



# Predictors of Receipt of Physical Health Services in Mental Health Clinics

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## Abstract

To inform efforts to improve physical health care for adults with serious mental illness, this study examines predictors of provision and receipt of physical health services in freestanding mental health clinics in New York state. The number of services provided over the initial 12-months of implementation varied across clinics from 0 to 1407. Receipt of services was associated with a diagnosis of schizophrenia, frequent mental and physical health visits in the prior year, and prescription of antipsychotic medications. Additional support may also be needed to enable clinics to target patients without established patterns of frequent mental health or medical visits.

**Keywords** Serious mental illness · Primary care services · Chronic physical illness · Integrated care

## Introduction

Adults with serious mental illness tend to suffer from chronic physical health conditions, such as diabetes, obesity, and hypertension, for which many receive inadequate medical care (Janssen et al. 2015; McGinty et al. 2015). One of the strategies currently being explored in the effort to improve care for this population is to locate physical health care services in specialty outpatient mental health clinics (Alakeson et al. 2010). This strategy has several potential advantages. First, many adults with serious mental illness rely on specialty mental health clinics as their primary ongoing connection to the health care system, with regular visits for therapy and/or medication management over long periods of time. Physical health services, particularly management of some chronic illnesses that require ongoing disease monitoring, might fit well into these existing utilization patterns. Providing care for physical health conditions alongside care for mental health conditions could obviate the need for obtaining care from multiple providers. Second, due to their greater familiarity with the patient population, specialty mental health clinics may be more equipped to provide patient-centered care to adults with serious mental illness, who often report experiences of discrimination when they seek care from general health care providers. Randomized controlled trials of physical health services in specialty mental health clinics have shown positive effects

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on quality of care (Druss et al. 2001, 2016). The model has also been widely implemented through Primary Behavioral Health Care Integration (PBHCI) grants awarded by the Substance Abuse and Mental Health Administration (SAMHSA) to individual clinics (Scharf et al. 2014; Druss et al. 2016). However, the potential for this strategy to impact physical health care for adults with serious mental illness throughout a large public mental health system has not been examined.

A recent policy intervention in New York state provides an opportunity to examine the ‘real world’ ability of specialty outpatient mental health clinics to provide physical health care services. Beginning in 2010, clinics were invited to enroll in a program that offered Medicaid reimbursement for two types of physical health care services, annual check-ups (health physicals, abbreviated ‘HP’) and regular monitoring of chronic physical conditions (health monitoring, abbreviated ‘HM’) (Breslau et al. 2017). As previously reported, about 50% of the 350 freestanding mental health clinics in the state enrolled in the health physicals/health monitoring (abbreviated ‘HM/HP’) program, indicating a high level of interest among clinics in providing these services to their patients. Freestanding clinics, i.e. those that are unaffiliated with a hospital or health system, are of particular interest because they face distinct challenges in providing physical health care, due to their small size, lack of clinical staff with general medical expertise, and lack of facilities in which to provide medical care (Druss et al. 2008).

In this report, we examine how the clinics that enrolled to provide physical health services provided them during the initial year of implementation. Specifically, we examine whether provision of general medical services is associated with clinic characteristics and whether receipt of those services is associated with individual patient characteristics. Identifying clinic level characteristics associated with implementation is important because it can help identify clinic types that face larger challenges in providing general medical services that could be addressed through targeted support efforts. We expect that clinics that are part of agencies with larger caseloads and larger proportions of their caseloads enrolled in Medicaid would be more likely to provide HM/HP services. Larger agencies are likely to have more capacity to introduce additional physical health services, those whose patients are more likely to be enrolled in Medicaid would have stronger financial incentives to respond to this Medicaid program. In addition, we expect greater provision of HM/HP services in clinics located in urban as opposed to rural areas, due to more severe workforce shortages in rural areas. It is also important to understand which patients are most likely to receive the services. While increasing options for medical care for adults with SMI is an important positive impact, the broader systemic impact of the policy on quality and utilization of care depend on the characteristics of the patients who receive the services.

## Methods

### Data Sources

Data come from three administrative databases maintained by the New York State Office of Mental Health. Provider agencies with licensed freestanding mental health clinics were identified from the Mental Health Provider Database known as CONCERTS. Data on the demographic, social, and clinical characteristics of patients seen in these clinics were taken from the patient characteristics survey (PCS), a biennial survey mental health services providers (New York State Office of Mental Health 2015). Data on health services received by patients in these clinics were drawn from the New York State Office of Mental Health Medicaid Claims Database, which includes all claims and encounters paid by Medicaid for individuals with a behavioral health diagnosis, service or medication. All study procedures were approved by the IRBs of the RAND Corporation and the New York State Office of Mental Health. As a retrospective analysis of medical claims data, formal consent was not required. The authors have no conflicts of interest to report.

### Sample

The 76 mental health provider agencies that operated freestanding mental health clinics in New York state between September 2010 and April 2014 and enrolled in the HM/HP program were included in the study. Of these 53%, 70%, provided at least one HM/HP service during this interval; 23 agencies did not provide any HM/HP services despite enrolling to do so. Each of the clinics that provided at least one HM/HP service was assigned a start date, set at the date of their first HM/HP service. Medicaid beneficiaries ages 18–64 were included in the study if they had a mental health clinic visit in one of those 53 agencies and had continuous Medicaid enrollment, defined as at least 9 months of enrollment with no more than two consecutive months of disenrollment, during the year following the agency start date. Individuals were excluded if they had services in more than one agency. Of the 34,536 number of eligible beneficiaries, 3532 (10%) received an HM/HP service during the 12 months following the agency start date.

## Measures

### Agency Characteristics

Agency characteristics were identified from the CONCERTS and PCS data. Measures from CONCERTS included the number of clinics in the agency, whether the agency was

county or privately run (auspice), population served (adult, mixed child and adult) and rural or urban based on the addresses for the agency and its' affiliated mental health clinics and the rural–urban commuting area codes (U.S. Department of Agriculture 2013). PCS data was used to calculate quartile distributions for agency size (census quartiles—large:top 25%, medium: 25–75%, and small:bottom 25%); proportion of non-white census (less than 14%; between 14% and 52.3%; and over 52.3%); and proportion of census with Medicaid (less than 67.7%; between 67.6% and 86.0%; and over 86.0%).

### Client Characteristics

Client characteristics were identified using the Medicaid claims data. Each individual's first mental health clinic visit after their agency's start date was considered their index visit.

**Demographic Characteristics** Gender, race/ethnicity (white, black, Hispanic, Asian, and other/unknown) and age (at agency start date), were obtained from Medicaid records. Medicaid eligibility categories were combined into two groups: disability and income. The disability category was determined by the supplemental security income (SSI) program that pays benefits to the disabled with limited income. The income based category is determined by the federal poverty level and the state-based enrollment rules.

**Clinical Characteristics** Primary psychiatric diagnosis was defined by a preponderance method developed in previous studies (Stein et al. 2014). An individual is assigned the most common psychiatric condition appearing in claims during the year prior to the individual's index visit. In the event of a tie, hierarchy decision rules based on the intensity of services were applied such that the type of service (e.g. a diagnosis for an inpatient service would be given priority over a diagnosis in an outpatient setting) and cost of services (e.g. the greater amount paid for a given service would be given priority) were used to distinguish the most probable mental health diagnosis. The following diagnostic categories were defined: depression (296.2–296.39, 300.4, 311), schizophrenia (ICD9: 295, 297, 298, 301.22), bipolar (296.4–296.89, 301.13), anxiety (300.0–300.29, 309.21, 312.23), PTSD (309.81), other trauma and stressor related disorders (excluding PTSD; 308, 309), neurodevelopmental conditions (299, 307, 314, 315, 319), substance-related conditions (292, 305), other MH diagnoses (all other codes between 293 and 316). Diabetes and cardiovascular conditions were categorized according to the chronic illness and disability payment system (CDPS) in the year prior to the index visit (Kronick et al. 2000). Individuals were defined as having “any cardiovascular disease or diabetes” if they had

any cardiovascular diagnosis (including ‘extra low’, ‘low’, ‘medium’ or ‘high’ CDPS subcategories) and/or a diagnosis of diabetes (‘Type1 high’, Type1 medium’, ‘Type2 low’ or ‘Type2 medium’ CDPS subcategories). Use of antipsychotic medications, considered here a clinical factor because of its relevance to provision of physical health care, was considered present if a patient had at least one prescription fill for an antipsychotic medication, oral or injectable, in the year prior to the index visit.

**Medical and Mental Health Care Utilization** Mental health clinic utilization was defined as the number of unique dates on which a patient had a claim for a visit to a mental health clinic in the year prior to their index visit. Visits were categorized into four levels: no visits, 1–3 visits, 4–8 visits, and more than eight visits. Similarly, the number of outpatient medical visits during the same period were classified as no visits, 1–3 visits, and three or more visits. Hospitalizations for mental health and medical conditions during the year prior to the index visit were defined as dichotomous variables.

### Statistical Analysis

Analyses were performed using SAS, version 9.4 (SAS Institute, Cary, NC). Characteristics of agencies that did and did not bill for HM/HP services and of patients that did and did not receive HM/HP services were compared, with chi square tests for differences between groups used to test for statistical significance. Unadjusted and adjusted comparisons were then estimated using generalized linear multi-level modeling (GLMM; SAS GLIMMIX procedure) to account for the clustering of clients within agencies. Specifically, odds ratios were estimated with 95% confidence intervals to determine the associations of each covariate with the likelihood of receiving an HM/HP service in the year following the agency start date. Study procedures were approved by the IRBs of the RAND Corporation and the New York State Office of Mental Health.

### Results

Of the 76 freestanding mental health clinics that enrolled to provide HM/HP services, 53 (69.7%) provided at least one HM/HP service within 12 months of enrolling (Table 1). Contrary to our expectations, the clinic agencies that provided HM/HP services did not differ significantly with respect to any of the assessed characteristics from those that did not provide HM/HP services; none of the chi square tests for association between clinic characteristics and provision of HM/HP services reached statistical significance at  $p=0.05$ .

**Table 1** Characteristics of enrolled agencies that did and did not provide HM/HP services

| Agency characteristics                               | Enrolled agencies |  | No HM/HP  |             | Provided HM/HP |             |
|--|-------------------|--|-----------|-------------|----------------|-------------|
|  | n                 |  | n         | %           | n              | %           |
| <b>Region</b>  |                   |  |           |             |                |             |
| Rural  | 17                |  | 4         | 23.5        | 13             | 76.5        |
| Urban  | 59                |  | 19        | 32.2        | 40             | 67.8        |
| <b>Agency size</b>                                   |                   |  |           |             |                |             |
| First quartile (< 142 patients)                      | 19                |  | 7         | 36.8        | 12             | 63.2        |
| Second or third quartiles (≥ 142 and ≤ 458 patients) | 38                |  | 9         | 23.7        | 29             | 76.3        |
| Fourth quartile (> 458 patients)                     | 19                |  | 7         | 36.8        | 12             | 63.2        |
| <b>Medicaid proportion</b>                           |                   |  |           |             |                |             |
| First quartile (< 0.68%)                             | 20                |  | 6         | 30.0        | 14             | 70.0        |
| Second or third quartiles (≥ 68% and ≤ 86%)          | 37                |  | 12        | 32.4        | 25             | 67.6        |
| Fourth quartile (> 86%)                              | 19                |  | 5         | 26.3        | 14             | 73.7        |
| <b>Number of clinics in agency</b>                   |                   |  |           |             |                |             |
| More than one  | 24                |  | 8         | 33.3        | 16             | 66.7        |
| Only one   | 52                |  | 15        | 28.8        | 37             | 71.2        |
| <b>Auspice</b>                                       |                   |  |           |             |                |             |
| Private non-profit                                   | 57                |  | 20        | 35.1        | 37             | 64.9        |
| County operated                                      | 19                |  | 3         | 15.8        | 16             | 84.2        |
| <b>Population served</b>                             |                   |  |           |             |                |             |
| Adult  | 50                |  | 12        | 24.0        | 38             | 76.0        |
| Mixed adults and children                            | 26                |  | 11        | 42.3        | 15             | 57.7        |
| <b>Non-white percentage</b>                          |                   |  |           |             |                |             |
| First quartile (< 14%)                               | 19                |  | 5         | 26.3        | 14             | 73.7        |
| Second or third quartiles (≥ 14% and ≤ 52%)          | 38                |  | 13        | 34.2        | 25             | 65.8        |
| Fourth quartile (> 52%)                              | 19                |  | 5         | 26.3        | 14             | 73.7        |
| <b>Total</b>   | <b>76</b>         |  | <b>23</b> | <b>30.3</b> | <b>53</b>      | <b>69.7</b> |

Chi Square tests for association between all clinic characteristics and provision of HM/HP services have  $p$ -values > 0.05

HM health monitoring, HP health physicals

To characterize variations in the provision of HM/HP services we examined the distribution of HM/HP claims across clinics and across patients during the 12 months following a clinic's first HM/HP claim. Among the 50 clinics that provided HM/HP services to adult patients (three of the 53 clinics that provided HM/HP services did not provide any of these services to adult patients) there was wide variation in the frequency with which they provided those services. The modal number of claims per clinic was one, the median was 40 and the mean was 160, reflecting the long tail of the distribution. Of the total number patients seen during the study period 34,536 about 10% of all patients seen in these clinics during the period, received at least one HM/HP service during that period. The modal number of HM/HP services per person was one, the mean was 2.26, and 10% of the patients who received an HM/HP service received five or more services.

Patients who received an HM/HP service differed from those that did not with respect to most of the characteristics

examined (Table 2). Recipients of an HM/HP services were more likely to be older, male, white or Hispanic, and to qualify for Medicaid by virtue of a disability rather than income threshold. Claims for HM/HP services were most common for patients with a diagnosis of schizophrenia and least common for patients with stressor related disorders other than PTSD and for substance use disorders. Receipt of an HM/HP service was also associated with a diagnosis of diabetes or CVD, being on an antipsychotic medication, and having more frequent outpatient mental health and physical health visits. Having a hospitalization or ED visit for a medical condition in the baseline year was not associated with receipt of an HM/HP service during the study period.

Relationships between patient characteristics and receipt of HM/HP services are generally sustained with adjustment for other characteristics and clustering within clinics (Table 3). Compared to patients with depression, use of HM/HP was significantly more likely for patients with schizophrenia and significantly less like for patients with trauma

**Table 2** Demographics, clinical characteristics and prior year service use among patients who received and did not receive HM/HP services

| Individual characteristics      | Total patient caseload<br>n | No HM/HP services |       | Received HM/HP services |       |
|---------------------------------|-----------------------------|-------------------|-------|-------------------------|-------|
|                                 |                             | n                 | %     | n                       | %     |
| <b>Demographics</b>             |                             |                   |       |                         |       |
| Age                             |                             |                   |       |                         |       |
| 18–25                           | 4696                        | 4332              | 92.25 | 364                     | 7.75  |
| 25–34                           | 7661                        | 7021              | 91.65 | 640                     | 8.35  |
| 35–44                           | 7342                        | 6569              | 89.47 | 773                     | 10.53 |
| 45–64                           | 14,837                      | 13,082            | 88.17 | 1755                    | 11.83 |
| Chi square <i>p</i> -value      |                             | <0.0001           |       |                         |       |
| Sex                             |                             |                   |       |                         |       |
| Male                            | 13,085                      | 11,649            | 89.03 | 1436                    | 10.97 |
| Female                          | 21,451                      | 19,355            | 90.23 | 2096                    | 9.77  |
| Chi square <i>p</i> -value      |                             | 0.0003            |       |                         |       |
| Race/ethnicity                  |                             |                   |       |                         |       |
| White                           | 20,512                      | 18,385            | 89.63 | 2127                    | 10.37 |
| Black                           | 6717                        | 6057              | 90.17 | 660                     | 9.83  |
| Asian                           | 358                         | 327               | 91.34 | 31                      | 8.66  |
| Hispanic                        | 3417                        | 2982              | 87.27 | 435                     | 12.73 |
| Other/unknown                   | 3532                        | 3253              | 92.10 | 279                     | 7.90  |
| Chi square <i>p</i> -value      |                             | <0.0001           |       |                         |       |
| Eligibility category            |                             |                   |       |                         |       |
| Disability                      | 19,704                      | 17,118            | 86.88 | 2586                    | 13.12 |
| Income                          | 14,832                      | 13,886            | 93.62 | 946                     | 6.38  |
| Chi square <i>p</i> -value      |                             | <0.0001           |       |                         |       |
| <b>Clinical characteristics</b> |                             |                   |       |                         |       |
| Behavioral health diagnosis     |                             |                   |       |                         |       |
| Depression                      | 11,003                      | 9913              | 90.09 | 1090                    | 9.91  |
| Schizophrenia                   | 5176                        | 4383              | 84.68 | 793                     | 15.32 |
| Bipolar                         | 5200                        | 4652              | 89.46 | 548                     | 10.54 |
| Anxiety                         | 3024                        | 2758              | 91.20 | 266                     | 8.80  |
| Stressor related (non-PTSD)     | 2434                        | 2282              | 93.76 | 152                     | 6.24  |
| PTSD                            | 1227                        | 1090              | 88.83 | 137                     | 11.17 |
| Neurodevelopmental/ADHD         | 1067                        | 943               | 88.38 | 124                     | 11.62 |
| Substance use disorders         | 3605                        | 3347              | 92.84 | 258                     | 7.16  |
| Other MH diagnoses              | 1800                        | 1636              | 90.89 | 164                     | 9.11  |
| Chi square <i>p</i> -value      |                             | <0.0001           |       |                         |       |
| Physical health conditions      |                             |                   |       |                         |       |
| Any CVD or DM category          | 13,026                      | 11,492            | 88.22 | 1534                    | 11.78 |
| No CVD or DM category           | 21,510                      | 19,512            | 90.71 | 1998                    | 9.29  |
| Chi square <i>p</i> -value      |                             | <0.0001           |       |                         |       |
| Antipsychotic medication        |                             |                   |       |                         |       |
| On antipsychotic                | 10,770                      | 9428              | 87.54 | 1342                    | 12.46 |
| Not on antipsychotic            | 23,766                      | 21,576            | 90.79 | 2190                    | 9.21  |
| Chi square <i>p</i> -value      |                             | <0.0001           |       |                         |       |
| Prior year service use          |                             |                   |       |                         |       |
| MH clinic visits                |                             |                   |       |                         |       |
| 0                               | 15,745                      | 14,605            | 92.76 | 1140                    | 7.24  |
| 1–3                             | 2902                        | 2625              | 90.45 | 277                     | 9.55  |
| 4–8                             | 3612                        | 3110              | 86.10 | 502                     | 13.90 |
| > 8                             | 12,277                      | 10,664            | 86.86 | 1613                    | 13.14 |
| Chi square <i>p</i> -value      |                             | <0.0001           |       |                         |       |

**Table 2** (continued)

| Individual characteristics         | Total patient caseload | No HM/HP services |       | Received HM/HP services |       |
|------------------------------------|------------------------|-------------------|-------|-------------------------|-------|
|                                    |                        | n                 | %     | n                       | %     |
| PH clinic visits                   |                        |                   |       |                         |       |
| 0                                  | 14,397                 | 13,051            | 90.65 | 1346                    | 9.35  |
| 1–3                                | 9882                   | 8864              | 89.70 | 1018                    | 10.30 |
| > 3                                | 10,257                 | 9089              | 88.61 | 1168                    | 11.39 |
| Chi square <i>p</i> -value         |                        | < 0.0001          |       |                         |       |
| Medical inpatient stay or ED visit |                        |                   |       |                         |       |
| Any medical inpatient or ED        | 18,703                 | 16,761            | 89.62 | 1942                    | 10.38 |
| No medical inpatient or ED         | 15,833                 | 14,243            | 89.96 | 1590                    | 10.04 |
| Chi square <i>p</i> -value         |                        | 0.2973            |       |                         |       |
| Total                              | 34,536                 | 31,004            | 89.77 | 3532                    | 10.23 |

*HM* health monitoring, *HP* health physicals, *MH* mental health, *PH* physical health, *ED* emergency department

and stressor-related disorders (other than PTSD), substance use disorders, and other diagnoses. With respect to prior-year service use, HM/HP use was more likely in patients on an antipsychotic medication, with four or more mental health visits, and with three or more outpatient medical visits.

## Discussion

Provision of care for chronic physical health conditions in specialty mental health clinics has been proposed as a strategy for improving the health status of adults with serious mental illness (Alakeson et al. 2010). To date, studies of this model have focused almost entirely on programs implemented for research purposes (Druss et al. 2010, 2016) or with dedicated grant funds (Scharf et al. 2014, 2016). This study examined a program in New York state that promoted this strategy simply by removing some of the commonly cited regulatory and financial barriers to provision of care for physical health conditions by specialty mental health clinics (Ramanuj et al. 2018). The evidence complements that from prior studies by reflecting real world consequences of promoting mental health based physical health care services in a sustainable way across a large public mental health system where implementation is shaped by diverse patient preferences and constrained by clinic capacities. Understanding factors that shaped implementation of the program can help inform future efforts to expand the reach and impact of these services.

We have reported earlier that interest among clinics in participating in the program was high, with about half of the eligible freestanding mental health clinics enrolling to provide HM/HP services (Breslau et al. 2017). In this analysis, we found that about one-third of the clinics that enrolled did not implement the program within the first 12-months

following enrollment. This finding suggests that many clinics face additional barriers to provision of physical health care services that were not addressed by simply allowing them to bill Medicaid for those services. The likely barriers, identified in prior studies, include start-up costs for new service types (Connor et al. 2018) and workforce shortages (Hall et al. 2015). Contrary to expectations, we did not observe associations between clinic characteristics and provision of HM/HP services that might explain why some clinics were able to provide the services and others were not. Notably, neither clinic size nor the proportion of the clinic's caseload that is covered by Medicaid, nor region of the state in which a clinic was located predicted provision of HM/HP services. Further study is needed to understand why some clinics implemented the program more successfully than others; factors such as clinic culture might play a larger role than the structural factors we investigated. Qualitative investigations focusing on comparing successful and unsuccessful implementers of the program could provide some answers. The wide variation in implementation across clinics suggests that there might be generalizable lessons that could be learned from more in-depth studies of clinics that were successful.

Within the clinics that provided HM/HP services during the 1st year of enrollment, about 10% of patients received at least one HM/HP service. While this may appear to be a low percentage, if appropriately targeted to individuals who might otherwise go without physical health care or to those at increased risk for poor health outcomes, the impact could be significant. Since high use of care is concentrated among a small proportion of patients, addressing the needs of a small group of patients with high likelihood of hospitalization can have a large impact. On the other hand, it is also possible that the patients who receive the HM/HP services are already receiving care for their physical health

**Table 3** Demographics, clinical characteristics, and prior year service use predictors of HM/HP use

|                                    | Unadjusted models |                      | Adjusted model |                      |
|------------------------------------|-------------------|----------------------|----------------|----------------------|
|                                    | OR                | CI                   | OR             | CI                   |
| <b>Demographics</b>                |                   |                      |                |                      |
| Age                                |                   |                      |                |                      |
| 18–25                              | Reference         |                      | Reference      |                      |
| 25–34                              | 1.14              | (0.986–1.308)        | 1.09           | (0.942–1.260)        |
| 35–44                              | <b>1.58</b>       | <b>(1.375–1.812)</b> | <b>1.27</b>    | <b>(1.102–1.472)</b> |
| 45–64                              | <b>2.10</b>       | <b>(1.847–2.379)</b> | <b>1.35</b>    | <b>(1.173–1.550)</b> |
| Sex                                |                   |                      |                |                      |
| Male (vs. female)                  | <b>1.12</b>       | <b>(1.042–1.210)</b> | <b>1.09</b>    | <b>(1.003–1.179)</b> |
| Race/ethnicity                     |                   |                      |                |                      |
| White                              | Reference         |                      | Reference      |                      |
| Black                              | 0.96              | (0.860–1.065)        | 0.99           | (0.866–1.104)        |
| Asian                              | 1.10              | (0.746–1.627)        | 1.06           | (0.709–1.577)        |
| Hispanic                           | <b>1.33</b>       | <b>(1.169–1.509)</b> | <b>1.33</b>    | <b>(1.169–1.519)</b> |
| Other/unknown                      | <b>0.70</b>       | <b>(0.607–0.798)</b> | <b>0.81</b>    | <b>(0.699–0.927)</b> |
| Eligibility category               |                   |                      |                |                      |
| Disability (vs. income)            | <b>2.65</b>       | <b>(2.439–2.879)</b> | <b>1.87</b>    | <b>(1.698–2.050)</b> |
| <b>Clinical characteristics</b>    |                   |                      |                |                      |
| Behavioral health diagnosis        |                   |                      |                |                      |
| Depression                         | Reference         |                      | Reference      |                      |
| Schizophrenia                      | <b>1.79</b>       | <b>(1.606–1.990)</b> | <b>1.35</b>    | <b>(1.204–1.520)</b> |
| Bipolar                            | 1.03              | (0.914–1.150)        | 0.97           | (0.862–1.093)        |
| Anxiety                            | 0.87              | (0.749–1.007)        | 0.96           | (0.828–1.119)        |
| Stressor related (non-PTSD)        | <b>0.43</b>       | <b>(0.358–0.522)</b> | <b>0.58</b>    | <b>(0.475–0.699)</b> |
| PTSD                               | 1.00              | (0.820–1.220)        | 1.00           | (0.818–1.227)        |
| Neurodevelopmental/ADHD            | 0.95              | (0.772–1.176)        | 0.90           | (0.725–1.124)        |
| Substance use disorders            | <b>0.58</b>       | <b>(0.497–0.668)</b> | <b>0.74</b>    | <b>(0.635–0.863)</b> |
| Other MH diagnoses                 | <b>0.76</b>       | <b>(0.637–0.916)</b> | <b>0.80</b>    | <b>(0.660–0.959)</b> |
| Physical health condition          |                   |                      |                |                      |
| CVD or DM (vs. neither)            | <b>1.42</b>       | <b>(1.320–1.533)</b> | 1.08           | (0.995–1.176)        |
| Antipsychotic medication           |                   |                      |                |                      |
| On antipsychotic (vs. not)         | <b>1.48</b>       | <b>(1.373–1.601)</b> | <b>1.19</b>    | <b>(1.093–1.289)</b> |
| Prior year service use             |                   |                      |                |                      |
| MH clinic visits                   |                   |                      |                |                      |
| 0                                  | Reference         |                      | Reference      |                      |
| 1–3                                | <b>1.20</b>       | <b>(1.038–1.384)</b> | 0.95           | (0.820–1.102)        |
| 4–8                                | <b>2.03</b>       | <b>(1.798–2.282)</b> | <b>1.42</b>    | <b>(1.253–1.609)</b> |
| > 8                                | <b>2.32</b>       | <b>(2.128–2.525)</b> | <b>1.53</b>    | <b>(1.388–1.678)</b> |
| PH clinic visits                   |                   |                      |                |                      |
| 0                                  | Reference         |                      | Reference      |                      |
| 1–3                                | 1.08              | (0.985–1.181)        | 1.09           | (0.995–1.202)        |
| > 3                                | <b>1.25</b>       | <b>(1.145–1.371)</b> | <b>1.15</b>    | <b>(1.045–1.272)</b> |
| Medical inpatient stay or ED visit |                   |                      |                |                      |
| Medical inpatient or ED (vs. none) | <b>0.92</b>       | <b>(0.854–0.989)</b> | 1.00           | (0.919–1.078)        |

Odds ratios estimated in logistic regression models using generalized estimating equations to account for clustering of individuals within clinics. Bold font indicates ORs significantly different from 1 at  $p=0.05$

HM health monitoring, HP health physicals, CVD cardiovascular disease, DM diabetes, MH mental health, PH physical health, ED emergency department

conditions in other settings, so that the added care duplicates rather than improves existing care. In fact, we might expect that without explicit targeting of services, patients who are more likely to receive care in general medical settings are also more likely to receive care when it is offered in mental health clinics.

Results of this study suggest that the targeting of the HM/HP services was at least partially successful in reaching patients with high need for care. Use of the HM/HP services was associated with demographic and clinical predictors of higher need for care, including older age, a diagnosis of schizophrenia, Medicaid eligibility due to disability, and use of anti-psychotic medications. A recent study in California found that older age and a diagnosis of schizophrenia are associated with lower likelihood of receiving general medical outpatient care in a sample of Medicaid enrollees with serious mental illness (Garcia et al. 2017). The need to monitor the physical health consequences of antipsychotic medications is also well established (Mitchell et al. 2012). Notably, we did not find evidence that minorities were less likely to receive HM/HP services; in fact, Hispanic patients were significantly more likely to receive an HM/HP service than non-Hispanic whites.

Use of HM/HP services is also associated with more frequent use of outpatient services in both mental health and general medical settings during the year prior to the start of the program, and these relationships are sustained after adjustment for medical diagnosis. This finding suggests that patients who were already well known to the clinics and patients who were receiving medical care in other settings were the most likely to receive HM/HP services when they were offered in their mental health clinic. The finding also suggests that some patients may tend to get more care than others, regardless of the specific type of care. It is therefore possible that some patients who received the HM/HP services may have been receiving ‘redundant’ care, i.e. care they were already receiving in other settings. However, individuals with higher use of mental health services and co-morbid medical conditions may be at increased risk for poor health outcomes. HP/HM services targeted to these individuals may help to mitigate risk by providing additional attention physical health conditions and ancillary health services and supports that primary care settings may not have the resources to provide. Future studies of total costs of care and clinical outcomes of care should pay close attention to this issue.

It is important to note that the Medicaid data on which this study is based may not include information on all the HM/HP services that were provided as a result of the program. First, services may have been provided to patients who were over 65 years of age, outside of the range of our study population. Second, some clinics had difficulty billing Medicaid for the services, which were non-traditional in the

clinic setting. There was concern that bills submitted for physical health services would be rejected, despite the fact that the clinic had enrolled. In both cases, the undercount of HM/HP services is more likely to affect the number of patients who received the services and the number of services per patient than the number of clinics that provided the services. The results we report should be considered a ‘lower bound’ estimate of the total volume of services provided as a result of the HM/HP program. Since clinics are unlikely to have persisted in providing the services over time without resolving billing questions, it is unlikely that the actual number of services provided is dramatically higher than the number of claims paid by Medicaid.

The experience of this program in New York state suggests that a relatively modest and simple regulatory change can lead to small but meaningful increase in the provision of physical health care services within freestanding specialty mental health clinics. The findings also demonstrate the limits of this approach. In particular, the findings highlight the need for additional supports to clinics to enable provision of services and to target services to patients who are poorly treated or undertreated. Qualitative studies of the participating clinics could help identify remaining barriers to implementation. Additional studies are also needed to determine whether the modest increases in care observed here can have an impact on quality of care, patterns of utilization of high intensity care and clinical outcomes.

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