STATE OF MARYLAND
DHMH
Maryland Department of Health and Mental Hygiene
Larry Hogan, Governor - Boyd Rutherford, Lt. Governor - Van Mitchell, Secretary

December 2, 2015

The Honorable Edward J. Kasemeyer
Chair
Senate Budget & Taxation Committee
3 West Miller Senate Office Bldg.
Annapolis, MD 21401-1991

The Honorable Maggie McIntosh
Chair
House Appropriations Committee
121 House Office Bldg.
Annapolis, MD 21401-1991

Re: 2015 Joint Chairmen's Report (p. 77) – Report on Patient Outcomes for Participants in Health Homes

Dear Chair Kasemeyer and Chair McIntosh:

In keeping with the requirements of the 2015 Joint Chairmen's Report (p. 77), enclosed is the Department of Health and Mental Hygiene's report on patient outcomes for participants in health homes. This report includes a comparison of Medicaid enrollees with similar chronic conditions who are not in health homes, as well as a comparison of outcomes between health homes (both of the same provider type and between health home provider types).

Thank you for your consideration of this information. If you have questions or need more information on the subjects included in this report, please contact Allison Taylor, Director of Governmental Affairs at (410) 767-6480.

Sincerely,

Van T. Mitchell
Secretary

Enclosure

cc: Shannon McMahon
Tricia Roddy
Susan Tucker
Erin McMullen
Alyssa Brown
Allison Taylor

The Hilltop Institute

analysis to advance the health of vulnerable populations

2015 Joint Chairmen's Report (p. 77): Report on Health Homes

November 2, 2015

UMBC

AN HONORS UNIVERSITY IN MARYLAND

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Executive Summary

The Affordable Care Act (ACA) of 2010[1] presented an opportunity for states to improve care coordination for Medicaid participants with chronic conditions by providing care through the Health Home model. Under this legislation, each state can develop a program that offers a person-centered approach to providing enhanced care management and care coordination. The Maryland Department of Health and Mental Hygiene (DHMH) responded to this initiative and submitted a Medicaid State Plan Amendment (SPA) that was approved by the Centers for Medicare & Medicaid Services (CMS) in October 2013.

The purpose of this report is to fulfill the Maryland General Assembly's request for an evaluation describing the outcomes of participants in the Maryland Health Home program. Maryland's Health Home program targets Medicaid participants with a serious and persistent mental illness (SPMI) and/or an opioid substance use disorder (SUD) and risk of additional chronic conditions due to tobacco, alcohol, or other non-opioid substance use and children with serious emotional disturbances (SED). Individuals can participate in Health Homes if they are eligible for and engaged with a psychiatric rehabilitation program (PRP), mobile treatment service (MTS), or an opioid treatment program (OTP) that has been approved by DHMH to function as a Health Home provider.

Participating Health Homes receive an initial intake and assessment fee of $98.87 when they enroll a new individual into the health home. Health Home providers are also eligible for a $98.87 monthly rate per participant for each month in which an enrollee receives at least two qualified health home services.[2] If an enrollee receives fewer than two services, the Health Home is not eligible to receive a payment for that individual for that month. Health home services include care coordination, care management, health promotion, and referrals to community and social support services. The State received a 90% enhanced Federal Medical Assistance Percentage (FMAP) for the provision of health home services during the first eight quarters of the program. As of September 2015, payments to Health Home providers total approximately $5,875,000.

[1] Pub. L. 111-148 (Mar. 23, 2010), as amended by the Health Care and Education Reconciliation Act of 2010, Pub. L. 111-152 (Mar. 30, 2010).

[2] Previous reports and presentations by the Department have referred to this payment as a "per member per month (PMPM)" payment. Since receipt of the monthly payment not guaranteed and is contingent on the provision of at least two health home services by the enrollee, the characterization of the payment as a PMPM is not strictly accurate. Program staff is in the process of updating the State's SPA, regulations and related documents to reflect this nuance.

Since the inception of the program, over 5,000 participants have received services from more than 30 Health Home providers across the state of Maryland. A majority of the participants were between the ages of 18 and 64 years, resided in the Baltimore metropolitan area, and were categorized as having a moderate to very high co-morbidity levels. The most frequently accessed provider type was PRP programs, which enrolled nearly 80 percent of all Health Home participants.

The outcomes of Health Home participants are presented concurrently with data from similar Medicaid participants who did not enroll in the program. The evaluation was structured to provide a summary of the health care utilization, quality, and costs between Health Home participants and a comparison group of Medicaid participants. The analysis began with the selection of the participant and comparison group populations, followed by a selection of measures used to describe the populations' interactions with the health care system, and then an estimation of the utilization, quality, and cost outcomes of interest. The outcomes are presented for calendar years (CYs) 2013 and 2014.

The goal of the Health Home program is to improve health outcomes for individuals with chronic conditions by providing patients with an enhanced level of care management and care coordination while also reducing costs. This analysis suggests that incremental progress towards achieving these goals may be underway. However, preliminary results should be interpreted with caution as sufficient time has not passed since the implementation of the program to detect meaningful and sustained differences in long-term health outcomes. Further, increases and decreases in care utilization observed when comparing the Health Home study and comparison groups were small. Due to the limited data available, it is difficult to discern whether fluctuations in utilization can be attributed exclusively to participation in a Health Home or were driven by other causes. Given these considerations, the results of this initial analysis suggest that:

- Participation in a Health Home may be associated with a modest increase in the use of ambulatory care services. Health Home study group participants with an ambulatory care visit increased by 1.9 percentage points from 84.1% to 86.0%. During the same time period, participants in the comparison group with at least one ambulatory care visit decreased by 0.2 percentage points from 84.5% to 84.3%.
- Across both CY 2013 and 2014, utilization of health care services by the comparison group was often greater than the study group. However, the comparison group also experienced more decreases in inpatient hospitalization, ED visits, 30-day all-cause hospital readmissions, and avoidable ED visits.
    - The percentage of study participants with at least one inpatient hospitalization increased by 0.8 percentage points from 26.2% to 27.0%. The percentage of comparison participants with at least one inpatient hospitalization visit decreased by 0.5% percentage points from 24.8% to 24.3%.

- The percentage of study participants with at least one ED visit increased by 1.3 percentage points from 56.4% to 57.7%. The percentage of comparison participants with at least one ED visit decreased by 1.6 percentage points from 60.3% to 58.7%.
- The percentage of study participants with at least one 30-day all-cause hospital readmission decreased by 0.3 percentage points from 4.3% to 4.0%. The percentage of comparison participants with at least one 30-day all-cause hospital readmission decreased by 0.5 percentage points from 5.2% to 4.7%.
- The percentage of study participants with at least one avoidable ED visit increased by 0.5 percentage points from 34.4% to 34.9%. The percentage of comparison participants with at least one avoidable ED visit decreased by 0.4% percentage points from 38.2% to 37.8%.

- Participants who received care from MTS providers had a higher percentage of inpatient hospitalizations, ED visits, and 30-day all-cause hospital readmissions when compared with those who received care from OTP or PRP providers. This may be due in part to the fact that the MTS population is higher risk than other Health Home participants.

Another critical limitation of this analysis is that the Medicaid Management Information System (MMIS2) fee-for-service (FFS) claims and managed care encounter data used for this report require approximately 12 and 6 months, respectively, before the data are considered final. The final evaluation to be delivered to CMS in 2016 will provide an opportunity for the data issues to be resolved, as well as time to incorporate additional analysis that more accurately reflect the Health Home program results.

November 2015 Health Home Report

Introduction

Pursuant to the 2015 Joint Chairman's Report (JCR), p. 77, the Maryland Medical Assistance Program (Medicaid) within the Maryland Department of Health and Mental Hygiene (DHMH) is required to submit a report on patient outcomes for participants in Health Homes. The JCR noted that the report should include a comparison with Medicaid participants with similar chronic conditions who are not in Health Homes, as well as a comparison of outcomes between Health Homes (both of the same provider type and between Health Home provider types).[3]

Section 1 of this report provides background information on the Health Home program as a whole, including an overview of the implementation of Health Homes in other states. Section 2 details the progress of the Maryland Health Home program, including descriptive statistics of participant characteristics between Health Homes. Section 3 provides a comparison of outcomes between Health Home participants and a comparison group composed of similar Medicaid participants.

Section 1. The Health Home Model

Background

Health Homes are intended to improve health outcomes for individuals with chronic conditions by providing patients with an enhanced level of care management and care coordination. The Affordable Care Act (ACA) created the option for state Medicaid programs to establish Health Homes.[4] Health Homes provide an integrated model of care that coordinates primary, acute, behavioral health, and long-term services and supports for Medicaid participants who have: two or more chronic conditions, one chronic condition and a risk for developing a second chronic condition, or a SPMI. In response to this initiative, DHMH submitted a Medicaid SPA that was approved by the Centers for Medicare & Medicaid Services (CMS) effective October 1, 2013.

The concept of the Health Home evolved from the Medical Home model, introduced by the American Academy of Pediatrics in 1967 to provide more centralized care for children with special health care needs. While a "Medical Home" initially denoted a single source for all of a patient's medical information, it came to refer more broadly to an approach to primary care that is comprehensive, coordinated, and patient- and family-centered (Sia, Tonninges, Osterhus, &

[3] Chairmen of the Senate Budget and Taxation Committee and House Appropriations Committee, Report on Fiscal 2016 State Operating Budget (HB 70) and the State Capital Budget (HB 71) and Related Recommendations, General Assembly 435th Session, p. 77 (Md. 2015).
[4] ACA § 2703(a) (42 USC § 1396w-4(a)).

Taba, 2004). In 2007, four primary care specialty societies (the American Academy of Physicians, the American Academy of Family Physicians, the American College of Physicians, and the American Osteopathic Association) agreed upon Joint Principles of the Patient-Centered Medical Home (PCMH) (Higgins, Chawla, Colombo, Snyder, & Nigam, 2013). The PCMH was to include a personal physician, a whole-person orientation, coordination across providers and specialties, safe and high-quality care, enhanced access to care, and payment that recognized the benefit provided to patients who have a patient-centered medical home.

There has been growing recognition of the fragmentation between behavioral health and primary care faced by individuals with mental health and/or SUDs, who are more likely to die prematurely from untreated and preventable chronic illnesses (Scott, & Happell, 2011). According to CMS, Medicaid is "the single largest payer for mental health services in the United States and is increasingly playing a larger role in the reimbursement of SUD services" (CMS, 2014). Additionally, Medicaid beneficiaries with serious mental illnesses (SMIs) and SUDs are more likely to have co-occurring chronic conditions than are similar Medicaid beneficiaries (Dickey, Normand, Weiss, Drake, & Azeni, 2002). These issues provide the motivation to examine the impact of additional care coordination and care management services on the health outcomes of vulnerable populations.

Health Home Programs Nationwide

As of May 2015, CMS approved 26 Health Home programs submitted by 19 states between 2011 and 2015 (CMS, 2015). Enrollment in these programs varies from less than 1,000 to over 500,000 participants. A majority of the programs are focused on participants with an SMI and/or an SUD. A significant proportion of programs have a broad focus, serving participants with chronic conditions. Two states have programs that are aimed at children with a serious emotional disturbance (SED). One state targets participants with HIV/AIDs. While some states have elected to auto-enroll all eligible Medicaid participants into the Health Home, other states require participants to actively choose to enroll and complete an intake process with a provider.

States are required to engage in activities to monitor the implementation and outcomes of their Health Home model. CMS established a multi-pronged approach to evaluating Health Homes. The data reporting requirements common to all states include a core set of eight metrics that were selected by CMS (CMS, 2010). These metrics target chronic disease, behavioral health, and appropriate utilization of health care. In order to implement a Health Home program, states submit a two-year SPA to CMS, during which time they receive an enhanced federal medical assistance percentage (FMAP) for the services provided. As part of their SPA, states outline their methodology for monitoring quality improvement, health care utilization, and the cost of care pertinent to their programs.

In addition to the reporting completed by the states, CMS is working with the U.S. Department of Health and Human Services Office of the Assistant Secretary for Planning Evaluation (ASPE) to conduct an independent evaluation of SPAs approved during the first three years of the

evaluation (Urban Institute, 2012). A five-year analytical plan is in place that began in October 2011. The initial three years of the evaluation focus on implementation, while the fourth and fifth year will measure changes in quality, cost, utilization, and health outcomes of program recipients compared with non-participants. The evaluation will be used to develop a report to Congress in 2017 (Department of Health and Human Services, 2014).

In August 2015, the Department reviewed Medicaid websites for states with an approved SPA to locate interim reports describing the implementation and outcomes of their Health Homes. In addition to Maryland, reports were published by Missouri, Maine, Iowa, and Washington. There were a range of different evaluations presented, reflecting the diversity of Health Home programs developed by these states. All states provided a description of their participant population, including demographics, clinical characteristics, and enrollment data. The states selected various metrics to evaluate their program but also incorporated some of the core measures designated by CMS. The metrics selected included Healthcare Effectiveness Data and Information Set (HEDIS)-derived outcome measures focusing on monitoring chronic disease management (Department of Mental Health and MO Healthnet, 2013), emergency department (ED) visits (Momany, Damiano, & Bentler, 2014), and total cost of care (Momany, Damiano, Bentler, McInroy, & Nguyen-Hoang, 2014).

Only two states, Missouri and Iowa, which implemented their programs in January 2012, had sufficient data available to offer post-intervention information in their evaluation (Momany, Damiano, Bentler, McInroy, & Nguyen-Hoang, 2014; Momany, Damiano, & Bentler, 2014; Department of Mental Health and MO Healthnet, 2013; Momany, Damiano, & Bentler, 2014). Both reports offered preliminary results suggesting that their Health Home programs had an effect on utilization and costs per Medicaid participant. The authors noted mixed results, with improvement in certain areas (e.g. reductions in ED visits and decreases in per member per month costs), but less or negative impact in other areas (e.g. preventive care visits). Caution must be used when interpreting these results. Each report applied different methods for conducting their analyses, used varying approaches in how they selected participants to include in the study, and may not have had sufficient time to detect changes in long-term health outcomes.

Section 2. The Maryland Health Home Program

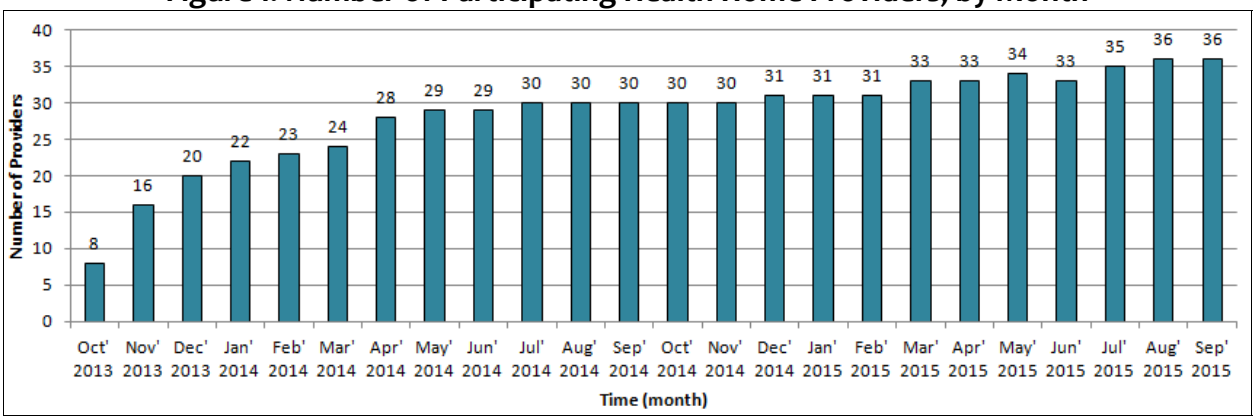
The Maryland Health Homes program builds on statewide efforts to integrate somatic and behavioral health services, with the aim of improving health outcomes and reducing avoidable hospital utilization. The program targets populations with behavioral health needs who are at high risk for additional chronic conditions, offering them enhanced care coordination and support services from providers from whom they regularly receive care. The program is focused on Medicaid participants with a serious and persistent mental illness (SPMI), an opioid SUD and risk of additional chronic conditions due to tobacco, alcohol, or other non-opioid substance use, and children with serious emotional disturbance (SED) (CMS, 2013). In the Health Home, the center of a patient's care, instead of being in a somatic care setting, is in MTSs, PRPs, and OTPs. This service delivery method is intended to include nurses and somatic care consultants into these programs and to make sure individuals in MTS, PRPs, and OTPs receive improved somatic care.

Medicaid participants can enroll in Health Homes if they are eligible for and engaged with a PRP, MTS, or an OTP that has been approved by DHMH to function as a Health Home provider. Instead of auto-enrollment into the program, Maryland requires participants to actively choose to enroll and complete an intake procedure. In order to improve care coordination, when enrolling into the Health Home, Medicaid participants are also required to consent to have their data shared with the Chesapeake Regional Information System for our Patients (CRISP), a regional health information exchange (HIE) serving Maryland and the District of Columbia. Individuals are excluded from Health Home participation if they are currently receiving other Medicaid-funded services that may duplicate those provided by Health Homes, such as targeted mental health care management.

Health Home providers must be enrolled as a Maryland Medicaid provider and accredited as a Health Home. A dedicated care manager must be assigned to each participant, and providers are required to maintain certain staffing levels based on the number of participants. The Health Home staff must include a Health Home director, physician, and nurse practitioner. Health Homes are responsible for documenting all services delivered, participant outcomes, and social indicators in the eMedicaid care management system. They must notify each participant's other providers of the participant's goals and the types of services an individual is receiving via the Health Home, and encourage participation in care coordination efforts.

Figure 1 displays the number of participating Health Home providers by month. These data include Health Homes that had at least one participant enrolled during that month. A small number of providers were active at the inception of the program. Within the first six months, the number of providers tripled. The number of participating providers then remained stable in the second half of 2014 and increased slightly throughout 2015.

Figure 1. Number of Participating Health Home Providers, by Month



Health Home Data

This report presents measures that were selected to provide an overview of the patient outcomes for participants in Health Homes, as requested by the Maryland General Assembly. The measures were calculated using data that Health Home providers entered into the eMedicaid care management data system and data from the Maryland Medicaid Information System (MMIS2).

eMedicaid is a secure web-based portal that allows healthcare practitioners to enroll as a Medicaid provider, verify recipient eligibility, obtain payment information, and serve as a care management tracking tool for providers participating in Maryland's Health Home program. Within eMedicaid, providers enroll participants and report participant diagnoses, outcomes, and services rendered. The measures of participant characteristics and Health Home services in the tables below are calculated from data reported by Health Home providers into the eMedicaid care management system.

The health care utilization and outcome measures were calculated using MMIS2 claims and encounter data. MMIS2 data are routinely used for evaluating the performance of the Medicaid program. Typically, MMIS2 data are not considered complete until 12 months have passed for adjudication of FFS claims and 6 months for submission of managed care encounters. Therefore, *all utilization measures in this report that are based on MMIS2 data should be considered preliminary* and will be revised and updated in future reports. This will most significantly affect measures of health care utilization for the most recently occurring period of enrollees' participation in a Health Home. Because additional claims and encounters will be submitted in later updates to the MMIS2, the majority of these recent measures will increase during subsequent revisions. This means that conclusions about trends cannot be definitively drawn from these interim data. The effectiveness of the program will be analyzed in the final evaluation to be submitted to CMS in 2016.

Participant Characteristics

Figure 2 presents enrollment data for the first eight quarters of the program. Enrollment is determined using data reported by Health Home providers into the eMedicaid care management system as of September 30, 2015. Figure 2 shows that a large portion of participants enrolled near the start of the program. While the enrollment of new participants dropped after the months immediately following implementation, new participants were continuously added every quarter, resulting in enrollment more than doubling between Quarters 1 and 8.

Figure 2. Number of Health Home Enrollees, by Enrollee Type and Quarter

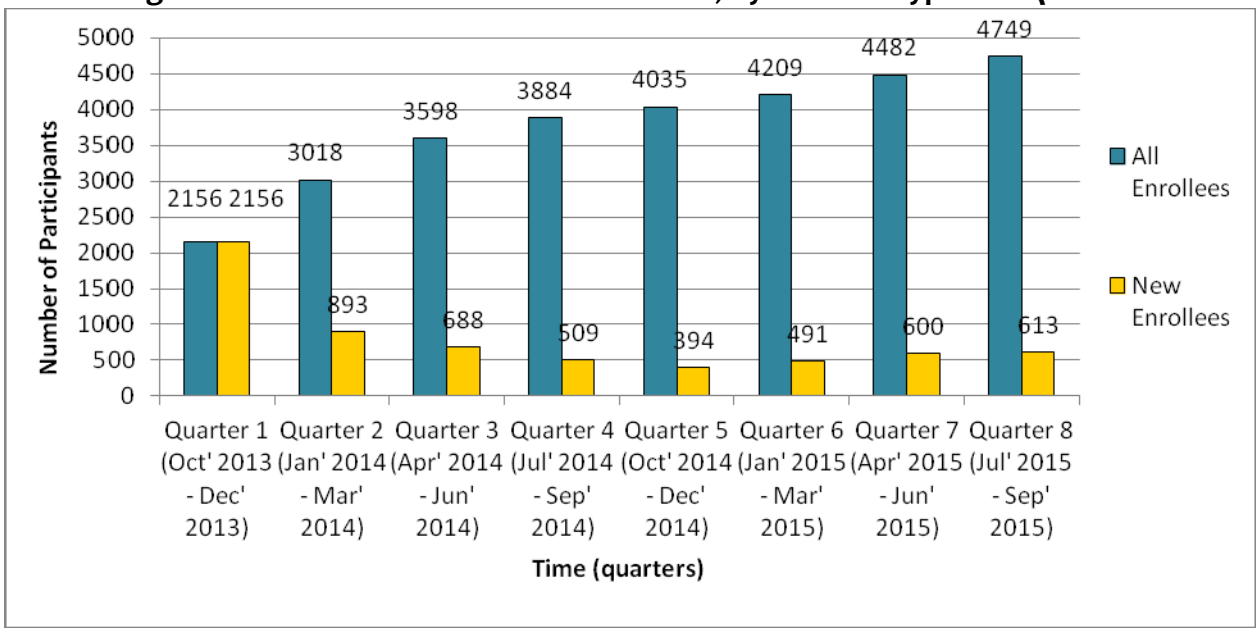


Figure 3 presents enrollment data by program type: PRP, MTS, or OTP. PRP providers consistently enrolled the largest number of participants, (roughly 80 percent of participants per quarter across all eight quarters). There were 3.7 to 6.6 percent of participants in an MTS program, and 10.5 to 17.2 percent of participants in an OTP across all intervention quarters. As of Quarter 8, only 3 of the 31 providers offer care to participants through multiple program types. The remaining providers offer services as one program type.

Figure 3. Number of Health Home Enrollees, by Program Type and Quarter

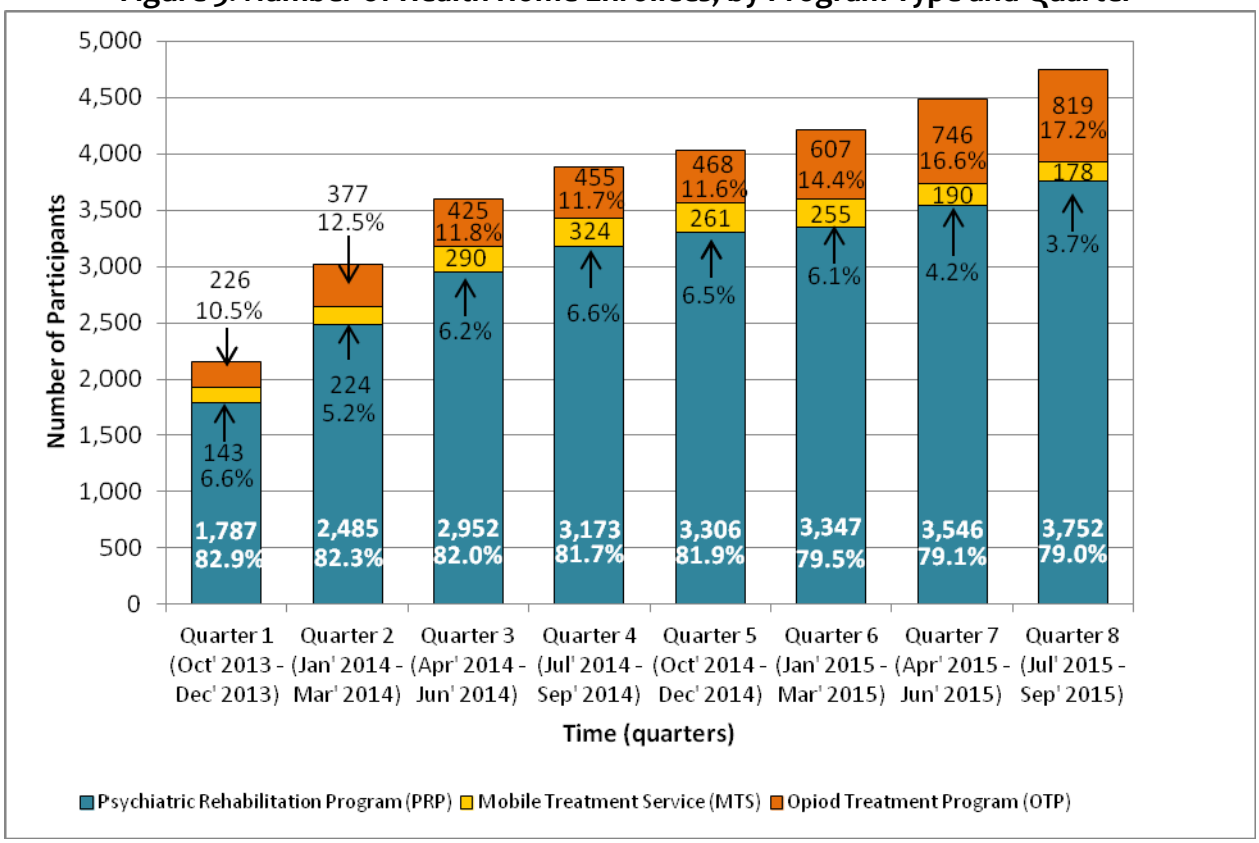


Table 1 presents the percentage of Health Home participants by various demographic characteristics.[5] The largest proportions of participants were aged 40 to 64 years (58.9 percent), followed by those aged 21 to 39 years (26.3 percent). Approximately 10 percent of the participants were under the age of 21 years. Table 1 also shows that the vast majority of the Health Home population identifies as either White (46.1 percent) or Black (45.8 percent). Those who identified as Other/Unknown, Asian, or Hispanic made up a small proportion (8.0 percent) of total participants. A slight majority of Health Home participants was male (54.1 percent). The region with the majority of participants was the Baltimore metropolitan area with 61.3 percent of all Health Home participants.[6] The next most common areas of residence were the Eastern Shore (18.6 percent) and Montgomery and Prince George's Counties (10.4 percent).

[5] Demographic and clinical data are only included for participants enrolled in Quarters 1 through 5. As of May 31, 2015, there are a total of 5,131 participants who have ever been enrolled into a Health Home since the start of the program. However, demographic and clinical data are unavailable for 21 participants.

[6] County of residence was determined based on the participant's last recorded address as of December 31, 2014.

A person's co-morbidity level is estimated based on the Johns Hopkins' Adjusted Clinical Groups (ACG) methodology, which uses claims data to classify individuals based on their projected and/or actual utilization of health care services. Approximately 56 percent of participants were categorized as having a very high or high co-morbidity level. Forty percent were classified as having a moderate co-morbidity level, and only 4 percent were classified as having a low co-morbidity level.

Table 1. Demographic and Clinical Characteristics of Health Home Participants[7]

Demographic/Clinical Characteristics	Health Home Study Group	
	Number	%
Age Group (Years)		
5 to 9	121	2.4%
10 to 14	243	4.8%
15 to 20	149	2.9%
21 to 39	1,334	26.3%
40 to 64	3,012	58.9%
65 and older	241	4.7%
Race/Ethnicity		
Asian	66	1.3%
Black	2,342	45.8%
White	2,357	46.1%
Hispanic	45	0.9%
Other/Unknown	300	5.9%
Gender		
Female	2,348	46.0%
Male	2,762	54.1%
Sex		
Baltimore Metro	3,132	61.3%
Eastern Shore	948	18.6%
Montgomery and Prince George's Counties	533	10.4%
Southern Maryland	8	0.2%
Western Maryland	482	9.4%
Other/Out of State	7	0.1%
ACG Co-Morbidity Level		
Low Co-morbidity	202	4.0%
Moderate Co-morbidity	2,046	40.0%
High Co-morbidity	1,333	26.1%

[7] Demographic and clinical data are only included for participants enrolled in Quarters 1 through 5. Data will be available for participants enrolled in Quarters 6 through 8 in upcoming quarterly reports available on the DHMH website (https://mmcp.dhmh.maryland.gov/SitePages/Healthy%20Homes.aspx).

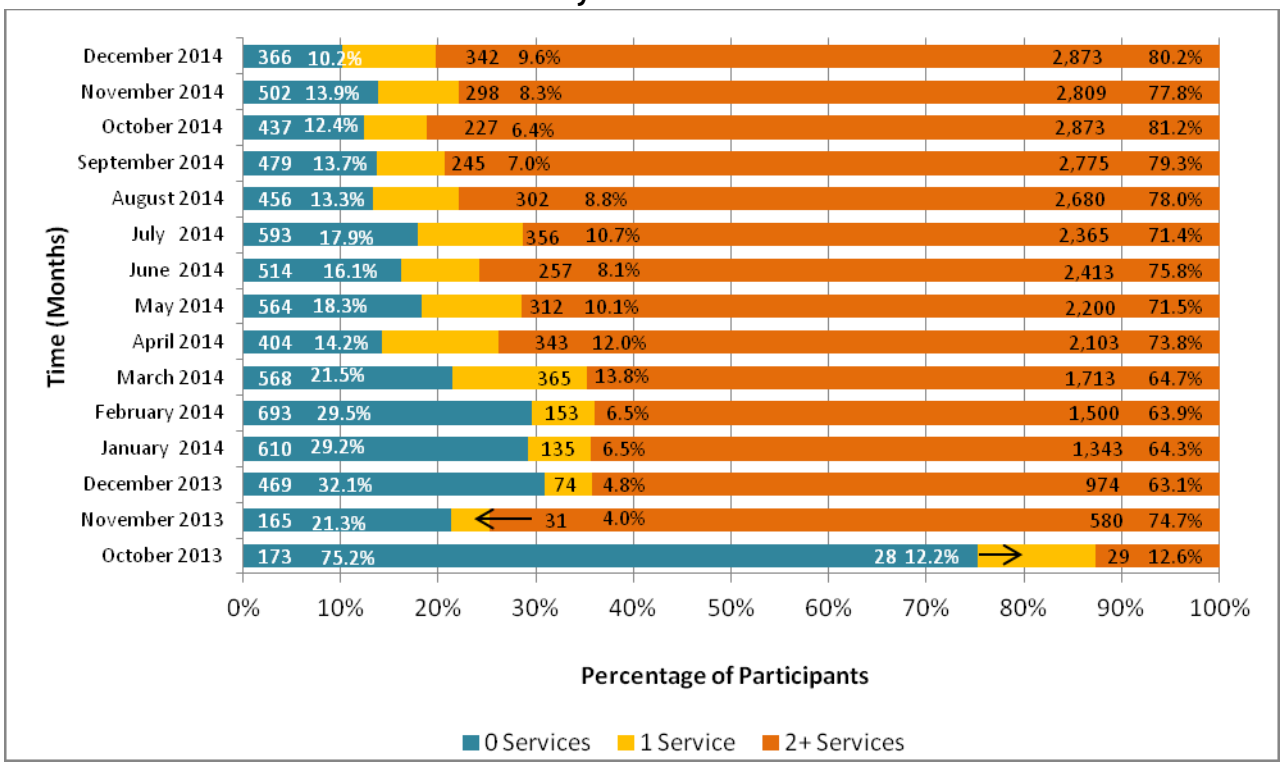
Demographic/Clinical Characteristics	Health Home Study Group	
	Number	%
Very-High Co-morbidity	1,529	30.0%
Total	**5,110**	

Health Home Services

Health Homes are required to provide at least two services to a participant in a given month in order to qualify for a $98.87 monthly rate per participant. Health home services include care coordination, care management, health promotion, and referrals to community and social support services. Categories of services include: (1) comprehensive care management to assess, plan, monitor, and report on participant health care needs and outcomes; (2) care coordination to ensure appropriate linkages, referrals, and appointment scheduling across different providers; (3) health promotion to aid participants in implementation of their care plans; (4) comprehensive transitional care to ease the transition when discharged from inpatient settings and ensure appropriate follow-up; (5) individual and family support services to provide support and information that is language, literacy, and culturally appropriate; and (6) referral to community and social support services.

Figure 4 displays the percentage of participants by the number of services received per month. During the first month of the program, 12.6 percent of participants received two or more services and 75.2 percent of participants did not receive any services. As time progressed, the number of participants receiving two or more services per month increased, ranging from 63.1 to 81.2 percent. A corresponding decrease in the number of participants who did not receive any services is also noted. The percentage of participants not receiving any services between November 2013 and December 2014 ranged from 10.2 to 32.1 percent.

Figure 4. Percentage of Health Home Participants Receiving 0, 1, or 2 or More Services, by Month[8]



[8] Service are only included for participants enrolled in Quarters 1 through 5. Data will be available for participants enrolled in Quarters 6 through 8 in subsequent quarterly reports on the DHMH website.

Figure 5 presents the average number of services among Health Home participants who received at least one service during the quarter. The average number of services increased as the program progressed, ranging from 4.8 in Quarter 1 to 6.8 in Quarter 5.

Figure 5. Average Number of Services Received by Health Home Participants, by Quarter[9]

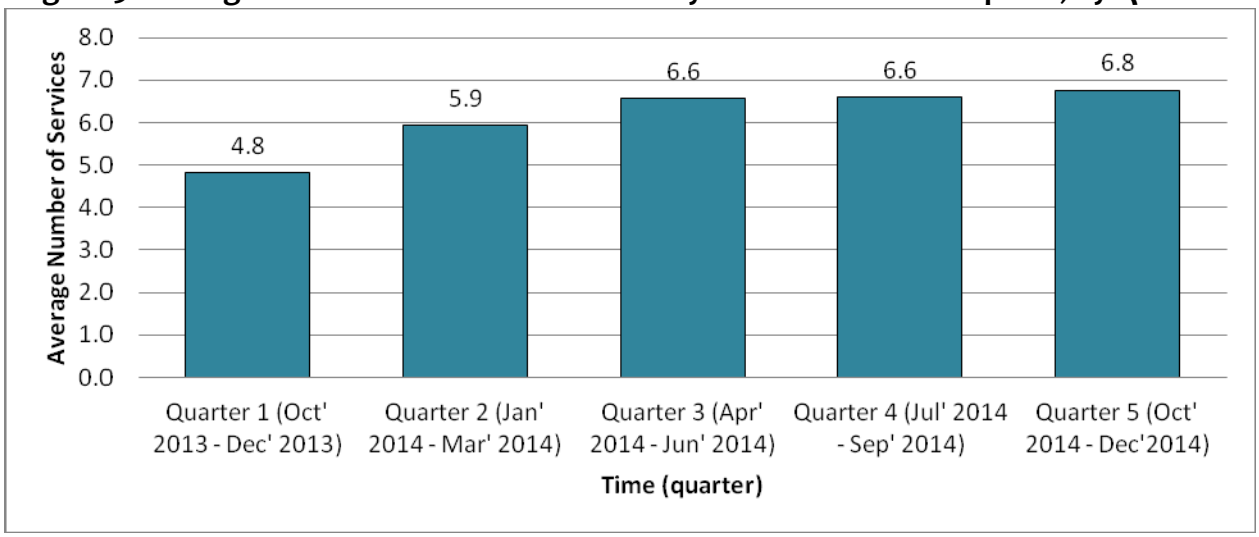
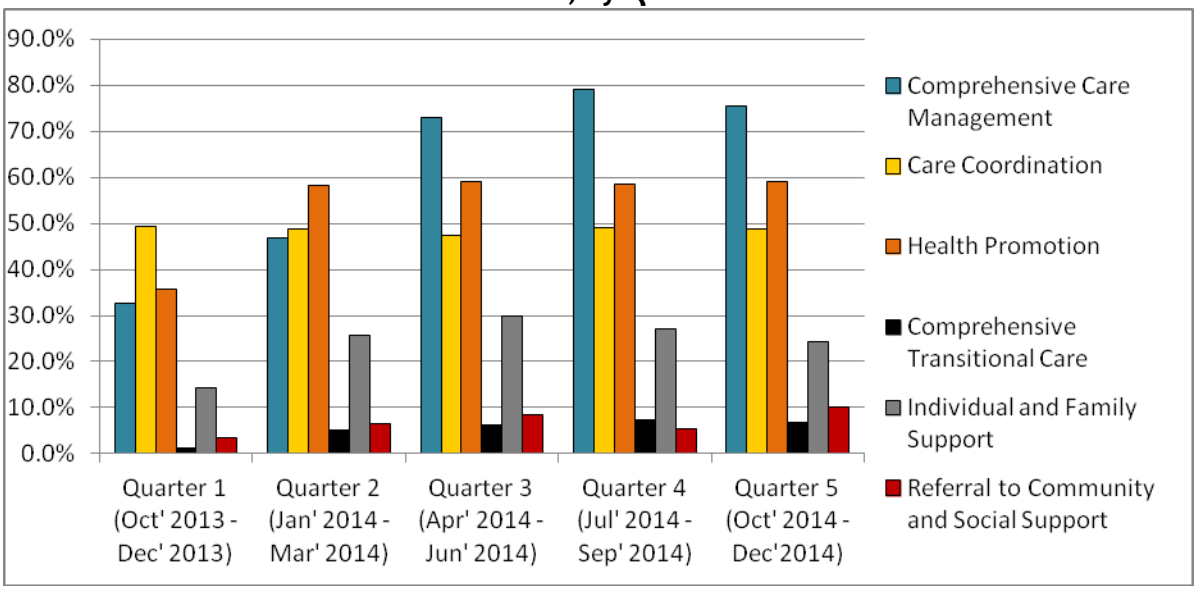


Figure 6 displays the percentage of participants who received at least one type of Health Home service required by CMS. The figure demonstrates that there is a strong demand from participants for the Health Home social services. Care coordination was consistently received at least once per quarter by approximately half of the participants, across the first five quarters of the program. The proportion of participants receiving a comprehensive care management service increased from 32.6 percent in Quarter 1 to 75.5 percent in Quarter 5. Receipt of health promotion services increased from 35.8 percent in Quarter 1 to between 58.3 and 59.2 percent through the subsequent four quarters. Comprehensive transitional care and referral to community and social support services were consistently received by the smallest proportion of participants.

[9] Service data are only included for participants enrolled in Quarters 1 through 5. Data will be available for participants enrolled in Quarters 6 through 8 in subsequent quarterly reports on the DHMH website.

Figure 6. Percentage of Health Home Participants by Types of Health Home Services Received, by Quarter[10]



Composition of Total Medicaid Services

Figure 7 presents the overall composition of services received by the Health Home participants, grouped into the following categories: prescriptions, behavioral health services, and general somatic services. In contrast with the service data presented above, these numbers are based on claims and encounters reported in the MMIS2. In Quarter 1, behavioral health visits accounted for approximately 24.2 percent of all services. The proportion of behavioral health services increased to 29.8 percent in Quarter 2 and then declined steadily to 26.1 percent by Quarter 5. The "general somatic care" category increased by about 4.1 percentage points between Quarters 1 and 3, and remained relatively steady thereafter. Prescriptions dropped from 28.7 percent in Quarter 1 to 19.8 percent in Quarter 2, then increased gradually from Quarters 3 through 5.

[10] Service data are only included for participants enrolled in Quarters 1 through 5. Data will be available for participants enrolled in Quarters 6 through 8 in subsequent quarterly reports on the DHMH website.

Figure 7. Composition of Types of Services received by Health Home Participants, by Quarter

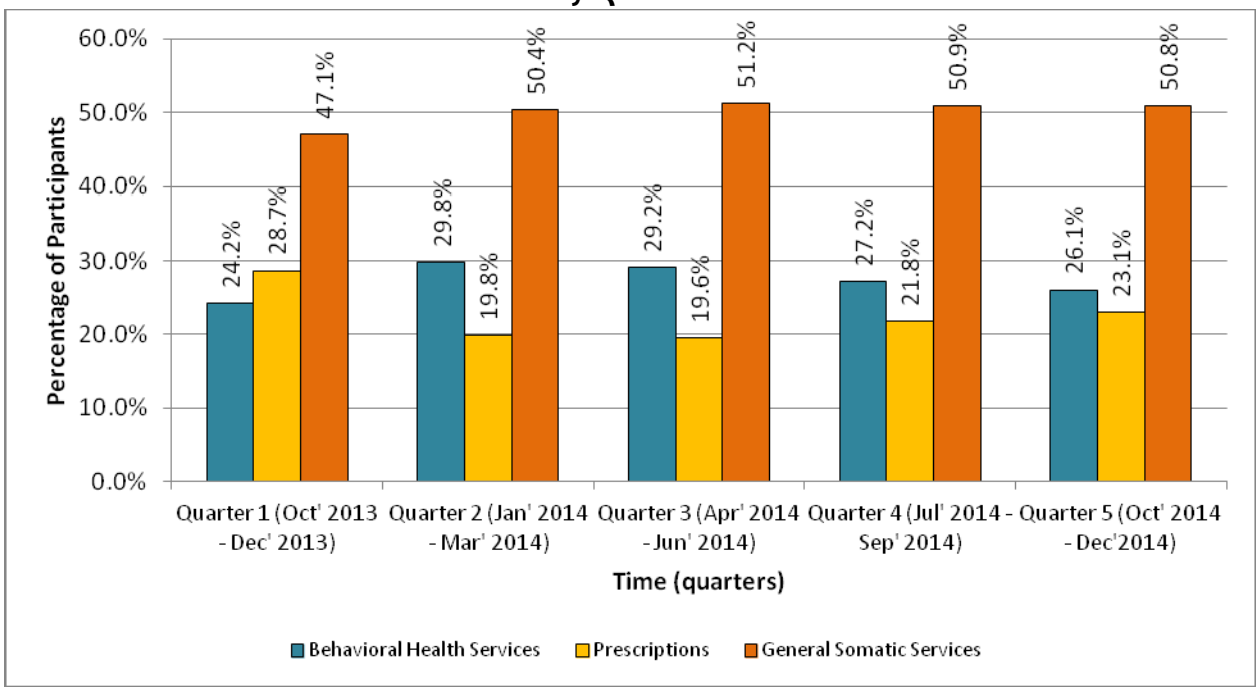


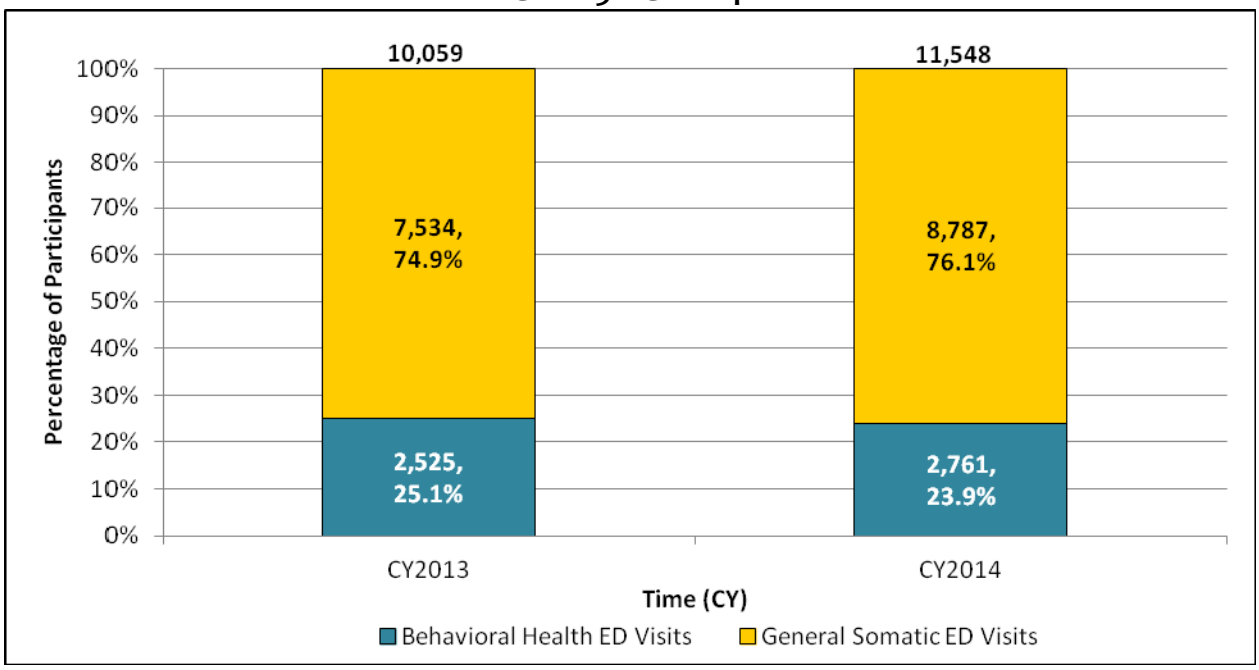
Table 2 presents the percentage of Health Home participants who had at least one ED visit in CY 2013 and CY 2014. The table also shows the percentages of participants who visited the ED for somatic care and/or behavioral health services. To identify those ED visits related to behavioral health, the team used a grouping method based on classifications developed by the New York University (NYU) Center for Health and Public Service Research (Billings, Parikh, & Mijanovich, 2000). In CY 2013, 18.5 percent of participants had an ED visit with a diagnosis related to behavioral health; this percentage increased to 21.1 percent in CY 2014. A greater percentage of participants, 50.8 percent, visited the ED for somatic care in CY 2014, compared with 45.2 percent in CY 2013.

Table 2. Percentage of Health Home Participants Completing ED Visits, by Service Type, CY 2013 – CY 2014

CY	# of Participants	# with Any ED Visit	% with Any ED Visit	% with Any Behavioral Health ED Visit	% with Any Somatic Care ED Visit
2013	5,110	2,612	51.1%	18.5%	45.2%
2014	5,110	2,927	57.3%	21.1%	50.8%

Figure 8 displays the distribution of Health Home participants' total number of ED visits, categorized by the type of care provided. Of the total ED visits in CY 2013, approximately one quarter (25.1 percent) were for behavioral health; the remaining 74.9 percent were for somatic care. While the total number of ED visits for behavioral health increased from 2,525 in CY 2013 to 2,761 in CY 2014, the proportion of behavioral health visits as a percentage of the total number of ED visits decreased by 1.2 percentage points (from 25.1 percent in CY 2013 to 23.9 percent in CY 2014).[11]

Figure 8. Number and Composition of ED Visits received by Health Home Participants, CY 2013 – CY 2014



[11] A preliminary analysis conducted by the Maryland Behavioral Health Network (MBHN) on a subset of seven Health Home providers suggests that there may have been decreases in non-behavioral health related health care service utilization rates, when comparing the period of January 1 through March 31 of CYs 2014 and 2015. These results are preliminary, and the methodology used to generate these rates has not been verified.

Section 3. Health Home Participant Outcomes

This section of the report presents a comparison of the health care utilization, quality, and costs between Health Home participants and a comparison group of Medicaid participants. The analysis began with the selection of the participant and comparison groups, followed by a selection of measures used to describe the populations' interactions with the health care system, and then an estimation of the utilization, quality, and cost outcomes of interest.

Evaluation Cohort Description

The team selected a sub-population of the Health Home and other Medicaid participants to use as study and comparison groups for this evaluation in order to help estimate the effects of the program. Estimating the same measures between carefully selected groups of similar people can aid in distinguishing changes associated with participation in the Health Home program from changes due to other contributing factors. To identify the comparison group of interest, the team first created a sub-group of Health Home and other Medicaid participants that met the following criteria:

1. Aged 18 to 64 years
2. Were continuously enrolled in Medicaid across CYs 2013 and 2014
3. Received care in CY 2013 from a provider of the same type as a Health Home provider, in order to estimate the outcomes of participants with similar health needs. These provider types include:
    a. Drug Clinics (Provider Type 32)
    b. Mobile Treatment Programs (Provider Type MT)
    c. Psychiatric Rehab Services Facilities (Provider Type PR)

Once the selection of potential comparison group members was completed, the team used a propensity score matching statistical technique to select an evaluation cohort, i.e., a study and comparison group, in which the likelihood of joining the program is as similar as possible between the two groups. The likelihood of joining the program was estimated based on participants' geographic region of residence, age, race/ethnicity, gender, ACG co-morbidity grouping, and type of Health Home provider seen. A detailed description of the process used to select the evaluation cohort is presented in Appendix A.

Demographic Characteristics

Table 3 provides a comparison of the study and comparison groups on several demographic and clinical characteristics. Overall, the propensity score matching technique produced a comparison group that was very similar to the study group. In both groups, a majority of the participants were between the ages of 18 and 64 years, resided in the Baltimore metropolitan area, and were

categorized as having a moderate to very high co-morbidity level. The characteristics of the study group differ significantly from the wider Health Home population. People in the study group are younger, more likely to be Black, more likely to be female, less likely to be from the Eastern Shore, and less likely to have low co-morbidities.

Table 3. Demographic and Clinical Characteristics of Study Group and Comparison Group

Descriptive Characteristics	Study Group		Comparison Group	
	Number	%	Number	%
Age Group (Years)				
Under 21	59	2.3%	251	5.0%
21 to 39	876	34.6%	1,446	28.6%
40 to 64	1,596	63.1%	3,365	66.5%
Race/Ethnicity				
Asian	50	2.0%	68	1.3%
Black	1,249	49.4%	2,479	49.0%
White	1,077	42.6%	2,150	42.5%
Hispanic	23	0.9%	59	1.2%
Other/Unknown	132	5.2%	306	6.1%
Gender				
Female	1,294	51.1%	2,562	50.6%
Male	1,237	48.9%	2,500	49.4%
Region				
Baltimore Metro	1,775	70.1%	3,599	71.1%
Eastern Shore	93	3.7%	188	3.7%
Montgomery and Prince George's Counties	408	16.1%	863	17.1%
Southern Maryland	4	0.2%	15	0.3%
Western Maryland	251	9.9%	397	7.8%
ACGs				
Low Co-morbidity	11	0.4%	123	2.4%
Moderate Co-morbidity	1,039	41.1%	1,927	38.1%
High Co-morbidity	721	28.5%	1,451	28.7%
Very-High Co-morbidity	760	30.0%	1,561	30.8%
Total	**2,531**		**5,062**	

Table 4 compares the distribution of the study group by program type with the comparison group in CY 2013. PRP providers were seen by the largest proportion of both the study and comparison groups, at 76.1 and 76.5 percent, respectively. Please note that the people in the comparison group could have seen more than one type of provider—these categories are not mutually exclusive, and, therefore, the sum of the frequencies does not equal the total comparison group population.

Table 4. Program Types of the Study Group and Comparison Group

Provider Type	Study Group		Comparison Group	
	Number	%	Number	%
Psychiatric Rehabilitation Facility	1,927	76.1%	3,870	76.5%
Mobile Treatment Services	210	8.3%	345	6.8%
Drug Clinic	527	20.8%	1,122	22.2%
Total	**2,531**		**5,062**	

Health Care Utilization Outcomes

All measures presented in the tables below include the study and comparison groups detailed above. In order to generate comparable results, all percentages have been weighted to account for the matching technique and sample size difference between the study and comparison groups. A description of the analytical methods used is included in Appendix A.

Inpatient Hospital Admissions

Table 5 compares the percentage of participants with at least one inpatient hospital admission in CY 2013 and CY 2014 for the Health Home study and comparison groups. In CY 2013, 26.2 percent of people in the study group had at least one inpatient hospital admission; this increased slightly to 27.0 percent in CY 2014. In CY 2013, 24.8 percent of people in the comparison group had at least one inpatient hospital admission; this decreased to 24.3 percent in CY 2014. Throughout the evaluation period, the group of participants receiving services from MTS providers had a greater percentage of inpatient hospital admissions and experienced the largest decrease in utilization compared with those enrolled in PRPs and OTPs.

Table 5. Percentage of Participants with at Least One Inpatient Hospital Admission, by Treatment Group, CY 2013 – CY 2014

	Inpatient Hospital Admissions			
	Health Home Study Group		Comparison Group	
	n = 2,531		n=5,062	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	22.1%	24.3%	24.6%	24.9%
MTS	45.5%	34.3%	42.0%	31.3%
PRP	25.7%	27.1%	24.4%	24.2%
Total	**26.2%**	**27.0%**	**24.8%**	**24.3%**

Lengths of Inpatient Hospital Stay

Table 6 compares the average lengths of stay (in days) in CY 2013 and CY 2014 for the Health Home study and comparison groups. In CY 2013, the average length of stay was nearly the same

for both the study and comparison groups, at 13.7 and 13.8 days, respectively. The average length of stay rose to 14.5 days in CY 2014 for the comparison group. On the other hand, the average length of stay fell slightly to 13.4 days for the study group. While the length of stay fell for those in the OTP and MTS study groups between CY 2013 and CY 2014, the average length of stay for those hospitalized rose for participants in the PRP study group.

Table 6. Average Length of Stay for Inpatient Hospital Admissions, by Treatment Group, CY 2013 – CY 2014

	Inpatient Hospital Admissions							
	Health Home Study Group				Comparison Group			
	n = 2,531				n=5,062			
	CY 2013		CY 2014		CY 2013		CY 2014	
Provider Type	Num with One or More Visits	Avg Length of Stay (Days)	Num with One or More Visits	Avg Length of Stay (Days)	Num with One or More Visits	Avg Length of Stay (Days)	Num with One or More Visits	Avg Length of Stay (Days)
OTP	510	14.4	536	13.7	941	14.0	936	15.0
MTS	61	16.0	46	15.2	144	18.3	108	14.9
PRP	92	8.5	101	11.2	274	11.9	278	13.1
Total	**663**	**13.7**	**683**	**13.4**	**1,256**	**13.8**	**1,230**	**14.5**

ED Utilization

As shown in Table 7, in 2013, 56.4 percent of study group participants had at least one ED visit in CY 2013, compared with 57.7 percent in CY 2014. While ED utilization was greater in the comparison group than in the study group, the percentage of participants in the comparison group with at least one ED visit decreased by 1.6 percentage points between CY 2013 and CY 2014. For Health Home participants receiving services from an MTS provider, the percent of those visiting an ED visit decreased by almost 7 percentage points between CY 2013 and CY 2014.

Table 7. Percentage of Participants with at Least One ED Visit, by Treatment Group, CY 2013 – CY 2014

	ED Visits			
	Health Home Study Group		Comparison Group	
	n = 2,531		n=5,062	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	61.5%	67.1%	65.6%	63.9%
MTS	73.9%	66.4%	71.3%	63.6%
PRP	54.1%	55.1%	59.1%	57.9%
Total	**56.4%**	**57.7%**	**60.3%**	**58.7%**

Ambulatory Care Utilization

An ambulatory care visit is defined as contact with a doctor or nurse practitioner in a clinic, physician's office, or hospital outpatient department.[12] Ambulatory care utilization often serves as a measure of access to care. Higher rates of ambulatory care can offer an alternative to less efficient care for non-emergent conditions in an ED visit setting, as well as preventing a condition to exacerbate to the extent that it requires an inpatient admission.

Table 8 shows that 84.1 percent of people in the study group had at least one ambulatory care visit in CY 2013, while 84.5 percent of the comparison group had at least one visit in CY 2013. While the rate of those in the study group increased to 86.0 percent between CY 2013 and CY 2014, those in the comparison group with an ambulatory care visit decreased slightly to 84.3 percent. Participants who received services from a PRP had a higher rate of ambulatory care visits compared with the other provider type for both the study and comparison group in both years.

Table 8. Percentage of Participants with at Least One Ambulatory Care Visit, by Treatment Group, CY 2013 – CY 2014

	Ambulatory Care Visits			
	Health Home Study Group		Comparison Group	
	n = 2,531		n=5,062	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	73.1%	84.1%	82.3%	83.9%
MTS	77.6%	83.6%	78.0%	80.9%
PRP	86.8%	86.5%	85.7%	84.9%
Total	**84.1%**	**86.0%**	**84.5%**	**84.3%**

Nursing Home Admissions

Table 9 presents information on nursing home stays. In CY 2013, roughly 2 percent of participants in both the study and comparison groups had at least one nursing home admission; this increased to 2.4 percent for both groups in CY 2014. OTP study group participants had the largest increase in nursing home admissions between CY 2013 and CY 2014, increasing from 1.2 percent in CY 2013 to 3.1 percent in CY 2014.

[12] This definition excludes ED visits, hospital inpatient services, substance abuse treatment, mental health, home health, x-ray, and laboratory services.

Table 9. Percentage of Participants with at Least One Nursing Home Admission, by Treatment Group, CY 2013 – CY 2014

	Nursing Home Admissions			
	Health Home Study Group		Comparison Group	
	n = 2,531		n=5,062	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	1.2%	3.1%	2.3%	2.5%
MTS	2.2%	1.5%	3.6%	4.0%
PRP	2.0%	2.4%	1.8%	2.1%
Total	**1.9%**	**2.4%**	**2.0%**	**2.4%**

Health Care Quality Outcomes

30-Day All-Cause Hospital Readmissions

The 30-day all-cause hospital readmission rate, based on National Committee for Quality Assurance (NCQA) definitions, was calculated as the percentage of acute inpatient stays during the measurement year that were followed by an acute inpatient readmission for any diagnosis within 30 days. The HEDIS 2013 specifications identify inclusion criteria for types of stays and hospitals. The HEDIS specifications also limit the population to people continuously enrolled in Medicaid with respect to the date of discharge.

As shown in Table 10, 4.3 percent of Health Home study group participants had at least one 30-day all-cause hospital readmission; this dropped slightly to 4.0 percent in CY 2014. In CY 2013, 5.2 percent of people in the comparison group had at least one 30-day all-cause hospital readmission; this decreased to 4.7 percent in CY 2014. Throughout the measurement period, participants receiving services from MTS providers had a greater likelihood of having a 30-day all-cause hospital readmission, occurring at almost twice the rate as those enrolled in OTP and PRP programs.

Table 10. Percentage of Participant with at Least One 30-Day All-Cause Hospital Readmission, by Treatment Group, CY 2013 – CY 2014

	30-Day All-Cause-Hospital Readmissions			
	Health Home Study Group		Comparison Group	
	n = 2,531		n=5,062	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	4.1%	5.3%	5.2%	5.2%
MTS	9.0%	9.0%	12.1%	7.6%
PRP	4.1%	3.4%	5.2%	4.6%
Total	**4.3%**	**4.0%**	**5.2%**	**4.7%**

Appropriateness of ED Care

One widely used methodology to evaluate the appropriateness of care in the ED setting is based on classifications developed by the NYU Center for Health and Public Service Research (Billings, Parikh, & Mijanovich, 2000). The algorithm assigns probabilities of likelihoods that the ED visit falls into one of the following categories:

1. *Non-emergent*: Immediate care was not required within 12 hours based on patient's presenting symptoms, medical history, and vital signs
2. *Emergent but primary care treatable*: Treatment was required within 12 hours, but it could have been provided effectively in a primary care setting (e.g., CAT scan or certain lab tests)
3. *Emergent but preventable/avoidable*: Emergency care was required, but the condition was potentially preventable/avoidable if timely and effective ambulatory care had been received during the episode of illness (e.g., asthma flare-up)
4. *Emergent, ED care needed, not preventable/avoidable*: Ambulatory care could not have prevented the condition (e.g., trauma or appendicitis)
5. *Injury*: Injury was the principal diagnosis
6. *Alcohol-related*: The principal diagnosis was related to alcohol
7. *Drug-related*: The principal diagnosis was related to drugs
8. *Mental-health related*: The principal diagnosis was related to mental health
9. *Unclassified*: The condition was not classified in one of the above categories

Table 11 presents the distribution of "non-emergent" ED visits for the Health Home study and comparison groups according to the NYU classification. If a visit is classified as more than 50 percent likely to fall into Categories 1 or 2 described above, then it is considered "non-emergent." The estimates presented in the table therefore show the percentage of participants who went to the ED when either immediate care was not required within 12 hours, or it could have been provided in a primary care setting. In CY 2013, 34.4 percent of the study group had at least one non-emergent ED visit, compared with 38.2 percent of the comparison group. In CY 2014, the non-emergent ED visit rate for the study group rose slightly to 34.9 percent, while the rate dropped slightly for the comparison group. During the evaluation period, participants receiving services from OTP providers had higher rates of non-emergent ED visits than those receiving services from the other provider types.

Table 11. Percentage of Participants with at Least One Non-Emergent ED Visit, by Treatment Group, CY 2013 – CY 2014

	Non-Emergent ED Visits			
	Health Home Study Group		Comparison Group	
	n = 2,531		n=5,062	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	43.8%	45.7%	45.5%	42.7%
MTS	42.5%	44.8%	43.2%	42.4%
PRP	31.8%	32.0%	36.9%	36.7%
Total	**34.4%**	**34.9%**	**38.2%**	**37.8%**

Health Care Cost Outcomes[13]

The following tables present preliminary data on the hospital inpatient, hospital outpatient, physician, and other services, as well as the total cost of health care for participants in the study and comparison groups. These data should be considered as preliminary due to the limited amount of time that has passed for adjudication of these claims and encounters. The interim administrative claims and encounter data that are available at this point may be missing payment information, and/or reversals of payment denials may not be reflected. In addition, please note that these data have not been revised to exclude outliers with extremely high or low total costs. Given the small sample size for some of the sub-populations, those outliers may have a significant effect on the average costs per group. In the final evaluation, the team plans to further examine the data to categorize extreme observations, determine if the data are a true reflection of the services received, and explore their impact on the group average.

[13] While the amounts charged for health care services are available on FFS claims, managed care encounters do not list payment amounts reliably. Costs for health care services received by participants covered by a Medicaid managed care organization are estimated through an imputation methodology.

Table 12 presents the average health care costs for hospital inpatient admissions by treatment group for CYs 2013 and 2014. The average hospital inpatient health care costs for both the study group and comparison group increased between CY 2013 and CY 2014.

Table 12. Average Hospital Inpatient Health Care Cost by Treatment Group and Provider Type, CY 2013- CY 2014

	Hospital Inpatient Health Costs			
	Health Home Study Group		Comparison Group	
Provider Type	CY 2013	CY2014	CY 2013	CY 2014
OTP	$17,133.68	$24,740.78	$27,669.01	$28,371.66
MTS	$17,674.93	$17,168.53	$21,907.30	$22,011.91
PRP	$13,486.82	$15,216.65	$16,883.24	$18,905.36
Total	**$14,372.86**	**$16,747.54**	**$19,174.76**	**$20,654.25**

Table 13 presents the average health care costs for hospital outpatient health care by treatment group for CYs 2013 and 2014. There was an increase in the average hospital outpatient health care costs for the study group between CY 2013 and CY 2014, and a small decrease for the comparison group. When reviewing across provider types, those in the MTS study group experienced the largest reduction in average costs between CY 2013 and CY 2014.

Table 13. Average Hospital Outpatient Health Care Cost by Treatment Group and Provider Type, CY 2013- CY 2014

	Hospital Outpatient Health Costs			
	Health Home Study Group		Comparison Group	
Provider Type	CY 2013	CY2014	CY 2013	CY 2014
OTP	$8,529.39	$8,077.79	$8,519.60	$7,219.02
MTS	$8,370.42	$6,627.58	$6,476.70	$6,384.36
PRP	$3,908.88	$4,421.04	$6,069.57	$6,345.25
Total	**$4,884.75**	**$5,248.34**	**$6,355.58**	**$6,276.18**

Table 14 presents the average health care costs for physician and other services (including physician fees, prescriptions, long-term care, and home health) by treatment group for CYs 2013 and 2014. Average health care costs increased for both the study and comparison groups. The OTP group had lower average costs than both the MTS and PRP participants across the evaluation period.

Table 14. Average Physician and Other Services Health Care Cost by Treatment Group and Provider Type, CY 2013- CY 2014

	Physician and Other Services Costs			
	Health Home Study Group		Comparison Group	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	$9,959.26	$12,857.91	$11,370.02	$13,026.70
MTS	$20,996.33	$24,887.51	$19,575.23	$20,508.75
PRP	$25,006.46	$27,104.15	$17,410.52	$18,235.62
Total	**$22,324.79**	**$24,642.33**	**$16,214.41**	**$17,255.66**

Table 15 presents the total average health care costs by treatment group for CYs 2013 and 2014. The average total health care cost for both the study and comparison groups increased during this time period. Similar to the other outcome measures, participants who saw MTS providers had a greater average total health care cost when compared with those who saw other provider types. The MTS group, which has a higher average cost compared with other groups, also has the smallest sample size, making it more susceptible to the influence of outliers in the data. Variations in average cost may also be attributable to the fact that individuals who receive care from an MTS provider are higher risk than individuals who receive care through other provider types.

Table 15. Average Total Health Care Cost per Person by Treatment Group and Provider Type, CY 2013- CY 2014

	Total Health Costs			
	Health Home Study Group		Comparison Group	
Provider Type	CY 2013	CY 2014	CY 2013	CY 2014
OTP	$18,443.59	$25,194.87	$23,655.01	$25,735.10
MTS	$35,101.57	$35,529.30	$33,036.95	$32,101.26
PRP	$30,872.66	$34,108.10	$25,343.96	$27,197.52
Total	**$29,057.16**	**$32,716.70**	**$24,967.72**	**$26,714.07**

Limitations

One of the major limitations of this analysis is that there has not been enough time between the implementation of the program to conduct an analysis of long-term health outcomes for this population. The health care utilization metrics included in this report were calculated using MMIS2 FFS claims and managed care encounter data. The data presented in this report were

current as of July 30, 2015. Typically, MMIS2 data are not considered complete until 12 months have passed for adjudication of FFS claims and 6 months for submission of managed care encounters. Therefore, measures based on MMIS2 data, particularly for recently occurring time periods, should be considered preliminary.

In addition, the differences between sub-groups should be interpreted with caution because of the small cohort sizes. Since the Health Homes are often small, especially when controlling for people who were continuously enrolled for a full calendar year, it was impossible to conduct a comparison between Health Home providers at this time. The sample size is such that only a small sub-group of the Health Homes could have been included in that type of analysis. In addition, the results of this analysis are not generalizable to the Medicaid population at large. The comparison group selected only includes those who sought out care in a PRP, OTP, or MTS facility, and met the other criteria to match to the study population of interest.

These and other factors will likely be incorporated into the methods to be used when preparing the final evaluation. For example, the variables available for this report do not have a powerful relationship with the likelihood of joining the program, which affected the regression used to generate the propensity score. Given the time to apply more meaningful data that theoretically directly contribute to the likelihood of joining the program, the results may be different. For example, data on a participant's claims and diagnosis history would provide information on potential chronic conditions that are a prerequisite for joining the program. The final evaluation may include other components, such as analysis within different time intervals, inclusion of length of enrollment in the program, statistical analysis of differences between the group estimates, inclusion of participants' diagnoses and health service history, and information about the Health Home program implementation.

Conclusion

Health Homes are intended to improve health outcomes for individuals with chronic conditions by providing patients with an enhanced level of care management and care coordination. The Maryland Health Home program is aimed at Medicaid participants with either a SPMI and/or an opioid SUD and risk of additional chronic conditions due to tobacco, alcohol, or other non-opiod SUD, and children with SED. The information presented in this report provides evidence that Health Homes successfully tie this extremely vulnerable population to social and somatic care services, improving their access to preventive care.

The results of this preliminary analysis suggest that Health Home participants had a strong demand for the Health Home social services, such as care coordination and health promotion. When comparing the study group and a comparison group of Medicaid participants with similar characteristics, preliminary results show mixed results in the overall trends for the health care utilization and outcomes measures for each group. For example, the Health Home study group had larger increases in rates of ambulatory care between CY 2013 and CY 2014 than the comparison group did. Additionally, although the comparison group's overall utilization of

services was often higher than that of the study group, the comparison group experienced more decreases in inpatient stays, ED visits, 30-day all-cause hospital readmissions, and avoidable ED visits. Finally, despite a higher overall rate of inpatient admissions, the average length of stay for those hospitalized was lower for the study group than the comparison group in both years.

A complete evaluation of this program will be completed once more time has passed for the anticipated long-term outcomes to present themselves.

Appendix A: Statistical Methods

Once the selection of potential matches was finished, the team implemented propensity score matching—a statistical technique that attempts to select a group of controls with which to compare the study population and minimize potential bias when comparing program-related outcomes. Propensity score matching creates a sample of participants and non-participants that are comparable across a set of independent characteristics theorized to have an effect on the outcomes of interest. By doing this, the groups are constructed to have a relatively similar likelihood of joining the study. For this analysis, the team created propensity scores by estimating a regression of the likelihood of joining the program on the following independent characteristics: geographic region of residence, age, race/ethnicity, gender, ACG co-morbidity grouping, and type of Health Home provider seen. The result was a one-to-two match between the study and comparison groups. Each member of comparison group can only be matched to one participant in the study group.

Table 16. Number of Health Home and Comparison Group Participants

Selection Criteria	Health Home Participants	Medicaid Participants
Full Group	5,110	1,279,315
Adults (aged 18-64) that had seen a PRP, OTP, or MTS provider and were continuously enrolled CY 2013 to CY 2014	3,462	19,581
Found an appropriate match via the propensity score selection process	2,531	5,062

To develop estimates of the outcomes of interest, the team used the generalized linear model procedure. The procedure takes into account the differences between the two groups, including their outcome variances, participation in the study versus comparison group, as well as the individual's propensity score. In addition, the means have been weighted between the two groups to account for the 1:2 matching.

Because of the propensity score method used to select the evaluation cohort, this analysis should not be considered to be generalizable to the Medicaid population at large or to all participants in the Health Home program. The people in the comparison group are only those that sought out care in a PRP, OTP, or MTS facility, as well as meeting the other criteria to match to the study population of interest. Furthermore, developing the group to be studied required reducing the sample by removing cases at the high and low ends of the distributions of the estimates propensity scores.

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