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Evaluation of the Maryland Health Home Program for Medicaid Enrollees with Severe Mental Illnesses or Opioid Substance Use Disorder and Risk of Additional Chronic Conditions

June 25, 2018

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AcademyHealth Annual Research Meeting

Presentation Outline

- Health Home Overview
- Maryland's Health Home Program
- Utilization Outcomes
- Regression Analysis

Health Home Overview

- Section 2703 of the ACA allowed for state Medicaid programs to provide Health Homes to beneficiaries with chronic conditions
- Health Homes provide a person-centered, integrated model of care that coordinates acute, behavioral health, and long-term services.
- Health Homes provide the following six core services:
 1. Comprehensive Care Management
 2. Care Coordination
 3. Health Promotion
 4. Comprehensive Transitional Care
 5. Individual and Family Supports
 6. Referral to Community & Social Supports

Maryland Health Home Program

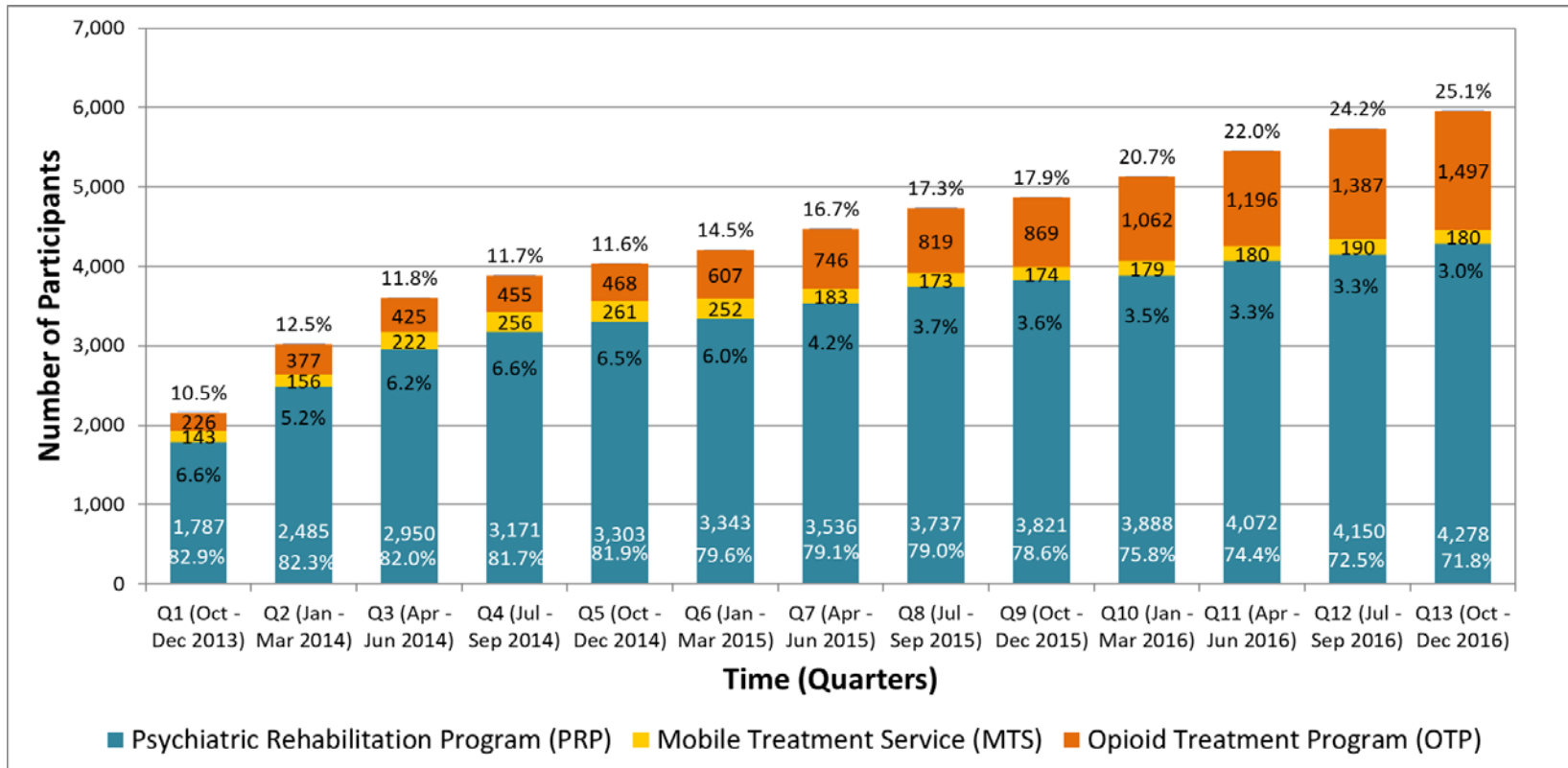
- Builds on statewide efforts to integrate somatic and behavioral health services
- Targets Medicaid enrollees with a Serious and Persistent Mental Illness (SPMI) or an opioid Substance Use Disorder (SUD) and at risk of chronic conditions
 - “At-risk” is defined by Maryland as people who currently use tobacco, alcohol, or other non-opioid substances
- Participants’ center of care is in the psychiatric rehabilitation program (PRPs) or opiate treatment program (OTPs)

Maryland Health Home Program

continued

- Implemented on October 1, 2013, and approved for 5 years
- Health Home providers must meet the following criteria:
 - Be enrolled as a Maryland Medicaid provider and Health Home accredited
 - Have a case manager assigned to each participant
 - Maintain certain staffing levels based on the number of participants, including a director, physician, and nurse practitioner
- Health Home providers are responsible for documenting all services delivered, participant outcomes, and social indicators in *eMedicaid* – a secure web-based portal
- Health Home providers must coordinate with participants' other providers:
 - Notify other providers of the enrollee's participation
 - Provide information of the participant's program goals and types of services received

Health Home Participants: Enrollment over Time



- Over 10,000 participants have joined the program since its inception.
- PRP providers consistently enrolled the largest number of participants (roughly 72 percent).

Health Home Participants: Demographic Characteristics

Demographic/Clinical Characteristics		Health Home	
		Num	Pct
Age Group	3 to 9	326	3.1%
	10 to 14	722	6.8%
	15 to 20	501	4.7%
	21 to 39	2,737	25.7%
	40 to 64	5,818	54.7%
	65 and older	539	5.1%
Race/ Ethnicity	Asian	112	1.1%
	Black	5,151	48.4%
	White	4,150	39.0%
	Hispanic	72	0.7%
	Other/Unknown	1,158	10.9%
Gender	Female	4,823	45.3%
	Male	5,820	54.7%
ACG Co- Morbidity	Low Co-Morbidity	665	6.3%
	Moderate Co-Morbidity	3,908	36.7%
	High Co-Morbidity	2,896	27.2%
	Very High Co-Morbidity	3,174	29.8%
Dual Eligibility	No	7,589	71.3%
	Yes	3,054	28.7%

- The largest proportion of participants were aged 40 to 64 years.
- About 15 percent of participants were under 21, with children as young as 3 participating in the program.
- Almost 1/3 of participants are dually eligible for Medicare and Medicaid.

ED Utilization Rates, by Length of Enrollment

Length of Enrollment	Total Participants	Number with Any ED Visit	Percentage of ED Utilization	Number of ED Visits	Average ED Visits per Participant
0 to 6 Months	8,526	3,367	39.5%	8,769	1.03
7 to 12 Months	6,656	2,358	35.4%	5,749	0.86
13 to 18 Months	5,011	1,669	33.3%	3,960	0.79
19 to 24 Months	3,738	1,183	31.6%	2,955	0.79
25 to 30 Months	2,782	886	31.8%	2,215	0.80
31 to 36 Months	2,149	474	22.1%	1,514	0.70
37 to 42 Months	1,151	175	15.2%	338	0.29

- ED Utilization rates were highest during a participant's first six months of enrollment.
- The average number of ED visits per participants decreased the longer participants were enrolled in the program.

Inpatient Utilization, by Length of Enrollment

Length of Enrollment	Total Participants	Number with Any Inpatient Visit	Percentage of Inpatient Utilization
0 to 6 Months	8,526	1,062	12.5%
7 to 12 Months	6,656	784	11.8%
13 to 18 Months	5,011	502	10.0%
19 to 24 Months	3,738	413	11.0%
25 to 30 Months	2,782	275	9.9%
31 to 36 Months	2,149	202	9.4%
37 to 42 Months	1,151	61	5.3%

- Similarly, inpatient utilization rates were highest during a participant's first 6 months of enrollment.
- Participants who remained in a Health Home program for 37 to 42 months had the lowest inpatient utilization rate.

Evaluation Cohort Selection

- We selected a subset of the Health Home participants and Medicaid enrollees to use as the evaluation study and comparison group.
- Inclusion criteria
 - Aged 18 to 64 throughout the entire study period
 - Resident of Maryland throughout the entire study period
 - Enrolled in Medicaid at least 10 months each year
 - Visited a psychiatric rehabilitation, opioid treatment, or mobile treatment provider
 - Study group: Enrolled in the program after CY2013 for at least 6 months

Evaluation Cohort Selection

continued

- After applying the inclusion criteria, we implemented propensity score matching (PSM) to select a comparison group with an estimated similar likelihood of joining the program.
- PSM explanatory factors: race, sex, geographic region, dual-eligibility, co-morbidities, type(s) of health home providers seen, MH and SUD diagnoses, number of recent ED and inpatient visits

Selection Criteria	Health Home Participants	Medicaid Participants
Full Group	10,643	1,226,303
Adults that had seen a HH provider and were enrolled in Medicaid at least 10 months each calendar year	6,882	17,750
Found an appropriate match via PSM	1,982	1,982

Evaluation Cohort Demographic Characteristics

Characteristics	Study Group		Comparison Group	
	Num	Pct	Num	Pct
Age Group				
Ages 18 to 21	25	1.3%	50	2.5%
Ages 21 to 39	534	26.9%	489	24.7%
Ages 40 to 64	1,423	71.8%	1,443	72.8%
Race/Ethnicity				
Asian	44	2.2%	20	1.0%
Black	864	43.6%	825	41.6%
White	979	49.4%	1,029	51.9%
Hispanic	22	1.1%	26	1.3%
Other	73	3.7%	82	4.1%
Gender				
Female	906	45.7%	937	47.3%
Male	1,076	54.3%	1,045	52.7%

Characteristics	Study Group		Comparison Group	
	Num	Pct	Num	Pct
Region				
Baltimore Metro	1,178	59.4%	1,192	60.1%
Eastern Shore	273	13.8%	244	12.3%
Montgomery and Prince George's County	288	14.5%	288	14.5%
Southern Maryland	*	*	*	*
Western Maryland	239	12.1%	252	12.7%
Out of State	*	*	*	*
ACG Comorbidity Level				
Low Comorbidity	*	*	45	2.27%
Moderate Comorbidity	874	44.1%	863	43.5%
High Comorbidity	549	27.7%	560	28.3%
Very High Comorbidity	*	*	564	28.5%
Dually Eligible				
No	1,126	56.8%	1,154	58.2%
Yes	856	43.2%	828	41.8%

Evaluation Cohort ED Visits, CY 2013 to CY 2016

Emergency Department Visits										
Health Home Study Group						Comparison Group				
n = 1,982						n = 1,982				
CY	0 Visits	1 Visit	2 Visits	3-4 Visits	5+ Visits	0 Visits	1 Visit	2 Visits	3-4 Visits	5+ Visits
2013	49.3%	19.8%	10.0%	9.3%	11.6%	48.3%	18.3%	12.0%	9.5%	11.9%
2014	47.8%	18.6%	11.4%	11.1%	11.2%	48.7%	18.8%	9.5%	10.3%	12.6%
2015	49.0%	20.0%	10.1%	10.1%	10.8%	50.9%	18.4%	10.7%	9.2%	10.9%
2016	49.8%	18.7%	10.7%	9.3%	11.6%	50.5%	18.8%	10.2%	10.1%	10.6%

- The percentages with five or more ED visits were higher in the comparison group on average, ranging from 10.6 to 12.6 percent for the comparison group and 10.8 to 11.6 percent for the Health Home study group.

Evaluation Cohort Inpatient Hospital Admissions, CY 2013 to CY 2016

Inpatient Hospital Admissions								
Health Home Study Group					Comparison Group			
n = 1,982					n = 1,982			
CY	0 Visits	1 Visit	2-3 Visits	4+ Visits	0 Visits	1 Visit	2-3 Visits	4+ Visits
2013	76.3%	15.7%	6.2%	1.8%	79.2%	13.1%	5.6%	2.1%
2014	77.0%	15.0%	6.5%	1.5%	79.1%	13.4%	5.6%	2.0%
2015	78.3%	14.2%	6.1%	1.5%	80.2%	12.4%	5.7%	1.8%
2016	78.2%	13.9%	6.0%	2.0%	79.6%	12.2%	6.3%	1.9%

- The percentages of participants with no inpatient hospital admissions were higher in the comparison group than in the Health Home study group in each year.
- The proportions with at least one inpatient visit decreased steadily for the study group, dropping from 23.7 percent in 2013 to 21.9 percent in 2016.

Difference-in-Differences Regression: ED Visits, CY 2013 to CY 2016

Independent Variable Description	Incidence Rate Ratio Estimate (95% Confidence Interval)	P-value
Health Home Program Indicator	0.93 (0.93-0.93)	<.0001
POST Time Period Indicator (CY2016)	1.11 (1.11-1.11)	<.0001
HH*POST Interaction Term	1.10 (1.102-1.104)	<.0001
High Co-morbidity	2.16 (1.92-2.44)	<.0001
Very High Co-morbidity	4.63 (4.00-5.36)	<.0001
Baltimore Metropolitan Region	1.28 (1.07-1.54)	0.0077
Montgomery and Prince George's Counties	0.78 (0.65-0.94)	0.0095
Western Maryland	1.09 (0.93-1.27)	0.2677
Visited an OTP Provider	1.16 (1.02-1.33)	0.0294
Visited an MTS Provider	1.77 (1.71-1.83)	<.0001

Having high or very high co-morbidity, living in Baltimore metropolitan region, and visiting an MTS or OTP provider were all factors associated with higher counts of ED visits.

Difference-in-Differences Regression: Inpatient Admissions, CY 2013 to CY 2016

Independent Variable Description	Incidence Rate Ratio Estimate (95% Confidence Interval)	P-value
Health Home Program Indicator	1.10 (1.10-1.11)	<.0001
POST Time Period Indicator (CY2016)	1.03 (1.03-1.03)	<.0001
HH*POST Interaction Term	0.96 (0.96-0.96)	<.0001
High Comorbidity	1.82 (1.64-2.03)	<.0001
Very High Comorbidity	3.55 (2.74-4.60)	<.0001
Baltimore Metropolitan Region	1.49 (1.48-1.50)	<.0001
Montgomery and Prince George's Counties	1.31 (1.06-1.60)	0.0107
Western Maryland	1.21 (1.20-1.21)	<.0001
Visited an OTP Provider	0.96 (0.77-1.20)	0.7197
Visited an MTS Provider	1.92 (1.90-1.93)	<.0001

Having high or very high co-morbidity; living in the Baltimore Metropolitan area, Montgomery or Prince George's County, or Western Maryland; and visiting an MTS provider were all factors associated with higher inpatient hospital admissions counts.

Challenges and Limitations

- Because of the propensity score method used, the analysis is not generalizable to the Medicaid population at large or to all participants in the Health Home program.
- Self-selection bias from both patients and providers is only partially mitigated by use of the difference-in-differences model.
- Sufficient time may not have passed to detect meaningful and sustained differences in long-term health outcomes.
- Ensuring a sufficient sample size while balancing enrollment length requirements.

Potential Future Research

- Investigate health care utilization in sub-populations of interest (e.g., high-utilizers, dual eligible, and long-vs. short-term enrollment lengths)
- Examine differences in behavioral health vs. other types of health care utilization
- Evaluate differences per provider and provider type
- Incorporate health home service utilization patterns into the outcomes analysis

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