


Effect of Enhanced Primary Care for People with Serious Mental Illness on Service Use and Screening



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BACKGROUND: Strategies are needed to better address the physical health needs of people with serious mental illness (SMI). Enhanced primary care for people with SMI has the potential to improve care of people with SMI, but evidence is lacking.

OBJECTIVE: To examine the effect of a novel enhanced primary care model for people with SMI on service use and screening.

DESIGN: Using North Carolina Medicaid claims data, we performed a retrospective cohort analysis comparing healthcare use and screening receipt of people with SMI newly receiving enhanced primary care to people with SMI newly receiving usual primary care. We used inverse probability of treatment weighting to estimate average differences in outcomes between the treatment and comparison groups adjusting for observed baseline characteristics.

PARTICIPANTS: People with SMI newly receiving primary care in North Carolina.

INTERVENTIONS: Enhanced primary care that includes features tailored for individuals with SMI.

MAIN MEASURES: Outcome measures included outpatient visits, emergency department (ED) visits, inpatient stays and days, and recommended screenings 18 months after the initial primary care visit.

KEY RESULTS: Compared to usual primary care, enhanced primary care was associated with an increase of 1.2 primary care visits (95% confidence interval [CI]: 0.31 to 2.1) in the 18 months after the initial visit and decreases of 0.33 non-psychiatric inpatient stays (CI: - 0.49 to - 0.16) and 3.0 non-psychiatric inpatient days (CI: - 5.3 to - 0.60). Enhanced primary care had no significant effect on psychiatric service and ED use. Enhanced primary care increased the probability of glucose and HIV screening, decreased the probability of lipid screening, and had no effect on hemoglobin A1c and colorectal cancer screening.

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CONCLUSIONS: Enhanced primary care for people with SMI can increase receipt of some preventive screening and decrease use of non-psychiatric inpatient care compared to usual primary care.

KEY WORDS: integrated care; enhanced primary care; serious mental illness; schizophrenia; Medicaid.

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INTRODUCTION

Effectively addressing the health needs of the 11.4 million adults living with serious mental illness (SMI) is one of the major challenges facing the US' healthcare system.¹ SMI is defined as any mental illness that results in serious functional impairment.² Adults with SMI have a higher prevalence of chronic physical health conditions than the general population,³⁻⁵ receive lower quality care for these conditions,⁶⁻⁹ and experience worse physical health outcomes that drive high-cost healthcare use.¹⁰⁻¹³ Better addressing the physical health needs of people with SMI could have substantial public health effects. People with SMI die an average of 25 years earlier than people without SMI, and most of these premature deaths are from treatable physical health conditions, including cardiovascular, pulmonary, and infectious diseases.¹⁴

Integrated care models that address physical and mental health, such as behavioral health homes (BHHs) and patient-centered medical homes (PCMHs), hold promise for improving the care of this population. The BHH model integrates primary care services in behavioral health (BH) clinic settings.¹⁵ Existing studies suggest that BHHs may improve preventive screening, increase primary care access, and reduce emergency department (ED) use but do not consistently improve clinical outcomes or reduce inpatient care use.¹⁶⁻¹⁹ A limitation of this literature is that studies have typically

compared BHHs to no primary care, raising the question of whether BHHs are achieving comparable outcomes to usual primary care.

In contrast to the BHH model, in which BH organizations manage patients' care, the PCMH model tasks PCPs with addressing patients' health needs in collaboration with other medical providers.²⁰ The PCMH model has been shown to improve some preventive screening and service use outcomes for people with SMI.^{21–24} However, Bowdoin et al. found that among people with mental illness, receiving care in a PCMH did not yield better preventive care or service use outcomes than having a non-PCMH usual source of care.^{25, 26} Enhancements to the PCMH model designed to meet the complex health needs of people with SMI may better leverage the potential of the model to serve this population, but evidence regarding what these enhancements should be is lacking.^{27, 28}

In this study, we examined a novel model of enhanced primary care for people with SMI. The enhanced primary care was delivered at WakeBrook Primary Care ("WakeBrook"), a primary care clinic co-located with a BH facility in Wake County, North Carolina. WakeBrook is a PCMH that provides care coordination, peer support, and self-management programs for people with SMI.^{15, 28, 29} Like BHHs, it is specifically geared toward the needs of people with SMI. The primary care services at WakeBrook tailored for individuals with SMI include the following: smaller patient panels, allowing providers to spend more time with each patient building trust; training for providers on working with people with SMI, to help providers understand the unique needs and challenges of this population and learn how to de-escalate crisis situations; and regular communication between PCPs and patients' behavioral health providers, enabling proactive planning to address patients' complex needs.³⁰ WakeBrook receives referrals of people with SMI who are receiving outpatient behavioral healthcare from community providers but are not in primary care. As such, WakeBrook is generally not responsible for delivering regular outpatient psychiatric care to its patients, though patients can receive crisis and inpatient care at the co-located behavioral health facility. The objective of this study was to evaluate the effects of enhanced primary care, as compared to usual primary care, on healthcare use and screening among people with SMI. We focused specifically on patients with schizophrenia or schizoaffective disorder due to the difficulty of accurately identifying other types of SMI in administrative data.

METHODS

We used North Carolina Medicaid claims data to conduct a retrospective cohort study comparing healthcare use and screening receipt of people with SMI. We compared people with SMI newly receiving enhanced primary care to people with SMI newly receiving usual primary care. We constructed a comparison group of people with SMI newly receiving usual

primary care in Mecklenburg County, a North Carolina county without an enhanced primary care clinic. We used inverse probability of treatment weighting to balance observed characteristics between the WakeBrook and comparison group. As sensitivity analyses, we compared the WakeBrook group to people with SMI from all North Carolina counties. All analyses were pre-specified.

Data Sources

We accessed North Carolina Medicaid claims and encounter data from January 2014 to September 2018 through the Carolina Cost and Quality Initiative.³¹ Approximately 18% of North Carolina's population is covered by Medicaid, which was not expanded under the Affordable Care Act. North Carolina's Medicaid program is currently a fee-for-service program but has a capitated BH carve-out wherein BH services are delivered by regional managed care organizations (MCOs). Our data included all claims from fee-for-service Medicaid and encounter data from the MCOs. We identified PCPs in the claims data by matching national provider identifiers (NPI) to the Centers for Medicare and Medicaid Services National Plan and Provider Enumeration System (NPPES),³² yielding a match rate of 98.2%. The study was approved by the University of North Carolina at Chapel Hill Institutional Review Board.

Setting and Participants

While WakeBrook accepts patients with a broader range of mental illness diagnoses, we restricted our sample to adults with schizophrenia or schizoaffective disorder to ensure that our treatment and comparison groups had similar disease severity. Diagnoses of psychotic disorders in administrative data may be more accurate than other psychiatric diagnoses, including depression and anxiety disorders.^{33–35} Individuals were eligible for inclusion in the study if they were 18 years of age or older and received a diagnosis of schizophrenia or a schizoaffective disorder on at least two service claims on two separate days during the study period.

We focused on individuals newly receiving primary care services to identify the effect of receiving primary care on outcomes. We identified individuals who had a new primary care visit between April 2015 and March 2017 after at least 6 months without a primary care visit to increase the likelihood that our sample was comprised of new primary care patients. We defined primary care visits as visits with evaluation and management current procedural terminology (CPT) codes where the rendering provider was a primary care provider, defined using NPPES specialty taxonomy codes. The first observed primary care visit after 6 months without a primary care visit is referred to as the index visit. We required individuals to be enrolled in Medicaid for at least 8 of the 12 months before their index visit and for at least 14 of the 18 months after their index primary care visit in order to ensure a sufficient time window for observing health service use in the baseline and follow-up periods.

The WakeBrook group consisted of individuals who had their index primary care visit at WakeBrook as identified by WakeBrook's billing NPI. We validated this group using electronic health records data. The primary comparison group consisted of individuals with schizophrenia or schizoaffective disorder with a new primary care visit who resided in Mecklenburg County, North Carolina. Mecklenburg was selected as a comparison county because it is a large, urban county similar to Wake County, where WakeBrook is located (Mecklenburg contains Charlotte, and Wake contains Raleigh), and it lacks an enhanced primary care clinic for people with SMI. The distance between Wake and Mecklenburg (approximately 150 mi) ensures individuals were likely not traveling between them for routine care. We also used a comparison group of adults with schizophrenia or schizoaffective disorder from any North Carolina county not attributed to WakeBrook to test the robustness of our findings.

Outcome Measures

We examined the health service use and recommended screening receipt by WakeBrook and comparison patients in the 18 months following their index primary care visit. Service use outcome measures included the total number of primary care visits, outpatient psychiatric visits, inpatient psychiatric admissions, inpatient psychiatric days, inpatient non-psychiatric admissions, inpatient non-psychiatric days, and emergency department (ED) visits in the 18-month follow-up period. The 18-month follow-up period was selected as the longest follow-up period for which sufficient sample was available for analysis. We defined visit and admission types using CPT codes, provider specialty type from NPPES, place of service codes, and facility revenue codes. We defined psychiatric inpatient stays using diagnosis-related groups and revenue codes, and we classified non-psychiatric inpatient use as all other inpatient stays as defined by revenue codes. Screening outcome measures included binary indicators of receipt of the following screenings in the 18-month follow-up period: hemoglobin A1c, glucose, lipids, colorectal cancer, cervical cancer, and human immunodeficiency virus (HIV). We restricted to the relevant clinical subpopulation for each screening type, based on U.S. Preventive Services Task Force recommendations and the input of our study team's clinician members (Appendix Table 1).³⁶

Statistical Analysis

We used inverse probability of treatment weighting (IPTW) with regression adjustment to balance the WakeBrook and comparison groups on factors that would affect the outcomes, including demographic characteristics, comorbid conditions, service use, screening receipt, and length of Medicaid enrollment in the 12 months prior to their index visit. We identified comorbid conditions following condition definitions from the Healthcare Cost and Utilization Project (HCUP) Clinical Classifications Software.^{37, 38} The IPTW approach allowed us to

mitigate selection bias due to observed differences between the WakeBrook and comparison groups.³⁹

By comparing the absolute value of the standardized differences ($\times 100$) in baseline characteristics between the WakeBrook and comparison group before and after weighting (Appendix Fig. 2), we concluded that we achieved appropriate balance between groups.⁴⁰ We recalculated the weights to reflect the different sample compositions in the screening analyses restricted to relevant subpopulations and the sensitivity analyses using the alternate comparison group. We used linear models for all outcomes, assuming Gaussian error distributions. We present average marginal effects with 95% confidence intervals (CI) from delta-method standard errors.⁴¹

RESULTS

We identified 160 eligible individuals with an index enhanced primary care visit at WakeBrook, 1433 individuals with a usual primary care visit from Mecklenburg County, and 16,095 eligible individuals with an index primary care visit anywhere in North Carolina (see Fig. 1). The most prevalent comorbid conditions in the sample were substance-related disorders (68% and 71% in the WakeBrook and Mecklenburg County groups, respectively), hypertension (52% and 60%), diabetes (49% and 46%), and hyperlipidemia (48% and 58%) (Table 1). We also observed high rates of comorbid bipolar disorder in both the WakeBrook and comparison groups (44% and 40%, respectively). Prior to weighting, the WakeBrook and comparison groups differed most dramatically with respect to the number of months of assertive community treatment (ACT) received in the 12 months before the index visit, number of psychiatric inpatient days in the 12 months before the index visit, proportion female, and proportion with congestive heart failure (Appendix Fig. 2).

Table 2 shows unadjusted monthly mean utilization measures in the 12 months before and 18 months after the index primary care visit, in order to make the baseline and follow-up periods comparable. The unadjusted monthly mean number of primary care visits in the WakeBrook group increased from 0.039 to 0.26 ($p < 0.001$) in the 12 months before and 18 months after the index visit (Table 2). WakeBrook patients had an unadjusted monthly mean of 0.20 primary care visits at WakeBrook in the 18 months after the index visit (not shown). The monthly mean values of all other service use measures did not significantly change with initiation of care at WakeBrook. Mecklenburg County comparison group patients experienced an increase from 0.047 to 0.23 in monthly mean primary care visits ($p < 0.001$). These patients also had increases in monthly mean outpatient psychiatric visits (0.12 to 0.13, $p = 0.011$), non-psychiatric inpatient stays (0.016 to 0.026, $p = 0.0094$), non-psychiatric inpatient days (0.16 to 0.28, $p = 0.020$), and ED visits (0.21 to 0.24, $p = 0.0018$).

In the adjusted analyses, we found that receiving enhanced primary care at WakeBrook was associated with an increase of

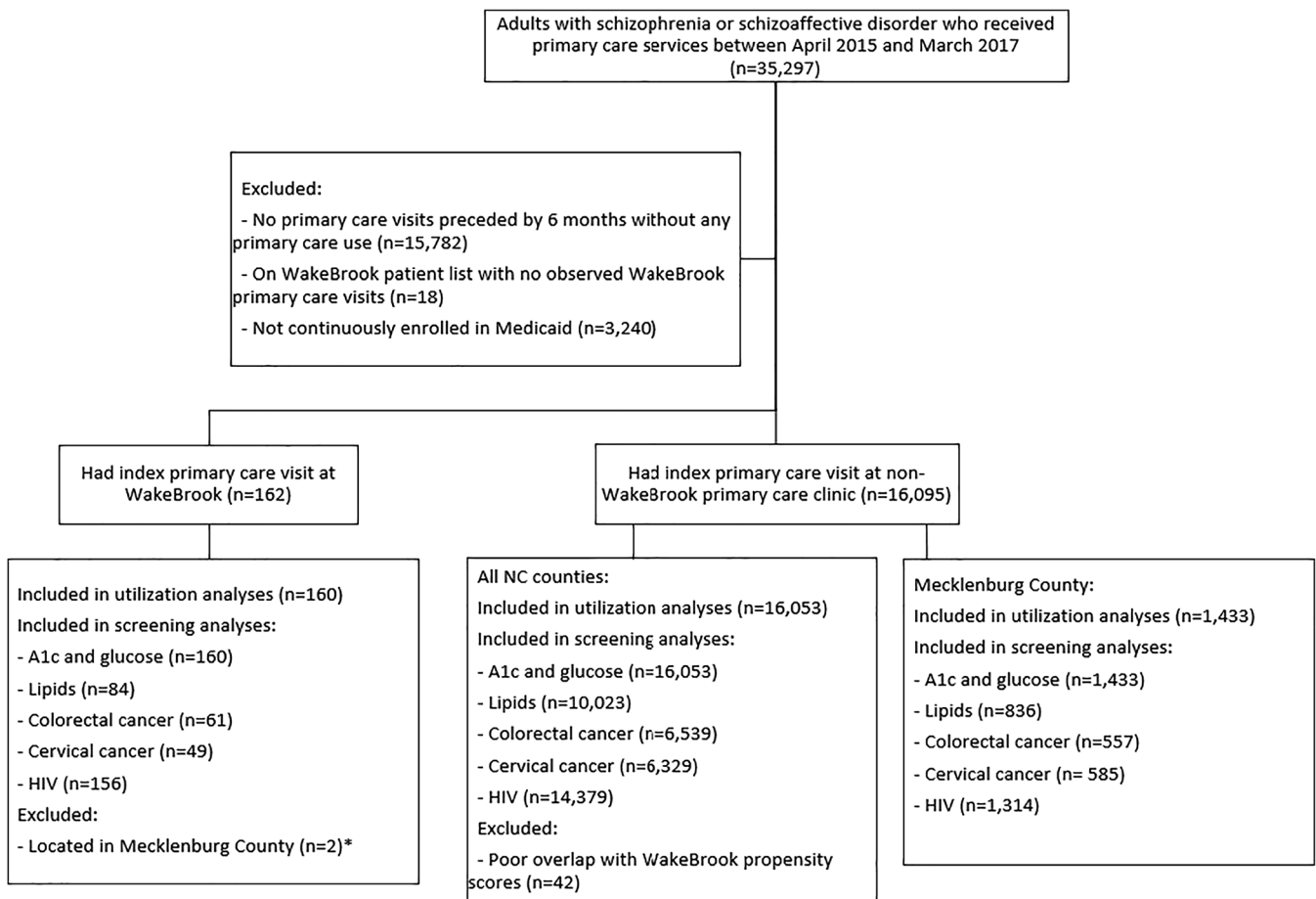


Figure 1 Construction of cohort of people with serious mental illness newly receiving primary care. The asterisk denotes participants not excluded from analyses with all NC counties comparison group. We excluded from the comparison groups 18 individuals who were on the list of WakeBrook patients based on the WakeBrook electronic health record list but who had no observed WakeBrook index primary care visit in Medicaid claims during our study period. We also excluded from the treatment group two individuals who had WakeBrook claims but whose recorded residence was in Mecklenburg County.

1.2 primary care visits (95% CI: 0.31 to 2.1) in the 18 months after the index visit compared to usual primary care (Table 3). Receiving enhanced primary care was associated with decreases of 0.33 non-psychiatric inpatient stays (CI: - 0.49 to - 0.16) and 3.0 non-psychiatric inpatient days (CI: - 5.3 to - 0.60) in the follow-up period. Receipt of enhanced primary care had no significant effect on the number of outpatient psychiatric visits, psychiatric inpatient use, or ED visits.

Receiving enhanced primary care was associated with an increase of 8.8 percentage points (CI: 1.7 to 16) in the probability of receiving glucose screening in the 18 months after the index visit and an increase of 10 percentage points (CI: 3.7 to 17) in the probability of receiving HIV screening in the follow-up period compared to usual primary care. Receipt of enhanced primary care was associated with a decrease of 11 percentage points (CI, - 18 to - 3.3) in the probability of receiving lipid screening in the follow-up period. Enhanced primary care had no significant effect on the probability of A1c and colorectal cancer screening receipt.

These results were robust when we included comparison group patients who had received primary care at any non-

WakeBrook location in North Carolina. In the service use analyses with this alternate comparison group, enhanced primary care was associated with decreases in the number of non-psychiatric inpatient stays and days that were similar in magnitude to the Mecklenburg County analyses, but there was no longer a significant effect on primary care visits. We again observed increases in the probability of glucose and HIV screening, as well as an increase in the probability of A1c screening. We did not observe a decrease in the probability of lipid screening when using the full North Carolina comparison group.

DISCUSSION

We found that enhanced primary care led to some improvements in preventive screening over usual primary care, suggesting that enhanced primary care may be superior in quality to approaches that deliver traditional forms of primary care to people with SMI. Relative to the low baseline screening rates in our sample (e.g., 11% of comparison group patients

Table 1 Baseline Characteristics of Individuals Who Newly Received Primary Care (Unweighted)

	Treatment group (n = 160)	Comparison group, Mecklenburg County (n = 1433)	p value, comparison of treatment and Mecklenburg county comparison groups [§]	Comparison group of non-WB patients, all NC counties (n = 16,053)	p value, comparison of treatment and all NC counties comparison groups [§]
Demographic characteristics*					
Age	42 ± 15	45 ± 15	0.015	46 ± 15	< 0.001
Female	33%	48%	< 0.001	48%	< 0.001
Race					
American Indian	0.63%	0.35%	0.59	1.2%	0.50
Asian	1.9%	2.2%	0.81	0.66%	0.065
Black	64%	70%	0.12	52%	0.0017
More than one race	1.3%	1.1%	0.81	1.1%	0.90
Race unknown	4.4%	5.0%	0.75	4.2%	0.93
White	28%	21%	0.062	40%	< 0.001
Ethnicity					
Hispanic	1.9%	3.1%	0.40	2.0%	0.91
Not Hispanic/ Latino	91%	83%	0.0070	88%	0.22
Ethnicity unknown	6.9%	14%	0.012	9.7%	0.21
Comorbid conditions					
Diabetes	49%	46%	0.46	44%	0.26
Hypertension	52%	60%	0.049	61%	0.024
COPD	21%	28%	0.070	30%	0.027
Asthma	22%	23%	0.67	23%	0.89
Hyperlipidemia	48%	58%	0.0090	51%	0.44
Alcohol-related disorder	24%	31%	0.085	23%	0.59
Substance- related disorder	68%	71%	0.50	63%	0.15
Acute myocardial infarction	1.9%	1.6%	0.80	2.7%	0.50
Coronary artery disease	6.9%	11%	0.15	13%	0.027
Congestive heart failure	1.3%	8.7%	< 0.001	9.6%	< 0.001
HIV	3.1%	4.3%	0.50	2.5%	0.33
Hepatitis	6.9%	7.5%	0.79	5.6%	0.51
Bipolar disorder	44%	40%	0.40	41%	0.63
Baseline service receipt [†]					
Months of ACT receipt	3.8 ± 5.0	0.93 ± 2.9	< 0.001	1.0 ± 3.0	< 0.001
Ever dually Medicare- eligible	46%	43%	0.59	48%	0.51
Ever received SSI	78%	70%	0.026	69%	0.014
Months Medicaid enrolled	12 ± 0.94	12 ± 0.68	0.041	12 ± 0.62	0.0023
Screening receipt in 12 months before index visit [‡]					
A1c	19%	19%	0.92	14%	0.086
Glucose	13%	11%	0.49	9.1%	0.093
Lipids	14%	25%	0.035	18%	0.33
Colorectal cancer	6.6%	4.3%	0.42	6.8%	0.94
Cervical cancer	8.2%	11%	0.52	11%	0.85
HIV	7.7%	12%	0.10	9.1%	0.70

COPD chronic obstructive pulmonary disease, HIV human immunodeficiency virus, ACT assertive community treatment, SSI Supplemental Security Income

*Continuous variables reported as means with standard deviation and binary variables as percentages

[†]Months of ACT receipt and Medicaid enrollment observed in 12 months prior to index primary care visit. Medicare dual eligibility and receipt of SSI observed across the study period

[‡]Refers to percentage that received screening type in the 12 months prior to index primary care visit, restricted to the relevant subpopulation for the screening.

[§]p values are from t tests of means of continuous variables and Pearson's chi-squared tests of categorical variables

received glucose screening in the 12 months prior to treatment and 12% received HIV screening), the magnitude of the increases in screening probability we observed was

substantial. The two exceptions to this were lipid and colorectal cancer screening. The relatively short follow-up period of 18 months used here may not allow for enough time to build

Table 2 Unadjusted Monthly Mean Utilization 12 Months Before and 18 Months After Index Primary Care Visit by Treatment Status

	Pre-treatment monthly mean	Post-treatment monthly mean	<i>p</i> value, comparison of means*
Treatment group			
Primary care visits	0.039	0.26	< 0.001
Outpatient psychiatric visits	0.15	0.16	0.79
Psychiatric inpatient stays	0.031	0.025	0.37
Psychiatric inpatient days	0.46	0.41	0.70
Non-psychiatric inpatient stays	0.0073	0.0063	0.72
Non-psychiatric inpatient days	0.054	0.068	0.70
ED visits	0.22	0.22	0.96
Comparison group, Mecklenburg County			
Primary care visits	0.047	0.23	< 0.001
Outpatient psychiatric visits	0.12	0.13	0.011
Psychiatric inpatient stays	0.020	0.020	1.0
Psychiatric inpatient days	0.20	0.24	0.12
Non-psychiatric inpatient stays	0.016	0.026	0.0094
Non-psychiatric inpatient days	0.16	0.28	0.020
ED visits	0.21	0.24	0.0018
Comparison group, all NC counties			
Primary care visits	0.046	0.25	< 0.001
Outpatient psychiatric visits	0.098	0.13	< 0.001
Psychiatric inpatient stays	0.015	0.015	0.58
Psychiatric inpatient days	0.16	0.16	0.42
Non-psychiatric inpatient stays	0.020	0.029	< 0.001
Non-psychiatric inpatient days	0.22	0.31	< 0.001
ED visits	0.18	0.21	< 0.001

**t* test of means pre- and post-treatment

trust for invasive procedures like colonoscopy. The data used here also does not allow us to assess whether there are clinically appropriate reasons for these screening rates to differ.

We also found that enhanced primary care for people with SMI resulted in fewer non-psychiatric inpatient hospitalizations and more primary care visits compared to usual primary care. Per our estimates, for every ten people with SMI newly enrolled in enhanced primary care rather than usual primary care, three non-psychiatric inpatient stays could be avoided and twelve additional primary care visits would take place over 18 months. Enhanced primary care may have increased patients' engagement in primary care and better controlled patients' physical health conditions compared to usual primary care, resulting in less need for inpatient care. Effects on psychiatric inpatient stays and days were not statistically significant and centered near zero, which could be due to Wake-Brook patients' proximity to a BH inpatient facility resulting in greater likelihood of hospitalization for BH reasons. Effects on ED visits were negative but not statistically significant.

Our results suggest that reductions in inpatient use and improvements in healthcare quality may be achievable from adapting primary care services for people with SMI. A potential advantage of the enhanced primary care model is that it could be adopted by existing PCMHs to provide integrated care for people with SMI, especially when BHHs are not present. However, unlike most PCMHs, WakeBrook is co-located within a behavioral health facility that offers crisis and inpatient psychiatric services. Implementing enhanced primary care in other contexts may require adaptations to offer primary care providers additional support. Primary care practices' ability to incorporate these components would likely rely on enhanced or flexible payment models. The use of

claims data in our study introduces limitations, like the inability to observe clinical outcomes and the potential lack of reliability of diagnostic information. We notably found very high rates of comorbid bipolar disorder in our patient samples, which may result from misdiagnoses. This study was only focused on North Carolina Medicaid enrollees and services reimbursed by Medicaid; therefore, we could not observe healthcare services provided by other primary care providers outside of Medicaid or North Carolina. Our analysis was limited to patients with psychotic disorders newly enrolled in primary care, as defined by a 6-month washout period, so our results are generalizable to that population. In addition, if any comparison practices offered primary care tailored for adults with SMI, our estimates would be overly conservative. Our analyses also have several strengths. We used IPTW with regression adjustment to control for selection bias. We controlled for several important baseline characteristics, including individuals' service use and screening receipt prior to newly receiving primary care services, improving comparability of our patient groups.

Overall, our study suggests that enhanced primary care for people with SMI shows promise. Future research should study the effects of enhanced primary care when implemented across different settings and populations and identify the specific intervention components that affect outcomes. In a 2017 study examining a PCMH model enhanced for high-cost, high-need populations in VA settings, Zulman et al. found that this enhanced primary care did not reduce acute care use compared to usual primary care, suggesting that enhanced care may require specific features to be effective.⁴² Understanding which intervention components are effective in which contexts would allow health system administrators and policymakers to

Table 3 Unadjusted Utilization and Screening Receipt 18 Months Post-treatment and IPTW Average Treatment Effects of Receiving Primary Care at WakeBrook on Utilization and Screening Receipt

Outcome	Treatment group [§]	Comparison group	Average treatment effect (95% confidence interval)
Mecklenburg County comparison			
Utilization [†]			
Primary care visits	4.7 ± 5.1	4.2 ± 4.4	1.2* (0.31, 2.1)
Outpatient psychiatric visits	2.8 ± 5.2	2.4 ± 3.6	- 0.18 (- 0.73, 0.38)
Psychiatric inpatient stays	0.44 ± 0.97	0.35 ± 1.1	- 0.024 (- 0.16, 0.12)
Psychiatric inpatient days	7.4 ± 18	4.3 ± 17	- 0.013 (- 2.5, 2.5)
Non-psychiatric inpatient stays	0.11 ± 0.48	0.48 ± 2.7	- 0.33* (- 0.49, - 0.16)
Non-psychiatric inpatient days	1.2 ± 7.4	5.0 ± 33	- 3.0* (- 5.3, - 0.60)
ED visits	4.0 ± 8.6	4.3 ± 7.7	- 0.80 (- 1.8, 0.18)
Screening receipt [‡]			
A1c screening	37%	35%	- 0.013 (- 0.094, 0.068)
Glucose screening	21%	19%	0.088* (0.017, 0.16)
Lipids screening	30%	42%	- 0.11 (- 0.18, - 0.033)*
Colorectal cancer screening	21%	11%	0.063 (- 0.064, 0.19)
HIV screening	25%	18%	0.10* (0.037, 0.17)
All NC counties comparison			
Utilization [†]			
Primary care visits	4.7 ± 5.1	4.6 ± 5.1	0.76 (- 0.37, 1.9)
Outpatient psychiatric visits	2.8 ± 5.2	2.4 ± 4.0	0.77 (- 0.12, 1.7)
Psychiatric inpatient stays	0.45 ± 1.0	0.27 ± 0.91	0.074 (- 0.059, 0.21)
Psychiatric inpatient days	7.9 ± 19	2.9 ± 12	6.1 (- 0.0033, 12.1)
Non-psychiatric inpatient stays	0.11 ± 0.47	0.52 ± 3.2	- 0.41* (- 0.59, - 0.24)
Non-psychiatric inpatient days	1.2 ± 7.4	5.6 ± 37	- 3.9* (- 6.7, - 1.1)
ED visits	4.0 ± 8.5	3.7 ± 7.3	- 0.29 (- 1.6, 1.0)
Screening receipt [‡]			
A1c screening	37%	27%	0.10* (0.0051, 0.20)
Glucose screening	21%	15%	0.084* (0.012, 0.16)
Lipids screening	29%	32%	- 0.0036 (- 0.066, 0.058)
Colorectal cancer screening	21%	14%	0.045 (- 0.058, 0.15)
HIV screening	25%	15%	0.11* (0.039, 0.18)

* $p < 0.05$ [†]All utilization outcomes refer to total number of visits or inpatient stay days across the 18-month follow-up period[‡]All screening outcomes refer to whether the screening type was received in the 18-month follow-up period[§]Continuous variables reported as means with standard deviation and binary variables as percentages^{||}The treatment group in these analyses included two additional individuals who were excluded from the Mecklenburg County comparison group analyses because they resided in Mecklenburg County

better determine whether and how to invest in enhanced primary care for people with SMI.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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