category. The result is an estimate of how different the outcome would be across different intervention types in the same category. Ratios greater than 1 suggest that the focal intervention increased the outcome, relative to the reference category, and ratios less than 1 suggest that the focal intervention lowered outcomes, relative to the reference category. For example, the relative rate ratio of 0.93 (95%CI 0.78 to 1.08) when comparing fruit and vegetable prescriptions to the reference category of healthy food boxes suggests that the point estimate is for slightly fewer ED visits with fruit and vegetable prescriptions, but that this difference is not statistically significantly different.

We note that we consider these analyses exploratory. Moreover, these results should be interpreted cautiously and with nuance. Some HOP services are not reasonable substitutes and may be used in different clinical populations or in different contextual circumstances (for instance, utility set-up may not be a substitute for housing navigation). Although covariate adjustment and the CITS methodology can help mitigate this to some extent, it may be that populations receiving different HOP interventions are not meaningfully comparable. Overall, we did not find meaningful heterogeneity across intervention types.

Table 69. Comparative Effectiveness of Different HOP Services for Monthly ED Visits at 6 Months after Index Date

Eligibility Category	Relative Rate Ratio (95% CI)
Food Interventions*	
Fruit and Vegetable Prescription	0.93 (0.78 to 1.08)
Prepared Meals	1.17 (0.90 to 1.45)
Housing Interventions**	
Essential Utility Set-Up	0.97 (0.81 to 1.13)

Home Remediation, Accessibility and Safety Modifications, or Inspection for Housing Safety and Quality	1.10 (0.87 to 1.33)
Transportation Interventions* **	
Health-Related Public Transportation	1.29 (0.68 to 1.89)

Notes: Estimates come from comparative interrupted time series models. Relative rate ratio represents a difference-in-differences estimate of the change in level of monthly ED visits, comparing a type of HOP service to the reference service in that category. A ratio greater than 1 suggests that the focal intervention led to a greater level of the outcome than the reference intervention, and a ratio less than 1 suggests that the focal intervention to a lower level of the outcome than the reference intervention.

* The reference category for food services was healthy food box

** The reference category for housing services was housing navigation, support and sustaining services

*** The reference category for transportation services was health-related private transportation

Inpatient Admissions

The unadjusted mean number of inpatient admissions per beneficiary per month over the entire study period was 0.02 (SD: 0.14). For the HOP group the mean was 0.02 (SD: 0.15), and for the non-HOP group the mean was 0.02 (SD: 0.13). In the HOP group, for non-pregnant adults it was 0.03 (SD: 0.18), for children aged 0 to 20 it was 0.005 (SD: 0.08), for children aged 0 to 3 it was 0.02 (SD: 0.15), and for pregnant individuals it was 0.04 (SD: 0.22).

Figure 38 presents the unadjusted mean number of inpatient admissions (with 95% confidence intervals) per 1000 person-months for those who enrolled in HOP and the non-HOP group, before and after the index date (month 0). Given decreasing numbers of observations as follow-up times increased, uncertainty is greater at later timepoints.

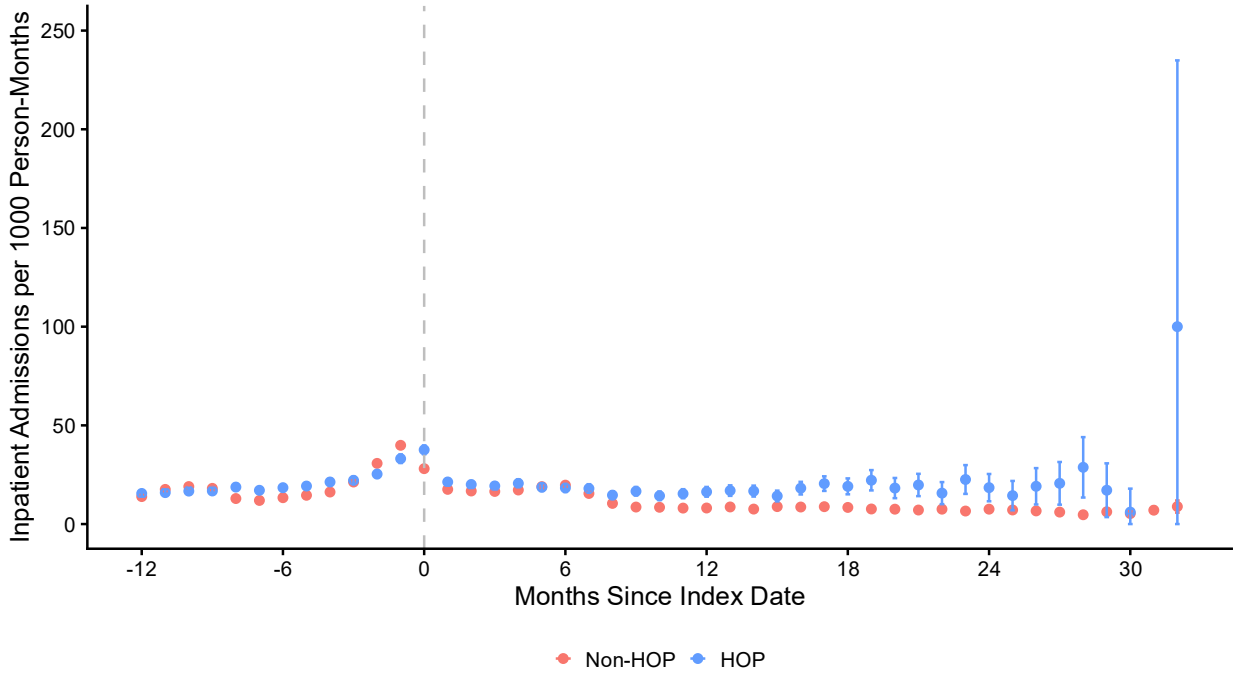


Figure 38. Unadjusted Mean Inpatient Admissions per 1000 person-months, with 95% confidence intervals

Figure 39 presents the unadjusted mean number of inpatient admissions per 1000 person months (with 95% confidence intervals) by eligibility category.

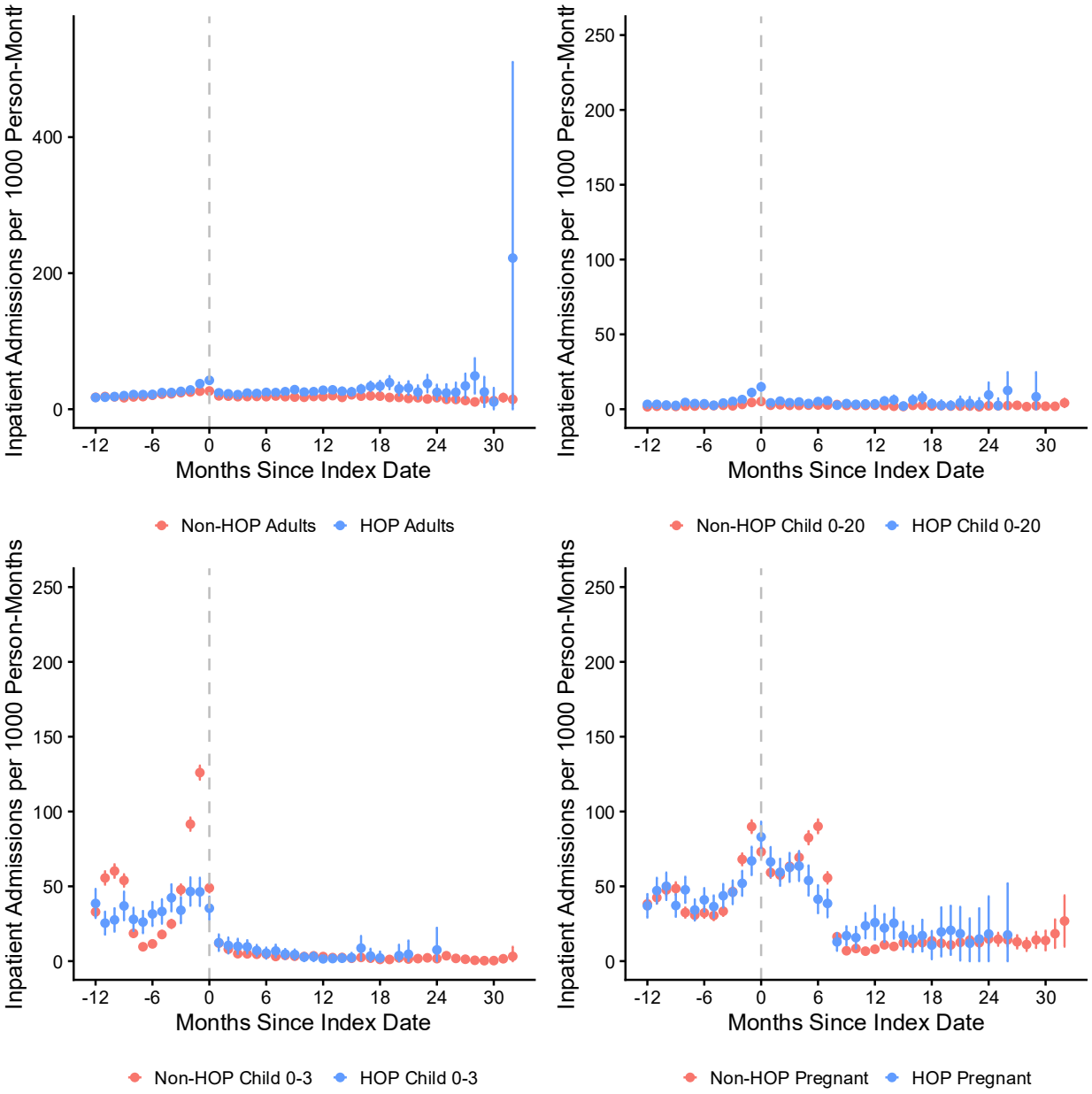


Figure 39. Unadjusted Mean Inpatient Admissions per 1000 Person-Months by Eligibility Category, with 95% Confidence Intervals

Comparative interrupted time series analyses partition the impacts of an intervention into a change in level (intercept of a regression line) and a change in trend (slope of a regression line). The estimated differential change in level attributable to HOP at the index month was -0.0062 (-0.0077 to -0.0047, p<.0001), and the estimated differential change in trend attributable to HOP over the entire post-index period was -0.0004 (-0.0006 to -0.0002, p<.0001). These two estimates of the differential impact of the

intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we present what those differences translated to as monthly differences averaged over the entire follow-up period.

Table 70 presents estimates of HOP's impact on inpatient admissions. These results are estimates of the differences in monthly inpatient admissions that are attributable to HOP enrollment, relative to a counterfactual situation in which HOP enrollment did not occur. For inpatient admissions, we estimated that, in the absence of HOP, there would have been 14.1 inpatient admissions per 1000 person-months across all HOP participants. Overall, HOP was associated with fewer inpatient admissions (approximately 7.2 fewer visits per 1000 person-months).

Table 70. Estimate of HOP Impact on Monthly Inpatient Admissions

Eligibility Category	Admissions per 1000 Person-Months in Absence of HOP (95% CI)	Differential Admissions per 1000 Person-Months Attributable to HOP Enrollment (95% CI)
Overall	14.1 (13.0 to 15.1)	-7.2 (-9.0 to -5.5)
Non-Pregnant Adults	20.1 (18.3 to 22.0)	-10.5 (-13.2 to -7.8)
Children 0 to 20 years of age	2.7 (2.4 to 3.0)	-1.4 (-1.8 to -1.1)
Children 0 to 3 years of age	11.6 (10.9 to 12.3)	-6.0 (-7.3 to -4.7)
Pregnant Individuals	34.5 (32.5 to 36.5)	-17.8 (-21.7 to -13.8)

Notes: Results represent marginalized estimates from the comparative interrupted time series analysis. Admissions per 1000 person-months is an estimate of how many inpatient admissions per 1000 person-months would have occurred in the absence of HOP, and thus can be understood as a baseline for counterfactual comparisons. Differential admissions per 1000 person-months represents an estimate of how many fewer (or more) visits than baseline occurred owing to HOP. Thus it is an estimate of the HOP impact on this outcome. Estimates were produced by applying marginal effects procedures to the comparative interrupted time series models.

Figure 40 presents estimates of the difference (with 95% confidence intervals) between inpatient admissions per 1000 person-months observed under HOP and under a counterfactual scenario in which HOP did not occur, using the same CITS models and marginalized estimates. Values below 0 indicate lower utilization with HOP, and values above 0 would indicate greater utilization with HOP, relative to HOP having not occurred.

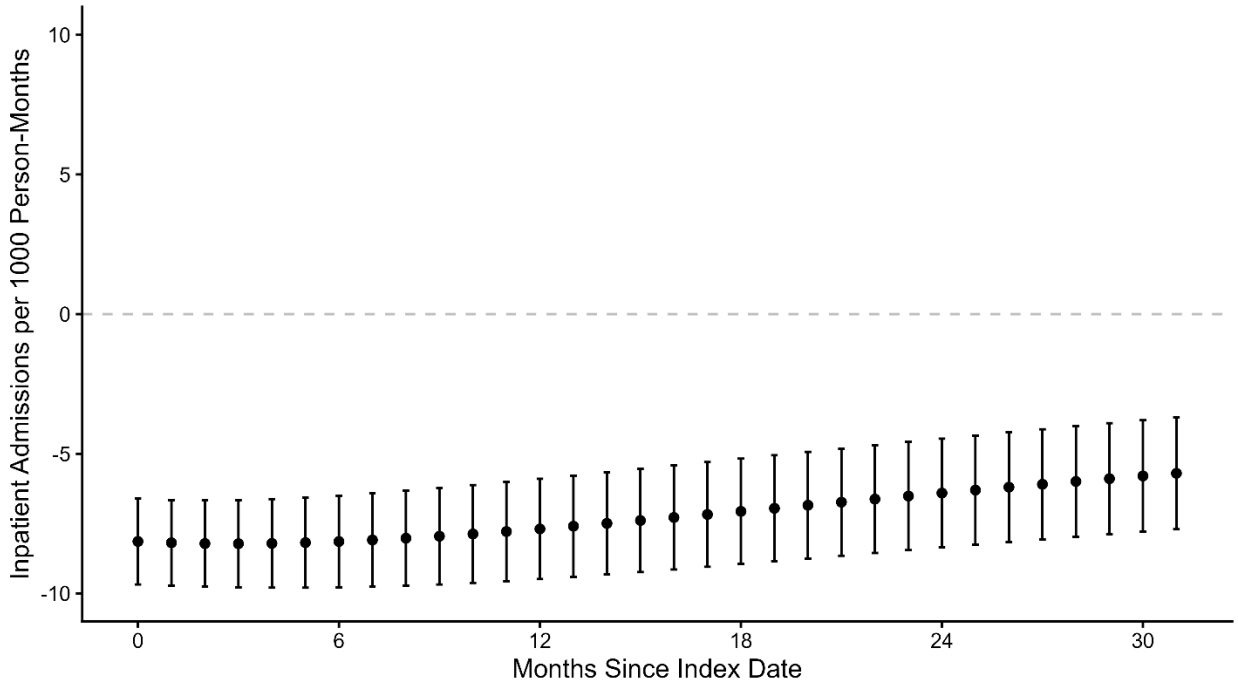


Figure 40. Estimated difference in inpatient admissions

Figure 40 note: Estimated difference per 1000 person-months, with 95% confidence intervals, under HOP, compared with counterfactual scenario in which HOP did not occur.

Using marginal effects procedures and CITS models, we examined estimates of HOP impacts on inpatient admissions for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities. These estimates are presented in **Figure 41**. Overall, estimates of HOP impact were generally greater for groups with greater baseline levels of inpatient admissions.

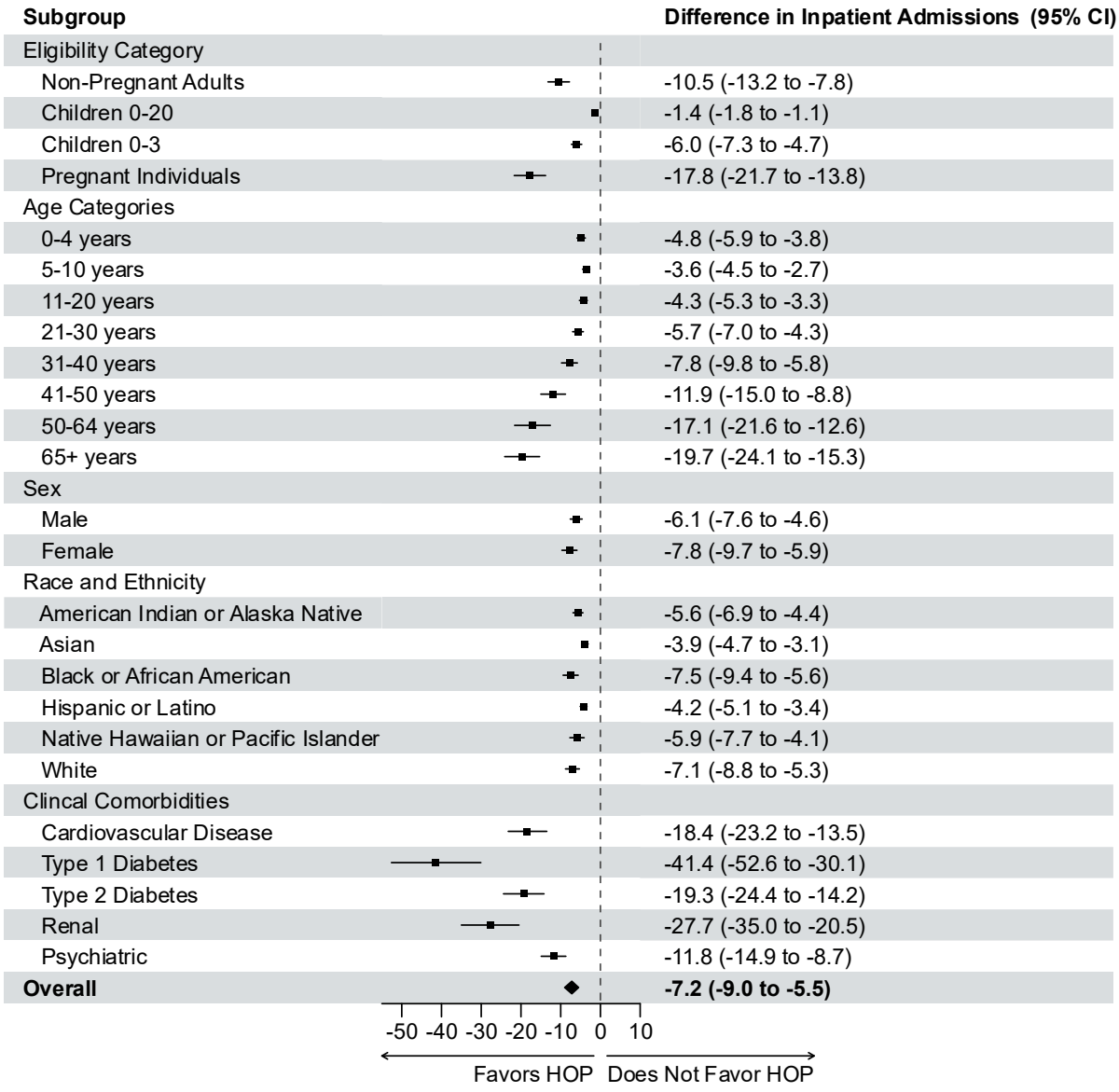


Figure 41. Estimated differential inpatient admissions per 1000 person-months

Figure 41 note: Findings attributable to HOP, by subgroups

The estimated impact of HOP on different categories of admissions, medical, surgical, and maternity, is presented in **Table 71**. Notably, the category definitions used for the NCQA HEDIS IPU metric exclude mental health admissions, so these categories do not represent all inpatient admissions observed. Overall, we found results regarding categories of admissions were consistent with expectations and the goals of the program. We estimated that medical and surgical admissions were lower with HOP than

they would have been in the absence of the program. Further, estimates of pregnancy-related admissions were higher, consistent with the goals of increasing maternity care. Because the IPU measure excludes mental health admissions, we suspect these likely make up the remainder of the difference in HOP's impact on overall admissions and HOP's impact on medical, surgical, and maternity admissions.

Table 71. Overall Estimated Impact of HOP on Medical, Surgical, and Maternity Admissions

Eligibility Category	Admissions per 1000 Person-Months in Absence of HOP (95% CI)	Differential Admissions per 1000 Person-Months Attributable to HOP Enrollment (95% CI)
Medical	7.7 (6.9 to 8.5)	-3.3 (-4.7 to -2.0)
Surgical	2.8 (2.0 to 3.6)	-1.7 (-2.8 to -0.6)
Maternity	4.1 (4.0 to 4.2)	1.6 (0.0 to 3.1)

Notes: Results represent marginalized estimates from the comparative interrupted time series analysis. Admissions per 1000 person-months is an estimate of how many inpatient admissions of a particular type per 1000 person-months would have occurred in the absence of HOP, and thus can be understood as a baseline for counterfactual comparisons. Differential admissions per 1000 person-months represents an estimate of how many fewer (or more) visits than baseline occurred owing to HOP. Thus it is an estimate of the HOP impact on this outcome. Estimates were produced by applying marginal effects procedures to the comparative interrupted time series models.

We conducted comparative effectiveness analyses (**Table 72**) that examined whether different HOP interventions were associated with different impacts on inpatient admissions. We examined these within categories of HOP interventions, using the most commonly provided intervention as a reference category. Some intervention categories were rarely used, and thus we could not estimate comparisons for them. We also did not estimate comparisons for individuals who received more than one type of intervention within a given category (e.g., two types of housing interventions), as it would be difficult to know what intervention to attribute any difference to.

For the comparative effectiveness analyses, we again fit CITS models, but this time the models were only among HOP participants, and thus compared how different services impacted outcomes. We express results as a relative difference in outcomes at 6 months (results were similar at other time points). To estimate this, we first calculate ratios of the level of outcomes at 6 months divided by the level of outcome at baseline, within a given intervention type, to estimate the relative impact of a given intervention on the outcome. We then divided that by the same ratio estimated for the reference category. The result is an estimate of how different the outcome would be across different intervention types in the same category. Ratios greater than 1 suggest that the focal intervention increased the

outcome, relative to the reference category, and ratios less than 1 suggest that the focal intervention lowered outcomes, relative to the reference category.

We note that we consider these analyses exploratory. Moreover, these results should be interpreted cautiously and with nuance. Some HOP services are not reasonable substitutes and may be used in different clinical populations or in different contextual circumstances (for instance, utility set-up may not be a substitute for housing navigation). Although covariate adjustment and the CITS methodology can help mitigate this to some extent, it may be that populations receiving different HOP interventions are not meaningfully comparable. Overall, we did not find meaningful heterogeneity across intervention types.

Table 72. Comparative Effectiveness of Different HOP Services for Monthly Inpatient Admissions at 6 Months after Index Date

Eligibility Category	Relative Rate Ratio (95% CI)
Food Interventions*	
Fruit and Vegetable Prescription	0.68 (0.29 to 1.06)
Prepared Meals	0.90 (0.56 to 1.24)
Housing Interventions**	
Essential Utility Set-Up	0.84 (0.49 to 1.18)
Home Remediation, Accessibility and Safety Modifications, or Inspection for Housing Safety and Quality	1.03 (0.57 to 1.49)
Transportation Interventions***	
Health-Related Public Transportation	1.55 (0.30 to 2.79)

Notes: Estimates come from comparative interrupted time series models. Relative rate ratio represents a difference-in-differences estimate of the change in level of monthly inpatient admissions, comparing a type of HOP service to the reference service in that category. A ratio greater than 1 suggests that the focal intervention led to a greater level of the outcome than the reference intervention, and a ratio less than 1 suggests that the focal intervention to a lower level of the outcome than the reference intervention.

* The reference category for food services was healthy food box

** The reference category for housing services was housing navigation, support and sustaining services

*** The reference category for transportation services was health-related private transportation

Outpatient Visits

The unadjusted mean number of outpatient visits per beneficiary per month over the entire study period was 0.7 (SD: 1.7). For the HOP group the mean was 1.0 (SD: 2.1), and for the non-HOP group the mean was 0.7 (SD: 1.6). In the HOP group, for non-pregnant adults it was 1.3 (SD: 2.4), for children aged 0 to 20 it was 0.6 (SD: 1.5), for children aged 0 to 3 it was 1.0 (SD: 1.8), and for pregnant individuals it was 1.2 (SD: 2.4).

Figure 42 presents the unadjusted mean number of outpatient visits (with 95% confidence intervals) per 1000 person-months for those who enrolled in HOP and the non-HOP group, before and after the index date (month 0). Given decreasing numbers of observations as follow-up times increased, uncertainty is greater at later timepoints.

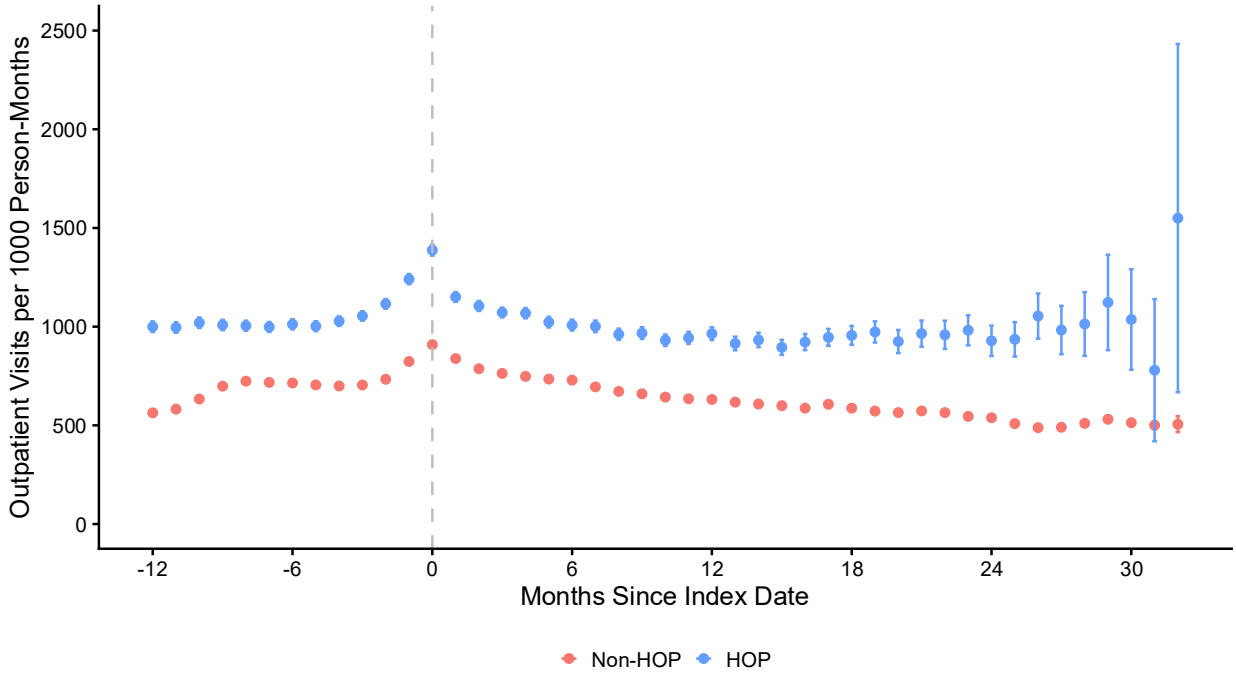


Figure 42. Unadjusted mean outpatient visits per 1000 person-months, with 95% confidence intervals

Figure 43 presents the unadjusted mean number of outpatient visits by eligibility category, with 95% confidence intervals.

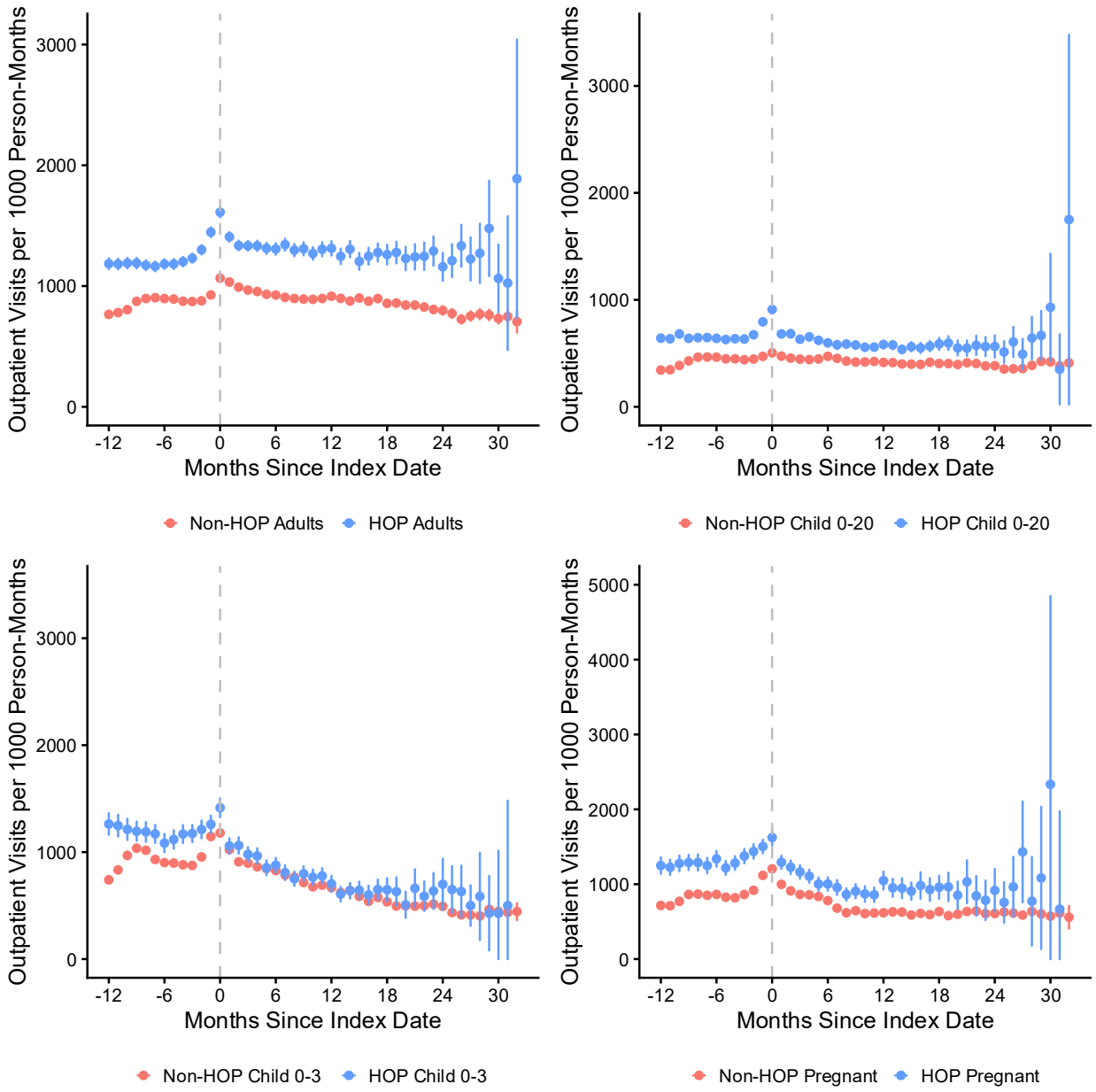


Figure 43. Unadjusted Mean Outpatient Visits per 1000 Person-Months by Eligibility Category, with 95% Confidence Intervals

Comparative interrupted time series analyses partition the impacts of an intervention into a change in level (intercept of a regression line) and a change in trend (slope of a regression line). The estimated differential change in level attributable to HOP at the index month was 0.02 (0.00 to 0.04, p = 0.03), and the estimated differential change in trend attributable to HOP over the entire post-index period was 0.005 (0.002 to 0.007, p<.0001). These two estimates of the differential impact of the intervention (that

is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we present what those differences translated to as monthly differences averaged over the entire follow-up period.

Table 73 presents estimates of HOP's impact on outpatient visits. These results are estimates of the differences in monthly outpatient visits that are attributable to HOP enrollment, relative to a counterfactual situation in which HOP enrollment did not occur. For outpatient visits, we estimated that, in the absence of HOP, there would have been 681.4 outpatient visits per 1000 person-months across all HOP participants. Overall, HOP was associated with increased outpatient visits (approximately 75.9 more visits per 1000 person-months). This is consistent with HOP's goal of increasing outpatient utilization. We examine HOP's impact on specific types of outpatient utilization later in this section.

Table 73. Estimate of HOP Impact on Monthly Outpatient Visits

Eligibility Category	Visits per 1000 Person-Months in Absence of HOP (95% CI)	Differential Visits per 1000 Person-Months Attributable to HOP Enrollment (95% CI)
Overall	681.4 (674.7 to 688.0)	75.9 (38.5 to 113.2)
Non-Pregnant Adults	881.4 (870.4 to 892.5)	93.0 (46.8 to 139.1)
Children 0 to 20 years of age	426.1 (421.6 to 430.7)	48.2 (22.9 to 73.4)
Children 0 to 3 years of age	770.3 (762.8 to 777.9)	81.4 (40.5 to 122.2)
Pregnant Individuals	768.4 (758.4 to 778.5)	83.4 (41.0 to 125.7)

Notes: Results represent marginalized estimates from the comparative interrupted time series analysis. Visits per 1000 person-months is an estimate of how many outpatient visits per 1000 person-months would have occurred in the absence of HOP, and thus can be understood as a baseline for counterfactual comparisons. Differential visits per 1000 person-months represents an estimate of how many fewer (or more) visits than baseline occurred owing to HOP. Thus it is an estimate of the HOP impact on this outcome. Estimates were produced by applying marginal effects procedures to the comparative interrupted time series models.

Figure 44 presents estimates of the difference (with 95% confidence intervals) between inpatient admissions per 1000 person-months observed under HOP and under a counterfactual scenario in which HOP did not occur, using the same CITS models and marginalized estimates. Values below 0 indicate lower utilization with HOP, and values above 0 would indicate greater utilization with HOP, relative to HOP having not occurred.

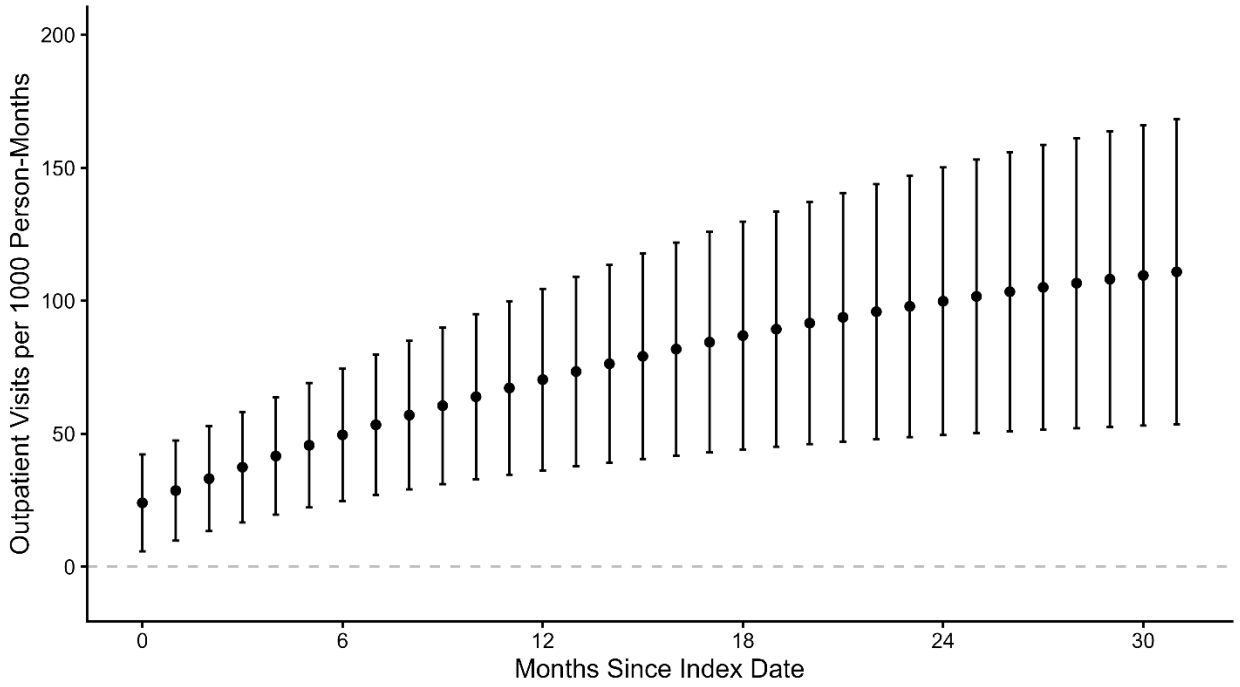


Figure 44. Estimated difference in outpatient visits

Figure 44 note: Estimated difference per 1000 person-months, with 95% confidence intervals, under HOP, compared with counterfactual scenario in which HOP did not occur.

Using marginal effects procedures and CITS models, we examined estimates of HOP impacts on inpatient admissions for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities. These estimates are presented in **Figure 45**. Overall, estimates of HOP impact were generally greater for groups with greater baseline levels of outpatient admissions.

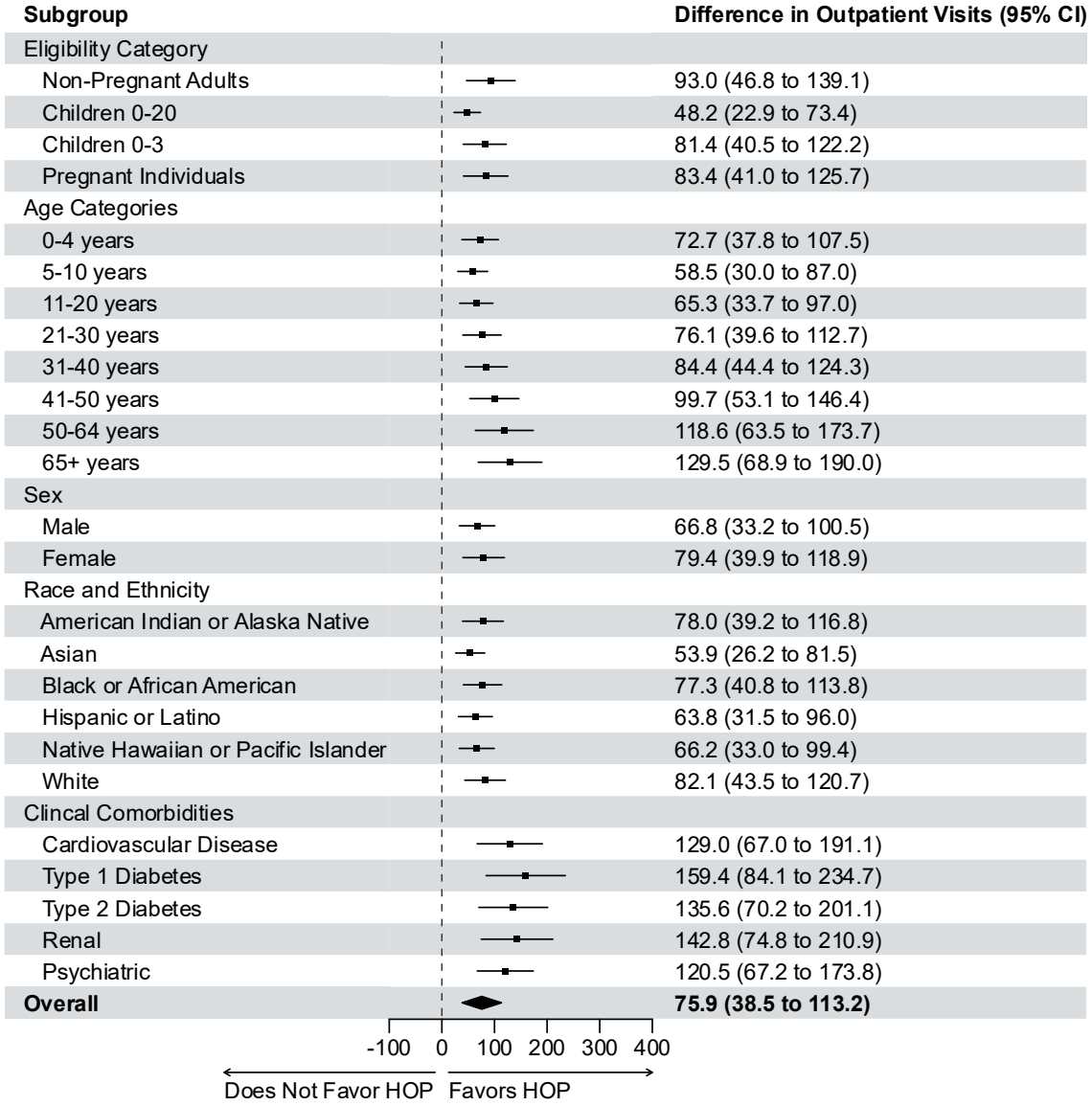


Figure 45. Estimated differential outpatient visits per 1000 person-months attributable to HOP, by subgroups

We conducted comparative effectiveness analyses (**Table 74**) that examined whether different HOP interventions were associated with different impacts on outpatient visits. We examined these within categories of HOP interventions, using the most commonly provided intervention as a reference category. Some intervention categories were rarely used, and thus we could not estimate comparisons for them. We also did not estimate comparisons for individuals who received more than one type of

intervention within a given category (e.g., two types of housing interventions), as it would be difficult to know what intervention to attribute any difference to.

For the comparative effectiveness analyses, we again fit CITS models, but this time the models were only among HOP participants, and thus compared how different services impacted outcomes. We express results as a relative difference in outcomes at 6 months (results were similar at other time points). To estimate this, we first calculate ratios of the level of outcomes at 6 months divided by the level of outcome at baseline, within a given intervention type, to estimate the relative impact of a given intervention on the outcome. We then divided that by the same ratio estimated for the reference category. The result is an estimate of how different the outcome would be across different intervention types in the same category. Ratios greater than 1 suggest that the focal intervention increased the outcome, relative to the reference category, and ratios less than 1 suggest that the focal intervention lowered outcomes, relative to the reference category.

We note that we consider these analyses exploratory. Moreover, these results should be interpreted cautiously and with nuance. Some HOP services are not reasonable substitutes and may be used in different clinical populations or in different contextual circumstances (for instance, utility set-up may not be a substitute for housing navigation). Although covariate adjustment and the CITS methodology can help mitigate this to some extent, it may be that populations receiving different HOP interventions are not meaningfully comparable. Overall, we found little heterogeneity across intervention types, except for home remediation.

Table 74. Comparative Effectiveness of Different HOP Services for Monthly Outpatient Visits at 6 Months after Index Date

Eligibility Category	Relative Rate Ratio (95% CI)
Food Interventions*	
Fruit and Vegetable Prescription	0.93 (0.86 to 1.01)
Prepared Meals	0.95 (0.79 to 1.11)
Housing Interventions**	
Essential Utility Set-Up	1.02 (0.93 to 1.11)
Home Remediation, Accessibility and Safety Modifications, or Inspection for Housing Safety and Quality	1.13 (1.01 to 1.25)
Transportation Interventions***	
Health-Related Public Transportation	1.10 (0.86 to 1.34)

Notes: Estimates come from comparative interrupted time series models. Relative rate ratio represents a difference-in-differences estimate of the change in level of monthly outpatient visits, comparing a type of HOP service to the reference service in that category. A ratio greater than 1 suggests that the focal intervention led

to a greater level of the outcome than the reference intervention, and a ratio less than 1 suggests that the focal intervention to a lower level of the outcome than the reference intervention.
*The reference category for food services was healthy food box
** The reference category for housing services was housing navigation, support and sustaining services
*** The reference category for transportation services was health-related private transportation

Prenatal and Postpartum Care

We assessed two indicators of outpatient care use specific to pregnant populations: receipt of timely prenatal care, and receipt of a postpartum visit. For these analyses, we fit standard two-period difference-in-difference models, as these outcomes do not lend themselves to interrupted time series analysis in this dataset. The unit of analysis was an 'episode' of pregnancy, and individuals with data on more than one pregnancy could appear in the dataset more than once. For each pregnancy, we assessed whether individuals did or did not meet measure criteria for timely prenatal care and receiving a postpartum visit. We include all available pregnancies from 2021 (approximately one year before the start of HOP services) and through the end of the demonstration period.

For the timely prenatal care outcome, the pregnancy was categorized as occurring in the pre-index period if the entire timely prenatal care assessment window (the first trimester of pregnancy or within 42 days of enrollment with the PHP) occurred before the index date; otherwise, it was categorized as occurring during the post-index period. For the postpartum visit outcome, the pregnancy was categorized as occurring in the pre-index period if the entire postpartum visit assessment window (21 to 56 days after delivery) occurred before the index date; otherwise, it was categorized as occurring in the post-index period.

For analysis, we fit logistic regression models, adjusted for age; race and ethnicity; disability status; index date; an index of rurality of residence; CDPS comorbidity and expenditure risk scores; an indicator of HOP clinical eligibility; and the difference, in days, between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals. After fitting these models, we used predictive margins to estimate the adjusted probability of the outcome under different scenarios.

For unadjusted results, the prevalence of timely prenatal care was high in the HOP group, 78.5% in the pre-index period (3,249 of 4,137 pregnancies) and 86.5% in the post-index period (467/540), which could present a 'ceiling effect' for further increases. The corresponding prevalences were lower in the non-HOP group, 71.3% in the pre-index period (13,049/18,315) and 83.5% in the post-index period

(6,602/7,907). The results of the difference-in-differences analyses are presented in **Table 75**. These results suggest that timely prenatal care increased less in the HOP than in the non-HOP group. Given relatively small sample sizes, particularly in the post-index HOP group, conducting sub-group and comparative effectiveness analyses was not feasible for this outcome. Of note, during the demonstration period, timely prenatal care was designated as a quality indicator subject to a withhold for all managed care plans (in both the HOP and non-HOP regions). Thus, this co-occurring intervention, which was unplanned at the time the HOP evaluation was designed, may have swamped out any impacts of HOP on this outcome, as evidenced by the large increase in receiving timely pre-natal care in the non-HOP group.

Table 75. Difference-in-Differences Results for Timely Prenatal Care

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.69	.86	-.07 (-.10 to -.04)	<.0001
HOP	.78	.89		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and the difference, in days, between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

In unadjusted results for rate of postpartum care outcome, the prevalence of having a postpartum care visit was 58.6% in the pre-index period (1,661 of 2,837 pregnancies) for the HOP group and 63.8% in the post-index period (827/1,296). In the non-HOP group, the postpartum visit rate increased from 65.1% in the pre-index period (5,017/7,957) to 65.8% in the post-index period (9,713 /14,826). The results of the difference-in-differences analyses are presented in **Table 76.** These results suggest that HOP did not result in a relative increase in receipt of postpartum visits. Given relatively small sample sizes, particularly in the post-index HOP group, conducting sub-group and comparative effectiveness analyses was not feasible for this outcome.

Table 76. Difference-in-Differences Results for Postpartum Visit

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.63	.66	.02 (-.02 to .05)	0.38
HOP	.59	.63		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, and the difference, in days, between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Well Child Visits

We examined several measures of receipt of well child care: receipt of a well child visit in the first 15 months of life, receipt of a well child visit in months 16-30 of life, and receipt of a well child visit annually between ages 3 and 21, broken down into subcategories of ages 3 to 6, ages 7 to 11, and ages 12 to 21.

For these analyses, we fit standard two-period difference-in-difference models, as these outcomes do not lend themselves to interrupted time series analysis in this dataset. The unit of analysis was a 'window' of time in which a visit could occur (a 15-month window for the months 0-15 and 16-30 outcomes, and a year of time for the other outcomes). We include all available windows of time from 2021 (approximately one year before the start of HOP services) through the end of the calendar year 2024 (for these outcomes, because it is assessed on a calendar year basis, the end date extended past the demonstration period of November 30, 2024). The outcome was categorized as occurring in the pre-index period if the entire assessment window occurred before the index date; otherwise, it was categorized as occurring during the post-index period.

For analysis, we fit logistic regression models, adjusted for age; race and ethnicity; disability status; index date; an index of rurality of residence; CDPS comorbidity and expenditure risk scores; an indicator of HOP clinical eligibility; assessment year; and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals (only possible for the outcomes after age 30 months). After fitting these models, we used predictive margins to estimate the adjusted probability of the outcome under different scenarios.

Results from the difference-in-differences analyses are shown in **Tables 77-82**. Overall, the estimates are consistent with HOP increasing wellness visits, most clearly for the Well Child/Adolescent Visit in Years of Life 3-21 outcome.

Table 77. Difference-in-Differences Results for Well Child Visit in Months of Life 0-15

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.70	.68	.04 (-.01 to .08)	0.12
HOP	.58	.59		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 78. Difference-in-Differences Results for Well Child Visit in Months of Life 16-30

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.72	.72	-.0006 (-.05 to .04)	0.98
HOP	.64	.63		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 79. Difference-in-Differences Results for Well Child/Adolescent Visit in Years of Life 3-21

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.57	.59	.01 (.004 to .02)	0.005
HOP	.54	.58		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 80. Difference-in-Differences Results for Well Child Visit in Years of Life 3-6

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.73	.75	.02 (-.002 to .04)	0.07
HOP	.72	.75		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 81. Difference-in-Differences Results for Well Child Visit in Years of Life 7-11

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.59	.62	.01 (-.007 to .03)	0.22
HOP	.54	.58		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 82. Difference-in-Differences Results for Well Adolescent Visit in Years of Life 12-21

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.50	.51	.008 (-.007 to .02)	0.31
HOP	.46	.48		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Medication Management for Children/Adolescents with Asthma

We examined whether HOP impacted the medication possession ratio for children/adolescents with asthma, divided into two subcategories: ages 5 to 11 and ages 12 to 18. A medication possession ratio > 0.75 indicated adequate medication management.

For these analyses, we fit standard two-period difference-in-difference models, as these outcomes do not lend themselves to interrupted time series analysis in this dataset. The unit of analysis was an assessment year. We include all available assessment years from 2021 (approximately one year before the start of HOP services) through the end of the demonstration period. The outcome was categorized as occurring in the pre-index period if the entire assessment window occurred before the index date; otherwise, it was categorized as occurring during the post-index period.

For analysis, we fit logistic regression models, adjusted for age; race and ethnicity; disability status; index date; an index of rurality of residence; CDPS comorbidity and expenditure risk scores; an indicator of HOP clinical eligibility; assessment year; and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals. After fitting these models, we used predictive margins to estimate the adjusted probability of the outcome under different scenarios.

Results from the difference-in-differences analyses are shown in **Tables 83-84**. Overall, HOP did not affect asthma medication possession.

Table 83. Difference-in-Differences Results for Asthma Medication Possession in Ages 5-11

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate
Non-HOP	.41	.43	-.03 (-.10 to .03)	0.34
HOP	.32	.31		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Table 84. Difference-in-Differences Results for Asthma Medication Possession in Ages 12-18

	Pre-Index Prevalence*	Post-Index Prevalence*	Difference-in-Difference Estimate* (95%CI)	P-value for Difference-in-Difference Estimate

Non-HOP	.37	.40	-.03 (-.09 to .04)	0.44
HOP	.29	.30		

*Estimates from predictive margins after fitting a logistic regression model adjusted for age, race and ethnicity, disability status, index date, an index of rurality of residence, CDPS comorbidity and expenditure risk scores, an indicator of HOP clinical eligibility, assessment year, and the difference between the outcome assessment date and the index date, with robust standard errors to account for possible repeated measures within individuals.

Evaluation Question 6

The goal of Evaluation Question 6 ("Cost of Care") analyses was to determine how healthcare costs changed with Pilot participation, among all participants and across different eligibility categories. Across different outcomes, costs considered included both medical care costs and costs incurred as part of the HOP program, including payments for direct services and administrative payments using capitation and other formulae. Along with these costs of care, which are all conceptually similar to operating expenses, we also examined capacity building spending as a separate category, with capacity building spending being conceptually similar to infrastructure costs.

Evaluation Question 6 ("Cost of Care") analyses used several analytic approaches, and three main outcome variables: 1) 'total cost of care': spending on medical care along with direct HOP service spending, 2) spending on medical care along with direct HOP service spending and HOP administrative spending, and 3) spending on medical care alone (to examine the impact of HOP on medical care spending directly). The main analytical approach used for the evaluation of healthcare costs was individual-level CITS analyses with monthly spending as the outcome. We examined spending on a monthly basis for up to 12 months before the index date, and for all months after the index date up to Nov 30, 2024 (the end of the study period).

Regarding HOP administrative costs, we present breakdowns of administrative payments made to PHPs and NLs. Since these operating expenses do not generate claims, we used the following approach to incorporate them into CITS analyses. We first totaled all administrative spending, and then divided that by the number of 'person-months' (that is, months of observation for each HOP participant from their index month until the end the evaluation period). This yielded a mean monthly administrative cost for each HOP participant. We then created a person-month expenditure variable consisting of all medical spending and direct HOP service spending for a particular individual in a particular month and added the mean monthly expenditure amount to that value for HOP participants, beginning in their index month.

The use of the comparison group helps protect the analyses from certain types of bias, such as regression to the mean or 'secular trends' (social conditions that affected Medicaid beneficiaries more broadly and were co-occurring with Pilot participation, but are not an effect of the Pilots themselves). The CITS analyses allow for a type of difference-in-differences estimate of HOP's impact, in the sense that they adjust changes in utilization before and after Pilot participation among Pilot participants for change in utilization in the non-HOP group (which cannot be attributable to HOP). The non-HOP group

consisted of Medicaid beneficiaries who screened positive for social risks (an eligibility criterion for Pilot enrollment) but who lived in counties not covered by the Pilots and so did not participate in the Pilots. These individuals should be subject to similar secular trends as Pilots participants. These analyses were centered around an index date (the date of Pilot enrollment for the HOP group and the date of first reporting a social risk during screening for the non-HOP group).

To account for repeated assessments within individuals, Evaluation Question 6 analyses used robust standard errors clustered at the level of the individual. Given high numbers of observations with 0 spending in a given month, we fit two-part models with a logistic component estimating whether there was any use of a particular type, and a generalized linear model component estimating the quantity of spending conditional on there being any. Analyses were adjusted for age, race and ethnicity, sex, disability status, index date, quarter of observation (to account for seasonality), an index of rurality of residence, CDPS comorbidity scores, an indicator of HOP clinical eligibility, and pre-index utilization to help account for the presence of a 'triggering event' (e.g., an ED visit that prompts HOP enrollment). Because we fit non-linear models, we used predictive margins for inference after fitting the models.[42] Further, to examine whether results were sensitive to specific modeling choices, we conducted robustness checks that made different modeling assumptions.

Finally, we examined capacity building spending, a separate category within the HOP program. Given the nature of capacity building spending as analogous to infrastructure costs (i.e., a relatively large upfront investment meant to be amortized over a relatively long timeframe), we anticipated that capacity building spending in the initial demonstration period would be greater than could be offset by decreased healthcare utilization in a short period of time.

Healthcare Spending

The overall unadjusted mean healthcare spending per beneficiary per month (including HOP program costs captured in the Encounter Processing System) over the entire study period was $896 (SD: $5365). For the HOP group the mean was $1391 (SD: $5789), and for the non-HOP group the mean was $807 (SD: $5281). In the HOP group, for non-pregnant adults the mean was $1878 (SD: $5966), for children aged 0 to 20 it was $739 (SD: $4227), for children aged 0 to 3 it was $1220 (SD: $10,015), and for pregnant individuals it was $1257 (SD: $4246).

Figure 46 presents the unadjusted monthly mean healthcare spending (including HOP program costs captured in the Encounter Processing System) for those who enrolled in HOP and the non-HOP group, before and after the index date (month 0). Given decreasing numbers of observations as follow-up times increased, uncertainty is greater at later timepoints.

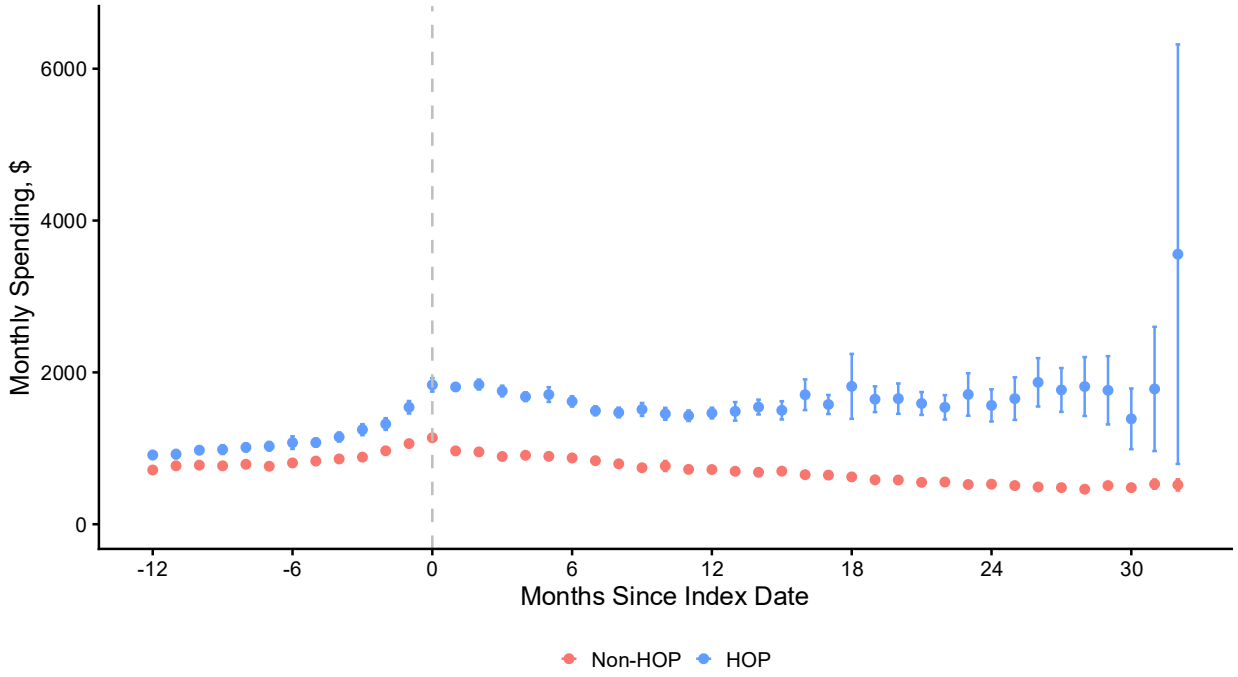


Figure 46. Unadjusted Mean Healthcare Spending, with 95% Confidence Intervals

Figure 47 presents the unadjusted mean monthly healthcare spending (including HOP service spending captured in the Encounters Processing System), with 95% confidence intervals, by eligibility category.

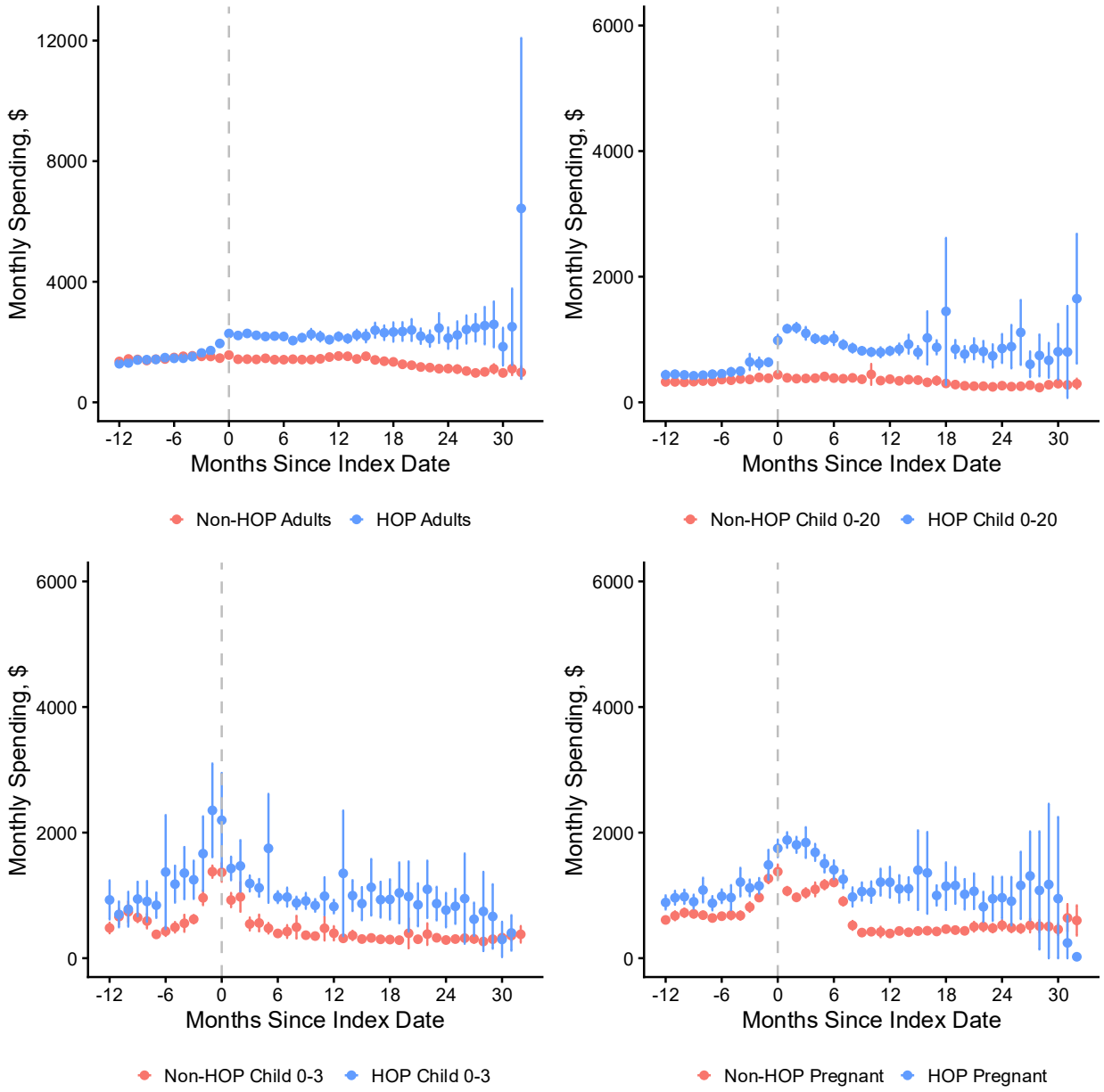


Figure 47. Unadjusted Mean Healthcare Spending by Eligibility Category, with 95% Confidence Intervals

Administrative payments made to PHPs and NLs are presented in **Table 85**. Payments made for the 4th quarter of 2024 were pro-rated to reflect the evaluation period (ending Nov 30, 2024). These payments are made outside of the Encounters Processing System, and thus do not generate a claim linked to a specific individual. Over the entire demonstration period, administrative payments to PHP's and NL's totaled $40,069,470.34.

Table 85. Administrative Payments Made to PHPs and NLs

Year	PHP Admin	NL/HSO Admin	Row Total
2022	$7,026,379.58	$2,695,239.39	**$9,721,618.97**
2023	$9,833,488.34	$7,496,119.30	**$17,329,607.64**
2024	$10,485,069.17	$2,533,174.56	**$13,018,243.73**
Total Demonstration Period	**$27,344,937.09**	**$12,724,533.25**	**$40,069,470.34**

In the unadjusted data, we observed evidence of a period of 'rising risk', where expenditures seemed to increase more steeply in HOP participants than non-HOP participants. To examine whether covariate adjustment in the CITS models did in fact, as intended, strengthen the plausibility of the version of the parallel trends assumption made in CITS analysis, we plotted the conditional spending means by time and HOP vs. non-HOP group (that is, the model-adjusted estimates in a model with an interaction term that allows trends to vary across groups) in the pre-index period (**Figure 48**). These show that the adjustment variables did help create conditional parallel trends in the pre-index period, which suggests that violations of the parallel trends assumption are less likely to bias the evaluation results.

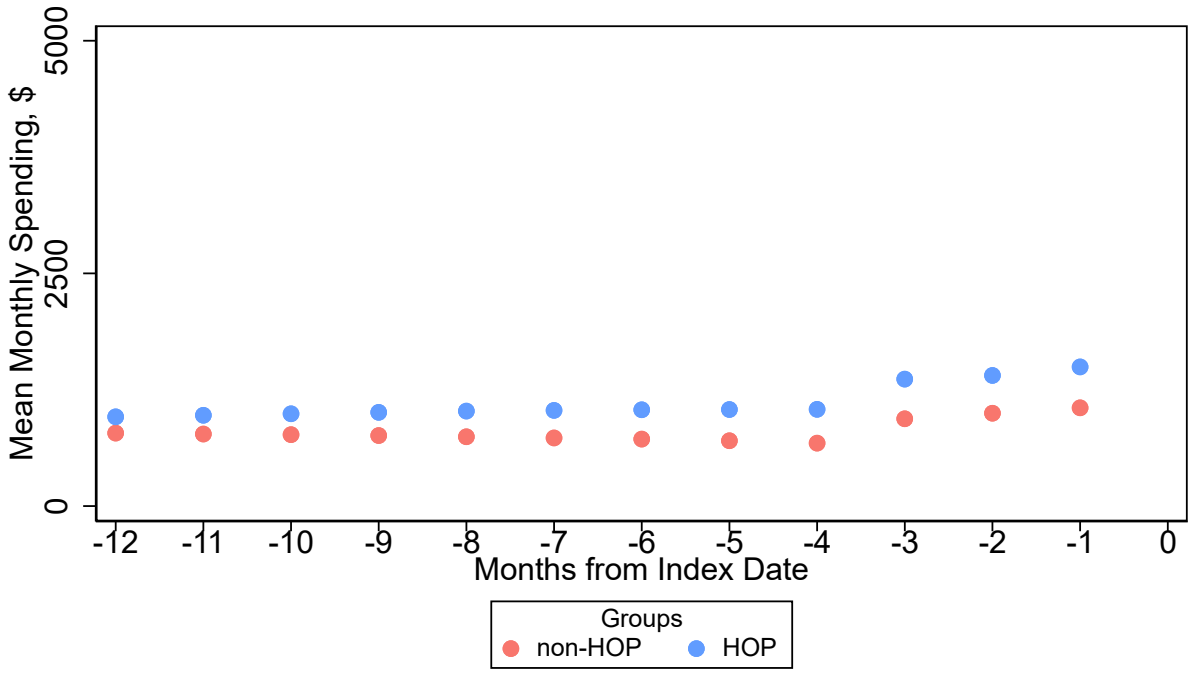


Figure 48. Estimated conditional mean monthly spending in the pre-index period

Figure 48 note: Mean difference in monthly spending per beneficiary per month in the HOP and non-HOP groups in the pre-intervention periods.

Comparative interrupted time series analyses partition the impacts of an intervention into a change in level (intercept of a regression line) and a change in trend (slope of a regression line). Using the total cost of care outcome (that is, including medical and direct HOP services spending, but not administrative spending that does not generate a claim), the estimated differential change in level attributable to HOP at the index month was $342.32 (282.80 to 401.84, p <.0001), and the estimated differential change in trend attributable to HOP over the entire post-index period was -$35.44 (-$43.54 to -$27.34, p<.0001) per beneficiary per month. These two estimates of the differential impact of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we present what those differences translated to as monthly differences averaged over 32 months, corresponding to the entire follow-up period.

Table 86 presents estimates of HOP's impact on monthly healthcare spending. These results are estimates of the differences in monthly healthcare spending that are attributable to HOP enrollment, relative to a counterfactual situation in which HOP enrollment did not occur. Overall, HOP was associated with lower monthly total cost of care spending of-$231 per beneficiary per month (95%CI -$372 to -$91).

Table 86. Estimate of HOP Impact on Healthcare Spending (Medical + HOP Services), Per Beneficiary Per Month, $

Eligibility Category	Differential Monthly Healthcare Spending Attributable to HOP Enrollment, $ (95% CI)
Overall	-231.22 (-371.62 to -90.83)
Non-Pregnant Adults	-251.59 (-388.20 to -114.97)
Children 0 to 20 years of age	-215.07 (-356.99 to -73.15)
Children 0 to 3 years of age	-221.93 (-366.78 to -77.08)
Pregnant Individuals	-229.93 (-373.44 to -86.42)

Notes: Results represent marginalized estimates from the comparative interrupted time series analysis. Monthly healthcare spending is an estimate of the per person per month spending, that would have occurred in the absence of HOP, and thus can be understood as a baseline for counterfactual comparisons. Differential monthly healthcare spending represents an estimate of how much less (or more) healthcare spending occurred owing to HOP (including HOP spending captured in the Encounters Processing System), relative to the counterfactual

baseline. Thus, it is an estimate of the HOP impact on this outcome. Estimates were produced by applying marginal effects procedures to the comparative interrupted time series models.

We also used CITS analyses to analyze a spending outcome that includes HOP administrative payments, along with medical and HOP service spending. In these analyses, the estimated differential change in level attributable to HOP at the index month was $441.30 ($382.26 to $500.34, p <.0001), and the estimated differential change in trend attributable to HOP over the entire post-index period was -$37.35 (-$45.35 to -$29.36, p<.0001) per beneficiary per month. These two estimates of the differential impact of the intervention (that is, the difference in what occurred compared with the estimate of what would have occurred in the absence of the intervention) can be combined to estimate impacts at different timepoints after the intervention. For these analyses, to make results easier to interpret, we present what those differences translated to as monthly differences averaged over 32 months, corresponding to the entire follow-up period.

Table 87 presents estimates of HOP's impact on monthly healthcare spending and HOP administrative spending. These results are estimates of the differences in monthly healthcare spending that are attributable to HOP enrollment, relative to a counterfactual situation in which HOP enrollment did not occur. Overall, using this spending outcome, HOP was associated with lower monthly spending of -$164 per beneficiary per month (95%CI -$312 to -$17).

Table 87. Estimate of HOP Impact on Healthcare Spending (Medical + HOP Services + HOP Administrative Spending), Per Beneficiary Per Month, $

Eligibility Category	Differential Monthly Healthcare Spending Attributable to HOP Enrollment, $ (95% CI)
Overall	-164.49 (-311.67 to -17.32)
Non-Pregnant Adults	-161.27 (-306.16 to -16.37)
Children 0 to 20 years of age	-165.71 (-313.75 to -17.67)
Children 0 to 3 years of age	-167.65 (-317.05 to -18.26)
Pregnant Individuals	-166.78 (-315.56 to -17.99)

Notes: Results represent marginalized estimates from the comparative interrupted time series analysis. Monthly healthcare spending is an estimate of the per person per month spending, that would have occurred in the absence of HOP, and thus can be understood as a baseline for counterfactual comparisons. Differential monthly healthcare spending represents an estimate of how much less (or more) healthcare spending occurred owing to HOP, relative to the counterfactual baseline. Thus, it is an estimate of the HOP impact on this outcome. Estimates were produced by applying marginal effects procedures to the comparative interrupted time series models.

Figure 49 presents estimates of the difference (with 95% confidence intervals) between healthcare spending (including spending on HOP services captured in the Encounters Processing System and HOP administrative spending) per beneficiary per month, observed under HOP and under a counterfactual scenario in which HOP did not occur, using the same CITS models and marginalized estimates. Values below 0 indicate lower spending with HOP, and values above 0 indicate greater spending with HOP, relative to HOP having not occurred.

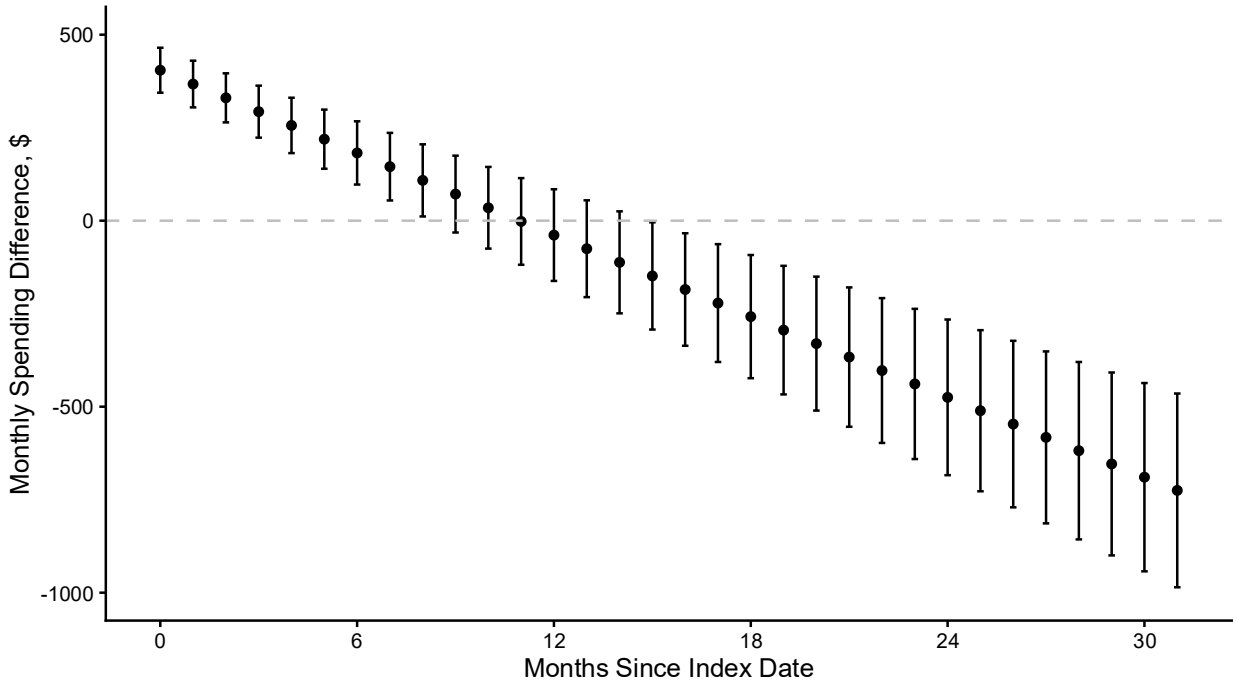


Figure 49. Estimated difference in monthly spending

Figure 49 note: Mean difference in monthly spending (medical + HOP services + HOP administrative) per beneficiary per month, with 95% confidence intervals, under HOP, compared with counterfactual scenario in which HOP did not occur.

Using marginal effects procedures and CITS models, we examined estimates of HOP impacts on monthly healthcare spending (medical + HOP services + HOP administrative) for different subgroups defined by eligibility criteria, demographics, and clinical comorbidities. These estimates are presented in **Figure 50**. Overall, estimates of HOP impact were generally similar, on an absolute scale, across demographic groups. Part of this similarity may owe to the method for adding administrative costs, as this adds an equal amount of administrative costs for each-person month, which will tend to reduce the heterogeneity in spending across subgroups.

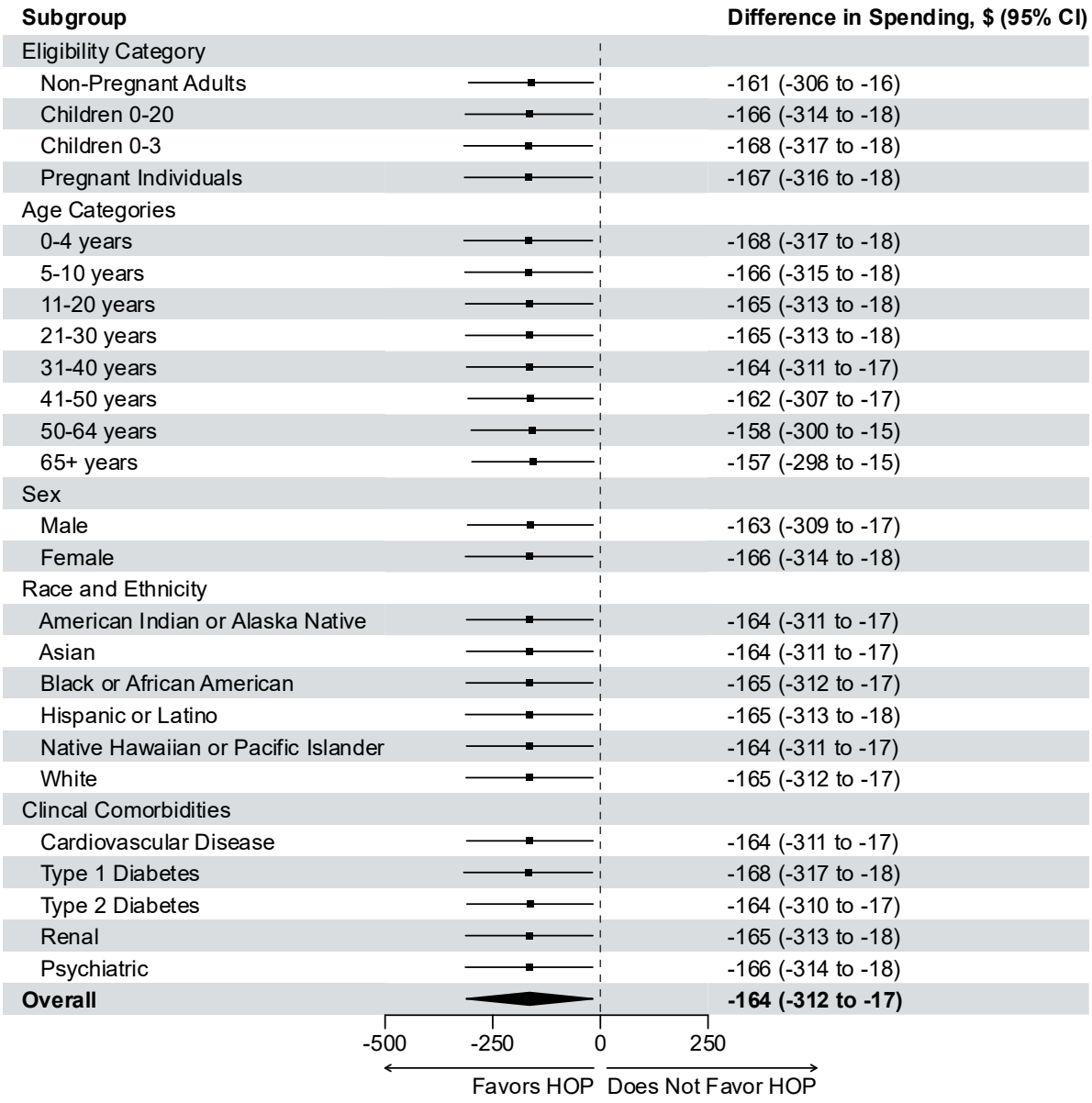


Figure 50. Estimated differential monthly healthcare spending

Figure 50 note: Mean monthly healthcare spending (medical + HOP services + HOP administrative) difference attributable to HOP, by subgroups

To ensure our estimates of HOP's impact on healthcare spending were robust to different modeling specifications, we conducted several sensitivity analyses that varied modeling assumptions (**Table 88**).

All specifications suggested substantial cumulative reductions in healthcare spending across the demonstration period, although some modeling choices resulted in extreme estimates, which supports using the main modelling specification as the best overall estimate of HOP's impact on healthcare spending.

Table 88. Estimate of HOP Impact on Healthcare Spending (Medical Care + HOP Services + HOP Administration), Per Beneficiary Per Month, $, across Differing Model Specifications

Model Specification	**Differential Monthly Medical Care Spending Attributable to HOP Enrollment, $ (95% CI)**
Main Model	-164.49 (-311.67 to -17.32)
Rising Risk Model	-288.50 (-475.82 to -101.19)
Two-Part Model with Gamma-Log Second Part	-660.99 (-1144.53 to -177.44)
Spline Model	-966.10 (-1824.51 to -107.70)

Notes: Results represent marginalized estimates from the comparative interrupted time series analysis. Monthly healthcare spending is an estimate of the per person per month spending that would have occurred in the absence of HOP, and thus can be understood as a baseline for counterfactual comparisons. Differential monthly healthcare spending represents an estimate of how much less (or more) healthcare spending occurred owing to HOP, relative to the counterfactual baseline. Thus, it is an estimate of the HOP impact on this outcome. Estimates were produced by applying marginal effects procedures to the comparative interrupted time series models.
The 'rising risk' model is the same as the main model, with the addition of incorporating a spline term to allow the time trend to vary during the period of rising risk (that is, the months immediately prior to the index date) apparent in the visualization of the raw means
The two-part model with gamma-log second part combines two generalized linear models: a model with a logistic link and binomial distribution in the first part to estimate the probability of any healthcare spending, and a generalized linear model with a log link and gamma distribution in the second part to estimate the amount of spending, conditional on their being any
The spline model uses flexibility estimated spline terms for the overall time trend of the comparative interrupted time series model, which relaxes the assumption of linear time trends

We conducted comparative effectiveness analyses **(Table 89)** that examined whether different HOP interventions were associated with different impacts on monthly healthcare spending. Since these analyses were conducted within HOP participants, the healthcare spending outcome used included medical and direct HOP service spending, but not administrative costs (because these were, by construction, the same for all person-months). This allowed the comparative effectiveness outcomes to focus on how the differential cost of the services themselves affected the parts of healthcare spending that could vary (that is, spending on medical care and direct HOP service spending). We examined these within categories of HOP interventions, using the most commonly provided intervention as a reference

category. Some intervention categories were rarely used, and thus we could not estimate comparisons for them. We also did not estimate comparisons for individuals who received more than one type of intervention within a given category (e.g., two types of housing interventions), as it would be difficult to know what intervention to attribute any difference to.

For the comparative effectiveness analyses, we again fit CITS models, but this time the models were only among HOP participants, and thus compared how different services impacted outcomes. We express results as a relative difference in outcomes at 6 months (results were similar at other time points). To estimate this, we first calculate ratios of the level of outcomes at 6 months divided by the level of outcome at baseline, within a given intervention type, to estimate the relative impact of a given intervention on the outcome. We then divided that by the same ratio estimated for the reference category. The result is an estimate of how different the outcome would be across different intervention types in the same category. Ratios greater than 1 suggest that the focal intervention increased the outcome, relative to the reference category, and ratios less than 1 suggest that the focal intervention lowered outcomes, relative to the reference category.

We note that we consider these analyses exploratory. Moreover, these results should be interpreted cautiously and with nuance. Some HOP services are not reasonable substitutes and may be used in different clinical populations or in different contextual circumstances (for instance, utility set-up may not be a substitute for housing navigation). Although covariate adjustment and the CITS methodology can help mitigate this to some extent, it may be that populations receiving different HOP interventions are not meaningfully comparable.

Table 89. Comparative Effectiveness of Different HOP Services for Monthly Healthcare Spending at 6 Months after Index Date

Eligibility Category	Relative Rate Ratio (95% CI)
Food Interventions*	
Fruit and Vegetable Prescription	0.92 (0.83 to 1.02)
Prepared Meals	1.00 (0.64 to 1.37)
Housing Interventions**	
Essential Utility Set-Up	1.21 (0.82 to 1.60)
Home Remediation, Accessibility and Safety Modifications, or Inspection for Housing Safety and Quality	0.87 (0.74 to 1.00)
Transportation Interventions***	
Health-Related Public Transportation	1.37 (1.06 to 1.67)

Notes: Estimates come from comparative interrupted time series models. Relative rate ratio represents a difference-in-differences estimate of the change in level of monthly healthcare spending, comparing a type of

HOP service to the reference service in that category. A ratio greater than 1 suggests that the focal intervention led to a greater level of the outcome than the reference intervention, and a ratio less than 1 suggests that the focal intervention to a lower level of the outcome than the reference intervention.
* The reference category for food services was healthy food box
** The reference category for housing services was housing navigation, support and sustaining services
*** The reference category for transportation services was health-related private transportation

Medical Care Spending

The above analyses have considered both spending on medical care and spending on HOP services captured in the Encounters Processing System (and, for some analyses, HOP administrative spending). We also sought to examine HOP's impact on medical spending alone (that is, without including HOP service spending). The reason for this is to ensure that decreasing spending trends were not simply related to providing fewer HOP services as time went on. Moreover, these analyses help check whether the modeling approach used helped account for potential differences in healthcare utilization in the index month. Since it is unlikely that HOP services would increase medical spending in the index month, we would expect that, if time-fixed and time-varying differences between HOP and non-HOP beneficiaries are appropriately accounted for in the CITS models, medical care spending would be similar or lower in the HOP, relative to the non-HOP, condition (owing to the impact of HOP services that begin in the index month). For these analyses, we fit CITS models identical to those used to examine healthcare spending, but using spending on medical care alone as the outcome.

Figure 51 presents estimates of the difference (with 95% confidence intervals) between medical care spending (not including spending on HOP services) per beneficiary per month, observed under HOP and under a counterfactual scenario in which HOP did not occur, using CITS models and marginalized estimates. Values below 0 indicate lower spending with HOP, and values above 0 indicate greater spending with HOP, relative to HOP having not occurred. These results show decreasing expenditures on medical care after HOP enrollment. These decreases are first noted right as HOP services begin (that is, in the index month), and continue throughout follow-up.

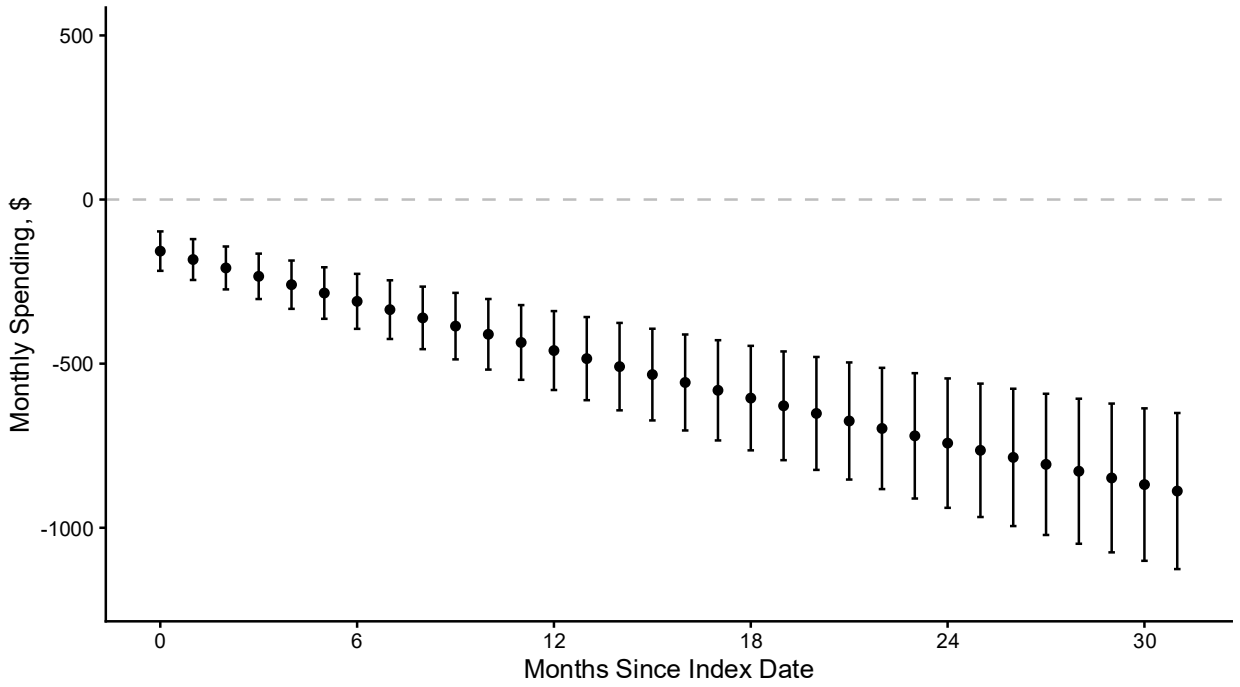


Figure 51. Estimated difference in monthly medical care spending

Figure 51 note: Monthly medical spending (not including HOP services) per beneficiary per month, with 95% confidence intervals, under HOP, compared with counterfactual scenario in which HOP did not occur.

Capacity Building Spending

Capacity building payments are presented in **Table 90**, below.

Table 90. Capacity Building Payments

Year	Payment Amounts
2021	$ 19,024,872.00
2022	$ 18,448,307.50
2023	$ 12,106,680.86
2024	$ 20,105,815.00
Total	**$ 69,685,675.36**

In total, $69,685,675.36 was invested in capacity building over the Demonstration Period, including prior to the beginning of HOP services (for context, total Medicaid spending from July 1, 2021 to June 30, 2024 was approximately $70 billion[43]). When comparing that amount to estimates of the impact of HOP spending from CITS models (including medical spending, HOP services spending, and HOP administrative spending) averaged over 32 months of follow-up (corresponding to the entire demonstration period),

we found that the amount spent on capacity building was similar in magnitude to estimated HOP savings during the demonstration period. For example, if HOP savings exactly offset capacity building spending, we would expect that adding together capacity building payments and HOP savings would net out at $0. In our estimates, we found that adding these quantities together netted out at $11,576,676 (95%CI -$40,413,757 to $63,567,110; p=0.66), which is statistically indistinguishable from $0.

Conclusions

With regard to Evaluation Question 1 ("Effective Delivery of Pilot Services") analyses, the state of North Carolina achieved its goal of establishing a multi-sector collaboration between the state, PHPs, NLs, HSOs, and healthcare systems. Pilot services were delivered effectively during the demonstration period. Through November 30, 2024, a total of 31,597 unique individuals were enrolled, and 691,504 services were delivered by 166 HSOs. Initial assessments of social needs occur promptly (most commonly right at the time of enrollment). Across the evaluation period, 86% of those who enrolled—27,141 out of 31,597 Pilot participants—received at least 1 invoiced service. Services typically began soon after enrollment—the median time for initial services to begin was 8 days, and 75% of initial services had a service start date within 17 days of enrollment in the Pilots. The rate of service receipt varied across need types. 85% of individuals reporting a food need received an invoiced food service during this period, 70% of those reporting a housing need received an invoiced housing service, 21% of those reporting a transportation need received an invoiced transportation service, and 15% of those reporting a toxic stress and/or IPV need received an invoiced toxic stress and/or IPV service. This difference may reflect both the phased rollout of services, with food services preceding all other services and IPV services coming much later, and the complexity of delivering different services to address varying needs. For example, the lower rate of housing service receipt could be related to housing shortages that are occurring across the communities served by the Pilots and the lower rate of transportation service receipt could be related to the varied availability of transportation resources across communities.

Food services constituted the majority of services delivered—84% when examining the number of services provided and 61% of the spending on HOP services. Invoices for services were paid in a timely fashion, with 61% of invoices paid within 30 days of service receipt, and about 80% paid within 45 days of service receipt. This is important as a major goal of the Pilots was to ensure that HSOs, many of which historically depend on grant funding received prior to delivery of services, could operate successfully with a financing model that includes payments made after services were delivered.

Interviews with HOP organizations (NLs, HSOs, and PHPs) highlighted the functioning of HOP's model. Interviews with PHPs emphasized that HOP engagement and enrollment were strengthened by flexible communication and collaboration across networks, care managers, and beneficiaries. However, service availability was challenging in some areas and for some service types. PHPs reported some limits

to organizational capacity and the need to expand staff responsibilities to deliver HOP services. This highlighted the need for staffing strategies focused on care coordination and restructuring. Communication approaches were tailored to beneficiary needs, but PHPs reported that more work in improving communication related to engagement, education, and collaboration across the HOP network is needed. While PHPs used NCCARE360 in varied ways to support collaboration, information management, and performance monitoring, there were limitations around functionality and data integration. PHPs emphasized the importance of user involvement in the design and testing of platform improvements. Interviews with NLs indicated continuous adjustments of staffing structures to meet evolving HOP needs, though perceptions of staffing sufficiency varied widely. Financial stability across NLs was influenced by HSO stability, payment timeliness, capacity building funds, and external funding opportunities. NLs noted that enrollment and engagement were strengthened through community outreach, financial support for HSOs, and strong collaboration, while service delivery challenges centered on funding sustainability, the reimbursement model, technological limitations, and network adequacy. NLs used communication, network expansion, and targeted training to overcome service barriers and relied on varied communication strategies to keep partners informed, though more streamlined and inclusive communication pathways are needed. NCCARE360 was widely used and valued for service coordination. Lastly, interviews with HSOs note the importance of regular communication across the network and with beneficiaries; adapting staffing to meet beneficiary needs; external financial support and capacity building funds; and the payment model. Further, HSOs identified that the collaborative network model facilitated success, and that NLs were invaluable in addressing HSO concerns and challenges. Regular, dedicated meetings with other HSOs also provided a benefit. Some identified challenges included administrative burden and limitations in resources and service network availability. NCCARE360 was seen as a necessary tool that was largely beneficial – utilized for referrals, invoicing, communication, and documentation. HSOs also suggested improvements for the NCCARE360 technology platform regarding invoicing functions, communication, and data accessibility.

Regarding Evaluation Question 2 (“Increased Rates of Social Risk Factor Screening and Connection to Appropriate Services”), we found that screening for social needs was significantly greater in Pilot regions, compared to non-Pilot regions. The health-related social need screening rate was about 20% higher in Pilot compared with non-Pilot regions, even though screening was recommended for Medicaid beneficiaries in all regions. However, there was substantial room for improvement, regarding screening rates, in both Pilot and non-Pilot regions. We were unable to evaluate whether more

individuals with positive screens were connected to services in Pilot regions, compared with non-Pilot regions, owing to lack of data regarding service connections in non-Pilot regions.

Evaluation Question 3 ("Improved Social Risk Factors") analyses evaluate whether Pilot services seem to be addressing the health-related social needs that Pilot participants report. Following the Driver Diagram **(Figure 7)** that depicts the underlying logic of the Pilots, addressing those needs is a key pathway whereby Pilot services can lead to changes in health, healthcare utilization, and healthcare cost. As expected, we found that needs were high around the time of Pilot enrollment, which likely reflects both the reasons for Pilot enrollment and the detailed need assessment that occurs at that time. Once Pilot services began to be delivered, we found, using interrupted time series analyses, that Pilot services reduced the total number of social risks. Moreover, Pilot services reduced the probability of reporting the specific risks of food needs, housing needs, and transportation needs, relative to estimates of what would have occurred had participants not enrolled in the Pilots. In contrast to the results for needs overall and food, housing, and transportation needs specifically, we did not find evidence that IPV and/or toxic stress needs decreased with Pilot participation. However, there are important caveats to these findings. First, IPV specific services were provided for less time than the other HOP services, and the reported prevalence of IPV and/or toxic stress needs was very low relative to other needs, which makes estimates more uncertain. Moreover, the nature of these needs may be such that they are disclosed only after sufficient rapport has been developed, which could make them more likely to be disclosed as service continues. When examining how different types of food, housing, and transportation services may affect needs, we generally did not find that particular services were clearly better at reducing reported needs than other service types.

Regarding Evaluation Question 4 ("Clinical Outcomes"), we did not find evidence that HOP affected birthweight outcomes. We also did not find evidence that HOP lowered hemoglobin A1c or blood pressure, although these analyses were limited to a subset of Medicaid beneficiaries with data in the North Carolina Health Information Exchange, NC HealthConnex. In surveys, HOP participants strongly endorsed the idea that HOP was improving health and rated their program experience positively. Participant-reported outcomes related to healthy days were consistent with meaningful improvements as a result of HOP participation. For other aspects of health-related quality of life, there was substantial statistical uncertainty in many of these estimates, precluding definitive conclusions. In interviews with HOP beneficiaries and beneficiary proxies, the majority reported positive experiences receiving HOP services. Some summarized their experiences as "a blessing" or "a total lifeline."

Beneficiaries thought the program provided options to meet their needs, along with a sense of security and reduced stress. However, some beneficiaries described challenges with strict program requirements and food delivery/quality issues. Many beneficiaries did not feel that changes to HOP were needed, but some offered suggestions such as increasing the variety of food options, more hands-on support for housing navigation, and more flexibility for healthy home goods. Beneficiaries emphasized a desire for streamlined processes, stronger operational functionality, and enhanced and expanded service offerings to better meet varying household needs. Most HOP beneficiaries noted positive impacts of HOP on their health. As one beneficiary shared, "It's definitely changed my health in a very positive way. Because before I wanted to eat healthier, I didn't always know where to begin." Overall, beneficiaries expressed strong support for sustaining and expanding HOP, emphasizing the need for long-term funding, broader outreach, and continuity in care management to ensure continued access to services they consider essential and transformative.

Regarding Evaluation Question 5 (“Healthcare Utilization”) analyses, we found that Pilot enrollment tends to occur during a period of rising risk for adverse healthcare utilization (and spending). We found that Pilot participation was associated with decreased emergency department utilization, relative to what would have occurred in the absence of the Pilots—approximately 14 fewer visits per 1000 person-months. Risk for these outcomes differed by participant characteristics, but we did not find that estimates of HOP’s impact differed very much, on a relative scale, across subgroups defined by HOP eligibility categories, demographics, or clinical characteristics. We also found little heterogeneity of impact by specific HOP services.

Regarding inpatient admissions, we found that Pilot participation was associated with fewer inpatient admissions, relative to what would have occurred in the absence of the Pilots—approximately 7 fewer per 1000 person-months. As with emergency department visits, risk of this outcome varied by participant characteristics, but we did not find, on a relative scale, meaningful variation in estimates of HOP’s impact across subgroups defined by HOP eligibility categories, demographics, or clinical characteristics. We also found little heterogeneity of impact by specific HOP services.

Regarding outpatient visits, as intended, HOP was associated with greater outpatient utilization, relative to what would have occurred in the absence of the Pilots—approximately 76 more per 1000 person-months. Increases were particularly notable for well-child visits. On the other hand, we did not find that HOP affected prenatal and postpartum visits. It is notable that prenatal care was a focus for overall quality improvement for North Carolina Medicaid Managed Care plans during the demonstration

period. We did not find that estimates of HOP's impact on outpatient differed very much across subgroups defined by HOP eligibility categories, demographics, or clinical characteristics. We also found little heterogeneity of impact by specific HOP services.

For Evaluation Question 6 ("Cost of Care") analyses we found that HOP was associated with lower healthcare expenditures. Considering both medical and direct spending on HOP services, we estimate that HOP was associated with -$231.22 (-$371.62 to -$90.83) less spending per month, when averaged over 32 months of follow-up (corresponding to the entire demonstration period). When also considering HOP administrative costs in addition to medical care spending and direct spending on HOP services, we estimate that HOP was associated with -$164.49 (95%CI -$311.67 to -$17.32) less spending per member per month, when averaged over 32 months of follow-up (corresponding to the entire demonstration period). We found that spending was related to participant characteristics (that is, some individuals had characteristics associated with greater spending regardless of HOP participation), but little evidence that the impact of HOP on healthcare spending varied by participant characteristics (on the absolute scale).

Overall, the findings of this report support the underlying rationale of the Pilots, which is that addressing social risk factors can lead to improvements in health, healthcare utilization, and healthcare cost. Of course, there are important limitations to keep in mind when interpreting these analyses. The most important limitation is that receipt of services was not randomly assigned. Results could be biased by time-varying confounding: aspects of a participant's clinical or social situation that could have influenced enrollment in HOP, what services they received, and the likelihood that their situation would improve on its own. Other limitations include the possibility of regression to the mean, or model misspecification that could impact the results presented. However, we conducted numerous sensitivity analyses and robustness checks, which did not substantively alter the overall conclusions. The analyses in this report used several approaches to mitigate these potential biases—particularly use of data from non-HOP participants (to help account for regression to the mean), regression adjustment (to help account for measured confounding), the use of data both before and after Pilot participation (to help account for time-fixed unmeasured confounding), and the use of contemporaneous data from other North Carolina Medicaid beneficiaries for many outcomes (to help account for potentially unmeasured time-varying confounding related to 'secular trends' or other factors that affect Medicaid beneficiaries separately from Pilot participation). Another limitation is that data quality issues could lead to erroneous estimates. Data used for evaluation were often collected for other purposes (typically

program implementation). However, administrative data were supplemented with primary data collection efforts, including surveying of HOP beneficiaries and qualitative interviews with both HOP beneficiaries and other key stakeholders.

In sum, we believe it is reasonable to conclude that the Pilots had an important impact on HOP beneficiaries in the first demonstration period.

Interpretations, Policy Implications, and Interactions with Other State Initiatives

Interpretations

We offer the following interpretations to integrate the findings of this summative evaluation report.

First, the Healthy Opportunities Pilots operated successfully during the demonstration period. The Healthy Opportunities Pilots are a complex program involving multi-sector collaboration between healthcare providers, health insurers, Network Lead organizations, and Human Services Organizations. To be successful, this approach required substantial infrastructure development, capacity building activities, and efforts to ensure a robust network of services were available for beneficiaries. Infrastructure that needed to be established included the development of information technology platforms; the legal and regulatory agreements necessary for the state of North Carolina, PHPs, NLs, HSOs, and healthcare organizations to collaborate; integrating HSOs into the healthcare ecosystem; and the interpersonal work of making these complex, multi-sector relationships effective and efficient. Moreover, this needed to be maintained on an ongoing basis. Such an undertaking is quite extensive, and its accomplishment is a notable success.

Second, HOP enrollment was substantial. Enrolling over 30,000 Medicaid beneficiaries makes HOP one of the largest implementations of a program of its type to date.

Third, screening for health-related social needs is greater in Pilot regions than non-Pilot regions. However, given that such screening is recommended for all Medicaid beneficiaries, there is room for improvement in both Pilot and non-Pilot regions. Nevertheless, the results support the idea that having clear pathways to address social risks can facilitate assessment for those risks.

Fourth, Pilot participation is associated with fewer total social risks and lower probability of experiencing food, housing, and transportation risks, relative to what we estimate would have occurred in the absence of HOP. Since the Driver Diagram that underlies the Pilots emphasizes the importance of addressing social risks to improve health, healthcare utilization, and healthcare spending, establishing the impact of Pilot participation on social risks is an important step in understanding the Pilots' impact. The pattern observed is overall one that was hypothesized—high (and rising) needs around the time of enrollment, with decline as participation continues.

Fifth, HOP's impact on specific clinical outcomes was mixed. HOP did not have a clear impact on birthweight outcomes, hemoglobin A1c, or blood pressure, but there were limitations to these analyses

regarding sample size and data availability such that drawing firm conclusions is difficult. However, results from surveys of HOP beneficiaries were more favorable, with participants reporting that HOP improved health and health-related quality of life and rating their experience with the program positively. Findings from qualitative interviews were also similar. Those interviewed strongly endorsed the idea that HOP services were having an important impact on their health, across the different service domains. Because health is a multi-dimensional construct, judging impact based on a small number of specific indicators may be less sensitive than more global, holistic assessment. Despite this, understanding whether interventions like HOP can be designed so as to have larger impacts on key clinical indicators is an important direction for future work.

Sixth, HOP's impact on healthcare utilization is clear. HOP is associated with less use of forms of care indicating worsening health (e.g., emergency department visits and inpatient admissions), and greater use of outpatient care including preventive care, especially for children.

Seventh, HOP's impact on healthcare spending also appears to be positive, with estimates of lower medical care use that offset spending on both HOP services and administration. Moreover, in a setting in which access to healthcare is not constrained, lower spending on healthcare services is an important global indicator of overall health.

Eighth, HOP offered a variety of services that might address social risks, such as fruit and vegetable prescriptions and food boxes to address food needs. Contrary to expectations, we in general did not find meaningful heterogeneity regarding impacts of these different services. This, overall, supports having an array of services to offer, with participants and care managers working together to select the service best suited for a particular individual's circumstances.

Ninth, the experience in HOP argues against, to some extent, a model of providing services to address social risks based on only offering services connected to the specific social risk an individual reports (for instance, only making food services available to those who report food needs). Instead, both the patterns of service use and the reported experiences of HOP participants suggest that risks can be reduced in varying ways—for instance, addressing a housing issue may free up resources for healthy food, reducing that risk even without a specific food service.

Tenth, estimated benefits from HOP accrued over relatively long-time frames, with estimated benefits two years or more from HOP enrollment dates. This suggests that evaluating the impact of programs like HOP over too short a timeframe may undercount the true impact. This is likely to be particularly true for children, where health benefits likely accrue over very long timeframes.

Eleventh, it is important to understand the likely trajectory of health and health service use. Enrollment in programs like HOP typically comes at a time of worsening health and increasing healthcare use—with associated increases in spending. Service use and total spending often increase around the time of HOP enrollment, partially related to the influx of resources provided by HOP, and partially related to the underlying circumstances that prompt HOP enrollment. Thus, HOP enrollment likely represents an inflection point or threshold in an individual's health and healthcare use trajectory. With the support of HOP services at that time, an individual seems to be set on a different trajectory than what might have occurred in the absence of HOP. In particular, the evaluation estimates worsening health and healthcare spending in the absence of HOP, while the provision of HOP services seems to stabilize and improve an individual's trajectory over time. This means that higher levels of healthcare service use and spending around the time of HOP enrollment are to be expected, followed by a decreasing trend as the impact of the services set in. This understanding has several implications. First, it speaks to the importance of using counterfactual evaluation methods capable of estimating what is likely to have occurred in the absence of HOP, rather than simply comparing pre- and post-intervention periods. Next, it highlights the importance of allowing sufficiently long timeframes for evaluation. Cutting off an evaluation too soon may mask impacts that become apparent over longer periods. Finally, it argues for nuance in using healthcare spending as an evaluation metric. The overall goal of programs like HOP is to use scarce resources wisely, but that does not necessarily imply that reductions in all healthcare spending are desirable. Spending on services like emergency department visits and inpatient admissions is desirable when they are needed, but reductions in the use of such services, when they remain accessible if needed, generally suggests an improvement in health. Thus, in the right circumstances, lower healthcare spending can be an important indicator of better health and quality of life. On the other hand, increased spending on preventive services is a desirable outcome, and of course HOP services themselves have a cost. Thus, there are forces working in opposite directions that might both tend to reduce spending in some areas and increase it in others. Overall, understanding HOP's overall impact requires more nuance than simply evaluating it on the basis of a net healthcare spending number.

Finally, it is important to acknowledge areas where HOP may have impacts that were not evaluated in this report. Given the types of services provided, HOP may have had spillover impacts on others in the household who were not themselves enrolled in HOP. Moreover, HOP may have had economic and social impacts in the communities served, related to the organizations providing HOP

services. The purpose of this evaluation was to investigate impacts on HOP enrollees specifically, but it is important to keep in mind that the impact of programs like HOP may be broader than that—and in particular may extend throughout communities.

Policy Implications

There are several key policy implications to be gleaned from the experience of the Pilots over the first demonstration period. First, the structure of service delivery used in the Pilots is feasible at scale, reaches those in need, and was sustained over the demonstration period. Second, the array of services available seems to be having an impact on reducing health-related social needs for Pilot participants and improving healthcare utilization. This supports the overall premise of HOP—that providing services to address social risk can advance the interest of the Medicaid program in improving the health of Medicaid beneficiaries.

Interactions with Other State Initiatives

HOP occurred in the midst of other changes to the Medicaid program in North Carolina. Most notably, HOP occurred during the transition to Medicaid managed care. HOP was fully integrated into this transition, with PHPs playing a major role in HOP implementation. HOP also occurred in concert with efforts to improve substance use disorder treatment in North Carolina. Given that many of the risks that HOP can address can also contribute to worse substance use disorder outcomes, HOP can be seen as complementary to those efforts.

Lessons Learned and Recommendations

Lessons learned from the HOP demonstration support several recommendations for Medicaid programs that seek to address social risks in order to improve the health of Medicaid beneficiaries. These are:

1. A Multi-Sector Collaboration Arrangement Can Effectively Deliver Services. Multi-sector collaboration programs like HOP require substantial cross-sector effort to coordinate the varying organizations and stakeholders involved. However, this work can result in effective delivery of services and offers advantages in terms of local expertise and making a wide array of services available to beneficiaries. To support such work, key factors include capacity building funding, which is needed to allow a large number of organizations to participate, and a strong information technology backbone. For HOP, this was achieved through a public-private partnership that established the NCCARE360 platform used for HOP.
2. Identification of Social Risks is Challenging to Scale. The large number of beneficiaries, frequently changing conditions, and competing demands to devote time to worthwhile activities all make social risk assessment challenging. However, having programs that can address such risks once they come to attention facilitates this assessment.
3. The Range of Services Available through HOP are Capable of Addressing Social Risks. Establishing that the offered services are capable of reducing social risks is important to understanding the mechanism of HOP. At the same time, the lack of clear superiority of different service types suggests a benefit in making a wide variety of services available to beneficiaries, allowing participants and care managers to select service(s) that best fits the situation of the beneficiary.
4. Further Program Refinement is Needed to Improve Some Clinical Outcomes. Although participant reported ratings of HOP's impact on their health and health-related quality of life was positive, we did not observe impacts from HOP on certain clinical outcomes, such as glycemic or blood pressure control. Refining services offered to increase the likelihood of improving these outcomes would strengthen HOP's impact on health.
5. Understand the Relationship between Pilot Services and Social Needs. The key focus of the Pilots is to address health-related social needs to improve health. How to operationalize 'addressing' health-related social needs is complex, however. Though resolution of a need (defined as no longer reporting a need one previously reported) is likely to be beneficial, it is

also important to recognize that needs could worsen in the absence of the Pilots, and thus services may be beneficial even if individuals continue to report a need. Indeed, interrupted time series estimates suggested that much of the difference between the probability of needs experienced by Pilot participants and what we estimate would have happened in the absence of the Pilots was driven by worsening needs in the counterfactual condition. Thus, assessment of whether Pilot services are 'addressing' needs should attend to the nuance of the situation Pilot participants experience.

6. Mappings between What Risks an Individual Experiences and What Services are Useful for Them May be Less Straightforward Than Anticipated. HOP participants often used services from a category different than their reported need (e.g., they may have reported a housing need but used a food service). This suggests that participants and care managers are able to view the beneficiary's situation holistically and make decisions about what available services are most likely to improve health. It also suggests that limiting allowable services to those that correspond to a reported need may narrow the scope for interventions to provide benefit.
7. The Principle that Upfront Spending can Improve Health is Sound. The spending pattern observed in HOP was one of higher spending around the time of HOP enrollment, partially reflecting an influx of resources to address acute needs, with declining spending over time. This is consistent with the association between social risk and deteriorating health. By providing assistance during this critical window, there appears to be an opportunity to set health on a better trajectory, with benefits that accrue over the long run.

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Attachments

CMS Approved Evaluation Design

Please see separate PDF of the CMS approved Evaluation Design.

Healthy Opportunities Pilots Fee Schedule

Please see separate PDF of the Healthy Opportunities Pilots Fee Schedule as of July 1, 2024.

Appendices

Please see separate PDF of the Appendices