

## EVALUATION REPORT

# PEBB Wellness Programs: HEM & Healthy Team Healthy U

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**CORE**

Center for Outcomes  
Research and Education

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# Executive Summary



## Overview

The Health Engagement Model (HEM) is a wellness initiative for Oregon state employees, and Healthy Team Healthy U (HTHU) is a program option within the HEM umbrella. In 2021, CORE was contracted to conduct an evaluation of HTHU and HEM with four objectives:

1. Assess the health impacts of the HEM program overall
2. Assess the impact of the HTHU program on healthcare utilization
3. Assess the impact of the HTHU program on self-reported health and health behaviors
4. Understand why the HTHU program was or was not successful for different participants

The study population, design, and key outcomes for each objective are summarized in the image below:

	HEM Overall	HTHU Program		
	OBJECTIVE 1 <i>Impacts on care utilization</i>	OBJECTIVE 2 <i>Impacts on care utilization</i>	OBJECTIVE 3 <i>Impacts on participants</i>	OBJECTIVE 4 <i>Optimizing program success</i>
Population	HEM participants and non-participants	HTHU users and a matched sample of non-users	Sample of recent HTHU users and non-users	Subsample of survey participants who used HTHU
Design	Compare health care claims data over time	Compare health care claims data over time	Survey to assess program engagement & outcomes	Interviews with a targeted subgroup of survey responders
Key Outcomes	Use of health care services over time	Use of health care services over time	Self-reported health, health behaviors, program satisfaction	Experiences, challenges and facilitators

Our analyses of health care utilization examined five outcomes and assessed the proportion of enrollees who used each type of care and the amount of utilization:

- **Inpatient** – any admission to the hospital for one or more nights
- **Emergency** – any visit to an emergency department (ED) that did not result in admission
- **Primary Care** – any outpatient visits that occurred with a primary care provider (PCP)
- **Specialty Care** – any outpatient visits that occurred with a specialist
- **Outpatient Mental Health** – any outpatient visits that occurred with a behavioral health specialist

### Units

Proportion with utilization (%): the proportion of enrolled members with one or more visits.

Per Member Per Month (PMPM): total number of visits per total number of members enrolled.

Per 1000 Members Per Month (per 1000mm): total number of visits per 1000 members enrolled.



## HEM Update

We used a person-year fixed effects analysis of PHP members enrolled in HEM and non-HEM health plans between 2011 and 2020 (n=12,684) to examine changes in health care utilization in any given year, since the first year of HEM, and for total years of HEM enrollment.

PHP members included in the sample had a mean age of 45, and most participated in HEM for all 10 years examined (59%). At baseline, a little over half of the sample (**51%**) **had one or more physical health conditions**, **13% had one or more mental health conditions**, and 8% had both a physical and mental health condition.

We found that in any given year, **those enrolled in HEM were more likely to have primary, specialty, and outpatient mental health care visits, and less likely to have ED visits**. This pattern remained largely consistent when we assessed utilization over time separately for three different sets of subgroups: those with high and low medical complexity, those over and under 50 years old, and those with and without chronic conditions. In addition, we found some effects on inpatient utilization in certain subgroups. These findings are summarized in the table below:

HEM vs. non-HEM enrollment in any given year (2011-2020):

	Overall	Medical Complexity		Age		Chronic Conditions	
		High	Low	50+	<50	Any	None
Primary Care	+4%	+3%	+6%	+6%	+2%	+1%	+5%
Specialty Care	+7%		+10%	+9%	+5%	+4%	+4%
Outpatient MH	+21%	+26%	+22%	+14%	+27%	+16%	+23%
Inpatient		-13%		-13%		-16%	+20%
ED	-14%	-11%	-13%	-13%	-14%	-16%	-18%



Higher likelihood of utilization



Lower likelihood of utilization



No significant difference

### Additional HEM findings:

- ▶ Changes in **amount of utilization followed similar patterns** as proportion with utilization of each type of care.
- ▶ We found **some evidence of a linear relationship between time since first enrollment and health care utilization**, but effect sizes were incredibly small given that utilization changes very little from year to year.
- ▶ When looking at utilization based on the total number of years of HEM enrollment, we found that **every year of HEM enrollment increased the number of primary and specialty care visits and decreased the number of inpatient and ED visits**.



## HTHU Evaluation

We used quantitative and qualitative methods to assess the impact of HTHU, including: (1) a difference-in-differences (DID) analysis of health care utilization for HTHU participants and a comparison group of non-participants; (2) analysis of survey responses from recent HTHU users and a matched sample of non-users; and (3) thematic analysis of interviews conducted with a subset of HTHU users.

### Impact on health care utilization

Compared to non-participants, HTHU participants in the claims analysis sample were younger (46 vs 48), more likely to be female sex (63% vs 51%), more likely to be White (66% vs 56%), and more likely to reside in a rural area (36% vs 32%). Participants had significantly higher levels of medical complexity compared to non-participants. HTHU participants were **more likely to have a physical health condition at the time of enrollment compared to non-participants (57% vs 53%)** and **more likely to have a mental health condition (23% vs 21%)**.

When comparing changes in utilization over time in participants to changes over time in the comparison group using a DID approach, we found that **participants were less likely to use outpatient mental health care**. This was largely driven by an increase in utilization in the non-HTHU group and by individuals who were more medically complex, older, or had chronic conditions, as utilization among the lower complexity, younger, and without chronic conditions groups did not change significantly. Those **under 50 were less likely to use inpatient care**, and those with high complexity were more likely to use the ED:

HTHU participants vs. non-participants after program enrollment:

	Overall	Medical Complexity		Age		Chronic Conditions	
		High	Low	50+	<50	Any	None
Primary Care							
Specialty Care							
Outpatient MH	-11%	-15%		-16%		-10%	
Inpatient					-33%		
ED		+25%					



Higher likelihood of utilization



Lower likelihood of utilization



No significant difference

### Impact on health and health behaviors

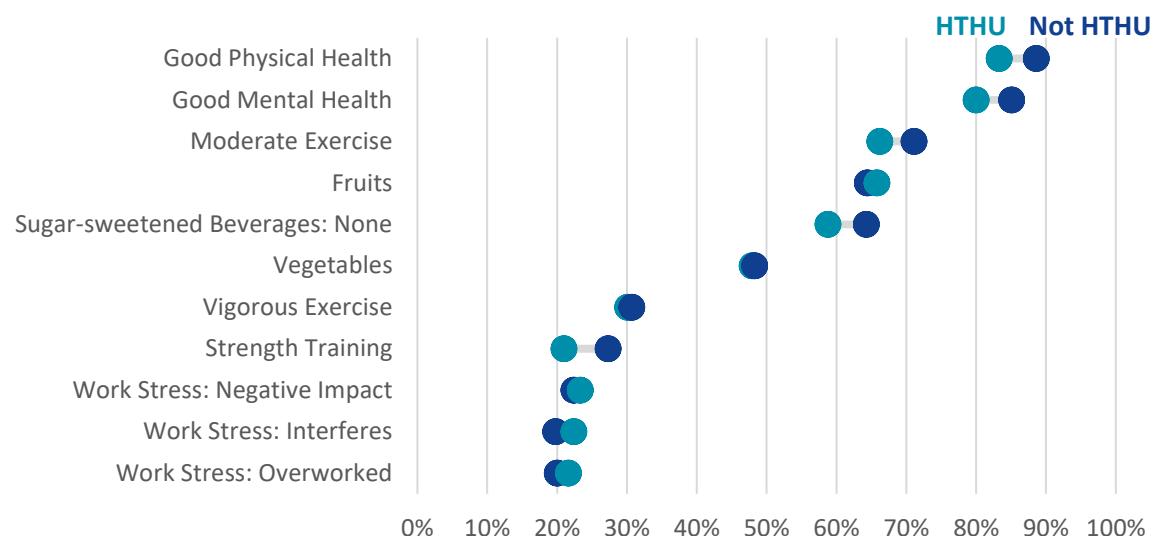
Of the 3,660 PEBB employees who were distributed the survey, a total of **827 (23%) completed the survey**, with similar response rates in both the HTHU and never-HTHU groups.

We constructed logistic regression models to compare the current health and health behaviors of HTHU and never-HTHU survey respondents using the following outcomes:

- **Good physical health** – excellent, very good, or good physical health
- **Good mental health** – excellent, very good, or good mental health
- **Moderate, vigorous, and strength training exercise** – 3+ days per week of each type
- **Fruits** – 2+ servings of fruit per day
- **Vegetables** – 3+ servings of vegetables per day
- **Sugar-sweetened beverages** – no days of consumption per week
- **Sleep** – at least 7 hours of sleep per night
- **Work stress** – often or very often experiencing each of the following: job negatively impacting health, work interfering with personal life, and feeling overworked.

While there were some differences in current health and behaviors between the groups, **none were statistically significant**:

#### Comparison of Health Outcomes between HTHU and Never-HTHU respondents



#### ***Additional Survey findings:***

- ▶ Most HTHU participants were **highly satisfied with their program experience**. Those who reported the fewest barriers to program participation were the most likely to report high satisfaction. Insufficient time during the workday was the most commonly reported barrier.
- ▶ Participants who identified as Black, Indigenous, or People of Color (BIPOC) were more likely than White participants to agree that **HTHU programming could be more relevant to their culture, language, or identity**.
- ▶ There was a marginally significant difference in self-reported physical health, with **HTHU participants reporting slightly worse health than non-participants after enrollment**. This finding could be due to selection into the program, as participants were slightly more medically complex than those who opted out of HTHU.
- ▶ Consistent sleep was the least commonly reported healthy behavior.

## **Experiences, Challenges, and Facilitators**

In interviews with 20 current and former participants of HTHU, we identified four themes related to participants' experiences with the program, including what they received and what they needed or wanted from the HTHU program:

- ▶ **HTHU motivated participants to improve their health:** The program served as a reminder or prompt to re-engage in healthy behaviors and provided a sense of accountability for many interviewees. Interviewees felt that incentives such as gym or nutrition program discounts could increase their engagement.
- ▶ **HTHU could be more personalized to a participant's goals and needs:** There was a common desire for the program to be more tailored to participants, such as providing recommendations for certain health conditions or connecting participation to specific health goals.
- ▶ **Social connection and workplace support are important but can have drawbacks:** Many interviewees joined HTHU while it was team-based and appreciated this aspect of the program. While social connection with colleagues and support from employers were generally viewed positively, some interviewees disliked the competitive aspects of the program.
- ▶ **Clarity and communication around the HTHU program could be improved:** Several interviewees struggled to distinguish HTHU from other health-related programs they may have participated in as part of HEM. Since the onset of the COVID-19 pandemic, interviewees found it difficult to remember to engage in the program.



## **Conclusion & Recommendations**

In general, findings suggest that HEM had a moderately positive effect on health care utilization. On the other hand, our evaluation of the HTHU program revealed mixed findings, including inconclusive impacts on health care utilization and few direct effects on self-reported health and health behaviors, but overall high satisfaction with the program. Across both assessments, mental health care utilization was difficult to interpret given that utilization of these services depends both on needs and availability. Nonetheless, mental health remains an important component of supporting employee wellness, and differences in utilization between older and younger PHP members raised additional questions about potential unmet needs among some employees. Additional subgroup-specific findings, as well as results of the HTHU survey and interviews consistently pointed towards a need for additional focus on employees' unique needs and preferences.



## **For more information**

This executive summary serves as a high-level overview of CORE's findings. Please refer to the full report for more on our assessment of the HEM and HTHU programs, including detailed technical appendices.

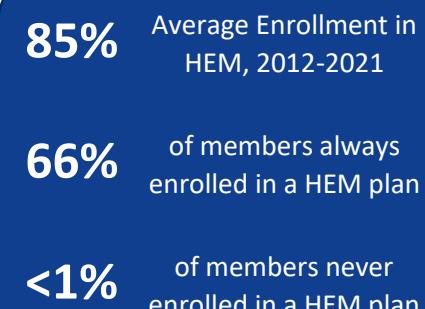
## Table of Contents

Background .....	9
Current Evaluation .....	10
HEM Update.....	11
Overview .....	11
Sample Description .....	11
Annual HEM Enrollment Status .....	13
Years since HEM enrollment.....	15
Total years of HEM enrollment.....	15
HEM Summary .....	15
Healthy Team Healthy U (HTHU) Evaluation .....	16
Overview .....	16
HTHU Claims Analysis: Impact on healthcare utilization.....	16
HTHU Survey: Impact on health and health behaviors .....	19
HTHU Interviews: Experiences, Challenges, and Facilitators.....	24
HTHU Summary.....	28
Conclusion & Recommendations.....	30
Appendices.....	31

## Background

The workplace offers a unique opportunity for health promotion for most adults, in part because of the amount of time spent working, but also due to the role employers play in sponsoring healthcare coverage. In the last decade, workplace wellness programs have grown in popularity; as of 2019, 84% of large employers offering health benefits also offered a workplace wellness program, up from about 70% in 2008.<sup>1</sup> The onset of the COVID-19 pandemic only made this link between employment and health more clear, as employers navigated a rapid shift towards remote work and new challenges to supporting employee health and wellbeing.

In addition to supporting employee wellness and productivity through health assessments and educational components, many workplace wellness programs also provide financial incentives for participation. The Health Engagement Model (HEM), introduced to state employees in Oregon by the Public Employees' Benefit Board (PEBB) in 2012, is an approach to wellness programs that incorporates personal health accountability, assessments, and education. Employees who choose to participate in HEM health plan have a lower deductible and receive a monthly incentive payment for their participation, which involves completing a health assessment and two “health actions” that meet their personal health goals during the enrollment year.



Since 2013, Healthy Team Healthy U (HTHU; now known as “Healthy You”) has been available to HEM enrollees as way to complete one of their required health actions. HTHU is evidence-

**19%**

of HEM enrollees chose HTHU as a required health action in 2017, the highest year of HTHU participation. Participation has dropped each year since.

based program that aims to create healthier minds, healthier bodies, and a healthier workplace. The HTHU programming has evolved over time; while it was originally designed as a 12-week team-based program, it eventually became a suite of tools and resources that employees can access at any time. At various points in its evolution, participants were given tangible incentives for joining, such as pedometers and blood pressure cuffs. HTHU has been a popular program within HEM since its introduction, but participation has declined in recent years.

In 2016, the Center for Outcomes Research and Education (CORE) conducted an evaluation of the HEM program through an analysis of healthcare claims and a survey of enrollees immediately after the HEM transition in 2012 and again two years later. This evaluation found

<sup>1</sup> Pollitz, K. & Rae, M. Trends in Workplace Wellness Programs and Evolving Federal Standards. *Kaiser Family Foundation*, available at: <https://www.kff.org/private-insurance/issue-brief/trends-in-workplace-wellness-programs-and-evolving-federal-standards/>

that employee satisfaction with HEM increased during its first two years, and new employees who were not employed by the state during the transition had higher satisfaction than their peers who did experience the transition. The vast majority of HEM enrollees completed their required health actions and most reported finding them useful. While most participants reported making lifestyle changes, there was no change overall in outcome measures related to diet, physical activity, and weight. In terms of healthcare utilization and cost, HEM participation was associated with lower costs, largely driven by a reduction in inpatient visits. The most significant savings were observed for participants who were 50 or older, had chronic conditions, and those at the top 20% of baseline health complexity.

## Current Evaluation

CORE's current evaluation provides an update to our previous assessment of HEM and takes a closer look at HTHU. The evaluation had four objectives:

1. Assess the health impacts of the HEM program overall
2. Assess the impact of the HTHU program on healthcare utilization
3. Assess the impact of the HTHU program on self-reported health and health behaviors
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Design	Compare health care claims data over time	Compare health care claims data over time	Survey to assess program engagement & outcomes	Interviews with a targeted subgroup of survey responders
Key Outcomes	Use of health care services over time	Use of health care services over time	Self-reported health, health behaviors, program satisfaction	Experiences, challenges and facilitators

**Approach & Data Sources.** We used a multi-method, retrospective longitudinal comparison study design to compare outcomes over time for HEM & HTHU participants and non-participants. Analyses included data from the following sources:

- **Providence Health Plan (PHP) Claims data:** PEBB member enrollment, demographic information, and detailed medical and behavioral health claims capturing all health care encounters for HEM participants and HTHU users.
- **HTHU Survey data:** A survey of HTHU users who participated in the program in 2020 or 2021 and a matched sample of non-participants who never enrolled in HTHU.
- **HTHU Interview data:** In-depth interviews with a subset of HTHU survey respondents, including those who were and were not satisfied with HTHU.

See Appendix A for more detailed methods used in this evaluation.

## HEM Update

### Overview

To assess the health impacts of the HEM program overall, we examined health care utilization using a person-year fixed effects analysis of PHP members enrolled in HEM and non-HEM health plans between 2011 and 2020. To be included in the analytic sample, an individual must have been enrolled in a PHP health plan during the entire study timeframe ( $n = 12,684$ ); however, enrollees may have switched between HEM and non-HEM plans during the study period. In any given year, HEM enrollment was defined as being enrolled in a HEM plan for at least 6 months of the calendar year.

### Sample Description

PEBB members with PHP in the current analysis had a mean age of 45. Most of the sample participated in HEM for all 10 years (59%), and the majority resided in an urban area (72%).

In addition to demographics, we examined the health profile of members at baseline. In the first year of HEM (2012), a little over half of the sample (**51%**) **had one or more physical health conditions**, **13% had one or more mental health conditions**, and 8% had both a physical and mental health condition.

#### Most frequent health conditions:

- Hyperlipidemia (12%)
- Fibromyalgia, Chronic Pain and Fatigue (12%)
- Depression (11%)
- Hypertension (10%)
- Anxiety Disorders (8.6%)
- Rheumatoid Arthritis/ Osteoarthritis (RA/OA) (6.0%)
- Diabetes (5.8%)
- Obesity (5.3%)
- Acquired Hypothyroidism (4.7%)
- Anemia (3.7%)

Characteristic	Percent or Mean
<b>HEM Participation</b>	
Always HEM	59.2%
Sometimes HEM	40.8%
<b>Sex</b>	
Female	53.3%
Male	46.7%
Unknown	<0.1%
<b>Race/Ethnicity</b>	
American Indian/Alaska Native	0.6%
Asian	3.5%
Black	1.2%
Hispanic	3.1%
Native Hawaiian/Pacific Islander	0.3%
Unknown	20.5%
White	70.7%
<b>Residence</b>	
Rural	25.4%
Unknown	2.2%
Urban	72.4%
<b>Age</b>	45 years

The analysis of health care utilization examined five outcomes and assessed the proportion of enrollees who used each type of care and the amount of utilization:

- **Inpatient** – any admission to the hospital for one or more nights
- **Emergency** – any visit to an emergency department (ED) that did not result in admission
- **Primary Care** – any outpatient visits that occurred with a primary care provider (PCP)
- **Specialty Care** – any outpatient visits that occurred with a specialist
- **Outpatient Mental Health** – any outpatient visits that occurred with a behavioral health specialist

We explored impacts of HEM in three ways, considering: (1) annual HEM enrollment status, (2) years since HEM enrollment, and (3) total years of HEM enrollment:

	Annual HEM enrollment	Years since HEM enrollment	Total years of HEM enrollment
Learning question	For any given year of PHP enrollment, did enrollment in a HEM plan change an individual's health care utilization?	For every year since HEM started, what was the change in health care utilization?	For every year of HEM enrollment, how did health care utilization change?
Comparison	Comparing utilization in years of HEM enrollment to years in which that individual did not enroll in HEM.	Comparing utilization to the baseline year, or the first year of HEM (2012). <sup>1</sup>	Comparing utilization to the baseline year, or the first year of HEM (2012). <sup>1</sup>
Interpretation	Results tell us whether the likelihood or amount of utilization of each type of care is higher, lower, or the same as it would have been if the individual did not participate in HEM that year.	Results demonstrate whether there is a relationship between time that HEM has existed and likelihood or amount of utilization. Results shed light on whether there are long-term or compounding effects of HEM regardless of whether an individual continued to enroll in HEM or not after the baseline year.	Results illustrate the extent to which additional years of HEM enrollment have additive effects on amount of utilization. <sup>2</sup>

<sup>1</sup>All individuals in the analytic sample were enrolled in HEM in the baseline year.

<sup>2</sup>Likelihood of utilization was not included in this model because odds of most types of utilization were nearly 100% due to the 10-year window examined in the analysis.

All models controlled for sex, race/ethnicity, urban/rural residence, age, and medical complexity (as measured by CDPS risk score and described below). Full results of all HEM claims analyses are provided in Appendix B.

## Health and Health Care Utilization during the first year of HEM (2012)

N = 12,684<sup>1</sup>

<b>CDPS Risk Score<sup>2</sup></b>	0.95 (0.71)
<b>Utilization</b>	
Inpatient	374 (2.9%)
Emergency Department (ED)	1,123 (8.9%)
Primary Care Provider (PCP)	9,937 (78%)
Specialty Care	6,231 (49%)
Outpatient Mental Health (MH)	233 (1.8%)
Inpatient per 1000mm	2.7 (17.0)
ED per 1000mm	10 (43)
PCP per 1000mm	190 (197)
Specialty Care per 1000mm	122 (222)
Outpatient MH per 1000mm	7 (84)
<b>Chronic Conditions</b>	
Physical Health Conditions	6,444 (51%)
Mental Health Conditions	1,624 (13%)
Dual Diagnosis	1,020 (8.0%)

<sup>1</sup> n (%); Mean (SD)

<sup>2</sup> A CDPS risk score of 1.0 represents the population average; scores < 1.0 are less medically complex than the average person, scores > 1.0 are more medically complex than the average person.

**CDPS Risk Score** is a widely used diagnosis-based risk adjustment model used to indicate illness burden related to major body systems or types of chronic disease.

### Units

Proportion with utilization (%): the proportion of enrolled members with one or more visits.

Per Member Per Month (PMPM): total number of visits per total number of members enrolled.

Per 1000 Members Per Month (per 1000mm): total number of visits per 1000 members enrolled.

## Annual HEM Enrollment Status

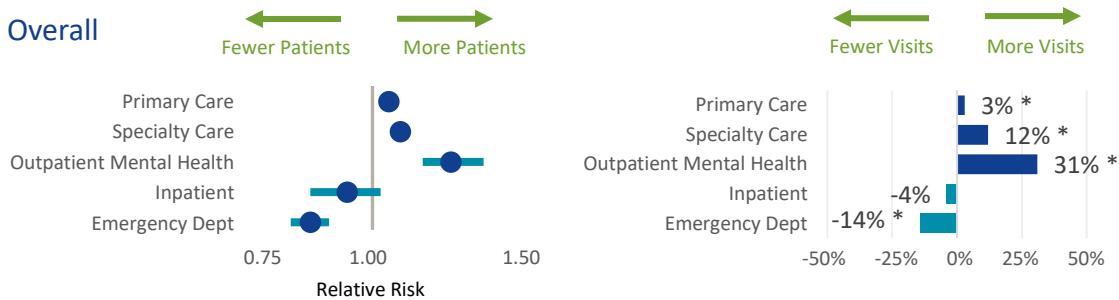
As described previously, this analysis compared health care utilization during HEM years to years in which an individual did not enroll in a HEM plan. Results reveal whether and how likelihood and amount of utilization in HEM years were different than they would have been if the individual did not participate in HEM that year.

We found that those enrolled in HEM in any given year were:

- 14% less likely to have an ED visit
- 21% more likely to have a mental health visit
- 4% more likely to have a PCP visit
- 7% more likely to have a specialty care visit

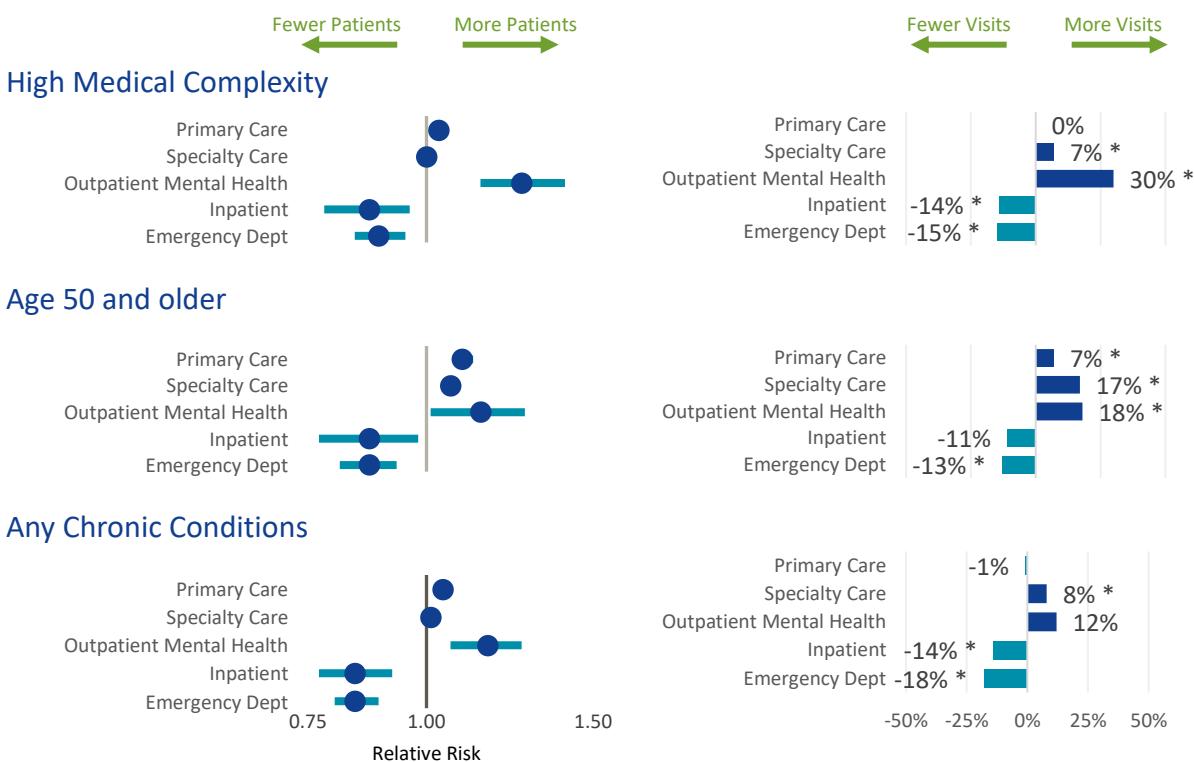
On average, those who were enrolled in HEM had a:

- 14% decrease in the number of ED visits
- 31% increase in the number of mental health visits
- 3% increase in the number of primary care visits
- 12% increase in the number of specialty care visits



Next, we examined changes in health care utilization over time separately for three different sets of subgroups: those with high and low medical complexity, those over and under 50 years old, and those with and without chronic conditions.

- The HEM effect for **primary care visits was strongest in the low complexity group** compared to the high complexity group (RR = 1.05 vs 1.00).
- The effect for **primary care visits was strongest in those with no chronic conditions** compared to the those with 1+ chronic condition (RR = 1.05 vs 1.01)
- The proportion of **high complexity HEM members having inpatient visits decreased** (RR = 0.87), while there was no significant difference among low complexity members.
- Significantly fewer members age 50+ had an inpatient visit when enrolled in HEM** (RR = 0.87). There was no significant difference for members age <50 years.
- Significantly fewer members with 1+ chronic condition had an inpatient visit when enrolled in HEM** (RR = 0.84) while those with no chronic conditions experienced a significant increase in inpatient utilization (RR = 1.20).



## Years since HEM enrollment

We also explored changes in utilization based on the number of years since first enrolling in HEM. In general, findings align with those of the individual year; however, the effect size is incredibly small. While **there may be a linear relationship between time since first enrollment and health care utilization, utilization changes very little from year to year**. For every year since initial HEM enrollment, there was a 9% increase in the likelihood of having a mental health visit and a 3% reduction in likelihood of an inpatient admission. There were no significant changes in other outcomes.

## Total years of HEM enrollment

Finally, we examined health care utilization based on the total number of years of HEM enrollment by summing utilization across all years included in the analysis. Compared to the baseline year, we found that for every year of HEM enrollment, overall, there was a:

- 2% increase in the number of primary care visits
- 5% decrease in the number of ED visits
- 2% decrease in the number of inpatient visits
- 4% increase in the number of specialty care visits

We also found some differences when looking at the same subgroups described previously:

- Members in the high medical complexity saw the greatest decrease in ED usage, with a **17% decrease in ED visits for every year of HEM enrollment**.
- While those age 50 and older saw no effect on mental health utilization, **those less than 50 years of age had 6% more mental health visits for every year of HEM enrollment**.
- While those without any chronic conditions saw no effect on inpatient utilization, **those with 1+ chronic condition had 3% fewer admissions for every year of HEM enrollment**.

## HEM Summary

In general, findings suggest that HEM had a moderately positive effect on health care utilization, with some differences between subgroups. The overall decrease in likelihood of ED use is encouraging assuming that this drop represents avoidable use of the ED for care that should be handled in other settings or visits avoided due to preventive or chronic care. This assumption is supported by the increased likelihood of primary and specialty care that was also observed. In addition, for those with high medical complexity, one or more chronic conditions, and over 50, we found a decrease in inpatient care, further supporting that avoidable hospitalizations may be prevented to some extent. The analysis of utilization based on total years of HEM enrollment added additional nuance and clarity; over time, the decrease in ED and inpatient utilization is driven by more complex members, and we continue to see an increase in primary and specialty care overall. Finally, the increase in likelihood of mental health care is difficult to interpret, as it may reflect improved access to care, greater need, or both. Over time, these visits were more concentrated among younger members, raising questions about potential gaps among older members and higher needs among younger members.

## Healthy Team Healthy U (HTHU) Evaluation

### Overview

To assess and understand the impact of HTHU on participants, we used quantitative and qualitative methods, including: (1) a difference-in-differences (DID) analysis of health care utilization for HTHU participants and a comparison group of non-participants; (2) analysis of survey responses from recent HTHU users and a matched sample of non-users; and (3) thematic analysis of interviews conducted with a subset of HTHU users.

### HTHU Claims Analysis: Impact on healthcare utilization

#### Sample

To be included in the claims analysis, PEBB PHP members must have been enrolled in HTHU for at least 12 consecutive months, with at least 12 months of non-HTHU enrollment prior to joining the program. In the comparison group, non-participants were enrolled in PHP for 24 consecutive months and did not join HTHU.

Compared to non-participants, HTHU participants were younger (46 vs 48), more likely to be female sex (63% vs 51%), more likely to be White (66% vs 56%), more likely to reside in a rural area (36% vs 32%), and had significantly higher levels of medical complexity.

#### Characteristics of HTHU participants and non-participants

Characteristic	Overall <sup>1</sup> N = 33,844	Control <sup>1</sup> N = 30,605	Case <sup>1</sup> N = 3,239	p-value <sup>2</sup>
<b>Age</b>	47 (11)	48 (12)	46 (10)	<0.001
<b>Sex</b>				<0.001
Male	16,332 (48%)	15,122 (49%)	1,210 (37%)	
Female	17,507 (52%)	15,478 (51%)	2,029 (63%)	
Unknown	5 (<0.1%)	5 (<0.1%)	0 (0%)	
<b>Race</b>				<0.001
American Indian/Alaska Native	193 (0.6%)	166 (0.5%)	27 (0.8%)	
Asian	854 (2.5%)	750 (2.5%)	104 (3.2%)	
Black	352 (1.0%)	311 (1.0%)	41 (1.3%)	
Hispanic	1,002 (3.0%)	822 (2.7%)	180 (5.6%)	
Native Hawaiian/Pacific Islander	109 (0.3%)	93 (0.3%)	16 (0.5%)	
White	19,368 (57%)	17,239 (56%)	2,129 (66%)	
Unknown	11,966 (35%)	11,224 (37%)	742 (23%)	
<b>Urban or Rural</b>				<0.001
Urban	21,414 (63%)	19,516 (64%)	1,898 (59%)	
Rural	10,840 (32%)	9,669 (32%)	1,171 (36%)	
Unknown	1,590 (4.7%)	1,420 (4.6%)	170 (5.2%)	
<b>CDPS Risk Score<sup>3</sup></b>	1.08 (0.92)	1.08 (0.93)	1.09 (0.85)	0.013

<sup>1</sup> Mean (SD); n (%)

<sup>2</sup> Wilcoxon rank sum test; Fisher's exact test; Pearson's Chi-squared test

<sup>3</sup> A CDPS risk score of 1.0 represents the population average; scores < 1.0 are less medically complex than the average person, scores > 1.0 are more medically complex than the average person.

HTHU participants were **more likely to have a physical health condition at the time of enrollment compared to non-participants (57% vs 53%)** and **more likely to have a mental health condition (23% vs 21%)**. The most frequent diagnosis among HTHU participants were chronic pain (20%), depression (17%), hypertension (14%), anxiety (14%), and high cholesterol (12%).

#### Most frequent health conditions:

- Fibromyalgia, Chronic Pain and Fatigue (20%)
- Depression (17%)
- Hypertension (14%)
- Anxiety Disorders (14%)
- Hyperlipidemia (12%)
- Obesity (15%)
- Rheumatoid Arthritis/Osteoarthritis (9.4%)
- Diabetes (8.2%)
- Acquired Hypothyroidism (6.3%)
- Migraine and Chronic Headache (6.8%)

#### Utilization before and after HTHU enrollment

Our analysis of health care utilization examined the same five types of care described previously (inpatient, ED, PCP, specialty care, and outpatient mental health), using the same two outcomes: (1) **likelihood** of each type of visit/encounter, and (2) **amount** of each type of care utilization.

Prior to enrollment, HTHU participants had similar likelihoods of inpatient usage and mental health services compared to non-participants, but higher likelihoods of using ED, primary care, and specialty care services. When they did receive mental health services, they received far fewer visits (0.97 vs 1.13 visits per year).

#### Changes in utilization over time among HTHU participants and non-participants

	Non-Participants N = 30,605			HTHU Participants N = 3,239		
	Pre <sup>1</sup>	Post <sup>1</sup>	Difference <sup>2</sup>	Pre <sup>1</sup>	Post <sup>1</sup>	Difference <sup>2</sup>
<b>Primary Care</b>						
Any Visit	24,195 (79%)	24,717 (81%)	1.70%***	2,663 (82%)	2,690 (83%)	0.83%
Visits per year	2.57 (2.81)	2.78 (3.07)	0.21***	2.82 (2.90)	3.06 (3.04)	0.23**
<b>Specialty Care</b>						
Any Visit	15,853 (52%)	15,708 (51%)	-0.47%	1,732 (53%)	1,739 (54%)	0.22%
Visits per year	1.53 (2.64)	1.57 (2.80)	0.04	1.58 (2.60)	1.54 (2.50)	-0.04
<b>OP Mental Health</b>						
Any Visit	3,794 (12%)	4,296 (14%)	1.60%***	394 (12%)	396 (12%)	0.06%
Visits per year	1.04 (4.09)	1.23 (4.62)	0.19***	0.97 (3.82)	0.93 (3.70)	-0.04
<b>Inpatient</b>						
Any Visit	1,097 (3.6%)	1,090 (3.6%)	-0.02%	121 (3.7%)	109 (3.4%)	-0.37%
Visits per year	0.0402 (0.2272)	0.0413 (0.2389)	0	0.0392 (0.2034)	0.0358 (0.2003)	0
<b>Emergency</b>						
Any Visit	3,429 (11%)	3,534 (12%)	0.34%	375 (12%)	435 (13%)	1.90%
Visits per year	0.16 (0.57)	0.18 (0.62)	0.01**	0.17 (0.60)	0.19 (0.58)	0.02

OP = Outpatient

Pre = 12 months prior to enrollment or matched index date

Post = 12 months following enrollment or matched index date

<sup>1</sup> n (%); Mean (SD)

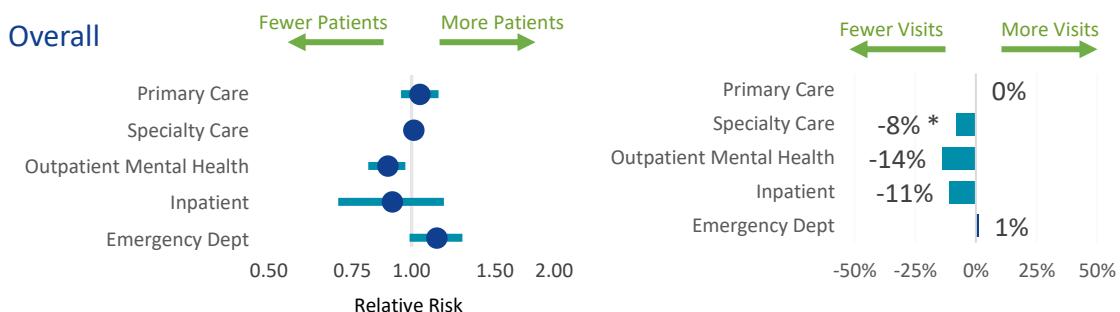
<sup>2</sup> 3-sample test for equality of proportions without continuity correction; Welch Two Sample t-test; \*\*\*p<0.001, \*\*p<0.05, \*p<0.01

## HTHU Difference-in-Differences (DID) Analysis

We used a DID approach to estimate the treatment effect of HTHU by comparing changes in utilization over time in participants to changes over time in the comparison group. Similar to the HEM analysis, we examined these potential differences for the sample overall, and for specific subgroups: those with high and low medical complexity, those over and under 50 years old, and those with and without chronic conditions. Full results of all HTHU claims analyses are provided in Appendix C.

### **Overall**

- Those who were enrolled in HTHU were **11% less likely to have a mental health visit** in the year following enrollment.
- Differences in the likelihood of ED, inpatient, PCP, and specialty care utilization were not significant.
- On average, those who were enrolled in HTHU had an **8% decrease in the number of specialty care visits**. No other outcomes differed significantly in amount of use.



### **Complexity**

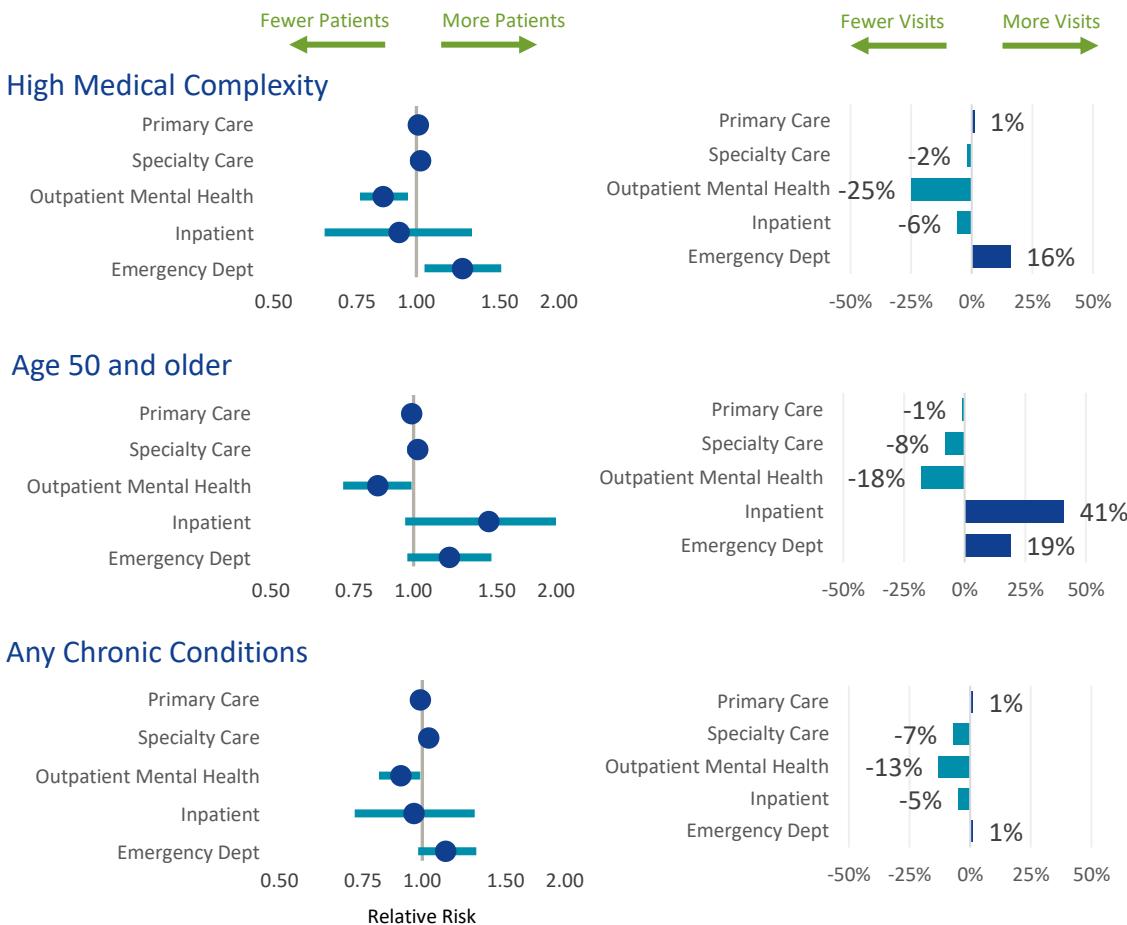
- Members with high medical complexity were **25% more likely to visit the ED** following HTHU enrollment ( $RR = 1.25$ ).
- Members with high medical complexity were **15% less likely to have a mental health visit** following HTHU enrollment ( $RR = 0.85$ ).
- Those with low medical complexity experienced no significant change in utilization following HTHU enrollment.
- There were no significant differences in the amount of utilization in either group.

### **Age**

- Members under age 50 were **33% less likely to have an inpatient visit** following HTHU enrollment ( $RR = 0.67$ ).
- Members age 50 and older were **16% less likely to have a mental health visit** following HTHU enrollment ( $RR = 0.84$ )
- There were no significant differences in the amount of utilization in either group.

### Chronic Conditions

- Members with any chronic conditions were **10% less likely to have a mental health visit** following HTHU enrollment ( $RR = 0.90$ )
- There were no significant differences in the amount of utilization in either group.



### HTHU Survey: Impact on health and health behaviors

We conducted a survey of recent HTHU users and a matched sample of employees who never participated in HTHU. The survey included questions on self-rated mental and physical health, health behaviors, and job stress. We also asked HTHU respondents questions related to their satisfaction with the program and any barriers they experienced. A full list of survey questions and responses is found in Appendix D.

#### Survey Sample

Of the 3,660 PEBB employees who were distributed the survey, a total of 827 (23%) completed the survey, with similar response rates in both the HTHU and never-HTHU groups. Respondents reported working at 55 of the PEBB agencies, with the highest number of respondents from the Department of Human Services and some of the state universities.

- Respondents were predominately **White (85%), female gender (84%), with English as their preferred language (99%)**. The average age was 49 years.
- A slightly higher percentage of HTHU than never-HTHU participants were **full-time and salaried (94% versus 90%), and worked the day shift (85% versus 79%)** although the percentage was very high for both groups.

#### Characteristics of HTHU and Never-HTHU survey respondents

	<b>Never HTHU<sup>1</sup> N=570</b>	<b>HTHU<sup>1</sup> N=257</b>
<b>Age</b>	49.6 (10.6)	48.8 (10.7)
<b>CDPS risk score<sup>2</sup></b>	1.22 (0.96)	1.3 (1.05)
<b>Mobility difficulties</b>	41 (7.2%)	23 (8.9%)
<b>Gender</b>		
Women	469 (84.7%)	206 (83.1%)
Men	79 (14.3%)	40 (16.1%)
Agender, Transgender, Non-Binary, Questioning, Other, Don't know, Refused	16 (2.8%)	8 (3.1%)
<b>Race/Ethnicity</b>		
American Indian / Alaskan Native	17 (3.0%)	12 (4.7%)
Asian	22 (3.9%)	11 (4.3%)
Black or African American	9 (1.6%)	5 (1.9%)
Hispanic, Latino/a/x, or Spanish origin	41 (7.2%)	16 (6.2%)
Native Hawaiian or Pacific Islander, Middle Eastern or North African, or Other	22 (3.9%)	12 (4.7%)
White	492 (86.3%)	213 (82.9%)
<b>Preferred Language</b>		
English	556 (98.6%)	250 (98.8%)
<b>Day Shift</b>	449 (79.3%)	215 (84.7%)
<b>Full-Time, Salaried</b>	508 (90.1%)	240 (94.5%)

<sup>1</sup> Mean (SD); n (%). Note: Small numbers are suppressed for reporting purposes only.

<sup>2</sup> A CDPS risk score of 1.0 represents the population average; scores < 1.0 are less medically complex than the average person, scores > 1.0 are more medically complex than the average person.

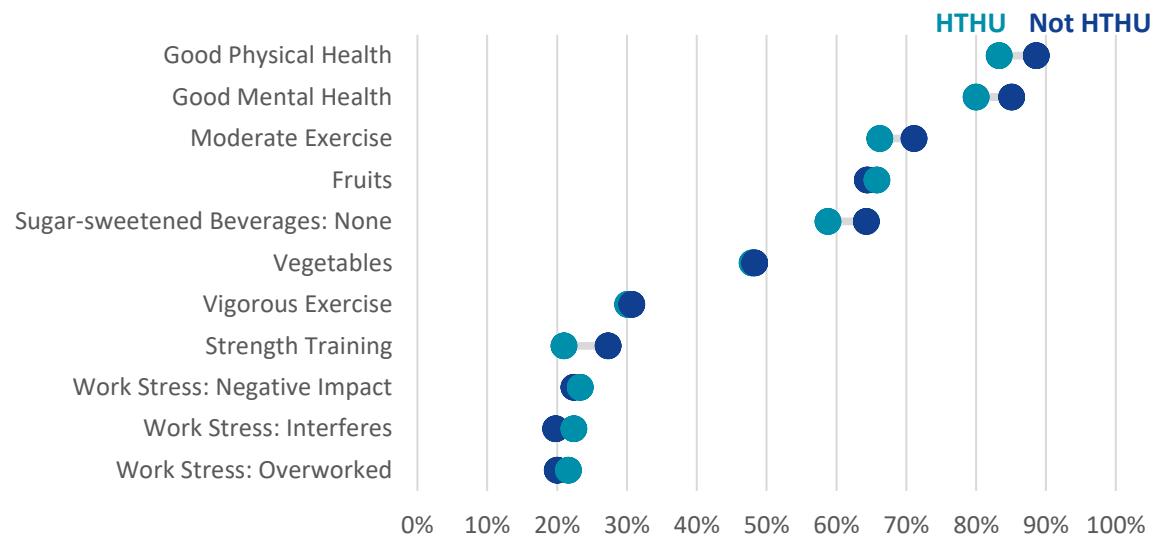
#### Health and Health Behaviors

We constructed logistic regression models to compare the current health and health behaviors of HTHU and never-HTHU survey respondents using the following outcomes:

- **Good physical health** – excellent, very good, or good physical health
- **Good mental health** – excellent, very good, or good mental health
- **Moderate, vigorous, and strength training exercise** – 3+ days per week of each type
- **Fruits** – 2+ servings of fruit per day
- **Vegetables** – 3+ servings of vegetables per day
- **Sugar-sweetened beverages** – no days of consumption per week
- **Sleep** – at least 7 hours of sleep per night
- **Work stress** – often or very often experiencing each of the following: job negatively impacting health, work interfering with personal life, and feeling overworked.

While there were some differences in current health and behaviors between the groups, none were statistically significant. Additionally, few HTHU participants attributed any changes in their health and health behaviors to the HTHU program itself, although slightly more respondents attributed changes in nutrition to the program.

#### Comparison of Health Outcomes between HTHU and Never-HTHU respondents



**Physical health, mental health, and job stress:** For the most part, participants reported that their physical and mental health was excellent, very good, or good (“good” health) and a limited proportion of both HTHU and non-HTHU participants reported frequently experiencing job stress.

- About a quarter of respondents felt their **physical health (27%) and mental health (25%) had improved** over the past year.
- **HTHU participants were less likely to report good physical health** than never-HTHU participants; this was the only marginally significant difference in health outcomes.
- A fairly low percentage of HTHU (23%) and never-HTHU participants (22%) reported that job stress negatively affected their mental health.

Because this survey was cross-sectional, the slightly worse health reported by the HTHU group may only indicate that PEBB employees with health challenges have an increased interest in engaging in a formal health program like HTHU in order to fill their HEM requirement.

**Nutrition:** With the exception of sugar-sweetened beverages, positive nutrition outcomes were reported by around the same percentage of HTHU and never-HTHU participants.

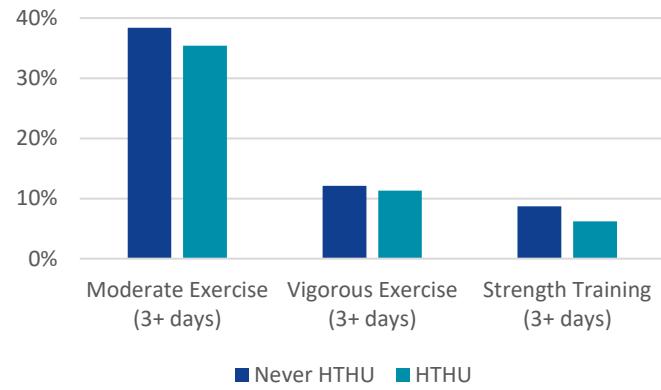
- Over half the survey participants (65%) reported eating two or more servings of fruit per day
- Slightly less than half of all participants (48%) reported eating three or more servings of vegetables per day.

- A smaller proportion of HTHU participants (59%) drank zero sugar-sweetened beverages in a week than never-HTHU respondents (64%).

While the HTHU program was not significantly related to dietary outcomes, we found that barriers to healthy eating (listed below) and social support (e.g., having someone offer to eat healthy foods with them) significantly affected dietary outcomes.

- Odds of engaging in healthy eating were negatively associated with the number of barriers experienced and positively associated with the number of social supports a participant reported.
- Barriers to healthy eating were: (1) not having sufficient time to cook, (2) not having convenient places to buy healthy food nearby, (3) feeling healthy food was too expensive, and (5) not enjoying changing the foods they eat.

**Exercise:** Of the three types (moderate, vigorous, and strength training), the largest proportion of both respondent groups engaged three or more days per week in moderate exercise.

- Participation in HTHU was not significantly related to the odds of engaging in any of the exercise types three or more times per week.
  - The number of reported barriers and social supports for exercise were significantly related to all three outcomes.
  - Barriers to exercise included: (1) not having sufficient time to exercise, (2) feeling physical discomfort when exercising, (3) not having convenient places to exercise nearby, (4) feeling unsafe exercising in their neighborhood, and (5) not enjoying exercise.
- 
- | Exercise Type               | Never HTHU (%) | HTHU (%) |
|-----------------------------|----------------|----------|
| Moderate Exercise (3+ days) | ~38            | ~35      |
| Vigorous Exercise (3+ days) | ~12            | ~11      |
| Strength Training (3+ days) | ~8             | ~6       |

The significant relationship between barriers and supports for diet and exercise outcomes may suggest that supporting program elements that focus on limiting barriers and increasing support could improve the health outcomes of participants.

**Sleep:** A particularly low proportion of both HTHU and never-HTHU respondents reported getting at least seven hours of sleep each day of the week (22.8% and 25.7%, respectively), making it the least commonly-achieved positive health outcome of any in the survey. Nearly a third of all participants reported getting a full night's sleep only three or fewer days per week.

**25%**

of all survey respondents received a full night's sleep (7 hours) every day of the week.

**Change in Health Behaviors:** The majority of respondents reported that their health and health behaviors were the same as one year prior to the survey, although around 15-20% of respondents reported “a little” improvement in each outcome.

- Most HTHU respondents did not attribute improvements in their healthy behaviors over the past year to the program, however **slightly more indicated that changes in their diet were due to their HTHU participation** than for the other behaviors.

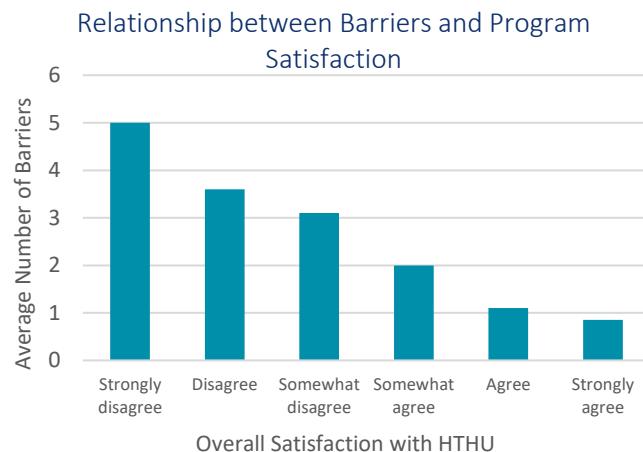
**Program Satisfaction:** A high proportion of the HTHU respondents who completed the survey agreed that they were satisfied with the program (82%), were likely to use it in the future (79%), and would recommend it to a colleague (82%). However, participants also reported a number of barriers to using the program.

- Lack of time was the most commonly-reported barrier, **54% of respondents reported insufficient time during the workday** to engage in HTHU.
- 34% of respondents indicated that their employer did not support engagement in the program.
- A larger proportion of Black, Indigenous, and People of Color (BIPOC) participants agreed with the statement “activities and sessions could be more relevant given my culture, language, or identity,” compared to White, single race participants (42% BIPOC, 23% White participants).

The number of barriers reported by respondents was associated with their overall program; participants who strongly disagreed with the statement ‘overall, I am satisfied with the HTHU program’ reported an average of 5.0 barriers, while those who strongly agreed reported an average of 1.1 barriers. Over half (51%) of respondents would have used the program more if their employer supported it.

**42%**

of BIPOC respondents agreed that the HTHU program could be more relevant to their culture, language, or identity.



#### Barriers to Using the HTHU Program

Barrier	N=257 <sup>1</sup>
Insufficient time during the workday	139 (54.1%)
Employer did not support engagement	86 (33.5%)
Activities and challenges were not useful	76 (29.6%)
Activities and sessions could be more relevant given culture, language, or identity	67 (26.1%)
Online learning sessions were not useful	55 (21.4%)
Insufficient access to technology	51 (19.8%)

<sup>1</sup>n (%)

## HTHU Interviews: Experiences, Challenges, and Facilitators

We interviewed 20 current and former participants of the HTHU program about their personal experiences with the program, what made the program easy or difficult to use, and their recommendations for improving the program. A number of interviewees participated in the program when it was team-based and involved a workbook; their feedback regarding the program often focused on and explored the positives and negatives around having a social aspect to a workplace wellness program.

Across all interviews, four key themes emerged related to what participants received and what they needed or wanted from the HTHU program:



### HTHU motivated participants to improve their health.

Many interviewees felt that HTHU did successfully encourage changes in their behavior. The motivation HTHU provided came from a few sources; in large part, HTHU served as a reminder or prompt to re-engage in physical activity, healthy eating, or other healthy behaviors. A number of interviewees focused on the sense of accountability they had to the program; a few participants mentioned that they needed some kind of accountability in order to keep with a program consistently. The sense of accountability was frequently discussed by interviewees who used the team-based approach available earlier in the program.

While HTHU recommendations, especially around diet and exercise, were often not considered ‘new’ information for interviewees, many found that re-learning or supplementing their existing knowledge supported their behavior changes. Interviewees indicated that the overlap with HTHU helped reinforce and remind them to make healthy choices.

Not all interviewees had a successful experience with HTHU, however. One participant indicated that workplace health programs, in general, will not always match people’s personalities; it can seem like such programs are too cut-and-dry and prescriptive (“*Just don’t do this. Just don’t do that*”). In addition, multiple interviewees reported that they had stopped using the program. For those who participated in the program before 2020, this was often due to the COVID-19 pandemic; interviewees de-prioritized the program in the beginning of the pandemic, especially, although some expressed interest in engaging again.

*“I think that it's like out of sight out of mind, so when you're doing a program like [HTHU], it keeps it in the forefront. And so you don't want to spend time reading information or watching the video and then ignore it... In that way, it can help someone change or improve their healthy habits.”*

***Recommendations for improvement:*** Interviewees emphasized that incentives were particularly helpful in motivating them to follow the HTHU program’s guidelines. For those who received the pedometer, blood pressure cuff, and strength bands distributed yearly as HTHU incentives earlier in the program, many found them useful or decided to purchase upgraded versions.

More generally, interviewees had suggestions for how incentives could increase their engagement in the program or with healthier behaviors. These included gym discounts, nutrition program discounts, and accumulating ‘points’ by participating in the program that could be exchanged for items in a program store or donations to organizations of their choice. One interviewee indicated that even a “gold star” provided some additional incentive to engage in HTHU.



### **HTHU could be more personalized to a participant’s goals and needs.**

While many interviewees found that the HTHU information was useful, even when high-level, there was a common desire that HTHU be more tailored to participants. Interviewees reported participating in the program for a variety of reasons; some had general health-related goals, like weight loss or increasing physical activity, while others had specific health concerns or chronic conditions to address. We heard from a number of participants that their conditions made some of the health recommendations inappropriate – such as one participant with specific dietary requirements that occasionally contradicted HTHU suggestions – or who wished that HTHU would offer recommendations around specific health conditions – such as prostate issues for men in a particular age bracket. One interviewee particularly enjoyed the live webinars, which they could choose from based on their interests, and was interested in even more in-depth information based on their specific interests and health concerns.

Some interviewees also expressed an interest in having a point of contact or health coach that could provide them more tailored information or respond to questions. While interviewees acknowledged that the program was designed for a large number of people (which contributed to keeping the information general), some suggested that there be at least some person to contact for a slightly smaller division of all PEBB employees (e.g., by agency). Interviewees also suggested that they could receive occasional reminder emails that tied back to their particular health goals, which they could identify at the beginning of the program.

Interviewees also varied in terms of which elements of the program they found challenging. One participant mentioned the importance of having varying degrees of difficulty in the suggestions or information provided, to allow participants to make moderate improvements to their healthy behaviors. In particular, they were interested in having recipe suggestions that

*“When I was first signing up, maybe if they asked me what drove me to sign up in the first place and then reminded me of my why a little later, it might have kept me engaged.”*

*“It seemed like it ran the gamut of everything from mental health and awareness to physical health and eating. It appeared to provide a holistic approach to health and not just focused on having an awesome beach body... I liked the all-encompassing aspect of it.”*

were healthy but not overly ‘ambitious,’ in terms of both the time it takes to prep the meal and the ingredients used – many of which did not appeal to the participant at all. Others found the additional screen time required to engage in the program to be too much of a commitment, especially if they were already spending 8- to 10-hour days on the computer. Similarly, some participants preferred the hard-copy versions of the workbook that were distributed when HTHU was team-based because they were less comfortable with apps or websites.

Accessibility was another program element that caused challenges for some participants. For example, one interviewee was troubled that the animated videos offered by the program did not have closed captioning and was therefore not accessible for participants who were Deaf or hard of hearing. While these particular videos were part of the earlier versions of HTHU and are no longer offered, it is important to determine what current program elements may create accessibility issues.



### **Social connection and workplace support are important, but can have drawbacks.**

A large number of interviewees had joined the HTHU program multiple years ago, often specifically because of the team-based nature of the program and the social connection it provided. Many of these participants were disappointed that the program no longer supported working as teams or stopped engaging with HTHU once that aspect was discontinued. In addition, as mentioned previously, completing the program as a group added a level of accountability that helped program adherence.

Interviewee opinions on whether and how much HTHU should support social connection varied. One interviewee mentioned that, while they were not opposed to interacting with co-workers through HTHU, they were highly uninterested in having that social connection be competitive (as with the current “challenges” that are part of HTHU). Another disliked being prompted to post comments on the leaderboard, because of the potential for social media-type interactions to turn contentious. At least one interviewee wanted workplace health programs to stay largely separate from the rest of their work and co-workers for privacy reasons.

Interviewees were also asked about support from their supervisor for engagement HTHU. Many, although not all, interviewees had felt supported by their supervisor or department in taking time to engage with HTHU, particularly since a number of them got together as a team or worked on the program at lunchtime. One interviewee mentioned that they feel more comfortable engaging with the program since the impact of the COVID-19 pandemic, which highlighted the need to support employee wellness. While interviewees did not want the

*“You have got to incentivize people by providing the time for them to do it. We’re all stretched thin, particularly now, and there has got to be a commitment from leadership to support that time and space to participate in these types of activities.”*

program to be promoted by supervisors and the workplace to the extent that it felt like a requirement, having supervisor support was considered helpful in engaging with the program.



### **Clarity and communication around the HTHU program could be improved.**

Throughout the interviews, it became evident that many participants did not have a clear idea of what the HTHU program offered, and how it had changed over time. Many interviewees were unsure of whether they were still enrolled in the HTHU program and whether the new Healthy U (HU) version was the same. Several interviewees were most familiar with the earlier iterations of the program (team-based, with printed workbooks and animated videos) and were unsure about which aspects of the program had been retained. Some were under the impression that the team aspect of the program was ongoing; one had tried to find information to re-start their group now that they were beginning to move back to office-based work. Even for elements that remained the same (like providing recipes), interviewees expressed confusion about where to find them in the newer, web-based version.

In addition to a lack of clarity about how the program had changed internally, interviewees often had difficulty distinguishing the HTHU program from other health-related programs. Some interviewees participated in multiple such programs provided by PEBB (e.g., Weight Watchers), which occasionally led to confusion about which benefits were associated with which program; while having a clear ‘branding’ may not be of primary importance to the HTHU program, it might create barriers to participants trying to remember where to find information they saw before. Even needing to remember logins and passwords added enough of a barrier to discourage participation.

***Effect of COVID-19:*** Keeping the program in mind for participants was important to many interviewees. Particularly during the pandemic, interviewees found it difficult to remember to engage with the program. As mentioned in the section on personalization, several were interested in receiving an increased number of reminders to help keep the program fresh in their mind. However, there were a range of opinions on the optimal amount of communication; one interviewee mentioned that the current level of reminders had already begun to feel like ‘nagging.’

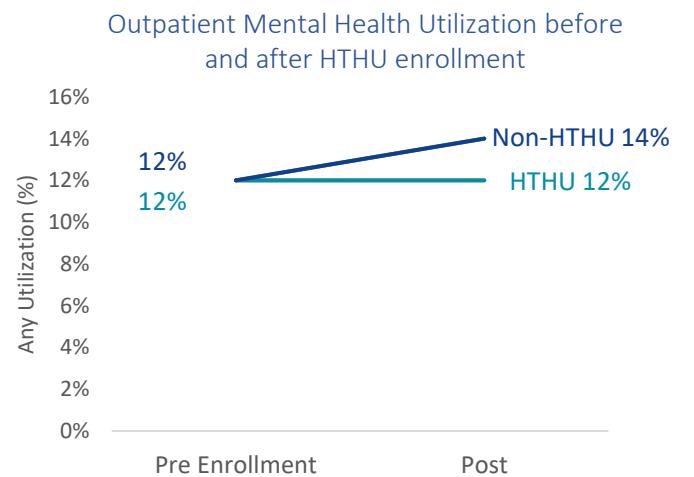
*“It's not like I lost an incredible amount of information or anything, but all of those lessons from the old way, of the old format and the level 1, 2, 3, that stuff was just gone without realizing it was going away. Then the new stuff was here without fully understanding how to navigate it and what the differences were.”*

*“I guess it was confusing, too, like, what's the connection? If there's a question about this, do I contact Providence? Do I contact PEBB? Do I contact this other sub-contracting entity? It was difficult to figure out who's on point for different things.”*

## HTHU Summary

Our evaluation of the HTHU program revealed mixed findings, including positive and negative changes in health care utilization, few direct impacts on self-reported health and health behaviors, and overall high satisfaction with the program. Of note, the incentive to participate in HTHU is much lower compared to HEM in general, which has clear financial benefits for PHP members. As such, those who choose HTHU to fulfill one of their health actions may be systematically different from those who do not. In fact, we observed several significant differences in our claims sample of HTHU participants and non-participants, with participants being slightly younger, more medically complex, and more likely to be female sex, White, and reside in a rural area. Survey respondents in both groups were also predominantly White and female gender, and more HTHU-users reported being in full-time, salaried employees in day shift positions. The demographics of HTHU participants and survey respondents highlight the importance of considering whose health care utilization and program experiences are not represented in the findings of this evaluation.

The claims analysis revealed that HTHU participants were less likely to use outpatient mental health care than non-participants in the year following program enrollment. This was largely driven by an increase in utilization in the non-HTHU control group, as shown in the figure. Participation in HTHU may have been protective and attenuated an increase in mental health care utilization that we would have otherwise expected to observe in this group. When looking at subgroups, we further found that the increase in utilization was driven by individuals who were more medically complex, as utilization among the lower complexity group did not change. As with our HEM analysis, interpretation of mental health care utilization is complicated; lower utilization may suggest that behavioral health needs were met or lessened, but it could also point to a limited ability to access mental health services given workforce shortages.



In addition, those who were more medically complex were more likely to visit the ED post-program enrollment compared to non-participants. This finding is unexpected; however, HTHU participants were more likely than non-participants to have one or physical and/or mental health condition at the time of enrollment, which could partially explain the higher likelihood of ED use. HTHU participants under the age of 50 were less likely to experience an inpatient admission post-enrollment compared to non-participants, suggesting that the program may have provided beneficial changes to utilization for some participants.

From the perspectives of program participants themselves, while there were no significant differences in health and health behaviors between participants and non-participants, we

found that most participants were highly satisfied with their program experience. Further, those who reported the fewest barriers to program participation were the most likely to report high satisfaction. There was a marginally significant difference in self-reported physical health, with participants reporting slightly worse health than non-participants. As with health care utilization, this finding could be due to selection into the program – participants were slightly more medically complex than non-participants. Across participants and non-participants, consistent sleep was the least common healthy behavior reported. In addition, we found that barriers and social support were associated with diet and exercise behaviors, suggesting that programs like HTHU might result in more positive outcomes by focusing more on these factors.

Finally, our interviews with a small subset of participants reinforced the general satisfaction with HTHU, but also provided insight into ways the program could be improved, including more personalization, accessibility, and clarity.

## Conclusion & Recommendations

- **Meeting employee needs and preferences.** In CORE's original evaluation of HEM in 2016, reductions in health care utilization were largely driven by enrollees who were 50 or older, had chronic conditions, and those at the top 20% of baseline health complexity. In the current assessment of both programs, we found similar differences in impact of HEM enrollment and HTHU participation for these subgroups. In addition, we heard from HTHU participants that there is a desire for more targeted programming to fit specific health needs, and BIPOC employees in particular felt that programs could be more culturally-relevant. Moreover, participants were significantly more medically complex than non-participants and reported poorer physical health, suggesting that members may be self-selecting into programs like HTHU based on certain health needs. Together, these findings underscore an opportunity for PEBB to consider unique health needs, goals, and preferences in the programs it offers to employees.
- **Supporting a mentally healthy workplace.** While less than a quarter of HTHU survey respondents reported that stress from their job negatively impacts their mental health, burnout and mental health are growing areas of concern for most employers, particularly in the context of the COVID-19 pandemic. We uncovered mixed findings with regard to mental health care utilization, with HEM enrollees overall having a higher likelihood of this outcome and HTHU participants having a lower likelihood. Interpreting these differences is difficult given that utilization of mental health services depends both on needs and on availability of services. Nonetheless, mental health remains an important component of supporting employee wellness and preventing burnout, turnover, and other outcomes linked to poor mental health.
- **Ensuring accessibility of wellness programming.** In the current digital age, most employee wellness programs involve some form of multimedia and technology. The rapid shift to remote work at the onset of the COVID-19 pandemic further increased our reliance on technology to complete work. Some interviewees in this study expressed a preference for HTHU's workbook and other features that took them away from a screen and made it easier to access and remember where certain resources could be found. Importantly, some components of the HTHU program were not accessible for individuals with vision or hearing issues. As with health needs and preferences, PEBB offerings may be more widely used and have greater impact by taking accessibility needs into account.

## Appendices

Appendix A – Detailed Methods .....	32
Appendix B – HEM Claims Analysis Results .....	36
Appendix C– HTHU Claims Analysis Results.....	40
Appendix D – Survey Questions, Responses, and Regression Results.....	47
Appendix E – HTHU Interview Guide .....	65

## Appendix A – Detailed Methods

### HEM Claims Analysis

#### Data Sources

To evaluate the effects of Health Engagement Model (HEM) plan participation, we conducted a retrospective cohort study. The primary data source for our analysis was PEBB Providence Health Plan administrative claims and enrollment data from January 1, 2011 through December 31, 2020. Member demographics including age, sex, race and ethnicity, and ZIP code were identified using enrollment data. Hospital admissions, emergency department visits, primary care and specialist visits, and outpatient behavioral health visits were identified from claims data according to the Healthcare Effectiveness Data and Information Set (HEDIS). Although HEDIS definitions changed during the study period, we applied 2019 definitions to ensure consistent variable definitions over time. Diagnosis codes and member demographics were used to assess medical complexity of members according to the Chronic Illness and Disability Payment System (CDPS). HEM participation dates were defined using plan type contained with the enrollment data.

#### Study Population

Using health plan enrollment data, we identified members who were continuously enrolled in a PEBB plan for the duration of the study period. We created a person-year level indicator for HEM enrollment based on plan enrollment dates. Enrollment in a HEM plan for 6 months or more during a given calendar year was assigned a value of 1 while enrollment for fewer than 6 months was assigned a value of 0.

#### Statistical Analysis

We explored the effect of HEM using three different definitions of participation; HEM participation at the individual year level (comparing members enrolled in HEM during a given year to those who were not), the effect of HEM implementation over time (years since HEM was implemented), and the effect of HEM participation over time (total years of participation). For each analysis, we evaluated the proportion of members with any utilization for hospital admissions, emergency department visits, primary care and specialist visits, and outpatient behavioral health visits using a modified Poisson regression with a log-link function and robust standard errors. The effect of HEM participation on per member per month utilization was estimated using a negative binomial model with a log link function. Age, sex, ethnicity, urban or rural residence, CDPS score were controlled for in all multivariable regression analyses.

We replicated all claims-data analyses for subgroups of members with one or more chronic condition identified using the Clinical Classification System, those age 50 and older, and those with a CDPS risk score in the top 20<sup>th</sup> percentile.

All procedures were approved and reviewed by the Providence Institutional Review Board. All statistical analysis was performed using R version 4.1.3. Statistical significance was estimated with two-sided p-values ( $p<0.05$ ) and regression results are presented with 95% confidence intervals (CIs).

## HTHU Claims Analysis

### Data Sources

To evaluate changes in healthcare utilization following enrollment in Health Team Healthy U (HTHU), we conducted a retrospective cohort study using a difference-in-difference approach. The primary data source for our analysis was PEBB Providence Health Plan administrative claims and enrollment data from January 1, 2011 through December 31, 2020. Member demographics including age, sex, race and ethnicity, and ZIP code were identified using enrollment data. Hospital admissions, emergency department visits, primary care and specialist visits, and outpatient behavioral health visits were identified from claims data according to the Healthcare Effectiveness Data and Information Set (HEDIS). Although HEDIS definitions changed during the study period, we applied 2019 definitions to ensure consistent variable definitions over time. Diagnosis codes and member demographics were used to assess medical complexity of members according to the Chronic Illness and Disability Payment System (CDPS). Additionally, HTHU program data containing dates of program enrollment was matched to health plan enrollment data.

### Study Population

The pre-intervention period was defined as the 12 months prior to an individual's initial enrollment into HTHU. The post-intervention period was defined as the 12 months following HTHU enrollment. Using HTHU program data matched to health plan enrollment data, we identified members who were enrolled in a PEBB plan for at least 24 consecutive months during the study period. Members who were enrolled in HTHU during every month of their respective PEBB plan enrollment were excluded. HTHU participants were included in the analysis if they enrolled in HTHU for at least 12 consecutive months and had at least 12 months of non-HTHU health plan enrollment prior to HTHU enrollment during the study period. The comparison group comprised of individuals enrolled in a PEBB plan for at least 24 consecutive months during study period and not were not enrolled in HTHU for 12 or more consecutive months. Index dates for the comparison group were randomly generated based on the distribution of HTHU participant index dates.

### Statistical Analysis

Difference-in-Difference approaches can be used to evaluate the effects of interventions introduced at a specific point in time. In settings where temporal trends are the same within the intervention and comparison groups, difference-in-difference designs can estimate intervention effect. When the change in the unexposed group is compared to the exposed group, the result is an estimate of the causal effect associated with the outcome of interest. By comparing healthcare utilization before and after enrollment in HTHU to trends in an unexposed comparison group, we estimated the effect of HTHU on the likelihood of utilization and total amount of utilization.

After establishing parallel baseline trends in per member per month utilization between HTHU participants and non-participants in the 12 months prior to a member's respective index date, we evaluated the proportion of members with any utilization for hospital admissions, emergency department visits, primary care and specialist visits, and outpatient behavioral health visits using a modified Poisson regression with a log-link function and robust standard errors. The effect of HTHU participation on per member per month utilization was estimated using a negative binomial model with a log link function. Age, sex, ethnicity, urban or rural residence, CDPS score were controlled for in all multivariable regression analyses.

We replicated all claims-data analyses for subgroups of members with one or more chronic condition identified using the Clinical Classification System, those age 50 and older, and those with a CDPS risk score in the top 20<sup>th</sup> percentile.

All procedures were approved and reviewed by the Providence Institutional Review Board. All statistical analysis was performed using R version 4.1.3. Statistical significance was estimated with two-sided p-values ( $p<0.05$ ) and regression results are presented with 95% confidence intervals (CIs).

## HTHU Survey Analysis

### **Survey sample creation**

HTHU participants were identified using a participant file provided by WebMD/StayWell and linked to PEBB Providence Health Plan (PHP) enrollment data. Propensity score matching was used to create a never-HTHU participant group whose characteristics matched those of the group of 2020-2021 HTHU participants but had never enrolled in HTHU in 2013-2021. Matching of participants was conducted on PHP claims and enrollment data from calendar year 2020 on these fields: sex, age, race/ethnicity, urban/rural status, CDPS risk score (i.e., health risk). Logistic regression was used to predict the probability of HTHU participation based on the listed characteristics. Nearest neighbor matching of propensity scores with a 3:1 ratio of controls to cases was used to determine case and control survey samples. This ratio was used to ensure sufficient response rates in both groups.

#### **Survey sample inclusion criteria:**

- Enrolled in Health Engagement Model (HEM)-based Providence Health Plan (PHP) for  $\geq 3$  months during calendar year 2020 (in an attempt to ensure at least three months or more of HTHU participation)
- Enrolled in a Health Engagement Model (HEM)-based PHP plan as of December 2021 (in an attempt to ensure continued PEBB employee)

#### **Survey sample exclusion criteria:**

- Enrolled in HTHU prior to but not during 2020/2021
- Missing sex, age, CDPS risk score, and/or urban/rural status
- No valid email address available

A total of 2,745 never-HTHU and 658 HTHU participants were invited to participate, with 570 (20.8%) never-HTHU and 257 (28.1%) HTHU participants completing the survey.

### **Statistical Analysis**

Preliminary analysis included examining distributions of responses and recoding variables as needed for analysis. Primary outcome variables were dichotomized according to general recommendations for each health behavior wherever possible:

- **Good physical health** – excellent, very good, or good physical health
- **Good mental health** – excellent, very good, or good mental health
- **Moderate, vigorous, and strength training exercise** – 3+ days per week of each type

- **Fruits** – 2+ servings of fruit per day
- **Vegetables** – 3+ servings of vegetables per day
- **Sugar-sweetened beverages** – no days of consumption per week
- **Sleep** – at least 7 hours of sleep per night
- **Work stress** – often or very often experiencing each of the following: job negatively impacting health, work interfering with personal life, and feeling overworked.

Health and health behaviors, as well as program satisfaction and barriers to program use were summarized descriptively. Logistic regression models were used to examine the association between HTHU participation and each primary outcome.

All procedures were approved and reviewed by the Providence Institutional Review Board. All statistical analysis was performed using Stata version 14.2. Statistical significance was estimated with two-sided p-values ( $p<0.05$ ).

## **HTHU Interviews**

Invitees were selected from survey participants who indicated that they were willing to be contacted about participating in an interview and provided their phone number. A balanced number of interviewees who indicated that they were satisfied with HTHU and those who were not satisfied were contacted and invited to participate in an interview; ultimately, interviews of 13 satisfied participants and 7 not-satisfied participants were conducted. Interviews lasted approximately 30 minutes, were transcribed, and were coded using Atlas.ti., followed by thematic analysis of coded transcripts to identify overarching themes.

## Appendix B – HEM Claims Analysis Results

**Table B1: Population Demographics**

Characteristic	N = 12,684
<b>Overall HEM Enrollment Status</b>	
Always HEM	7,506 (59%)
Sometimes HEM	5,178 (41%)
<b>Total Years Enrolled in HEM</b>	
	9 (2)
<b>Age</b>	
	45 (9)
<b>Gender</b>	
Female	6,761 (53%)
Male	5,921 (47%)
<b>Race</b>	
American Indian/Alaska Native	72 (0.6%)
Asian	441 (3.5%)
Black	156 (1.2%)
Hispanic	395 (3.1%)
Native Hawaiian/Pacific Islander	43 (0.3%)
Unknown	2,604 (21%)
White	8,973 (71%)
<b>Language</b>	
English	347 (2.7%)
Other	2 (<0.1%)
Unknown	12,335 (97%)
<b>Urban or Rural</b>	
Rural	3,226 (25%)
Urban	9,181 (72%)
Unknown	277 (2.2%)

<sup>1</sup> n (%); Mean (SD)

**Table B2: Baseline Chronic Conditions and Utilization**

Characteristic	2011 N = 12,684	2012 N = 12,684	2013 N = 12,684	2014 N = 12,684	2015 N = 12,684	2016 N = 12,684	2017 N = 12,684	2018 N = 12,684	2019 N = 12,684	2020 N = 12,684
<b>HEM Enrollment</b>	0 (0%)	12,684 (100%)	10,081 (79%)	10,211 (81%)	10,799 (85%)	10,382 (82%)	10,846 (86%)	10,865 (86%)	11,268 (89%)	11,385 (90%)
<b>CDPS Risk Score</b>	0.95 (0.71)	0.95 (0.71)	0.98 (0.76)	1.01 (0.77)	1.06 (0.81)	1.11 (0.90)	1.13 (0.92)	1.17 (0.95)	1.22 (1.01)	1.22 (1.07)
<b>Inpatient</b>										
Any Utilization	399 (3.1%)	374 (2.9%)	387 (3.1%)	349 (2.8%)	345 (2.7%)	352 (2.8%)	379 (3.0%)	354 (2.8%)	370 (2.9%)	340 (2.7%)
Per 1000 member months	2.8382 (16.3343)	2.7003 (17.0300)	2.8054 (16.6881)	2.4177 (14.8236)	2.5294 (16.2339)	2.5491 (15.9071)	2.8119 (17.8752)	2.6017 (16.3401)	2.8645 (21.2539)	2.5951 (17.4276)
<b>Emergency Department</b>										
Any Utilization	1,136 (9.0%)	1,123 (8.9%)	1,133 (8.9%)	1,126 (8.9%)	1,209 (9.5%)	1,303 (10%)	1,280 (10%)	1,336 (11%)	1,405 (11%)	1,120 (8.8%)
Per 1000 member months	10 (39)	10 (43)	10 (39)	10 (40)	11 (40)	12 (43)	12 (44)	13 (46)	13 (51)	11 (43)
<b>Primary Care Provider</b>										
Any Utilization	10,021 (79%)	9,937 (78%)	9,998 (79%)	10,055 (79%)	10,109 (80%)	10,198 (80%)	10,369 (82%)	10,635 (84%)	10,653 (84%)	10,142 (80%)
Per 1000 member months	200 (208)	190 (197)	196 (206)	199 (213)	206 (226)	212 (231)	224 (237)	241 (249)	250 (271)	217 (239)
<b>Specialty Care</b>										
Any Utilization	6,631 (52%)	6,231 (49%)	6,324 (50%)	6,506 (51%)	6,705 (53%)	6,882 (54%)	6,849 (54%)	6,698 (53%)	6,979 (55%)	6,580 (52%)
Per 1000 member months	129 (220)	122 (222)	125 (231)	128 (234)	134 (237)	140 (227)	135 (225)	135 (229)	142 (243)	126 (224)
<b>Outpatient Mental Health</b>										
Any Utilization	238 (1.9%)	233 (1.8%)	1,459 (12%)	1,418 (11%)	1,428 (11%)	1,485 (12%)	1,491 (12%)	1,565 (12%)	1,725 (14%)	1,456 (11%)
Per 1000 member months	6 (78)	7 (84)	78 (321)	79 (318)	80 (326)	82 (346)	84 (334)	89 (346)	94 (358)	59 (254)
<b>Chronic Conditions</b>										
Physical Health Conditions	4,646 (37%)	6,444 (51%)	6,617 (52%)	6,804 (54%)	7,095 (56%)	7,362 (58%)	7,441 (59%)	7,657 (60%)	7,972 (63%)	8,099 (64%)
Mental Health Conditions	1,037 (8.2%)	1,624 (13%)	1,643 (13%)	1,693 (13%)	1,900 (15%)	2,408 (19%)	2,643 (21%)	2,707 (21%)	2,876 (23%)	3,016 (24%)
Dual Diagnosis	504 (4.0%)	1,020 (8.0%)	1,089 (8.6%)	1,148 (9.1%)	1,349 (11%)	1,753 (14%)	1,936 (15%)	2,013 (16%)	2,174 (17%)	2,297 (18%)
ADHD	136 (1.1%)	206 (1.6%)	213 (1.7%)	226 (1.8%)	256 (2.0%)	271 (2.1%)	257 (2.0%)	245 (1.9%)	266 (2.1%)	289 (2.3%)
Alcohol Use Disorders	9 (<0.1%)	22 (0.2%)	24 (0.2%)	26 (0.2%)	50 (0.4%)	149 (1.2%)	373 (2.9%)	662 (5.2%)	273 (2.2%)	267 (2.1%)
Acute Myocardial Infarction	8 (<0.1%)	10 (<0.1%)	8 (<0.1%)	11 (<0.1%)	21 (0.2%)	17 (0.1%)	24 (0.2%)	34 (0.3%)	44 (0.3%)	44 (0.3%)
Anemia	460 (3.6%)	466 (3.7%)	486 (3.8%)	509 (4.0%)	492 (3.9%)	482 (3.8%)	517 (4.1%)	530 (4.2%)	571 (4.5%)	558 (4.4%)
Anxiety Disorders	636 (5.0%)	1,094 (8.6%)	1,139 (9.0%)	1,168 (9.2%)	1,277 (10%)	1,490 (12%)	1,572 (12%)	1,647 (13%)	1,785 (14%)	1,901 (15%)
Asthma	350 (2.8%)	292 (2.3%)	348 (2.7%)	341 (2.7%)	365 (2.9%)	455 (3.6%)	531 (4.2%)	600 (4.7%)	567 (4.5%)	626 (4.9%)
Atrial Fibrillation	47 (0.4%)	54 (0.4%)	61 (0.5%)	64 (0.5%)	81 (0.6%)	96 (0.8%)	121 (1.0%)	138 (1.1%)	170 (1.3%)	178 (1.4%)
Bipolar Disorder	96 (0.8%)	135 (1.1%)	133 (1.0%)	139 (1.1%)	156 (1.2%)	170 (1.3%)	148 (1.2%)	137 (1.1%)	136 (1.1%)	142 (1.1%)

Breast Cancer	77 (0.6%)	96 (0.8%)	111 (0.9%)	109 (0.9%)	120 (0.9%)	141 (1.1%)	152 (1.2%)	174 (1.4%)	190 (1.5%)	189 (1.5%)
Cataract	173 (1.4%)	196 (1.5%)	233 (1.8%)	313 (2.5%)	381 (3.0%)	469 (3.7%)	556 (4.4%)	671 (5.3%)	886 (7.0%)	868 (6.8%)
Heart Failure	22 (0.2%)	35 (0.3%)	44 (0.3%)	46 (0.4%)	47 (0.4%)	59 (0.5%)	65 (0.5%)	103 (0.8%)	128 (1.0%)	140 (1.1%)
Chronic Kidney Disease	74 (0.6%)	144 (1.1%)	181 (1.4%)	188 (1.5%)	278 (2.2%)	499 (3.9%)	603 (4.8%)	666 (5.3%)	700 (5.5%)	760 (6.0%)
COPD	32 (0.3%)	31 (0.2%)	39 (0.3%)	44 (0.3%)	66 (0.5%)	81 (0.6%)	107 (0.8%)	99 (0.8%)	107 (0.8%)	96 (0.8%)
Colorectal Cancer	13 (0.1%)	10 (<0.1%)	13 (0.1%)	17 (0.1%)	14 (0.1%)	19 (0.1%)	20 (0.2%)	26 (0.2%)	37 (0.3%)	38 (0.3%)
Cystic Fibrosis	41 (0.3%)	60 (0.5%)	40 (0.3%)	49 (0.4%)	49 (0.4%)	54 (0.4%)	62 (0.5%)	55 (0.4%)	56 (0.4%)	54 (0.4%)
Depression	1,422 (11%)	1,408 (11%)	1,415 (11%)	1,475 (12%)	1,710 (13%)	1,799 (14%)	1,792 (14%)	1,883 (15%)	2,002 (16%)	1,958 (15%)
Diabetes	602 (4.7%)	742 (5.8%)	797 (6.3%)	858 (6.8%)	914 (7.2%)	973 (7.7%)	1,063 (8.4%)	1,146 (9.0%)	1,202 (9.5%)	1,251 (9.9%)
Drug Use Disorders	--	9 (<0.1%)	13 (0.1%)	17 (0.1%)	25 (0.2%)	55 (0.4%)	74 (0.6%)	79 (0.6%)	96 (0.8%)	104 (0.8%)
Epilepsy	35 (0.3%)	63 (0.5%)	62 (0.5%)	63 (0.5%)	56 (0.4%)	61 (0.5%)	66 (0.5%)	67 (0.5%)	66 (0.5%)	70 (0.6%)
Fibromyalgia, Chronic Pain, and Fatigue	949 (7.5%)	1,460 (12%)	1,429 (11%)	1,531 (12%)	1,843 (15%)	2,265 (18%)	2,592 (20%)	2,725 (21%)	2,680 (21%)	2,375 (19%)
Glaucoma	257 (2.0%)	267 (2.1%)	272 (2.1%)	303 (2.4%)	343 (2.7%)	374 (2.9%)	429 (3.4%)	465 (3.7%)	494 (3.9%)	464 (3.7%)
Hearing Impairment	66 (0.5%)	128 (1.0%)	123 (1.0%)	157 (1.2%)	178 (1.4%)	224 (1.8%)	251 (2.0%)	300 (2.4%)	396 (3.1%)	372 (2.9%)
HIV/AIDS	12 (<0.1%)	12 (<0.1%)	12 (<0.1%)	12 (<0.1%)	12 (<0.1%)	13 (0.1%)	13 (0.1%)	13 (0.1%)	13 (0.1%)	14 (0.1%)
Hyperlipidemia	1,467 (12%)	1,472 (12%)	1,491 (12%)	1,505 (12%)	1,591 (13%)	1,710 (13%)	1,673 (13%)	1,516 (12%)	1,619 (13%)	1,614 (13%)
Benign Prostatic Hyperplasia	73 (0.6%)	68 (0.5%)	85 (0.7%)	97 (0.8%)	119 (0.9%)	132 (1.0%)	202 (1.6%)	219 (1.7%)	251 (2.0%)	275 (2.2%)
Hypertension	1,290 (10%)	1,300 (10%)	1,392 (11%)	1,488 (12%)	1,578 (12%)	1,762 (14%)	1,835 (14%)	2,105 (17%)	2,292 (18%)	2,194 (17%)
Acquired Hypothyroidism	586 (4.6%)	601 (4.7%)	671 (5.3%)	670 (5.3%)	723 (5.7%)	780 (6.1%)	818 (6.4%)	812 (6.4%)	857 (6.8%)	863 (6.8%)
Ischemic Heart Disease	130 (1.0%)	181 (1.4%)	197 (1.6%)	221 (1.7%)	238 (1.9%)	271 (2.1%)	312 (2.5%)	361 (2.8%)	402 (3.2%)	424 (3.3%)
Leukemias and Lymphomas	13 (0.1%)	26 (0.2%)	29 (0.2%)	34 (0.3%)	36 (0.3%)	41 (0.3%)	51 (0.4%)	60 (0.5%)	66 (0.5%)	69 (0.5%)
Liver Disease	52 (0.4%)	101 (0.8%)	109 (0.9%)	115 (0.9%)	136 (1.1%)	178 (1.4%)	196 (1.5%)	241 (1.9%)	278 (2.2%)	291 (2.3%)
Migraine and Chronic Headache	244 (1.9%)	427 (3.4%)	414 (3.3%)	436 (3.4%)	512 (4.0%)	593 (4.7%)	642 (5.1%)	638 (5.0%)	714 (5.6%)	696 (5.5%)
Mobility Impairments	10 (<0.1%)	18 (0.1%)	21 (0.2%)	18 (0.1%)	21 (0.2%)	22 (0.2%)	21 (0.2%)	27 (0.2%)	29 (0.2%)	27 (0.2%)
Multiple Sclerosis	30 (0.2%)	41 (0.3%)	42 (0.3%)	48 (0.4%)	49 (0.4%)	54 (0.4%)	55 (0.4%)	53 (0.4%)	56 (0.4%)	58 (0.5%)
Obesity	331 (2.6%)	668 (5.3%)	758 (6.0%)	888 (7.0%)	1,068 (8.4%)	1,263 (10.0%)	1,482 (12%)	1,690 (13%)	1,724 (14%)	1,606 (13%)
Osteoporosis	37 (0.3%)	42 (0.3%)	43 (0.3%)	57 (0.4%)	54 (0.4%)	84 (0.7%)	100 (0.8%)	108 (0.9%)	130 (1.0%)	149 (1.2%)
Prostate Cancer	31 (0.2%)	31 (0.2%)	35 (0.3%)	41 (0.3%)	45 (0.4%)	54 (0.4%)	57 (0.4%)	69 (0.5%)	80 (0.6%)	88 (0.7%)
Personality Disorders	8 (<0.1%)	13 (0.1%)	15 (0.1%)	14 (0.1%)	78 (0.6%)	181 (1.4%)	231 (1.8%)	218 (1.7%)	214 (1.7%)	206 (1.6%)
Post-Traumatic Stress Disorder	91 (0.7%)	126 (1.0%)	137 (1.1%)	149 (1.2%)	170 (1.3%)	196 (1.5%)	221 (1.7%)	240 (1.9%)	254 (2.0%)	266 (2.1%)
Peripheral Vascular Disease	10 (<0.1%)	13 (0.1%)	7 (<0.1%)	15 (0.1%)	18 (0.1%)	19 (0.1%)	22 (0.2%)	43 (0.3%)	62 (0.5%)	60 (0.5%)
RA/OA	429 (3.4%)	767 (6.0%)	843 (6.6%)	932 (7.3%)	1,009 (8.0%)	1,190 (9.4%)	1,292 (10%)	1,352 (11%)	1,519 (12%)	1,502 (12%)

Stroke / TIA	26 (0.2%)	19 (0.1%)	27 (0.2%)	37 (0.3%)	38 (0.3%)	27 (0.2%)	31 (0.2%)	28 (0.2%)	34 (0.3%)	30 (0.2%)
Traumatic Brain Injury	--	--	8 (<0.1%)	15 (0.1%)	19 (0.1%)	28 (0.2%)	20 (0.2%)	20 (0.2%)	28 (0.2%)	33 (0.3%)
Tobacco Use	150 (1.2%)	288 (2.3%)	267 (2.1%)	262 (2.1%)	250 (2.0%)	253 (2.0%)	235 (1.9%)	280 (2.2%)	308 (2.4%)	296 (2.3%)
Pressure and Chronic Ulcers	7 (<0.1%)	16 (0.1%)	17 (0.1%)	12 (<0.1%)	21 (0.2%)	30 (0.2%)	39 (0.3%)	45 (0.4%)	49 (0.4%)	52 (0.4%)
Viral Hepatitis	25 (0.2%)	37 (0.3%)	41 (0.3%)	41 (0.3%)	44 (0.3%)	41 (0.3%)	42 (0.3%)	36 (0.3%)	34 (0.3%)	38 (0.3%)

<sup>1</sup> n (%); Mean (SD)

## Appendix C– HTHU Claims Analysis Results

**Table C1: Relative Risk of Healthcare Utilization for Years Enrolled in HEM by Subgroup**

Characteristic	Emergency Dept			Inpatient			Outpatient Mental Health			Primary Care			Specialty Care		
	RR	95% CI	p-value	RR	95% CI	p-value	RR	95% CI	p-value	RR	95% CI	p-value	RR	95% CI	p-value
<b>Unadjusted Analysis</b>															
Overall	0.9	0.82, 0.90	<0.001	0.97	0.89, 1.06	0.5	1.27	1.18, 1.37	<0.001	1.05	1.04, 1.06	<0.001	1.07	1.06, 1.09	<0.001
Low Risk	0.9	0.80, 0.90	<0.001	1.19	1.05, 1.35	0.008	1.25	1.14, 1.36	<0.001	1.06	1.05, 1.08	<0.001	1.10	1.08, 1.12	<0.001
High Risk	0.9	0.83, 0.94	<0.001	0.86	0.77, 0.96	0.005	1.33	1.20, 1.47	<0.001	1.00	1.00, 1.01	0.2	1.03	1.02, 1.05	<0.001
Age < 50	0.9	0.81, 0.92	<0.001	1.13	1.01, 1.26	0.036	1.32	1.21, 1.44	<0.001	1.03	1.02, 1.04	<0.001	1.06	1.03, 1.09	<0.001
Age 50+	0.9	0.80, 0.92	<0.001	0.86	0.76, 0.97	0.016	1.20	1.07, 1.35	0.002	1.07	1.06, 1.09	<0.001	1.09	1.07, 1.12	<0.001
No Chronic Conditions	0.8	0.76, 0.90	<0.001	1.39	1.18, 1.64	<0.001	1.31	1.18, 1.46	<0.001	1.07	1.05, 1.09	<0.001	1.05	1.02, 1.08	0.003
1+ Chronic Condition	0.8	0.78, 0.87	<0.001	0.84	0.76, 0.92	<0.001	1.20	1.10, 1.32	<0.001	1.01	1.00, 1.02	0.018	1.04	1.02, 1.06	<0.001
<b>Adjusted Analysis</b>															
Overall	0.9	0.82, 0.90	<0.001	0.94	0.86, 1.02	0.12	1.21	1.13, 1.31	<0.001	1.04	1.03, 1.05	<0.001	1.07	1.05, 1.09	<0.001
Low Risk	0.9	0.82, 0.92	<0.001	1.13	1.00, 1.29	0.059	1.22	1.12, 1.33	<0.001	1.06	1.04, 1.07	<0.001	1.10	1.08, 1.12	<0.001
High Risk	0.9	0.84, 0.95	<0.001	0.87	0.78, 0.96	0.007	1.26	1.14, 1.40	<0.001	1.00	0.99, 1.01	0.6	1.03	1.02, 1.05	<0.001
Age < 50	0.9	0.80, 0.91	<0.001	1.06	0.95, 1.19	0.3	1.27	1.16, 1.38	<0.001	1.02	1.00, 1.03	0.008	1.05	1.02, 1.07	<0.001
Age 50+	0.9	0.81, 0.93	<0.001	0.87	0.77, 0.98	0.025	1.14	1.01, 1.27	0.027	1.06	1.05, 1.08	<0.001	1.09	1.07, 1.12	<0.001
No Chronic Conditions	0.8	0.75, 0.89	<0.001	1.20	1.02, 1.43	0.032	1.23	1.10, 1.38	<0.001	1.05	1.03, 1.07	<0.001	1.04	1.01, 1.07	0.015
1+ Chronic Condition	0.8	0.80, 0.89	<0.001	0.84	0.77, 0.92	<0.001	1.16	1.06, 1.26	0.001	1.01	1.00, 1.01	0.073	1.04	1.03, 1.06	<0.001

RR = Rate Ratio, CI = Confidence Interval

Controlling for year (continuous), gender, race, urban or rural residence, age (continuous), and CDPS risk score (continuous)

**Table C2: Percent Change in PMPM Healthcare Utilization for Years Enrolled in HEM by Subgroup**

	Emergency Dept			Inpatient			Outpatient Mental Health			Primary Care			Specialty Care		
	IRR	95% CI	p-value	IRR	95% CI	p-value	IRR	95% CI	p-value	IRR	95% CI	p-value	IRR	95% CI	p-value
<b>Unadjusted Analysis</b>															
Overall	0.83	0.78, 0.87	<0.001	0.95	0.87, 1.04	0.2	1.41	1.31, 1.53	<0.001	1.04	1.03, 1.06	<0.001	1.10	1.07, 1.13	<0.001
Low Risk	0.84	0.79, 0.90	<0.001	1.18	1.04, 1.34	0.01	1.41	1.27, 1.56	<0.001	1.07	1.05, 1.09	<0.001	1.14	1.11, 1.18	<0.001
High Risk	0.83	0.76, 0.90	<0.001	0.85	0.76, 0.95	0.004	1.44	1.27, 1.64	<0.001	1.02	0.99, 1.04	0.2	1.07	1.03, 1.11	<0.001
Age < 50	0.84	0.78, 0.91	<0.001	1.11	0.99, 1.25	0.076	1.52	1.36, 1.70	<0.001	1.03	1.01, 1.05	0.009	1.07	1.03, 1.12	<0.001
Age 50+	0.81	0.75, 0.88	<0.001	0.84	0.74, 0.95	0.005	1.26	1.13, 1.42	<0.001	1.07	1.04, 1.09	<0.001	1.13	1.09, 1.17	<0.001
No Chronic Conditions	0.82	0.75, 0.90	<0.001	1.36	1.15, 1.60	<0.001	1.69	1.49, 1.93	<0.001	1.06	1.03, 1.08	<0.001	1.05	1.01, 1.09	0.024
1+Chronic Condition	0.77	0.73, 0.82	<0.001	0.82	0.74, 0.91	<0.001	1.20	1.09, 1.32	<0.001	0.99	0.97, 1.00	0.14	1.04	1.01, 1.07	0.003
<b>Adjusted Analysis</b>															
Overall	0.86	0.81, 0.90	<0.001	0.96	0.88, 1.04	0.3	1.31	1.19, 1.44	<0.001	1.03	1.02, 1.05	<0.001	1.12	1.09, 1.15	<0.001
Low Risk	0.86	0.80, 0.91	<0.001	1.13	0.99, 1.28	0.065	1.31	1.15, 1.50	<0.001	1.05	1.04, 1.07	<0.001	1.14	1.11, 1.18	<0.001
High Risk	0.85	0.78, 0.92	<0.001	0.86	0.77, 0.96	0.007	1.30	1.14, 1.48	<0.001	1.00	0.98, 1.02	>0.9	1.07	1.04, 1.11	<0.001
Age 50+	0.87	0.81, 0.93	<0.001	0.89	0.78, 1.01	0.067	1.18	1.03, 1.34	0.013	1.07	1.05, 1.09	<0.001	1.17	1.13, 1.20	<0.001
Age < 50	0.83	0.78, 0.90	<0.001	1.05	0.93, 1.19	0.4	1.46	1.28, 1.67	<0.001	1.01	0.99, 1.03	0.5	1.07	1.04, 1.11	<0.001
No Chronic Conditions	0.83	0.76, 0.91	<0.001	1.21	1.02, 1.43	0.028	1.55	1.31, 1.84	<0.001	1.04	1.01, 1.06	0.001	1.05	1.01, 1.09	0.019
1+Chronic Condition	0.82	0.77, 0.87	<0.001	0.86	0.78, 0.95	0.002	1.12	1.00, 1.26	0.053	0.99	0.97, 1.00	0.06	1.08	1.05, 1.11	<0.001

IRR = Incidence Rate Ratio, CI = Confidence Interval

Controlling for year (continuous), gender, race, urban or rural residence, age (continuous), and CDPS risk score (continuous)

**Table C3: Difference in Difference estimate of Relative Risk of Utilization Following HTHU Enrollment by Subgroup**

Characteristic	Emergency Dept			Inpatient			Outpatient Mental Health			Primary Care			Specialty Care		
	RR	95% CI	p-value	RR	95% CI	p-value	RR	95% CI	p-value	RR	95% CI	p-value	RR	95% CI	p-value
<b>Unadjusted Analysis</b>															
Overall	1.13	0.99, 1.28	0.064	0.91	0.70, 1.17	0.5	0.89	0.81, 0.97	0.008	1.04	0.95, 1.14	0.4	1.01	0.98, 1.05	0.5
High Risk	1.25	1.04, 1.51	0.017	0.92	0.64, 1.31	0.6	0.85	0.76, 0.96	0.009	1.01	0.99, 1.03	0.4	1.02	0.97, 1.06	0.5
Low Risk	1.07	0.90, 1.27	0.4	0.89	0.61, 1.28	0.5	0.93	0.82, 1.05	0.2	0.98	0.96, 1.01	0.2	1.01	0.96, 1.07	0.6
Age 50+	1.19	0.97, 1.46	0.091	1.44	0.96, 2.15	0.081	0.84	0.71, 0.99	0.036	0.99	0.96, 1.02	0.4	1.02	0.97, 1.07	0.6
Age < 50	1.08	0.92, 1.27	0.3	0.67	0.48, 0.95	0.023	0.91	0.82, 1.01	0.065	0.99	0.96, 1.02	0.4	1.02	0.96, 1.07	0.6
1+ Chronic Conditions	1.12	0.98, 1.30	0.11	0.96	0.72, 1.29	0.8	0.90	0.81, 0.99	0.039	0.99	0.97, 1.01	0.3	1.03	0.99, 1.07	0.2
No Chronic Conditions	1.20	0.92, 1.57	0.2	0.81	0.47, 1.39	0.4	0.89	0.76, 1.04	0.13	0.99	0.95, 1.03	0.7	0.99	0.91, 1.08	0.8
<b>Unadjusted Analysis</b>															
Overall	1.13	0.99, 1.28	0.064	0.91	0.70, 1.17	0.5	0.89	0.81, 0.97	0.008	1.04	0.95, 1.14	0.4	1.01	0.98, 1.05	0.5
High Risk	1.25	1.04, 1.51	0.017	0.92	0.64, 1.31	0.6	0.85	0.76, 0.96	0.009	1.01	0.99, 1.03	0.4	1.02	0.97, 1.06	0.5
Low Risk	1.07	0.90, 1.27	0.4	0.89	0.61, 1.28	0.5	0.93	0.82, 1.05	0.2	0.98	0.96, 1.01	0.2	1.01	0.96, 1.07	0.6
Age 50+	1.19	0.97, 1.46	0.091	1.44	0.96, 2.15	0.081	0.84	0.71, 0.99	0.036	0.99	0.96, 1.02	0.4	1.02	0.97, 1.07	0.6
Age < 50	1.08	0.92, 1.27	0.3	0.67	0.48, 0.95	0.023	0.91	0.82, 1.01	0.065	0.99	0.96, 1.02	0.4	1.02	0.96, 1.07	0.6
1+ Chronic Conditions	1.12	0.98, 1.30	0.11	0.96	0.72, 1.29	0.8	0.90	0.81, 0.99	0.039	0.99	0.97, 1.01	0.3	1.03	0.99, 1.07	0.2
No Chronic Conditions	1.20	0.92, 1.57	0.2	0.81	0.47, 1.39	0.4	0.89	0.76, 1.04	0.13	0.99	0.95, 1.03	0.7	0.99	0.91, 1.08	0.8

RR = Rate Ratio, CI = Confidence Interval

Controlling for year (continuous), gender, race, urban or rural residence, age (continuous), and CDPS risk score (continuous)

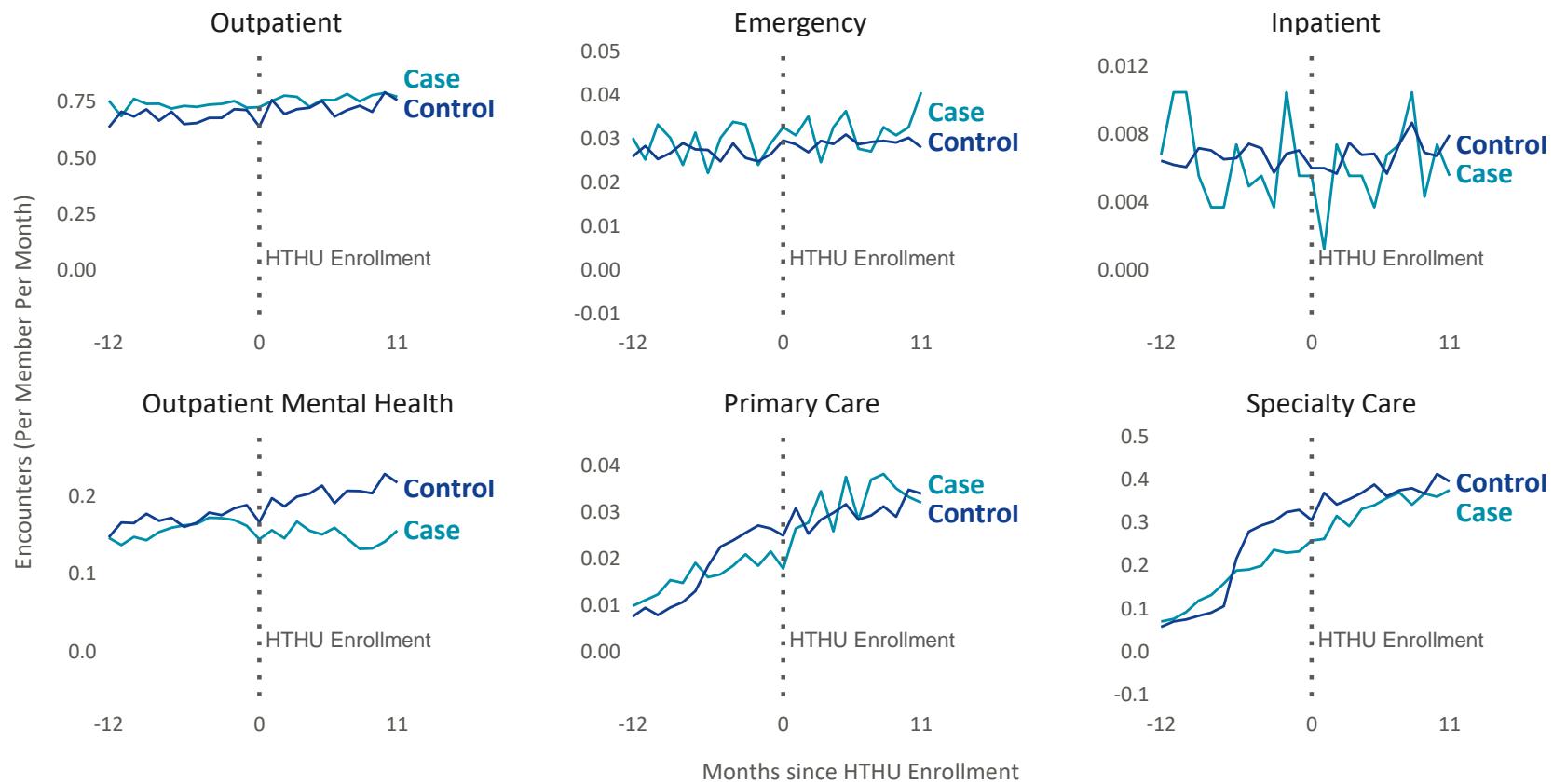
**Table C4: Difference in Difference estimate of Percent Change in Utilization Following HTHU Enrollment by Subgroup**

	Emergency Dept			Inpatient			Outpatient Mental Health			Primary Care			Specialty Care		
	IRR	95% CI	p-value	IRR	95% CI	p-value	IRR	95% CI	p-value	IRR	95% CI	p-value	IRR	95% CI	p-value
<b>Unadjusted Analysis</b>															
Overall	1.01	0.86, 1.20	0.9	0.89	0.67, 1.17	0.4	0.81	0.66, 0.99	0.037	1.00	0.95, 1.05	>0.9	0.95	0.87, 1.03	0.2
High Risk	1.16	0.89, 1.50	0.3	0.94	0.64, 1.40	0.8	0.73	0.54, 1.00	0.048	1.00	0.92, 1.09	>0.9	0.98	0.86, 1.12	0.8
Low Risk	0.92	0.75, 1.14	0.5	0.81	0.55, 1.19	0.3	0.88	0.68, 1.15	0.4	1.00	0.95, 1.06	>0.9	0.92	0.84, 1.01	0.1
Age 50+	1.19	0.92, 1.54	0.2	1.41	0.90, 2.22	0.13	0.82	0.56, 1.20	0.3	0.99	0.92, 1.07	0.8	0.93	0.82, 1.05	0.2
Age < 50	0.93	0.75, 1.15	0.5	0.64	0.45, 0.92	0.016	0.79	0.63, 1.01	0.058	1.01	0.94, 1.08	0.8	0.97	0.87, 1.09	0.6
Any Chronic Conditions	1.01	0.83, 1.22	>0.9	0.95	0.68, 1.30	0.7	0.81	0.63, 1.03	0.091	1.00	0.94, 1.06	>0.9	0.95	0.86, 1.04	0.3
No Chronic Conditions	1.11	0.81, 1.52	0.5	0.76	0.44, 1.31	0.3	0.81	0.57, 1.16	0.2	1.00	0.92, 1.09	>0.9	0.94	0.82, 1.09	0.4
<b>Adjusted Analysis</b>															
Overall	1.01	0.86, 1.19	0.9	0.89	0.67, 1.17	0.4	0.86	0.66, 1.11	0.2	1.00	0.96, 1.05	0.9	0.92	0.85, 1.00	0.047
High Risk	1.16	0.90, 1.49	0.3	0.94	0.64, 1.39	0.8	0.75	0.53, 1.06	0.11	1.01	0.93, 1.09	0.9	0.98	0.87, 1.12	0.8
Low Risk	0.92	0.75, 1.14	0.4	0.85	0.52, 1.39	0.5	0.88	0.62, 1.26	0.5	1.01	0.95, 1.06	0.8	0.91	0.82, 1.00	0.051
Age 50+	1.19	0.92, 1.54	0.2	1.41	0.90, 2.21	0.13	0.82	0.56, 1.20	0.3	0.99	0.92, 1.06	0.7	0.92	0.82, 1.03	0.14
Age < 50	0.93	0.75, 1.15	0.5	0.70	0.40, 1.21	0.2	0.79	0.62, 1.01	0.059	1.02	0.96, 1.09	0.5	0.92	0.83, 1.03	0.2
Any Chronic Conditions	1.01	0.83, 1.22	>0.9	0.95	0.69, 1.30	0.7	0.87	0.64, 1.19	0.4	1.01	0.95, 1.07	0.8	0.93	0.85, 1.02	0.13
No Chronic Conditions	1.11	0.81, 1.51	0.5	0.72	0.32, 1.65	0.4	0.81	0.57, 1.15	0.2	1.00	0.92, 1.08	>0.9	0.93	0.80, 1.08	0.4

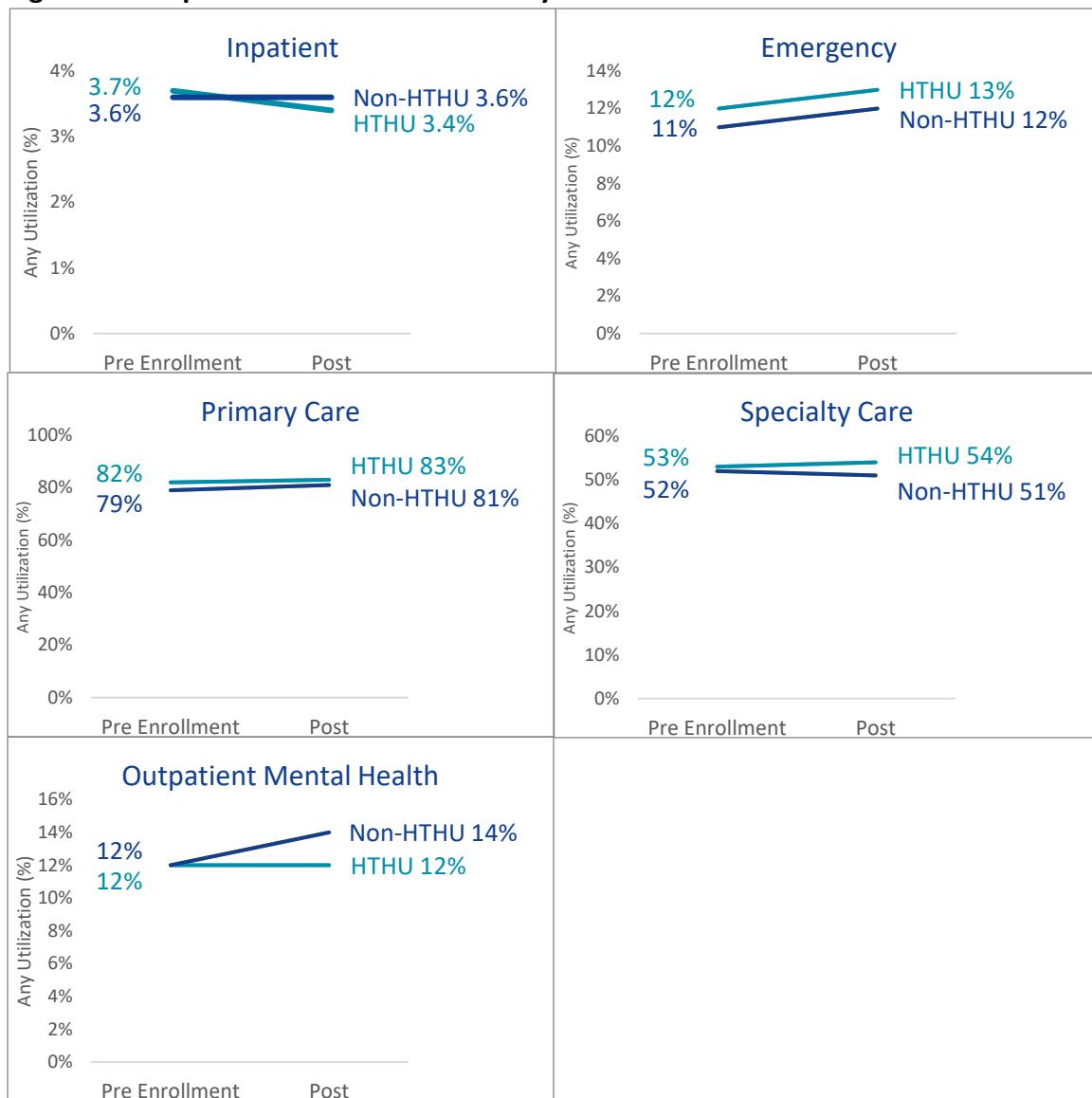
IRR = Incidence Rate Ratio, CI = Confidence Interval

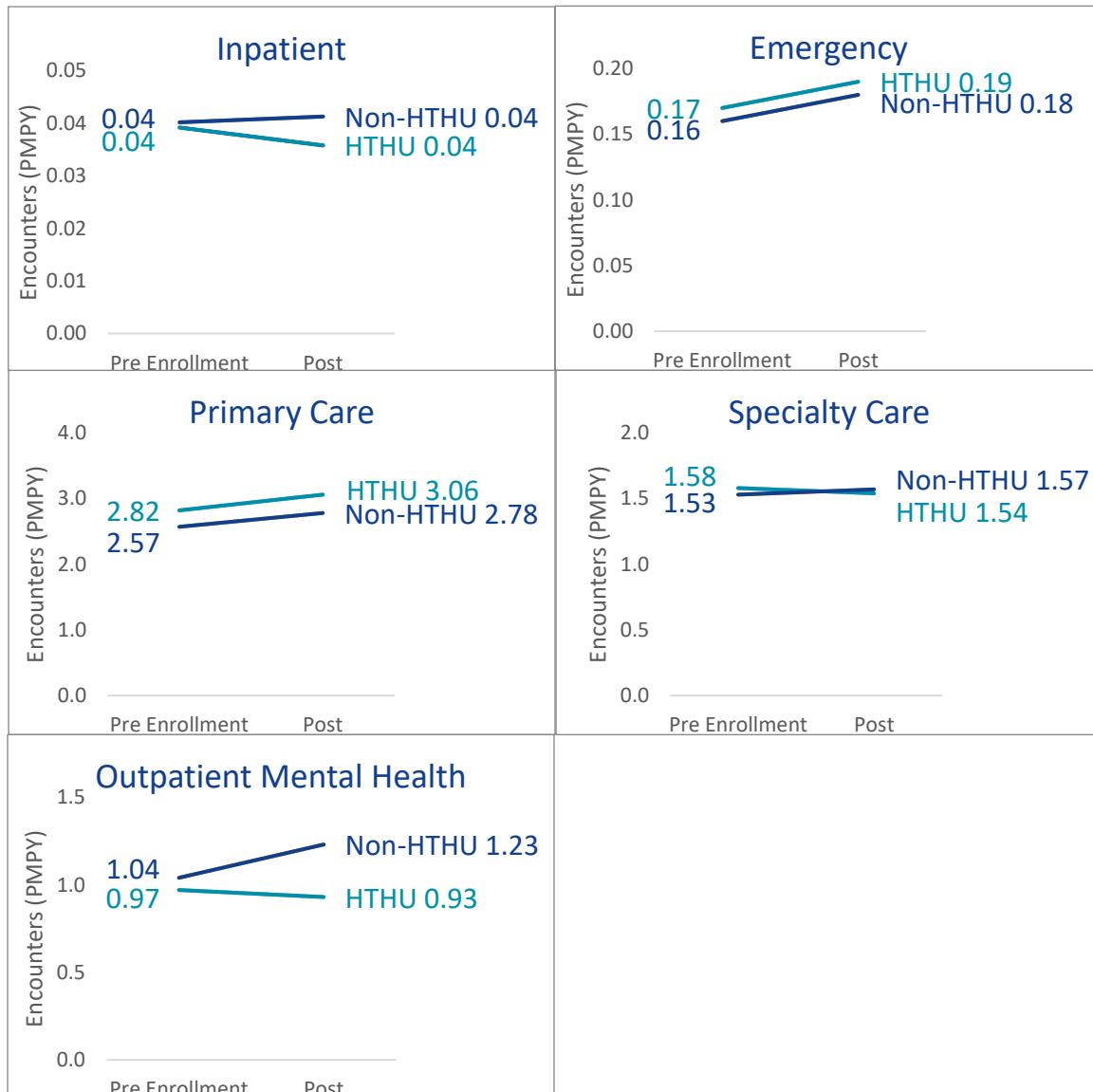
Controlling for year (continuous), gender, race, urban or rural residence, age (continuous), and CDPS risk score (continuous)

**Figure C1: Per Member Utilization by Month Before and After Enrollment**



**Figure C2: Proportion of Members with any Utilization Before and After Enrollment**



**Figure C3: Per Member Per Month Utilization Before and After Enrollment**

## Appendix D – Survey Questions, Responses, and Regression Results

### Survey questions and responses

Note: Small numbers have been suppressed for reporting purposes only.

#### 1. In general, how would you describe your overall physical and mental health?

- Physical health

	Non HTHU	HTHU	Total
Excellent	51 (8.9%)	9 (3.5%)	60 (7.3%)
Very good	195 (34.2%)	103 (40.1%)	298 (36.0%)
Good	258 (45.3%)	102 (39.7%)	360 (43.5%)
Fair	59 (10.4%)	36 (14.0%)	95 (11.5%)
Poor or Unknown	7 (1.3%)	7 (2.7%)	14 (1.7%)
Total	570	257	827

- Mental or emotional health

	Non HTHU	HTHU	Total
Excellent	74 (13.0%)	17 (6.6%)	91 (11.0%)
Very good	201 (35.3%)	88 (34.2%)	289 (34.9%)
Good	205 (36.0%)	99 (38.5%)	304 (36.8%)
Fair	75 (13.2%)	42 (16.3%)	117 (14.1%)
Poor or Unknown	15 (2.7%)	11 (4.3%)	26 (3.2%)
Total	570	257	827

#### 2. Compared to 12 months ago, how is your overall physical and mental health?

- Physical health

	Non HTHU	HTHU	Total
Worse, Much worse, or Unknown	101 (17.8%)	42 (16.4%)	143 (17.2%)
About the same	320 (56.1%)	142 (55.3%)	462 (55.9%)
Better	125 (21.9%)	62 (24.1%)	187 (22.6%)
Much better	24 (4.2%)	11 (4.3%)	35 (4.2%)
Total	570	257	827

- Mental health

	Non HTHU	HTHU	Total
Much worse or Unknown	14 (2.5%)	8 (3.1%)	22 (2.6%)
Worse	83 (14.6%)	42 (16.3%)	125 (15.1%)
About the same	335 (58.8%)	143 (55.6%)	478 (57.8%)
Better	104 (18.2%)	59 (23.0%)	163 (19.7%)
Much better	34 (6.0%)	5 (1.9%)	39 (4.7%)
Total	570	257	827

#### 3. Do you think any of these changes were due to participating in the HTHU program?

Physical health changes	42 (16.3%)
Mental health changes	21 (8.2%)
None of the above	104 (40.5%)
<i>Missing</i>	107 (41.6%)
Total	257

#### 4. Thinking about your typical diet:

- How many servings of fruit do you eat a day? (A serving is 1/2 cup of fruit, or 1 medium-sized fruit)

	Non HTHU	HTHU	Total
0 or Unknown	33 (5.8%)	11 (4.3%)	44 (5.3%)
1	171 (30.0%)	77 (30.0%)	248 (30.0%)
2	203 (35.6%)	92 (35.8%)	295 (35.7%)

3	105 (18.4%)	53 (20.6%)	158 (19.1%)
4	38 (6.7%)	15 (5.8%)	53 (6.4%)
5 or more	20 (3.6%)	9 (3.5%)	29 (3.5%)
Total	570	257	827

• How many servings of vegetables do you eat a day? (A serving is 1/2 cup of a vegetable, or 1 cup of lettuce or leafy greens)

	Non HTHU	HTHU	Total
0, 1, or Unknown	102 (18.0%)	51 (19.9%)	153 (18.4%)
2	195 (34.2%)	83 (32.3%)	278 (33.6%)
3	138 (24.2%)	70 (27.2%)	208 (25.2%)
4	80 (14.0%)	33 (12.8%)	113 (13.7%)
5	33 (5.8%)	14 (5.4%)	47 (5.7%)
6 or more	22 (3.9%)	6 (2.3%)	28 (3.4%)
Total	570	257	827

5. On average, how many days a week do you do the following?

• Moderate physical activity - 30 minutes or more (Include activities like walking or bicycling at a regular pace. Do not include strength training)

	Non HTHU	HTHU	Total
0 or Unknown	38 (6.7%)	16 (6.2%)	54 (6.5%)
1	61 (10.7%)	29 (11.3%)	90 (10.9%)
2	67 (11.8%)	42 (16.3%)	109 (13.2%)
3	104 (18.2%)	47 (18.3%)	151 (18.3%)
4	82 (14.4%)	32 (12.5%)	114 (13.8%)
5	89 (15.6%)	42 (16.3%)	131 (15.8%)
6	47 (8.2%)	18 (7.0%)	65 (7.9%)
7	82 (14.4%)	31 (12.1%)	113 (13.7%)
Total	570	257	827

• Vigorous physical activity -30 minutes or more (Include activities like digging, aerobics, running, or fast bicycling. Do not include strength training)

	Non HTHU	HTHU	Total
0	188 (33.0%)	95 (37.0%)	283 (34.2%)
1	99 (17.4%)	47 (18.3%)	146 (17.7%)
2	104 (18.2%)	37 (14.4%)	141 (17.0%)
3	70 (12.3%)	30 (11.7%)	100 (12.1%)
4	35 (6.1%)	18 (7.0%)	53 (6.4%)
5	45 (7.9%)	16 (6.2%)	61 (7.4%)
6, 7, or Unknown	29 (5.1%)	14 (5.5%)	43 (5.2%)
Total	570	257	827

• Strength training (Include doing push-ups, exercising against resistance, weightlifting)

	Non HTHU	HTHU	Total
0	243 (42.6%)	113 (44.0%)	356 (43.0%)
1	97 (15.8%)	51 (17.5%)	148 (16.3%)
2	87 (14.2%)	49 (16.8%)	136 (15.0%)
3	81 (13.2%)	33 (11.3%)	114 (12.6%)
4	33 (5.4%)	9 (3.1%)	42 (4.6%)
5	40 (6.5%)	9 (3.1%)	49 (5.4%)
6	9 (1.5%)	7 (2.4%)	16 (1.8%)
7 or Unknown	11 (1.6%)	5 (1.4%)	15 (1.6%)
Total	570	257	827

• Drink sugar-sweetened beverages? (Include regular soda or pop that contains sugar and sweetened fruit drinks, such as juice or lemonade. Do not include diet soda or pop.)

	Non HTHU	HTHU	Total
0	365 (64.0%)	150 (58.4%)	515 (62.3%)
1	85 (14.9%)	50 (19.5%)	135 (16.3%)
2	50 (8.8%)	23 (8.9%)	73 (8.8%)
3	26 (4.6%)	9 (3.5%)	35 (4.2%)

4	9 (1.6%)	9 (3.5%)	18 (2.2%)
5 or 6	23 (4.1%)	5 (2.0%)	28 (3.4%)
7 or Unknown	12 (2.2%)	11 (4.3%)	23 (2.8%)
Total	570	257	827

• Get at least seven (7) hours of sleep

	Non HTHU	HTHU	Total
0 or Unknown	25 (4.4%)	13 (5.2%)	38 (4.6%)
1	24 (4.2%)	9 (3.5%)	33 (4.0%)
2	67 (11.8%)	26 (10.1%)	93 (11.2%)
3	61 (10.7%)	38 (14.8%)	99 (12.0%)
4	67 (11.8%)	28 (10.9%)	95 (11.5%)
5	91 (16.0%)	46 (17.9%)	137 (16.6%)
6	90 (15.8%)	39 (15.2%)	129 (15.6%)
7	145 (25.4%)	58 (22.6%)	203 (24.5%)
Total	570	257	827

6. Compared to 12 months ago, do you think you engage in each of the following health behaviors more or less?

• The number of servings of fruit you eat a day

	Non HTHU	HTHU	Total
Much less	13 (2.3%)	9 (3.5%)	22 (2.7%)
A little less	56 (9.8%)	21 (8.2%)	77 (9.3%)
About the same	394 (69.1%)	176 (68.5%)	570 (68.9%)
A little more	93 (16.3%)	47 (18.3%)	140 (16.9%)
Much more or Unknown	14 (2.5%)	4 (1.6%)	18 (2.2%)
Total	570	257	827

• The number of servings of vegetables you eat a day

	Non HTHU	HTHU	Total
Much less	8 (1.4%)	8 (3.1%)	16 (1.9%)
A little less	36 (6.3%)	26 (10.1%)	62 (7.5%)
About the same	382 (67.0%)	160 (62.3%)	542 (65.5%)
A little more	115 (20.2%)	55 (21.4%)	170 (20.6%)
Much more or Unknown	29 (5.1%)	8 (3.1%)	37 (4.4%)
Total	570	257	827

• The number of days a week you walk or are moderately physically active for at least 30 minutes

	Non HTHU	HTHU	Total
Much less	34 (6.0%)	17 (6.6%)	51 (6.2%)
A little less	80 (14.0%)	40 (15.6%)	120 (14.5%)
About the same	290 (50.9%)	138 (53.7%)	428 (51.8%)
A little more	122 (21.4%)	45 (17.5%)	167 (20.2%)
Much more or Unknown	44 (7.7%)	17 (6.6%)	61 (7.4%)
Total	570	257	827

• The number of days a week you are vigorously physically active for at least 30 minutes

	Non HTHU	HTHU	Total
Much less	51 (8.9%)	21 (8.2%)	72 (8.7%)
A little less	80 (14.0%)	42 (16.3%)	122 (14.8%)
About the same	330 (57.9%)	146 (56.8%)	476 (57.6%)
A little more	78 (13.7%)	28 (10.9%)	106 (12.8%)
Much more or Unknown	31 (5.4%)	20 (7.8%)	51 (6.1%)
Total	570	257	827

• The number of days a week you exercise to strengthen your muscles

	Non HTHU	HTHU	Total
Much less	50 (8.8%)	24 (9.3%)	74 (8.9%)
A little less	70 (12.3%)	34 (13.2%)	104 (12.6%)
About the same	338 (59.3%)	163 (63.4%)	501 (60.6%)

A little more	83 (14.6%)	23 (8.9%)	106 (12.8%)
Much more or Unknown	29 (5.1%)	13 (5.1%)	42 (5.1%)
Total	570	257	827

• The number of days a week you drink sugar-sweetened beverages

	Non HTHU	HTHU	Total
Much less	68 (11.9%)	38 (14.8%)	106 (12.8%)
A little less	49 (8.6%)	23 (8.9%)	72 (8.7%)
About the same	426 (74.7%)	187 (72.8%)	613 (74.1%)
A little more	22 (3.9%)	5 (1.9%)	27 (3.3%)
Much more or Unknown	5 (0.9%)	4 (1.6%)	9 (1.1%)
Total	570	257	827

• The number of days a week you sleep at least seven hours

	Non HTHU	HTHU	Total
Much less	10 (1.8%)	8 (3.1%)	18 (2.2%)
A little less	64 (11.2%)	26 (10.1%)	90 (10.9%)
About the same	406 (71.2%)	177 (68.9%)	583 (70.5%)
A little more	66 (11.6%)	40 (15.6%)	106 (12.8%)
Much more or Unknown	24 (4.3%)	6 (2.3%)	30 (3.6%)
Total	570	257	827

7. Do you think any of these changes were due to participating in the HTHU program?

Diet-related changes (i.e., fruits, vegetables, beverages)	57 (77.8%)
Exercise-related changes (i.e., physical activity, strength training)	40 (15.6%)
Sleep-related changes	30 (11.7%)
None of the above	115 (44.8%)
<i>Missing</i>	64 (24.9%)
Total	257

8. These questions ask about the difficulties you may experience around engaging in healthy behaviors, like physical activity and healthy eating. Please tell us how much you agree or disagree with the following statements.

• I don't have enough time to exercise

	Non-HTHU	HTHU	Total
Strongly disagree	82 (14.4%)	37 (14.4%)	119 (14.4%)
Disagree	157 (27.5%)	68 (26.5%)	225 (27.2%)
Somewhat disagree	84 (14.7%)	37 (14.4%)	121 (14.6%)
Somewhat agree	168 (29.5%)	77 (30.0%)	245 (29.6%)
Agree	50 (8.8%)	27 (10.5%)	77 (9.3%)
Strongly agree or Unknown	29 (5.1%)	11 (4.3%)	40 (4.9%)
Total	570	257	827

• I feel physical discomfort when I exercise

	Non-HTHU	HTHU	Total
Strongly disagree	93 (16.3%)	43 (16.7%)	136 (16.4%)
Disagree	172 (30.2%)	74 (28.8%)	246 (29.7%)
Somewhat disagree	72 (12.6%)	28 (10.9%)	100 (12.1%)
Somewhat agree	139 (24.4%)	68 (26.5%)	207 (25.0%)
Agree	56 (9.8%)	23 (8.9%)	79 (9.6%)
Strongly agree or Unknown	38 (6.7%)	21 (8.2%)	59 (7.1%)
Total	570	257	827

• There are not enough convenient places to exercise near me (like parks, gyms, or fitness clubs)

	Non-HTHU	HTHU	Total
Strongly disagree	135 (23.7%)	60 (23.3%)	195 (23.6%)
Disagree	220 (38.6%)	94 (36.6%)	314 (38.0%)
Somewhat disagree	82 (14.4%)	41 (16.0%)	123 (14.9%)
Somewhat agree	74 (13.0%)	37 (14.4%)	111 (13.4%)

Agree	33 (5.8%)	13 (5.1%)	46 (5.6%)
Strongly agree or Unknown	26 (4.5%)	12 (4.7%)	38 (4.5%)
Total	570	257	827

• I feel unsafe walking or exercising in my neighborhood

	Non-HTHU	HTHU	Total
Strongly disagree	182 (31.9%)	70 (27.2%)	252 (30.5%)
Disagree	222 (38.9%)	90 (35.0%)	312 (37.7%)
Somewhat disagree	59 (10.4%)	36 (14.0%)	95 (11.5%)
Somewhat agree	55 (9.6%)	34 (13.2%)	89 (10.8%)
Agree	25 (4.4%)	20 (7.8%)	45 (5.4%)
Strongly agree or Unknown	27 (4.7%)	7 (2.7%)	34 (4.1%)
Total	570	257	827

• I don't enjoy exercising

	Non-HTHU	HTHU	Total
Strongly disagree	132 (23.2%)	59 (23.0%)	191 (23.1%)
Disagree	162 (28.4%)	70 (27.2%)	232 (28.1%)
Somewhat disagree	80 (14.0%)	35 (13.6%)	115 (13.9%)
Somewhat agree	111 (19.5%)	58 (22.6%)	169 (20.4%)
Agree	51 (8.9%)	24 (9.3%)	75 (9.1%)
Strongly agree or Unknown	34 (6.0%)	11 (4.3%)	45 (5.4%)
Total	570	257	827

• I don't have enough time to cook

	Non-HTHU	HTHU	Total
Strongly disagree	110 (19.3%)	54 (21.0%)	164 (19.8%)
Disagree	190 (33.3%)	78 (30.4%)	268 (32.4%)
Somewhat disagree	93 (16.3%)	44 (17.1%)	137 (16.6%)
Somewhat agree	122 (21.4%)	59 (23.0%)	181 (21.9%)
Agree	42 (7.4%)	18 (7.0%)	60 (7.3%)
Strongly agree or Unknown	13 (2.3%)	4 (1.6%)	17 (2.1%)
Total	570	257	827

• There are not enough places to buy healthy food near me

	Non-HTHU	HTHU	Total
Strongly disagree	198 (34.7%)	86 (33.5%)	284 (34.3%)
Disagree	231 (40.5%)	106 (41.2%)	337 (40.7%)
Somewhat disagree	71 (12.5%)	28 (10.9%)	99 (12.0%)
Somewhat agree	36 (6.3%)	22 (8.6%)	58 (7.0%)
Agree, Strongly agree, or Unknown	34 (5.9%)	15 (5.9%)	49 (6.0%)
Total	570	257	827

• Healthy food is too expensive

	Non-HTHU	HTHU	Total
Strongly disagree	75 (13.2%)	29 (11.3%)	104 (12.6%)
Disagree	117 (20.5%)	61 (23.7%)	178 (21.5%)
Somewhat disagree	76 (13.3%)	34 (13.2%)	110 (13.3%)
Somewhat agree	169 (29.6%)	71 (27.6%)	240 (29.0%)
Agree	63 (11.1%)	41 (16.0%)	104 (12.6%)
Strongly agree or Unknown	70 (12.3%)	21 (8.2%)	91 (11.0%)
Total	570	257	827

• I don't enjoy changing the foods I eat

	Non-HTHU	HTHU	Total
Strongly disagree	117 (20.5%)	41 (16.0%)	158 (19.1%)
Disagree	208 (36.5%)	101 (39.3%)	309 (37.4%)
Somewhat disagree	105 (18.4%)	56 (21.8%)	161 (19.5%)
Somewhat agree	100 (17.5%)	39 (15.2%)	139 (16.8%)
Agree	25 (4.4%)	14 (5.4%)	39 (4.7%)
Strongly agree or Unknown	15 (2.6%)	6 (2.3%)	21 (2.6%)
Total	570	257	827

• I don't have enough information on the changes I can make to my diet or exercise

	Non-HTHU	HTHU	Total
Strongly disagree	181 (31.8%)	76 (29.6%)	257 (31.1%)
Disagree	230 (40.4%)	101 (39.3%)	331 (40.0%)
Somewhat disagree	84 (14.7%)	36 (14.0%)	120 (14.5%)
Somewhat agree	45 (7.9%)	28 (10.9%)	73 (8.8%)
Agree, Strongly agree, or Unknown	30 (5.2%)	16 (6.3%)	46 (5.6%)
Total	570	257	827

9. In the last month, how frequently have you had friends or family members do the following?

• Encouraged me to be more physically active

	Non-HTHU	HTHU	Total
Never	188 (33.0%)	81 (31.5%)	269 (32.5%)
Rarely	120 (21.1%)	58 (22.6%)	178 (21.5%)
Sometimes	148 (26.0%)	73 (28.4%)	221 (26.7%)
Often	60 (10.5%)	25 (9.7%)	85 (10.3%)
Very often	28 (4.9%)	11 (4.3%)	39 (4.7%)
Not applicable or Unknown	26 (4.6%)	9 (3.5%)	35 (4.2%)
Total	570	257	827

• Participated in physical activity with me

	Non-HTHU	HTHU	Total
Never	93 (16.3%)	50 (19.5%)	143 (17.3%)
Rarely	108 (18.9%)	61 (23.7%)	169 (20.4%)
Sometimes	176 (30.9%)	81 (31.5%)	257 (31.1%)
Often	96 (16.8%)	44 (17.1%)	140 (16.9%)
Very often	79 (13.9%)	15 (5.8%)	94 (11.4%)
Not applicable or Unknown	18 (3.2%)	6 (2.4%)	24 (2.9%)
Total	570	257	827

• Spent time being physically active around me

	Non-HTHU	HTHU	Total
Never	94 (16.5%)	48 (18.7%)	142 (17.2%)
Rarely	105 (18.4%)	57 (22.2%)	162 (19.6%)
Sometimes	174 (30.5%)	88 (34.2%)	262 (31.7%)
Often	99 (17.4%)	45 (17.5%)	144 (17.4%)
Very often	80 (14.0%)	16 (6.2%)	96 (11.6%)
Not applicable or Unknown	18 (3.2%)	3 (1.2%)	21 (2.5%)
Total	570	257	827

• Encouraged me to eat more healthily

	Non-HTHU	HTHU	Total
Never	193 (33.9%)	79 (30.7%)	272 (32.9%)
Rarely	130 (22.8%)	62 (24.1%)	192 (23.2%)
Sometimes	120 (21.1%)	67 (26.1%)	187 (22.6%)
Often	71 (12.5%)	31 (12.1%)	102 (12.3%)
Very often	32 (5.6%)	10 (3.9%)	42 (5.1%)
Not applicable or Unknown	24 (4.3%)	9 (3.1%)	32 (3.9%)
Total	570	257	827

• Offered to eat healthy foods with me

	Non-HTHU	HTHU	Total
Never	142 (24.9%)	55 (21.4%)	197 (23.8%)
Rarely	88 (15.4%)	48 (18.7%)	136 (16.4%)
Sometimes	146 (25.6%)	73 (28.4%)	219 (26.5%)
Often	100 (17.5%)	58 (22.6%)	158 (19.1%)
Very often	66 (11.6%)	17 (6.6%)	83 (10.0%)
Not applicable or Unknown	28 (4.9%)	6 (2.3%)	34 (4.1%)
Total	570	257	827

• **Ate healthy or low-fat foods in front of me**

	Non-HTHU	HTHU	Total
Never	85 (14.9%)	40 (15.6%)	125 (15.1%)
Rarely	85 (14.9%)	40 (15.6%)	125 (15.1%)
Sometimes	164 (28.8%)	90 (35.0%)	254 (30.7%)
Often	127 (22.3%)	57 (22.2%)	184 (22.2%)
Very often	83 (14.6%)	20 (7.8%)	103 (12.5%)
Not applicable or Unknown	26 (4.6%)	10 (3.9%)	36 (4.3%)
Total	570	257	827

**10. You participated in the Health Engagement Model (HEM) incentive program offered by your employer, which asks you to take health actions. One potential health action was engaging with the wellness program Healthy Team Healthy U. To the best of your knowledge, please tell us why you did not choose to participate in the HTHU program. Mark all that apply.**

	Non-HTHU
I did not know about the HTHU wellness program	236 (41.4%)
I am healthy, so I don't need it	80 (14.0%)
The program seemed like it would take too much time or effort	69 (12.1%)
The program was not interesting to me	108 (19.0%)
I was concerned the information I gave might impact my job or pay	19 (3.3%)
I was concerned the information I gave might not be secure	41 (7.2%)
Other (please tell us):	104 (18.3%)
<i>Missing</i>	28 (4.9%)
Total	570

**11. Over the past 12 months, how often has it been hard for you to pay for any of the following?**

• **Medical care**

	Non-HTHU	HTHU	Total
Never	349 (61.2%)	155 (60.3%)	504 (60.9%)
Rarely	81 (14.2%)	40 (15.6%)	121 (14.6%)
Sometimes	91 (16.0%)	36 (14.0%)	127 (15.4%)
Often	17 (3.0%)	9 (3.5%)	26 (3.1%)
Very often	18 (3.2%)	11 (4.3%)	29 (3.5%)
Prefer not to respond or Unknown	14 (2.4%)	6 (2.3%)	20 (2.5%)
Total	570	257	827

• **Food**

	Non-HTHU	HTHU	Total
Never	377 (66.1%)	153 (59.5%)	530 (64.1%)
Rarely	88 (15.4%)	44 (17.1%)	132 (16.0%)
Sometimes	68 (11.9%)	42 (16.3%)	110 (13.3%)
Often	9 (1.6%)	4 (1.6%)	13 (1.6%)
Very often	14 (2.5%)	9 (3.5%)	23 (2.8%)
Prefer not to respond or Unknown	14 (2.5%)	5 (2.0%)	19 (2.3%)
Total	570	257	827

• **Housing**

	Non-HTHU	HTHU	Total
Never	403 (70.7%)	175 (68.1%)	578 (69.9%)
Rarely	84 (14.7%)	41 (16.0%)	125 (15.1%)
Sometimes	44 (7.7%)	26 (10.1%)	70 (8.5%)
Often	11 (1.9%)	8 (3.1%)	19 (2.3%)
Very often	15 (2.6%)	3 (1.2%)	18 (2.2%)
Prefer not to respond or Unknown	13 (2.3%)	4 (1.6%)	17 (2.1%)
Total	570	257	827

• **Utilities**

	Non-HTHU	HTHU	Total
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Never	393 (68.9%)	162 (63.0%)	555 (67.1%)
Rarely	87 (15.3%)	47 (18.3%)	134 (16.2%)
Sometimes	49 (8.6%)	30 (11.7%)	79 (9.6%)
Often	10 (1.8%)	6 (2.3%)	16 (1.9%)
Very often	17 (3.0%)	5 (1.9%)	22 (2.7%)
Prefer not to respond or Unknown	14 (2.5%)	7 (2.8%)	21 (2.5%)
Total	570	257	827

**12. Thinking about your current job, how often does each of the following statements describe how you feel?**

- I feel that my job is negatively affecting my physical or emotional well being**

	Non-HTHU	HTHU	Total
Never	107 (18.8%)	45 (17.5%)	152 (18.4%)
Rarely	134 (23.5%)	63 (24.5%)	197 (23.8%)
Sometimes	195 (34.2%)	86 (33.5%)	281 (34.0%)
Often	64 (11.2%)	25 (9.7%)	89 (10.8%)
Very often	62 (10.9%)	34 (13.2%)	96 (11.6%)
Prefer not to respond or Unknown	8 (1.4%)	4 (1.6%)	12 (1.4%)
Total	570	257	827

- I have too much work to do and/or too many unreasonable deadlines**

	Non-HTHU	HTHU	Total
Never	114 (20.0%)	47 (18.3%)	161 (19.5%)
Rarely	174 (30.5%)	71 (27.6%)	245 (29.6%)
Sometimes	160 (28.1%)	78 (30.4%)	238 (28.8%)
Often	58 (10.2%)	27 (10.5%)	85 (10.3%)
Very often	54 (9.5%)	27 (10.5%)	81 (9.8%)
Prefer not to respond or Unknown	10 (1.8%)	7 (2.8%)	17 (2.1%)
Total	570	257	827

- I feel that job pressures interfere with my family or personal life**

	Non-HTHU	HTHU	Total
Never	131 (23.0%)	50 (19.5%)	181 (21.9%)
Rarely	155 (27.2%)	77 (30.0%)	232 (28.1%)
Sometimes	165 (28.9%)	70 (27.2%)	235 (28.4%)
Often	59 (10.4%)	28 (10.9%)	87 (10.5%)
Very often	52 (9.1%)	29 (11.3%)	81 (9.8%)
Prefer not to respond or Unknown	8 (1.5%)	3 (1.2%)	11 (1.4%)
Total	570	257	827

**13. People sometimes look to others for support. How often is each of the following kinds of support available to you if you need it?**

- Take you to the doctor if needed**

	Non-HTHU	HTHU	Total
None or Unknown	49 (8.6%)	16 (6.2%)	65 (7.9%)
A little of the time	55 (9.6%)	25 (9.7%)	80 (9.7%)
Some of the time	101 (17.7%)	41 (16.0%)	142 (17.2%)
Most of the time	153 (26.8%)	75 (29.2%)	228 (27.6%)
All of the time	212 (37.2%)	100 (38.9%)	312 (37.7%)
Total	570	257	827

- Help you if you were confined to bed**

	Non-HTHU	HTHU	Total
None	63 (11.1%)	29 (11.3%)	92 (11.1%)
A little of the time	51 (8.9%)	24 (9.3%)	75 (9.1%)
Some of the time	102 (17.9%)	36 (14.0%)	138 (16.7%)
Most of the time	158 (27.7%)	72 (28.0%)	230 (27.8%)
All of the time	191 (33.5%)	91 (35.4%)	282 (34.1%)
Missing	5 (0.9%)	5 (1.9%)	10 (1.2%)

Total	570	257	827
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• Share your most private worries and fears with

	Non-HTHU	HTHU	Total
None or Unknown	40 (7.0%)	22 (8.6%)	62 (7.5%)
A little of the time	71 (12.5%)	36 (14.0%)	107 (12.9%)
Some of the time	106 (18.6%)	50 (19.5%)	156 (18.9%)
Most of the time	161 (28.2%)	71 (27.6%)	232 (28.1%)
All of the time	192 (33.7%)	78 (30.4%)	270 (32.6%)
Total	570	257	827

• Turn to for suggestions about how to deal with a personal problem

	Non-HTHU	HTHU	Total
None or Unknown	33 (5.8%)	18 (7.0%)	51 (6.2%)
A little of the time	60 (10.5%)	39 (15.2%)	99 (12.0%)
Some of the time	115 (20.2%)	47 (18.3%)	162 (19.6%)
Most of the time	167 (29.3%)	75 (29.2%)	242 (29.3%)
All of the time	195 (34.2%)	78 (30.4%)	273 (33.0%)
Total	570	257	827

• Do something enjoyable with

	Non-HTHU	HTHU	Total
None or Unknown	14 (2.4%)	7 (2.7%)	21 (2.6%)
A little of the time	43 (7.5%)	27 (10.5%)	70 (8.5%)
Some of the time	114 (20.0%)	53 (20.6%)	167 (20.2%)
Most of the time	201 (35.3%)	78 (30.4%)	279 (33.7%)
All of the time	198 (34.7%)	92 (35.8%)	290 (35.1%)
Total	570	257	827

• Love and make you feel wanted

	Non-HTHU	HTHU	Total
None or Unknown	22 (3.9%)	6 (2.3%)	28 (3.4%)
A little of the time	38 (6.7%)	21 (8.2%)	59 (7.1%)
Some of the time	72 (12.6%)	43 (16.7%)	115 (13.9%)
Most of the time	179 (31.4%)	68 (26.5%)	247 (29.9%)
All of the time	259 (45.4%)	119 (46.3%)	378 (45.7%)
Total	570	257	827

14. Why did you choose to participate in the HTHU program? Mark all that apply.

	HTHU
To meet the Health Engagement Model (HEM) health action requirement	202 (78.6%)
It was recommended by a colleague	24 (9.3%)
I hoped it would provide helpful health information	134 (52.1%)
I hoped it would help me change my health behaviors	113 (44.0%)
The description of the program was interesting to me	77 (30.0%)
Unknown or Other (please tell us):	22 (8.6%)
Total	257

15. Please tell us how much you agree or disagree with the following statements about your satisfaction with HTHU:

• Overall, I was satisfied with the HTHU program

	HTHU
Strongly disagree or Disagree	26 (10.1%)
Somewhat disagree	18 (7.0%)
Somewhat agree	86 (33.5%)
Agree	96 (37.4%)
Strongly agree	25 (9.7%)
Missing	6 (2.3%)

Total	257
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- Based on my experiences so far, I am likely to use the HTHU program in the future

	HTHU
Strongly disagree	7 (2.7%)
Disagree	19 (7.4%)
Somewhat disagree	26 (10.1%)
Somewhat agree	70 (27.2%)
Agree	98 (38.1%)
Strongly agree	33 (12.8%)
<i>Missing</i>	4 (1.6%)
Total	257

- Based on my experiences so far, I would recommend the HTHU program to a coworker

	HTHU
Strongly disagree	5 (1.9%)
Disagree	19 (7.4%)
Somewhat disagree	22 (8.6%)
Somewhat agree	73 (28.4%)
Agree	101 (39.3%)
Strongly agree	31 (12.1%)
<i>Missing</i>	6 (2.3%)
Total	257

**16. For the following, please tell us how much you agree or disagree with the statements about the HTHU program.**

- I usually had sufficient time during the workday to engage with the HTHU online platform and activities

	HTHU
Strongly disagree	32 (12.5%)
Disagree	55 (21.4%)
Somewhat disagree	52 (20.2%)
Somewhat agree	61 (23.7%)
Agree	43 (16.7%)
Strongly agree	7 (2.7%)
<i>Missing</i>	7 (2.7%)
Total	257

- I had sufficient access to the technology (computers, etc.) I needed to engage with the HTHU online platform and activities during the workday

	HTHU
Strongly disagree	10 (3.9%)
Disagree	18 (7.0%)
Somewhat disagree	23 (8.9%)
Somewhat agree	60 (23.3%)
Agree	111 (43.2%)
Strongly agree	26 (10.1%)
<i>Missing</i>	9 (3.5%)
Total	257

- My employer supported engagement in the HTHU program

	HTHU
Strongly disagree	18 (7.0%)
Disagree	24 (9.3%)
Somewhat disagree	44 (17.1%)
Somewhat agree	60 (23.3%)
Agree	75 (29.2%)
Strongly agree	26 (10.1%)
<i>Missing</i>	10 (3.9%)
Total	257

- I would use the program more if my employer supported engagement in the HTHU program**

<b>HTHU</b>	
Strongly disagree	20 (7.8%)
Disagree	48 (18.7%)
Somewhat disagree	51 (19.8%)
Somewhat agree	60 (23.3%)
Agree	47 (18.3%)
Strongly agree	23 (8.9%)
<i>Missing</i>	8 (3.1%)
Total	257

- The HTHU team activities and challenges were useful**

<b>HTHU</b>	
Strongly disagree	10 (3.9%)
Disagree	22 (8.6%)
Somewhat disagree	44 (17.1%)
Somewhat agree	91 (35.4%)
Agree	66 (25.7%)
Strongly agree	13 (5.1%)
<i>Missing</i>	11 (4.3%)
Total	257

- The HTHU online learning sessions were useful**

<b>HTHU</b>	
Strongly disagree	8 (3.1%)
Disagree	17 (6.6%)
Somewhat disagree	30 (11.7%)
Somewhat agree	98 (38.1%)
Agree	77 (30.0%)
Strongly agree	11 (4.3%)
<i>Missing</i>	16 (6.2%)
Total	257

- The HTHU activities and sessions could have been more relevant to me given my culture, identity, or my language**

<b>HTHU</b>	
Strongly disagree	41 (16.0%)
Disagree	66 (25.7%)
Somewhat disagree	68 (26.5%)
Somewhat agree	37 (14.4%)
Agree	23 (8.9%)
Strongly agree	7 (2.7%)
<i>Missing</i>	15 (5.8%)
Total	257

**17. These questions are about how the COVID-19 pandemic and a shift to remote work setting affected your use of the HTHU program.**

- Were you part of the HTHU program prior to the beginning of the COVID-19 pandemic (around March 2020)?**

<b>HTHU</b>	
Yes	209 (81.3%)
No	48 (18.7%)
Total	257

- Do you use the HTHU program services more or less often since the pandemic began?**

<b>HTHU</b>	
Much less often	61 (23.7%)
Less often	44 (17.1%)
About the same	88 (24.3%)
More often or Much more often	15 (5.9%)
<i>Missing</i>	49 (19.1%)
Total	257

- Has your satisfaction with the HTHU program changed since the pandemic began?

	HTHU
Much less satisfied	16 (6.2%)
Less satisfied	9 (3.5%)
About the same	170 (66.2%)
More satisfied or Much more satisfied	11 (4.3%)
<i>Missing</i>	<i>51 (19.8%)</i>
Total	257

**18. Questions about mobility, vision, and hearing:**

	Non-HTHU (Yes)	HTHU (Yes)	Total (Yes)
Do you have serious difficulty walking or climbing stairs?	41 (7.2%)	23 (8.9%)	64 (7.7%)
Are you blind or do you have serious difficulty seeing, even when wearing glasses?	12 (2.1%)	5 (1.9%)	17 (2.1%)
Are you deaf or do you have serious difficulty hearing?	14 (2.5%)	8 (3.1%)	22 (2.7%)

**19. What is your current living arrangement? Mark all that apply.**

	Non-HTHU	HTHU	Total
Live alone	100 (17.5%)	43 (16.7%)	143 (17.3%)
Live with spouse or partner	391 (68.6%)	178 (69.3%)	569 (68.8%)
Live with other relatives (including children)	143 (25.1%)	73 (28.4%)	216 (26.1%)
Live with my parents	21 (3.7%)	10 (3.9%)	31 (3.7%)
Live with friends or roommates, Other, or Unknown	22 (3.9%)	5 (2.0%)	27 (3.2%)

**20. What categories describe you? Mark all that apply.**

	Non-HTHU	HTHU	Total
American Indian / Alaskan Native	17 (3.0%)	12 (4.7%)	29 (3.5%)
Asian	22 (3.9%)	11 (4.3%)	33 (4.0%)
Black or African American	9 (1.6%)	5 (1.9%)	14 (1.7%)
Hispanic, Latino/a/x, or Spanish origin	41 (7.2%)	16 (6.2%)	57 (6.9%)
White	492 (86.3%)	213 (82.9%)	705 (85.2%)
Middle Eastern or North African, Native Hawaiian or Pacific Islander, or Some other race, ethnicity, or origin	22 (3.9%)	12 (4.7%)	34 (4.1%)
<i>Missing</i>	<i>8 (1.4%)</i>	<i>6 (2.3%)</i>	<i>14 (1.7%)</i>

**21. What is your gender? Mark all that apply.**

	Non-HTHU	HTHU	Total
Woman	470 (82.5%)	207 (80.5%)	677 (81.9%)
Man	79 (13.9%)	40 (15.6%)	119 (14.4%)
Nonbinary, Agender / No gender, Questioning, Don't Know, Not listed,			
Unknown	14 (2.6%)	6 (2.4%)	20 (2.3%)
I don't want to answer	10 (1.8%)	6 (2.3%)	16 (1.9%)

**22. Are you transgender?**

	Non-HTHU	HTHU	Total
Yes or Unknown	8 (1.4%)	6 (2.3%)	14 (1.7%)
No	553 (97.0%)	243 (94.6%)	796 (96.3%)

**23. Which of these best describes your sexual orientation or sexual identity? Mark all that apply.**

	Non-HTHU	HTHU	Total
Same-gender loving or same-sex loving	15 (2.7%)	6 (2.3%)	21 (2.5%)
Lesbian or Gay	19 (3.3%)	10 (3.8%)	29 (3.5%)
Bisexual or Pansexual	30 (4.3%)	12 (4.7%)	42 (5.1%)
Straight (attracted mainly to other gender(s) or sex(es))	444 (77.9%)	187 (72.8%)	631 (76.3%)
Queer	5 (0.9%)	5 (1.9%)	10 (1.2%)

Asexual, Questioning, Don't Know, or Not Listed	10 (1.8%)	7 (2.7%)	17 (2.0%)
I don't know what this question is asking	11 (1.9%)	8 (3.1%)	19 (2.3%)
I don't want to answer	49 (8.6%)	30 (11.7%)	79 (9.6%)
<i>Missing</i>	9 (1.6%)	7 (2.7%)	16 (1.9%)

**24. What is the highest level of education you have completed? Mark only one.**

	Non-HTHU	HTHU	Total
High school diploma, GED or a high school equivalent, or Unknown	43 (7.6%)	14 (5.5%)	57 (6.9%)
Some college	103 (18.1%)	64 (24.9%)	167 (20.2%)
Vocational training or 2-year degree	49 (8.6%)	30 (11.7%)	79 (9.6%)
4-year college degree	167 (29.3%)	89 (34.6%)	256 (31.0%)
Advanced or graduate degree	208 (36.5%)	60 (23.3%)	268 (32.4%)
Total	570	257	827

**25. What was your gross household income (before taxes and deductions are taken out) for last year? Your best estimate is fine.**

	Non-HTHU	HTHU	Total
\$0 to \$40,000	35 (6.1%)	11 (4.3%)	46 (5.5%)
\$40,001 to \$60,000	98 (17.2%)	54 (21.0%)	152 (18.4%)
\$60,001 to \$80,000	94 (16.5%)	55 (21.4%)	149 (18.0%)
\$80,001 to \$100,000	93 (16.3%)	51 (19.8%)	144 (17.4%)
\$100,001 or more	231 (40.5%)	76 (29.6%)	307 (37.1%)
<i>Missing</i>	19 (3.3%)	10 (3.9%)	29 (3.5%)
Total	570	257	827

**26. What best describes your employment?**

	Non-HTHU	HTHU	Total
Full-time, salaried	449 (78.8%)	215 (83.7%)	664 (80.3%)
Full-time, hourly	82 (14.4%)	34 (13.2%)	116 (14.0%)
Part-time, salaried or hourly	35 (6.2%)	4 (1.6%)	39 (4.7%)
Retired or Unknown	4 (0.7%)	4 (1.6%)	8 (0.9%)
Total	570	257	827

**27. When do you normally work?**

	Non-HTHU	HTHU	Total
Days	508 (89.1%)	240 (93.4%)	748 (90.4%)
Nights or Unknown	19 (3.4%)	4 (1.6%)	23 (2.8%)
Both	43 (7.5%)	13 (5.1%)	56 (6.8%)
Total	570	257	827

**28. What is your preferred language?**

	Non-HTHU	HTHU	Total
English	556 (97.5%)	250 (97.3%)	806 (97.5%)
Spanish, Vietnamese, American Sign Language, Other, or Unknown	14 (2.6%)	7 (2.8%)	21 (2.5%)
Total	570	257	827

**29. Which state agency or university do you work for?**

	NON-HTHU	HTHU	Total
DEPARTMENT OF HUMAN SERVICES	83 (14.6%)	53 (20.6%)	136 (16.4%)
UNIVERSITY OF OREGON	90 (15.8%)	22 (8.6%)	112 (13.5%)
OREGON STATE UNIVERSITY	89 (15.6%)	14 (5.4%)	103 (12.5%)
OREGON DEPARTMENT OF TRANSPORTATION	21 (3.7%)	17 (6.6%)	38 (4.6%)
OREGON HEALTH AUTHORITY	19 (3.3%)	18 (7.0%)	37 (4.5%)
PORTLAND STATE UNIVER	23 (4.0%)	10 (3.9%)	33 (4.0%)
DEPARTMENT OF CORRECTIONS	20 (3.5%)	10 (3.9%)	30 (3.6%)
EMPLOYMENT DEPARTMENT	12 (2.1%)	15 (5.8%)	27 (3.3%)
CONSUMER & BUSINESS SERVICES	8 (1.4%)	6 (2.3%)	14 (1.7%)

OTHER (See below)	173 (30.4%)	76 (29.6%)	249 (30.1%)
Missing	32 (5.6%)	16 (6.2%)	48 (5.8%)
<i>Total</i>	570	257	827

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**Agencies included in "other" category above:**

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JUDICIAL DEPARTMENT  
 SOUTHERN OREGON UNIVERSITY  
 OTHER  
 DEPARTMENT OF JUSTICE  
 DEPARTMENT OF REVENUE  
 EASTERN OREGON UNIVERSITY  
 DEPARTMENT OF EDUCATION  
 OREGON YOUTH AUTHORITY  
 WESTERN OREGON UNIVERSITY  
 DEPARTMENT OF ADMINISTRATIVE SERVICES  
 DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DEPARTMENT OF FISH & WILDLIFE  
 OREGON STATE POLICE  
 PUBLIC EMPLOYEES RETIREMENT SYSTEM  
 FORESTRY DEPARTMENT  
 OREGON INSTITUTE OF TECHNOLOGY  
 OREGON LIQUOR CONTROL COMMISSION  
 DEPARTMENT OF PARKS & RECREATION  
 OREGON MILITARY DEPARTMENT  
 DEPARTMENT OF AGRICULTURE  
 OREGON STATE LOTTERY  
 PUBLIC UTILITY COMMISSION  
 WATER RESOURCES DEPARTMENT  
 HOUSING & COMMUNITY SERVICES  
 DEPARTMENT OF VETERANS AFFAIRS  
 HEALTH RELATED LICENSING BOARD  
 LEGISLATIVE ASSEMBLY  
 OREGON BUSINESS DEVELOPMENT DEPARTMENT  
 OREGON CORRECTIONS ENTERPRISE  
 OREGON STATE LIBRARY  
 PUBLIC DEFENSE SERVICES COMMISSION  
 SECRETARY OF STATE  
 BOARD OF PHARMACY  
 BUREAU OF LABOR & INDUSTRY  
 DEPARTMENT OF PUBLIC  
 DIVISION OF STATE LANDS  
 EMPLOYMENT RELATIONS BOARD  
 LAND CONSERVATION & DEVELOPMENT  
 LEGISLATIVE ADMINISTRATION  
 LEGISLATIVE COUNSEL COMMITTEE  
 MENTAL HEALTH REGULATORY AGENCY  
 OREGON AVIATION DIVISION  
 OREGON RACING COMMISSION  
 OREGON SALMON COMMISSION  
 OREGON STATE MARINE BOARD  
 OREGON TOURISM COMMISSION  
 RETIRED OR NOT APPLICABLE

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## Regression results

### Odds of Physical, Mental Outcomes Associated with HTHU Participation, By Type

VARIABLES	Physical Health OR(SE)	Mental Health OR(SE)
HTHU	0.65* (0.16)	0.71 (0.15)
Age	1.04*** (0.01)	1.04*** (0.01)
Trouble with mobility	0.18*** (0.06)	0.34*** (0.11)
Race		
American Indian or Alaskan Native	0.58 (0.31)	0.80 (0.41)
Asian	1.66 (1.35)	2.20 (1.74)
Black	1.84 (2.07)	0.61 (0.49)
Hispanic / Latinx	5.95** (5.39)	1.97 (1.26)
Native Hawaiian or Pacific Islander	0.21 (0.22)	
White	1.03 (0.63)	0.92 (0.49)
Other	1.98 (1.75)	0.91 (0.57)
Gender		
Male	1.21 (0.44)	0.78 (0.23)
Other (Agender, Non-binary, Trans-gender, Self-described)	1.12 (1.25)	0.11** (0.10)
Live alone	0.96 (0.31)	1.24 (0.38)
Average social support	1.18 (0.14)	1.58*** (0.17)
Income		
\$1 - \$20,000	0.59 (1.26)	0.14 (0.22)
\$20,001 - \$40,000	9.19 (13.44)	0.47* (0.21)
\$40,001 - \$60,000	7.76 (10.96)	0.90 (0.28)
\$60,001 - \$80,000	9.95 (14.07)	0.80 (0.24)
\$80,001 - \$100,000	10.28* (14.54)	0.92 (0.28)
\$100,001 or more	14.26* (20.03)	
Constant	0.08 (0.13)	0.22* (0.19)
Observations	764	751
Chi-Squared Value	69.55	68.61
Pseudo R-Squared Value	0.117	0.101

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### Odds of Dietary Outcomes Associated with HTHU Participation, By Type

VARIABLES	Fruit OR(SE)	Vegetable OR(SE)	Beverages OR(SE)
HTHU	1.05 (0.18)	0.95 (0.16)	0.86 (0.15)
Age	1.00 (0.01)	1.00 (0.01)	1.04*** (0.01)
Barriers to healthy eating	0.80*** (0.06)	0.71*** (0.06)	0.81*** (0.06)
Support for healthy eating	1.23*** (0.09)	1.22*** (0.09)	1.19** (0.09)
Race			
American Indian or Alaskan Native	0.60 (0.24)	1.21 (0.49)	1.45 (0.63)
Asian	1.12 (0.59)	0.90 (0.44)	1.09 (0.54)
Black	0.94 (0.63)	1.30 (0.82)	0.49 (0.32)
Hispanic / Latinx	0.94 (0.41)	1.37 (0.57)	0.96 (0.41)
Native Hawaiian or Pacific Islander	1.84 (2.11)	0.81 (0.77)	0.23 (0.26)
White	0.79 (0.32)	0.95 (0.36)	1.70 (0.65)
Other	1.97 (1.10)	1.39 (0.68)	1.44 (0.74)
Gender			
Male	0.70 (0.15)	0.50*** (0.11)	0.49*** (0.11)
Other (Agender, Non-binary, Trans-gender, Self-described)	1.00 (0.80)	1.92 (1.53)	1.20 (0.98)
Live alone	0.69* (0.15)	0.74 (0.16)	1.08 (0.26)
Average social support	0.99 (0.08)	1.03 (0.08)	1.02 (0.09)
Income			
\$1 - \$20,000	0.37 (0.60)	1.17 (1.90)	
\$20,001 - \$40,000	0.55 (0.21)	0.66 (0.25)	0.74 (0.80)
\$40,001 - \$60,000	0.85 (0.19)	0.78 (0.17)	1.41 (1.47)
\$60,001 - \$80,000	0.93 (0.21)	1.22 (0.26)	1.32 (1.37)
\$80,001 - \$100,000	0.66* (0.15)	1.17 (0.25)	1.89 (1.97)
\$100,001 or more	-	-	1.94 (2.00)
Constant	3.21* (2.20)	1.22 (0.81)	0.10* (0.13)
Observations	776	776	775
Chi-Squared Value	38.98	52.37	88.90
Pseudo R-Squared Value	0.0384	0.0488	0.0864

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### Odds of Exercise Outcomes Associated with HTHU Participation, By Type

VARIABLES	Moderate Exercise OR(SE)	Vigorous Exercise OR(SE)	Strength Exercise OR(SE)
HTHU	0.87 (0.16)	1.13 (0.22)	0.86 (0.18)
Age	1.00 (0.01)	0.99 (0.01)	0.98** (0.01)
Barriers to healthy exercise	0.57*** (0.05)	0.46*** (0.04)	0.47*** (0.05)
Support for healthy exercise	1.36*** (0.13)	1.47*** (0.13)	1.33*** (0.12)
Trouble with mobility	0.46** (0.14)	0.26** (0.14)	0.43 (0.24)
Race			
American Indian or Alaskan Native	0.95 (0.43)	2.02 (0.99)	2.00 (0.99)
Asian	1.48 (0.90)	0.38 (0.23)	0.83 (0.49)
Black	0.93 (0.65)	1.27 (0.92)	1.38 (1.03)
Hispanic / Latinx	1.76 (0.89)	1.52 (0.71)	2.27* (1.04)
Native Hawaiian or Pacific Islander	1.01 (1.03)	2.60 (2.78)	4.03 (4.25)
White	1.29 (0.59)	0.61 (0.26)	1.11 (0.47)
Other	1.98 (1.27)	1.00 (0.57)	1.25 (0.73)
Gender			
Male	1.28 (0.34)	1.35 (0.33)	1.39 (0.35)
Other (Agender, Non-binary, Trans-gender, Self-described)	1.98 (1.72)	3.11 (2.76)	2.70 (2.46)
Live alone	0.94 (0.24)	1.20 (0.32)	1.36 (0.38)
Average social support	1.04 (0.10)	1.11 (0.11)	1.17 (0.12)
Income			
\$1 - \$20,000	0.31 (0.57)		3.77 (9.23)
\$20,001 - \$40,000	0.60 (0.25)	0.31 (0.40)	1.41 (2.14)
\$40,001 - \$60,000	1.52 (0.39)	0.39 (0.48)	1.53 (2.25)
\$60,001 - \$80,000	1.01 (0.25)	0.47 (0.59)	1.03 (1.51)
\$80,001 - \$100,000	1.13 (0.28)	0.31 (0.38)	1.49 (2.19)
\$100,001 or more	-	0.34 (0.42)	1.56 (2.27)
Constant	2.25 (1.69)	2.59 (3.56)	0.54 (0.89)
Observations	759	758	760
Chi-Squared Value	106.6	159.9	133.8
Pseudo R-Squared Value	0.114	0.172	0.155

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### Odds of Sleep and Job Stress Outcomes Associated with HTHU Participation, By Type

VARIABLES	Sleep OR(SE)	Job Stress		
		Negative Impact OR(SE)	Overworked OR(SE)	Interferes with Life OR(SE)
HTHU	0.81 (0.15)	1.08 (0.21)	1.07 (0.21)	1.11 (0.22)
Age	1.00 (0.01)	0.98* (0.01)	0.98* (0.01)	0.97*** (0.01)
Race				
American Indian or Alaskan Native	1.09 (0.50)	0.66 (0.35)	1.12 (0.54)	0.37 (0.24)
Asian	0.98 (0.56)	1.12 (0.67)	1.51 (0.87)	0.37 (0.25)
Black	0.62 (0.52)	0.36 (0.40)	0.76 (0.65)	1.63 (1.24)
Hispanic / Latinx	1.30 (0.59)	1.04 (0.53)	0.34* (0.21)	0.43 (0.25)
Native Hawaiian or Pacific Islander	-	-	0.69 (0.80)	-
White	1.08 (0.46)	1.13 (0.52)	0.92 (0.44)	0.61 (0.31)
Other / Self-identified	2.06 (1.10)	1.30 (0.72)	1.33 (0.75)	0.89 (0.55)
Gender				
Male	0.63* (0.17)	0.75 (0.20)	0.87 (0.23)	0.82 (0.22)
Other	0.56	5.28* (4.54)	0.93 (0.83)	3.57 (2.93)
(Agender, Non-binary, Trans-gender, Self-described)				
Live alone	1.18 (0.30)	0.92 (0.24)	0.65 (0.19)	0.72 (0.20)
Average social support	1.30*** (0.12)	0.71*** (0.07)	0.70*** (0.07)	0.66*** (0.07)
Income				
\$1 - \$20,000	2.27 (4.33)			
\$20,001 - \$40,000	1.22 (1.55)	0.33 (0.49)	0.29 (0.45)	0.39* (0.21)
\$40,001 - \$60,000	0.82 (1.01)	0.38 (0.55)	0.31 (0.46)	0.81 (0.22)
\$60,001 - \$80,000	1.52 (1.86)	0.31 (0.46)	0.66 (0.98)	0.81 (0.22)
\$80,001 - \$100,000	1.37 (1.68)	0.42 (0.62)	0.45 (0.66)	0.95 (0.25)
\$100,001 or more	1.32 (1.60)	0.40 (0.59)	0.64 (0.94)	
Constant	0.08* (0.12)	5.35 (8.24)	4.83 (7.54)	10.60*** (8.57)
Observations	769	764	767	764
Chi-Squared Value	23.29	30.11	34.31	40.90
Pseudo R-Squared Value	0.0267	0.0366	0.0440	0.0531

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Appendix E – HTHU Interview Guide

### Getting Started & Using the Program

Healthy Team Healthy U is one option to fulfill PEBB's Health Engagement Model. Why did you choose HTHU to fill the requirement?

*[Example probes]*

- *Were there any aspects of HTHU you thought were preferable to the other options?*

Was there anything in particular you were hoping to achieve by joining the program?

When you first started the program, were you expecting to see any changes to your health or your habits because of HTHU?

When you first started the program, were there parts of the HTHU program that you were the most interested in using?

*[Example probes]*

- *Are those the parts of the program that you ended up using the most?*

Are you still enrolled in the HTHU program?

*[Example probes for participants that are no longer enrolled in the program]*

- *Why did you stop using the program?*
- *Is there anything that would have helped you continue?*

### Overall Experience & Satisfaction

Can you tell me how you typically use[d] the HTHU program?

What parts of HTHU did you use the most, and why?

What parts of HTHU did you use the least, and why?

What did you like best about the program?

*[Example probes]*

- *Was there anything that could have made those parts better or more useful to you?*

What did you like least about the program?

*[Example probes]*

- *Was there anything that could have made those parts better or more useful to you?*

Did anyone (such as family, friends, co-workers, or your supervisor) support you in participating in HTHU?

### Barriers

Were there aspects of the program that made it challenging to use?

*[Example probes]*

- *Did you feel like you had sufficient time in a day (either work time or non-work time) to engage with the program?*
- *Did you have all the access to technology / technical assistance you needed to engage with the program?*
- *Did you have any concerns about the privacy of your health data?*

What would need to change for you to be able to use HTHU more easily?

### **Effectiveness of Program**

Have you made any health behavior changes in the last year?

*[Example probes]*

- *What were the changes?*
- *Can you tell me a little about what prompted you to make those changes?*
- *Do you think that participating in the HTHU program played any role in those changes?*

If you haven't made any health behavior changes, what would help or motivate you to change any health behaviors?

*[Example probes]*

- *What do you think is the primary reason you haven't made any changes?*
- *[If applicable] You mentioned on your survey, that [X] made changing your health behaviors difficult. Can you tell me more about that?*
- *Is there anything you think the HTHU program could do differently that would help you improve on your health behaviors?*

Have you talked to your doctor / other healthcare providers about anything related to the program?

*[Example probes]*

- *Did you share your HTHU health risk assessment with your doctor or other healthcare providers?*

### **Impact of COVID-19**

What was the overall impact of the COVID-19 pandemic on your mental and physical health?

Has COVID-19 changed the way you interacted with the HTHU program?

Was there anything that would have helped you engage with or use the program during the pandemic?



Center for Outcomes  
Research and Education

The Center for Outcomes Research and Education (CORE) is an independent team of scientists, researchers, and data experts with a vision for a healthier, more equitable future. Based in Portland, Oregon, we partner with changemakers and communities to take on today's biggest barriers to better health. Through research, evaluation, and analytics, we provide insights that help shape and sustain healthier systems, policies, and programs.

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