Continuity of Care After Inpatient Discharge of Patients With Schizophrenia in the Medicaid Program: A Retrospective Longitudinal Cohort Analysis

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Objective: This study seeks to identify patient, facility, county, and state policy factors associated with timely schizophrenia-related outpatient treatment following hospital discharge.

Method: A retrospective longitudinal cohort analysis was performed of 2003 national Medicaid claims data supplemented with the American Hospital Association facility survey, the Area Resource File, and a Substance Abuse and Mental Health Services Administration Medicaid policy report. The analysis focuses on treatment episodes of adults, aged 20 to 63 years, who received inpatient care for *ICD-9-CM*–diagnosed schizophrenia (59,567 total treatment episodes). Rate and adjusted odds ratio (AOR) of schizophrenia-related outpatient visits within 7 days and 30 days following hospital discharge are assessed.

Results: Of the 59,567 hospital discharges, 41.7% received schizophrenia-related outpatient visits in 7 days and 59.3% in 30 days following hospital discharge. The adjusted odds of 30-day follow-up outpatient visits were significantly related to preadmission outpatient mental health visits (AOR = 3.72; 99% CI, 3.44–4.03), depot (AOR = 2.83; 99% CI, 2.53–3.18) or oral (AOR = 1.73; 99% CI, 1.62–1.84) antipsychotics as compared with no antipsychotics, and absence of a substance use disorder diagnosis (AOR = 1.35; 99% CI, 1.25–1.45). General hospital as compared with a psychiatric hospital treatment (AOR = 1.32; 99% CI, 1.14–1.54) and patient residence in a county with a larger number of psychiatrists per capita (AOR = 1.27; 99% CI, 1.08–1.50) were related to receiving follow-up outpatient visits. By contrast, residence in a county with a high poverty rate (AOR = 0.60; 99% CI, 0.54–0.67) and treatment in a state with prior authorization requirements for < 12 annual outpatient visits (AOR = 0.69; 99% CI, 0.63–0.75) reduced the odds of follow-up care.

Conclusions: Patient characteristics, clinical management, geographical resource availability, and the mental health policy environment all appear to shape access to care following hospital discharge in the community treatment of adult schizophrenia.

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The transition from inpatient to outpatient psychiatric care poses substantial risks of premature treatment disengagement.[1,2] In one study of a diagnostically mixed sample of adult Medicaid psychiatric inpatients, roughly one-half (51%) received no outpatient care during the first 30 days following hospital discharge.[1] Because lack of timely outpatient mental health care following psychiatric hospital discharge increases the risk of relapse and poor mental health outcomes,[3–5] linking inpatients to outpatient care following hospital discharge is a recognized indicator of quality of care.[6]

Several patient factors have been reported to increase the risk of incomplete referrals from inpatient to outpatient psychiatric care. Male sex, minority ethnic/racial ancestry, substance use disorders, a lack of outpatient care prior to hospital admission, and short index inpatient admissions have each been associated with incomplete referrals for outpatient mental health care.[1,7–9] Type of health insurance coverage has also been correlated with timely follow-up; Medicaid patients tend to be less likely than privately insured patients to receive care within 30 days of psychiatric hospital discharge.[10] Psychiatric inpatients within health plans that require greater cost sharing for mental health than other health services are also less likely than their counterparts in plans with mental health parity to receive timely follow-up care.[11]

Prior research in other areas of medicine has demonstrated that in addition to patient characteristics, hospital characteristics,[12] regional factors,[13] and statewide influences[14] can meaningfully reduce or promote continuity of treatment. In the current context, it is conceivable, for example, that a scarcity of outpatient mental health professionals in the surrounding community or administrative barriers to outpatient mental health services might impede the connection of psychiatric inpatients to outpatient care. At present, however, little is known about the role of hospital characteristics, community factors, or state mental health policies in promoting outpatient care following psychiatric hospital discharge.

Most previous research on outpatient mental health care following inpatient discharge has involved diagnostically mixed samples of psychiatric inpatients. As a result, the specific factors that affect linkage to outpatient care for key vulnerable groups including patients with schizophrenia remain poorly defined. Patients with schizophrenia account for nearly one-fifth of all inpatient days of psychiatric care in community hospitals in the United States,[15] and even subtle disruptions in their antipsychotic treatment increase their risk of relapse.[16,17]

The current study addresses these gaps in knowledge by combining several national data sources to examine a wide range of factors potentially associated with timely follow-up outpatient mental health care in a large national sample of Medicaid-financed inpatients treated for schizophrenia. A greater understanding of how patient characteristics, hospital organizational features, community factors, and state Medicaid policies contribute to the probability of timely follow-up outpatient care may inform clinical interventions and programmatic reforms aimed at smoothing the transition from inpatient to outpatient care.

METHOD

Data Sources

Four sources of data were utilized: (1) 2003 national Medicaid Analytic Extract (MAX) files,[18] (2) the American Hospital Association (AHA) annual survey,[19] (3) the Area Resource File (ARF),[20] and (4) the Substance Abuse and Mental Health Services Administration (SAMHSA) state mental health Medicaid policy report.[21] The primary source of patient-level data was the 2003 MAX files from all 50 states and the District of Columbia obtained from the Center for Medicare and Medicaid Services. These files include patient eligibility, demographic characteristics, medical service, and prescription claims data from the over 40 million beneficiaries enrolled in Medicaid nationwide. The annual AHA survey of hospitals assesses the organizational structure, facilities and services, and financial performance of all short-term hospitals in the United States.[19] The ARF, which is compiled by the US Health Resources and Services Administration, contains county-level variables from several sources that measure the health professions, resource scarcity, socioeconomic characteristics, and other geographic health-related characteristics.[20] In 2003, SAMHSA sponsored a survey of state Medicaid directors from all 50 states and the District of Columbia that involved an assessment of state Medicaid mental health coverage.[21] In the current analysis, the Medicaid provider number on hospital discharge claims from the Medicaid file was used to link patients to hospitals providing their care and identified in the AHA annual survey, the county of residence of the patient was used to link to ARF variables, and the state of residence of the patient was used to link to the SAMSHA policy report.

The study was reviewed and determined to be exempt from human subjects review by the New York State Psychiatric Institute Institutional Review Board.

Sample Selection

Study subjects aged 20 to 63 years were followed through Medicaid medical service and pharmacy claims for a 90-day period before each hospital admission and a 30-day period after hospital discharge for the treatment of schizophrenia (*International Classification of Diseases, Ninth Revision, Clinical Modification* [*ICD-9-CM*] code: 295) as the first listed diagnosis. Hospitalizations were included only if the patient was continuously eligible for Medicaid services for the 90 days before hospital admission and 30 days following hospital discharge. Individual patients could contribute more than one schizophrenia treatment–related hospital discharge (ie, treatment episode) to the analysis. Hospitalizations were excluded from the analysis if a diagnosis of dementia-related disorder (*ICD-9-CM* codes: 290–294, 330, 331) occurred during the 90-day preperiod. Hospital admissions for patients also enrolled in Medicare (Medicare data were not available), hospital admissions that were followed by a hospital readmission during the 30-day period postdischarge, and hospital admissions of > 30 days' duration were excluded from the study sample. Inpatient admissions of longer than 30 days are relatively uncommon[22] and are associated with a relatively low risk of early hospital readmission.[23]

Outcomes

The 2 outcome variables were ≥ 1 follow-up outpatient visit with a diagnosis of schizophrenia within 7 days and 30 days of a schizophrenia-related hospital discharge. These visits were identified on the basis of the presence of 1 or more Medicaid claims for outpatient visits with a schizophrenia diagnosis (*ICD-9-CM* code: 295) in any position during, respectively, the 7-day and 30-day period following hospital discharge. Follow-up care was defined as any Medicaid-reimbursed outpatient mental health service for schizophrenia, including outpatient mental health visits, partial hospital care, family-based therapy, rehabilitation services, and other community-based mental health services. The definitions of the outcomes were based on the Health Plan Employer Data and Information Set quality measures for follow-up after hospitalization for mental illness.[6]

Independent Variables

Independent variables included patient, hospital, local resource, and state policy level variables. Patient level variables from the Medicaid eligibility and claims files included patient age at hospital discharge (20–35, 36–45, or 46–63 years), sex, race/ethnicity, primary hospital discharge diagnosis (schizophrenia vs schizoaffective disorder), length of index hospital stay (short: 1–8 days; medium: 9–12 days; long: 13–30 days), and type of Medicaid financing arrangement (fee-for-service vs some managed care). On the basis of claims during the 90-day period prior to hospital admission, treatment episodes were also classified with respect to presence or absence of a diagnosis for a chronic medical illness,[24] substance use disorder (*ICD-9-CM* codes: 291–292, 303–305), or any mental disorder (*ICD-9-CM* codes: 290–319) and a filled antipsychotic medication prescription. These prescriptions were hierarchically organized as (1) any long-acting injections (ie, depot medications) with or without oral medications, (2) oral but no long-acting injectable medications, and (3) no antipsychotic medications. Medicaid eligibility was categorized as poverty-related or disability-related.

From the AHA data, the hospital providing care for the treatment episode was characterized with respect to number

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of total beds (small: 1–99; medium: 100–499; large: ≥ 500), number of psychiatric beds (none, 1–39, ≥ 40), provision of outpatient psychiatric services (yes or no), hospital ownership (public; private, nonprofit; private, for-profit), and hospital type (psychiatric and community or other). Hospitals were also characterized with AHA data by the percentage of total annual discharges of patients enrolled in Medicaid (low: 0%–19%; medium: 20%–39%; high: ≥ 40%) and by medical resident teaching status (teaching or nonteaching).

Area Resource File data were used to characterize counties in which patients resided with respect to regional mental health resources, income, and population density. Specifically, discharges were classified by county with respect to the number of psychiatrists (none; low: 0.01–14.99; high: ≥ 15.00), psychologists (none; low: 0.01–99.99; high: ≥ 100.00), and social workers (none; low: 0.01–299.99; high: ≥ 300.00) per 100,000 residents. Other ARF variables included county per capita annual income from all sources (low: < $25,000; medium: $25,000–49,000; high: ≥ $50,000), percentage of county population in poverty (low: 0%–14%; medium: 15%–19%; high: ≥ 20%), and county population per square mile (low: ≤ 399; medium: 400–1,000; high: > 1,000).

The SAMHSA state Medicaid policy report was used to distinguish patients treated in states with preauthorization requirements for the first 1 to 11 outpatient mental health visits per year from patients treated in states that do not require preauthorization or only require preauthorization for ≥ 12 outpatient mental health visits per year. A second variable indicated whether state Medicaid coverage included services provided at specialized outpatient mental health clinics.

Analytic Plan

The percentages of treatment episodes with at least 1 qualifying outpatient schizophrenia-related visit within 7 and 30 days of hospital discharge, respectively, were determined overall and stratified by each patient, hospital, county, and state Medicaid policy characteristic. For each of these characteristics, Wald χ^2 tests were performed to test the difference in proportions of patient treatment episodes receiving and not receiving schizophrenia-related outpatient visits in 7 and 30 days following hospital discharge ($\alpha = .01$, 2-tailed). Adjusted odds ratios with 99% CIs were calculated for each characteristic using logistic regression analyses to measure the effect of each variable on the probability of receiving outpatient visits following hospital discharge, controlling for all other patient, hospital, county, and policy covariates. Because of the nesting of treatment episodes under individual patients and patients within hospitals, the observations are nonindependent. Accordingly, generalized estimating equations were used to adjust all standard errors and confidence intervals for the clustering of observations. Given the large sample sizes, we consider odds ratios with 99% CIs that do not include 1.0 to be statistically significant and odds ratios of > 1.20 or < 0.80 to be potentially substantial from a clinical or policy perspective.

RESULTS

Overall

The sample included 59,567 treatment episodes from 49,239 unique patients. Within the first week of hospital discharge, approximately 4 in 10 (41.7%) treatment episodes in the study sample included ≥ 1 schizophrenia-related outpatient visit. By 30 days, this percentage had increased to nearly 6 in 10 (59.3%).

Patient Characteristics

In the bivariate analyses, the percentage of treatment episodes that included schizophrenia-related outpatient visits 7 and 30 days following hospital discharge significantly varied by all patient characteristics examined, except treatment of prior substance use disorder for both outcomes, diagnostic subtype for the 7-day outcome, and patient age group for the 30-day outcome (Table 1). Especially low rates of follow-up were observed among treatment episodes that did not include outpatient mental health treatment or antipsychotic medications in the 90 days before the initial hospitalization and among treatment episodes of patients whose Medicaid eligibility was related to poverty rather than disability.

In the 7-day regression, significant associations with follow-up schizophrenia-related outpatient visits were evident between each patient characteristic except patient age (Table 1). Outpatient mental health care prior to hospital admission, depot antipsychotic medication as compared with no antipsychotic treatment prior to admission, and Medicaid eligibility related to disability rather than poverty were each associated with particularly high odds of receiving schizophrenia-related outpatient visits during the first week following hospital discharge. Significant associations with follow-up visits were also evident for male sex, oral antipsychotic medications, long as compared with short length of inpatient stays, schizophrenia as compared with schizoaffective disorder, fee-for-service as compared with managed care financing, and prior treatment of a chronic medical illness. The pattern of predictors from the 30-day regression resembled that from the 7-day regression, except that in the 30-day model the "other" race/ethnicity group was not significantly more likely than the white group to receive follow-up visits. In both models, absence of a diagnosis of a substance use disorder during the 90 days before hospital admission was linked to significantly higher odds of receiving outpatient schizophrenia-related visits following hospital discharge (Table 1).

Hospital Characteristics

All of the hospital characteristics, except hospital teaching status for both outcomes and hospital-operated outpatient psychiatric services for the 7-day outcome, were significantly related to outpatient follow-up visits in the bivariate analyses (Table 2). In the 7- and 30-day regressions, treatment in a hospital that serves a higher rather than a lower percentage of Medicaid-financed patients and treatment in a smaller rather than a larger hospital increased the odds of receiving

Table 1. Rates of 7-Day and 30-Day Follow-Up Outpatient Schizophrenia-Related Treatment Stratified by Patient Characteristics[a]

	7-Day Follow-Up Visit					30-Day Follow-Up Visit				
Characteristic	%	χ^2	*df*	*P*	AOR (99% CI)	%	χ^2	*df*	*P*	AOR (99% CI)
Age, y		18.8	2	<.0001			7.0	2	.03	
20–35 (n = 18,657)	40.8				0.96 (0.90–1.03)	58.9				1.02 (0.95–1.09)
36–45 (n = 20,489)	41.4				0.96 (0.90–1.02)	58.9				0.99 (0.93–1.06)
46–63 (n = 20,421)	42.8				1.00	59.9				1.00
Sex		9.3	1	.002			17.9	1	<.0001	
Male (n = 32,700)	42.3				1.08 (1.02–1.14)	60.2				1.12 (1.05–1.17)
Female (n = 26,867)	40.9				1.00	58.2				1.00
Race/ethnicity		79.9	3	<.0001			110.3	3	<.0001	
White (n = 28,337)	43.3				1.00	61.8				1.00
African American (n = 19,639)	41.2				1.03 (0.96–1.10)	57.1				0.94 (0.88–1.00)
Hispanic (n = 3,679)	38.1				0.92 (0.82–1.03)	56.5				0.93 (0.83–1.05)
Other (n = 1,543)	45.6				1.24 (1.05–1.46)	60.8				1.09 (0.92–1.29)
Diagnostic subtype[b]		0.2	1	.67			18.1	1	<.0001	
Schizoaffective (n = 28,469)	41.7				1.00	58.2				1.00
Schizophrenia (n = 31,098)	41.6				1.15(1.09–1.21)	60.2				1.28 (1.21–1.35)
Length of admission, d		13.2	2	.001			21.5	2	<.0001	
Short, 1–8 (n = 32,701)	41.0				1.00	58.3				1.00
Medium, 9–12 (n = 11,783)	42.5				1.04 (0.97–1.11)	60.5				1.07 (1.00–1.14)
Long, 13–30 (n = 15,083)	42.5				1.08 (1.02–1.16)	60.4				1.10 (1.03–1.17)
Medicaid eligibility		201.4	1	<.0001			273.8	1	<.0001	
Poverty (n = 1,833)	20.6				1.00	35.2				1.00
Disability (n = 57,564)	41.1				2.10 (1.72–2.59)	60.1				2.00 (1.67–2.40)
Financing arrangement		390.1	1	<.0001			336.2	1	<.0001	
Fee-for-service (n = 36,498)	44.1				1.12 (1.05–1.20)	61.6				1.16 (1.09–1.24)
Managed care (n = 23,069)	37.8				1.00	55.6				1.00
Prior chronic medical illness[c]		153.1	1	<.0001			1,469.1	1	<.0001	
Present (n = 46,271)	46.2				1.15 (1.08–1.22)	64.2				1.14 (1.07–1.22)
Absent (n = 13,296)	40.2				1.00	57.8				1.00
Prior outpatient mental health care[c]		1,802.7	1	<.0001			2,769.7	1	<.0001	
Present (n = 50,958)	45.9				3.33 (3.04–3.64)	64.5				3.72 (3.44–4.03)
Absent (n = 8,609)	16.8				1.00	28.5				1.00
Prior antipsychotics[c]		1,300.9	2	<.0001			1,795.4	2	<.0001	
Depot (n = 4,938)	55.5				2.41 (2.16–2.68)	74.7				2.83 (2.53–3.18)
Oral (n = 40,310)	44.8				1.65 (1.54–1.76)	63.2				1.73 (1.62–1.84)
None (n = 14,319)	30.3				1.00	42.9				1.00
Prior substance use disorder[c]		0.8	1	.36			1.2	1	.23	
Present (n = 8,173)	42.3				1.00	58.8				1.00
Absent (n = 51,394)	41.7				1.22 (1.12–1.32)	59.4				1.35 (1.25–1.45)

[a]Data are from National Medicaid Data. Adjusted odds ratios (AORs) are from logistic regressions with all variables as covariates. Sample sizes vary due to missing data. [b]Hospital discharge diagnosis. [c]Based on 90 days before inpatient admission.

follow-up schizophrenia-related outpatient visits. In addition, treatment in a private, nonprofit hospital as compared with a private, for-profit hospital was associated with a significantly higher likelihood of receiving a schizophrenia-related outpatient visit within 7 days of hospital discharge (Table 2).

County Characteristics

Each of the county characteristics was significantly related to follow-up visits at 7 and 30 days following hospital discharge (Table 3). The 7- and 30-day regressions revealed that patient residence in a county with a high or medium as compared with a low poverty rate was associated with lower odds of schizophrenia-related follow-up visits. Patient residence in a county with a medium or high as compared with a low population density was also associated with lower odds of follow-up outpatient visits in both models. By contrast, patient residence within counties with large numbers of psychiatrists per capita was significantly related to an increased likelihood of follow-up visits. Neither the population density of social workers nor psychologists was significantly related to follow-up visits in the multivariate regressions (Table 3).

State Medicaid Policies

Treatment episodes of patients who live in states that require preauthorization for fewer than 12 annual outpatient mental health visits had significantly lower odds of follow-up outpatient visits than those of patients who lived in states that do not require preauthorization or only require preauthorization for ≥ 12 outpatient mental health visits per year. There were significant bivariate associations between state Medicaid coverage of outpatient mental health clinics and successful linkage to outpatient care within 7 and 30 days, but these associations were not significant in the multivariate analyses (Table 3).

DISCUSSION

Approximately 4 in 10 adults diagnosed with schizophrenia in this national sample of Medicaid patients did not receive outpatient treatment for their disorder within 1 month of hospital discharge. Such discontinuities in care have been found to markedly increase the risk of relapse.[3–5] The risk of not receiving timely follow-up care appears to be a joint function of patient, hospital, local resource, and

Table 2. Rates of 7-Day and 30-Day Follow-Up Outpatient Schizophrenia-Related Treatment Stratified by Hospital Characteristics[a]

	7-Day Follow-Up Visit					30-Day Follow-Up Visit				
Hospital Characteristic	%	χ^2	*df*	*P*	AOR (99% CI)	%	χ^2	*df*	*P*	AOR (99% CI)
Number of total beds[b]		90.0	2	<.0001			44.7	2	<.0001	
Small, 1–99 (n = 3,596)	41.7				1.00	60.5				1.00
Medium, 100–499 (n = 36,402)	43.7				0.85 (0.75–0.96)	60.6				0.79 (0.70–0.89)
Large, ≥ 500 (n = 12,511)	37.9				0.75 (0.65–0.86)	56.9				0.72 (0.62–0.83)
Number of psychiatric beds[b]		47.8	2	<.0001			57.7	2	<.0001	
0 (n = 2,047)	43.3				1.00	62.3				1.00
1–39 (n = 18,844)	43.9				0.87 (0.75–1.00)	61.8				0.86 (0.74–1.00)
40+ (n = 19,067)	40.2				0.86 (0.75–1.00)	58.5				0.89 (0.76–1.03)
Outpatient psychiatric services[b]		3.1	2	.22			17.3	2	.0002	
Present (n = 26,901)	42.3				1.03 (0.96–1.10)	60.3				0.97 (0.92–1.02)
Absent (n = 13,057)	41.6				1.00	60.1				1.00
Hospital control[b]		220.4	2	<.0001			145.7	2	<.0001	
Private, nonprofit (n = 34,158)	44.4				1.00	61.7				1.00
Public (n = 9,808)	38.6				0.95 (0.88–1.02)	57.2				1.02 (0.95–1.11)
Private, for-profit (n = 8,543)	35.8				0.90 (0.82–0.98)	54.7				0.96 (0.88–1.05)
Annual discharges, Medicaid, %[b]		41.5	2	<.0001			28.7	2	<.0001	
Low, 0–19 (n = 26,191)	42.4				1.00	60.8				1.00
Medium, 20–39 (n = 20,751)	40.4				1.12 (1.05–1.19)	58.2				1.05 (0.99–1.21)
High, 40+ (n = 8,543)	45.3				1.36 (1.22–1.50)	60.2				1.12 (1.01–1.24)
Teaching status of hospital		1.63	1	.44			2.1	1	.35	
Teaching (n = 24,370)[b]	41.7				1.02 (0.96–1.08)	59.9				0.98 (0.92–1.04)
Nonteaching (n = 28,139)	42.1				1.00	59.5				1.00
Hospital type		79.2	1	<.0001			91.6	1	<.0001	
Psychiatric (n = 2,222)	32.4				1.00	49.5				1.00
General and other (n = 50,287)	42.3				1.26 (1.08–1.47)	60.1				1.32 (1.14–1.54)

[a]Patient-level data are from national Medicaid claims files. Adjusted odds ratios (AORs) are from logistic regressions with all variables as covariates. Sample sizes vary due to missing data. [b]American Hospital Association survey data.

Table 3. Rates of 7-Day and 30-Day Follow-Up Schizophrenia-Related Outpatient Treatment, Stratified by County and State Medicaid Policy Characteristics[a]

	7-Day Follow-Up Visits					30-Day Follow-Up Visits				
County and State Medicaid Policy Characteristic	%	χ^2	*df*	*P*	AOR (99% CI)	%	χ^2	*df*	*P*	AOR (99% CI)
County characteristics										
Psychiatrists per 100,000 residents		309.7	2	<.0001			161.4	2	<.0001	
None, 0 (n = 29,690)	39.0				1.00	58.7				1.00
Low, 0.01–14.99 (n = 3,631)	39.7				0.99 (0.87–1.14)	56.7				1.02 (0.89–1.17)
High, 15.00+ (n = 24,244)	46.4				1.29 (1.10–1.51)	62.9				1.27 (1.08–1.50)
Psychologists per 100,000 residents		56.6	2	<.0001			18.1	2	.0004	
None, 0 (n = 35,659)	40.8				1.00	60.5				1.00
Low, 0.01–99.99 (n = 10,657)	42.5				1.17 (0.78–1.77)	59.3				1.17 (0.77–1.78)
High, 100+ (n = 11,249)	41.3				0.95 (0.62–1.45)	58.8				1.03 (0.67–1.59)
Social workers per 100,000 residents		444.5	2	<.0001			282.7	2	<.0001	
None, 0 (n = 27,278)	40.9				1.00	60.7				1.00
Low, 0.01–299.99 (n = 10,383)	37.7				0.76 (0.50–1.14)	55.4				0.72 (0.47–1.09)
High, 300.00+ (n = 19,904)	48.3				1.10 (0.72–1.66)	64.2				0.97 (0.64–1.49)
Annual income per capita, county		108.1	2	<.0001			42.6	2	<.0001	
Low, < $25,000 (n = 9,494)	39.2				1.00	58.2				1.00
Medium, $25,000–49,999 (n = 40,610)	43.1				0.93 (0.84–1.03)	60.1				0.92 (0.83–1.02)
High, $50,000 (n = 7,461)	39.6				0.99 (0.83–1.18)	57.1				0.94 (0.78–1.21)
County population in poverty, %		820.2	2	<.0001			732.3	2	<.0001	
Low, 0%–14% (n = 36,028)	46.9				1.00	64.1				1.00
Medium, 15%–19% (n = 11,600)	31.2				0.62 (0.57–0.67)	48.8				0.62 (0.58–0.68)
High, 20%+ (n = 9,937)	36.8				0.59 (0.52–0.65)	54.7				0.60 (0.54–0.67)
County population per square mile		85.9	2	<.0001			33.6	2	<.0001	
Low, ≤ 399 (n = 18,921)	42.4				1.00	60.9				1.00
Medium, 400–1,000 (n = 8,312)	38.3				0.74 (0.67–0.81)	57.4				0.78 (0.71–0.86)
High, > 1,000 (n = 30,332)	42.7				0.80 (0.73–0.87)	59.0				0.83 (0.76–0.91)
State Medicaid policy characteristics										
Prior authorization, < 12 outpatient mental health visits[b]		326.8	1	<.0001			183.2	1	<.0001	
Present (n = 7,323)	31.7				0.62 (0.56–0.68)	52.0				0.69 (0.63–0.75)
Absent (n = 52,244)	43.1				1.00	60.3				1.00
Mental health clinic coverage[b]		304.4	3	<.0001			231.1	1	<.0001	
Present (n = 33,473)	43.8				1.02 (0.95–1.09)	61.1				1.04 (0.97–1.12)
Absent (n = 26,094)	39.0				1.00	56.9				1.00

[a]Independent variables derived from Area Resource File. Psychiatrists are limited to those in patient care. Adjusted odds ratios (AORs) are from logistic regressions with all variables as covariates. Sample sizes vary due to missing data. [b]Substance Abuse and Mental Health Services Administration (SAMHSA)–derived data.

state Medicaid policy factors. A greater understanding of these factors may help identify high-risk patient subgroups as well as inform clinical interventions and programmatic reforms aimed at smoothing the transition from inpatient to outpatient care.

Consistent with previous research with diagnostically heterogeneous samples,[1] receiving outpatient care during the period preceding hospital admission was an especially powerful predictor of successful linkage to outpatient care. As compared with patients who had not received outpatient care during the 90 days before hospital admission, those who had received such care had over 3 times the odds of receiving care in the first month following hospital discharge. Having a usual source of mental health care emerged as the single most important factor in promoting continuity of care following hospital discharge. For patients who have not received treatment during the period preceding inpatient admission, proactive clinical efforts may be necessary to coordinate the transition from inpatient to outpatient care.[25] One promising hospital-based approach for these patients involves establishing contact between the patient and a new outpatient clinician prior to hospital discharge.[7] Strong consideration should be given to dropping reimbursement restrictions on outpatient visits during the inpatient care of patients who were not receiving outpatient care prior to hospital admission. Service innovations are needed to help assure that adults with schizophrenia have a regular and ongoing source of outpatient mental health care.

Even after controlling for prior outpatient mental health care, patients who received long-acting injectable antipsychotic medications prior to hospital admission were more likely to follow through with outpatient care than were patients who received only oral antipsychotic medications during this period. Patients who received no antipsychotic medications before hospital admission for the treatment of schizophrenia had the lowest rate of outpatient follow-up. The current findings underscore the importance of taking a careful medication history from inpatients for the period preceding hospital admission. Patients who were not taking antipsychotic medications prior to hospital admission are at high risk for treatment disengagement following hospital discharge. For these patients, clinical attention to medication acceptance and discharge planning may facilitate their engagement in outpatient services and reduce risk of hospital readmission.[26]

Use of long-acting antipsychotic medications may be concentrated among patients who have relatively strong connections to outpatient care and are therefore more likely to follow-up with outpatient care after hospital discharge. Patients with schizophrenia who do not take oral or depot antipsychotic medications prior to hospital admission may also be at higher risk than patients who receive antipsychotic medications during this period for slower and more complex recoveries.[27] Differences in the trajectory of recovery may in turn influence engagement with outpatient care following hospital discharge.

A recent history of treatment for a substance use disorder substantially increased the risk of not receiving follow-up outpatient care after controlling for several potentially confounding factors. Patients with substance use disorders are known to be at high risk of premature treatment termination.[9,28] Some,[1] but not all,[2] research further suggests that comorbid substance use disorders tend to reduce continuity from inpatient to outpatient psychiatric care.

Patients treated in specialized psychiatric hospitals were less likely to receive follow-up care than those treated in general and other hospitals. It is possible that as compared with psychiatric hospitals, community hospitals tend to devote greater clinical attention to discharge planning or have stronger referral networks and better established collaborative relationships with community mental health agencies. Psychiatric inpatients in general hospitals have been found to report less stigma and social rejection than their counterparts in specialized psychiatric hospitals.[29] Active efforts to promote and coordinate referrals may be especially important within specialized psychiatric hospitals.

Local availability of psychiatrists also appeared to influence continuity of care. Patients who live in counties with more psychiatrists may have more options and greater access to outpatient psychiatric care than those who live in areas without psychiatrists. At the same time, however, the adjusted models revealed that residence in a more densely populated county tended to decrease outpatient follow-up care. As noted in previous research,[30] our study revealed that in more densely populated areas, it is possible that recently discharged psychiatric patients have a greater tendency to become lost during the interagency referral process.

Residence in an impoverished area was also associated with low rates of follow-up care. High-poverty counties tend to have high rates of unemployment, homelessness, and residential turnover and fewer mental health care resources.[31,32] These and related factors may create unfavorable conditions for people with schizophrenia to navigate the interface separating inpatient from outpatient care. In the allocation of scarce public resources, such as state-funded case managers and referral coordinators that focus on linking high-need patients to care, consideration should be given to the greater challenges of achieving continuity of care in high-poverty areas.

Health care policies appear to exert an influence over access to outpatient care following hospital discharge. Specifically, statewide Medicaid policies that require preauthorization starting with fewer than 12 annual outpatient mental health visits appear to increase the risk of not receiving follow-up outpatient care. Preauthorization, which is aimed at controlling costs through a reduction of discretionary use of outpatient mental health services, may, for some patients, inadvertently limit access to critically important care.[11] Patients treated under managed care also tended to be less likely than those treated under fee-for-service arrangements to receive follow-up care. These findings point out potential quality of care risks associated with 2 common policy approaches to containing mental health care costs.

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This study has several potential limitations. First, data were not available concerning many factors that may influence use of follow-up outpatient mental health care. For example, no measures were available concerning the extent to which inpatient staff prepare patients for their first scheduled outpatient visit, arrange for outpatient visits during the inpatient stay, employ patient-centered approaches to clinical decision making, or contact patients following hospital discharge to encourage follow-up. Second, diagnoses were based on clinician judgment and were not subject to expert validation through standardized or structured assessment. From a policy perspective, however, conclusions derived from community diagnostic patterns are relevant to service delivery. Third, analyses are limited to nonelderly adult Medicaid recipients and may not generalize to privately insured or uninsured populations or to older adult patient populations. Nevertheless, Medicaid is the largest third-party payer of schizophrenia outpatient care in the United States. Fourth, it is also not possible to generalize to the large number of Medicaid patients who receive inpatient care in state mental hospitals that do not receive Medicaid reimbursement. Fifth, nonresponse to the hospital survey resulted in a variable number of missing discharges ranging from number of hospital beds (6.8%) to presence of an outpatient psychiatric service (32.9%). The county-level variables were missing in 3.4% of discharges. Missing responses open the possibility of selection bias. Sixth, uncertainty exists regarding the accuracy of claims-based measures of long-acting injection antipsychotic medications.[33,34] Finally, the results may also not generalize to the large number of treatment episodes (20,374 treatment episodes) that resulted in hospital readmissions for general medical or psychiatric disorders during the first 30 days following initial hospital discharge. Following the algorithms for the Health Plan Employer Data and Information Set follow-up after hospitalization for mental illness measures, these discharges were excluded from the analysis because hospital readmission may prevent the outpatient follow-up visit from taking place.[6]

Schizophrenia generally requires long-term and ongoing treatment to promote recovery.[35] In community treatment, the risks of discontinuity between inpatient and outpatient follow-up care are substantial for patients with schizophrenia in the Medicaid program, especially for patients who are not receiving antipsychotic medications or other outpatient mental health care prior to hospital admission and for patients treated in states with extensive preauthorization requirements for outpatient care. The processes that govern linkage are quite complex. Patient characteristics, clinical management, geographical resource availability, and mental health policy environment all influence access to care following hospital discharge. A greater focus is needed on treatments, services, and policies that promote the timely transition to outpatient care in the community treatment of schizophrenia.

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