

# Potential Disparities in the Management of Schizophrenia in the United States

Kathryn Rost, Ph.D.

Yi-Ping Hsieh, Ph.D.

Stanley Xu, Ph.D.

Nir Menachemi, Ph.D.

Alexander S. Young, M.D., M.S.H.S.

**Objective:** This study investigated whether outpatient visits to psychiatrists and primary care physicians (family physicians, general internists, or general practitioners) by individuals with schizophrenia differed in antipsychotic medication management and subsequent hospitalization by age, gender, race-ethnicity, insurance, rurality, and region. **Methods:** Data for the study were from office visit forms completed between 1999 and 2007 by physicians in the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey. A total of 3,359 outpatient visits by individuals with a diagnosis of schizophrenia were identified. The research team used four logistic regression models to test the relationship of sociodemographic variables to antipsychotic medication management during the visit and to hospitalization after the visit. The four models controlled for available clinical covariates with or without physician specialty in the entire cohort and in the cohort of visits in which patients had no active psychotic symptoms. **Results:** In at least three of the four models, the research team observed that visits by non-Hispanic black patients had significantly ( $p < .05$ ) greater odds of involving antipsychotic medication management than visits by non-Hispanic whites (range of odds ratios [ORs] 1.66 to 1.88) and of resulting in hospitalization (range of ORs, 3.52 to 6.95). In all four models, visits by patients who lacked insurance were significantly less likely to result in hospitalization than visits by patients who had private insurance ( $OR = < .001$  in all models). **Conclusions:** These findings provide the first national evidence of potential treatment disparities for schizophrenia. Further research is needed to definitively identify disparities and to understand their causes and consequences. (*Psychiatric Services* 62:613–618, 2011)

In contrast to other mental disorders for which treatment disparities have been convincingly demonstrated (1–5), no national stud-

ies have examined treatment disparities for schizophrenia, even though regional studies have reported large variations in treatment (6–8). This

study investigated differences in antipsychotic medication management and hospitalization by age, gender, race-ethnicity, insurance, rurality, and region and controlled for available indicators of clinical severity in a nationally representative sample of outpatient visits made from 1999 through 2007 by patients with a diagnosis of schizophrenia.

## Methods

### Sample

We conducted a secondary analysis of office visit forms collected in the 1999–2007 National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS). NAMCS produces an annual national probability sample of visits to physicians who provide outpatient care in free-standing, office-based practices, including health maintenance organizations and nonfederal government clinics. During the nine years (1999–2007), physician participation rates averaged 64.3%, ranging from a low of 58.9% in 2005 to a high of 67.7% in 2000. NHAMCS produces an annual national probability sample of visits to physicians who provide outpatient care in nonfederal general and short-stay hospitals. During the nine years, NHAMCS sampled between 458 and 546 hospitals each year. Of the sampled hospitals, 391 to 462 hospitals were eligible to participate in the survey. Annual response rates ranged from 89.4% to 96.0%. Physicians complete a standardized office visit form for each sampled visit. The form contains detailed infor-

---

*Dr. Rost is affiliated with the Department of Mental Health Law and Policy, College of Behavioral and Community Sciences, University of South Florida, 13301 Bruce B. Downs Blvd., Tampa, FL 33612 (e-mail: kmrost@usf.edu). Dr. Hsieh is with the Department of Medical Sociology and Social Work, Kaohsiung Medical University, Kaohsiung City, Taiwan. Dr. Xu is with the Institute for Health Research, Kaiser Permanente, Denver, Colorado. Dr. Menachemi is with the Department of Health Care Organization and Policy, University of Alabama at Birmingham. Dr. Young is with the Department of Psychiatry, University of California, Los Angeles.*

mation, including up to three patient reasons for the visit, up to three physician diagnoses based on ICD-9, medications and other treatment provided, and visit disposition, including whether the patient was hospitalized.

For the study reported here, NAMCS and NHAMCS data files were combined in accordance with directions for analysis provided by the National Center for Health Statistics (NCHS) (9). The study sample included all visits made by patients aged 18 and older to psychiatrists and primary care physicians (family physicians, general internists, or general practitioners) in which schizophrenia (ICD-9 code 295.XX) was listed as one of the three physician diagnoses. The 120 (unweighted) visits to physician assistants and nurse practitioners could not be included because we could not determine whether these providers worked in states that gave them prescribing privileges. The NCHS Institutional Review Board approved the data collection protocol, including a waiver of the requirement for informed consent of participating patients. The Florida State University Institutional Review Board approved the analysis.

#### *Operational definition of major constructs*

**Independent variables.** Age was defined in tertiles (18–35, 36–50, and 51–100 years) to examine nonlinear relationships. Gender was defined as female or male. Race-ethnicity was defined as non-Hispanic white, non-Hispanic black, Hispanic, and other. For the insurance variable, the primary expected source of payment for the visit was defined as private, Medicare, Medicaid, none, and other (10). Rurality was defined by non-metropolitan statistical area (rural) or metropolitan statistical area (urban) (11) to capture differential access to specialty care (12). Region was coded as Northeast, Midwest, South, or West; state mental health spending per capita differs across regions (13).

**Dependent variables.** Management of antipsychotic medication (aripiprazole, chlorpromazine, clozapine, fluphenazine, haloperidol, loxapine, mesoridazine, molindone, olanzapine,

paliperidone, perphenazine, promazine, quetiapine, risperidone, thioridazine, thiothixene, trifluoperazine, and ziprasidone) was defined as physician notation of medications prescribed, ordered, supplied, administered, or continued at the visit. The wording of the item did not allow us to definitively differentiate patients who did or did not take any antipsychotic medication. Visits characterized as not involving antipsychotic medication management identified patients who currently had no prescription for any antipsychotic medication from any provider as well as patients who were currently taking an antipsychotic medication prescribed by this or another provider that did not require a refill or adjustment at the visit. No data on dosage were available. Hospitalization was defined as a notation by the physician in the visit disposition section that the patient was hospitalized after the visit. No data on psychiatric versus medical hospitalization were available.

#### *Available clinical covariates*

An active psychotic symptom was defined as a physician notation that one of up to three reasons for the visit included delusions or hallucinations, functional or organic psychoses, or speech or sense disturbances not including paresthesias. An active physical problem was defined as a physician notation that one of up to three reasons for the visit included one of 198 physical symptoms, diagnoses, or treatments. Medications was defined as the total number of psychotropic and nonpsychotropic medications (other than antipsychotic medication) prescribed, ordered, supplied, administered, or continued during the visit. Social disruption was defined as a physician notation that one of up to three reasons for the visit included violence, hostility, temper, hysteria, marital strife, family difficulties, or police or legal problems. Substance use diagnosis was defined as physician notation that one of up to three diagnoses for the visit was an alcohol or drug problem. Physician specialty was categorized as psychiatrist or primary care physician (general internist, family physician, or general practitioner).

#### *Analyses*

We used four logistic regression models to test the relationship of sociodemographic variables to antipsychotic medication management and hospitalization. Model 1 was conducted for the entire cohort and controlled for clinical covariates. Model 2 was conducted for the cohort with no psychotic symptoms and controlled for clinical covariates. Model 3 was conducted for the entire cohort and controlled for clinical covariates and physician specialty. Model 4 was conducted for the cohort with no psychotic symptoms and controlled for clinical covariates and physician specialty. We tested sociodemographic predictors in the entire cohort and in the cohort with no active psychotic symptoms to determine whether the same disparities could be observed in the clinically heterogeneous sample (entire cohort) and the clinically homogeneous sample (cohort with no active psychotic symptoms) to reduce concerns about treatment differences arising from unobserved clinical variation. We tested sociodemographic predictors in models that did and did not control for physician specialty to differentiate disparities in the current health care system (in which sociodemographic groups differ in the probability of specialty care treatment) from disparities in some future health care system (in which sociodemographic groups do not differ in the probability of specialty care treatment).

Using weights to account for selection probability, nonresponse, and other factors necessary to characterize a national sample of schizophrenia visits in the United States during the nine-year period, each logistic regression was adjusted for clinical covariates that predicted the dependent variable at the  $p < .2$  level in univariate analyses. Each model also included survey year, which was coded as a linear variable after preliminary investigation identified no quadratic trends in any dependent variable by time. We present model 1 findings in the tables because this model produced the most generalizable findings on potential disparities in the current health care delivery system. Significant sociodemographic predictors in

the other three models are presented in the Results section to allow readers to compare the consistency of findings in clinically heterogeneous and homogeneous populations (model 1 compared with model 2, and model 3 compared with model 4) and in the current health care system and in some future health care system in which sociodemographic subgroups are equally likely to receive specialty care (model 1 compared with model 3, and model 2 compared with model 4).

## Results

Table 1 presents descriptive statistics (weighted percentages) for the 3,359 visits by physician specialty. Psychiatrists accounted for 86.1% of all visits, and primary care physicians accounted for the remaining 13.9% of visits. Antipsychotic medication was managed during 81.8% of all visits, significantly more often by psychiatrists than primary care physicians (85.0% and 62.3%, respectively,  $p < .001$ ). Hospitalization occurred after 1.0% of visits, with no significant differences between psychiatrists and primary care physicians.

### Antipsychotic medication management

In model 1 (the entire cohort), visits by non-Hispanic blacks were more likely than visits by non-Hispanic whites to involve antipsychotic medication management (odds ratio [OR]=1.66,  $p < .05$ ) (Table 2). Visits made by middle-aged patients were less likely than visits by younger patients to involve antipsychotic medication management (OR=.66,  $p = .03$ ), as were visits by rural patients compared with those by urban patients (OR=.49,  $p = .04$ ). In model 2 (the cohort with no active psychotic symptoms), the findings for non-Hispanic blacks (OR=1.88, 95% confidence interval [CI]=1.17–3.03,  $p < .01$ ) were similar to those in model 1. In model 3 (the entire cohort with control for physician specialty), the findings for non-Hispanic blacks (OR=1.48, CI=.92–2.37,  $p = .10$ ) and middle-aged patients (OR=.67, CI=.45–1.01,  $p = .06$ ) were similar to those in model 1 but at the level of a trend. In model 4 (the cohort with no active

**Table 1**

Patient sociodemographic characteristics for 3,359 outpatient visits by individuals with a diagnosis of schizophrenia between 1999 and 2007, by physician specialty<sup>a</sup>

Characteristic	Psychiatrist (N=3,020) <sup>b</sup>	Primary care physician (N=339) <sup>c</sup>	Total (N=3,359) <sup>d</sup>	p
Independent variable				
Age				
18–35	24.1	11.9	22.4	.01
36–50	43.5	50.2	44.4	
51–100	32.4	37.9	33.2	
Female	45.2	50.4	45.9	.35
Race-ethnicity				
Non-Hispanic white	58.9	60.0	59.0	.25
Non-Hispanic black	21.1	26.6	21.8	
Hispanic	9.7	4.3	8.9	
Other	10.4	9.1	10.2	
Insurance				
Private	14.2	8.2	13.4	.06
Medicare	31.1	28.5	30.7	
Medicaid	36.5	47.8	38.1	
None	8.1	3.6	7.5	
Other	10.1	11.9	10.4	
Rural	8.5	18.9	10.0	.01
Region				
Northeast	33.0	32.8	33.0	.90
Midwest	16.8	17.2	16.9	
South	30.1	26.6	29.6	
West	20.0	23.4	20.5	
Clinical covariate				
Active psychotic symptoms	26.1	12.7	24.2	.02
Active physical problems	5.0	45.9	10.7	<.001
Social disruption	5.0	.3	4.4	<.001
Medications (M±SD)	2.59±.07	3.44±.21	2.71±.07	<.001
Substance use diagnosis	2.5	.1	2.1	<.001
Dependent variable				
Antipsychotic medication	85.0	62.3	81.8	<.001
Hospitalization	1.0	1.1	1.0	.95

<sup>a</sup> Values are weighted percentages unless otherwise indicated.

<sup>b</sup> Weighted N=17,702,505

<sup>c</sup> Weighted N=2,852,559

<sup>d</sup> Weighted N=20,555,064

psychotic symptoms with control for physician specialty), the findings for non-Hispanic blacks (OR=1.76, CI=1.12–2.76,  $p = .01$ ) were similar to those in model 1. No other sociodemographic characteristics were statistically significant in models 2, 3, or 4.

### Hospitalization

In model 1 (the entire cohort), visits made by non-Hispanic blacks were more likely than visits by non-Hispanic whites to result in hospitalization (OR=3.52,  $p = .04$ ) (Table 3). Visits by patients with no insurance were less likely than visits by patients with private insurance to result in hospitalization (OR<.001,  $p < .01$ ). In model 2 (the cohort with no active psychotic

symptoms) and model 3 (the entire cohort with control for physician specialty), the findings for non-Hispanic blacks were similar to those in model 1 (OR=6.95, CI=1.47–32.78,  $p < .01$ , and OR=3.69, CI=1.16–11.77,  $p = .03$ , respectively), as were the findings for no insurance (OR<.001,  $p < .01$  for both models). In model 4 (the cohort with no active psychotic symptoms with control for physician specialty), the findings for non-Hispanic blacks (OR=6.95, CI=1.47–32.78,  $p = .01$ ) and lack of insurance (OR<.001, CI=<.001–<.001,  $p < .01$ ) were similar to those in model 1. Visits by patients with Medicare and Medicaid were more likely than visits by patients with private insurance to result in

**Table 2**

Logistic regression model (model 1) testing the relationship of patient sociodemographic variables to antipsychotic medication management during the outpatient visit of patients with a diagnosis of schizophrenia<sup>a</sup>

Parameter	Beta estimate	SE	p	OR	95% CI
Intercept	.45	.42	.29	—	—
Year	-.06	.05	.22	.94	.86–1.04
Age (reference: 18–35)					
36–50	-.42	.20	.03	.66	.45–.97
51–100	.23	.22	.31	1.25	.81–1.94
Female (reference: male)	-.27	.15	.06	.76	.57–1.01
Race-ethnicity (reference: non-Hispanic white)					
Non-Hispanic black	.50	.25	.05	1.66	1.01–2.72
Hispanic	.16	.31	.61	1.17	.64–2.16
Other	-.28	.30	.36	.76	.42–1.37
Insurance (reference: private insurance)					
Medicare	-.37	.30	.22	.69	.38–1.24
Medicaid	-.36	.30	.24	.70	.38–1.27
None	-.16	.60	.79	.85	.26–2.76
Other	-.46	.38	.23	.63	.30–1.34
Rural (reference: urban)	-.71	.35	.04	.49	.25–.97
Active psychotic symptoms (reference: none)	.42	.23	.07	1.52	.97–2.41
Active physical problems (reference: none)	-1.76	.33	<.001	.17	.09–.33
Medications	1.02	.10	<.001	2.76	2.28–3.35

<sup>a</sup> Model 1 controlled for clinical covariates. Covariates that did not meet criteria for inclusion in the model: social disruption, substance use diagnosis, and region

**Table 3**

Logistic regression model (model 1) testing the relationship of patient sociodemographic variables to hospitalization after the outpatient visit of patients with a diagnosis of schizophrenia<sup>a</sup>

Parameter	Beta estimate	SE	p	OR	95% CI
Intercept	-4.56	1.28	<.001	—	—
Year	-.02	.13	.91	.98	.76–1.28
Age (reference: 18–35)					
36–50	-.57	.72	.42	.56	.14–2.30
51–100	-.71	.85	.40	.50	.09–2.60
Female (reference: male)	-.24	.63	.70	.78	.23–2.70
Race-ethnicity (reference: non-Hispanic white)					
Non-Hispanic black	1.26	.61	.04	3.52	1.06–11.65
Hispanic	-.97	1.10	.38	.38	.04–3.25
Other	.40	.82	.63	1.49	.30–7.48
Insurance (reference: private insurance)					
Medicare	-1.01	.97	.30	.37	.06–2.43
Medicaid	-.07	.91	.94	.93	.16–5.53
None	-15.86	1.10	<.001	<.001	<.001 <sup>b</sup>
Other	-.89	1.04	.39	.41	.05–3.11
Rural (reference: urban)	-1.21	1.13	.28	.30	.03–2.74
Active psychotic symptoms (reference: none)	1.49	.64	.02	4.42	1.27–15.42
Social disruption (reference: none)	1.64	.70	.02	5.15	1.31–20.26

<sup>a</sup> The model controlled for clinical covariates. Covariates that did not meet criteria for inclusion in the model: active physical problems, medications, substance use diagnosis, and region

<sup>b</sup> The highest and lowest value in the confidence interval were both less than <.001 and could not be estimated in SAS.

hospitalization (OR=2.09, CI=1.10–3.97,  $p=.02$ , and OR=43.9, CI=4.44–435.47,  $p<.01$ , respectively). No other sociodemographic characteristics were statistically significant in models 2, 3, and 4.

As shown in Table 4, non-Hispanic black race-ethnicity increased the likelihood of antipsychotic medication management and hospitalization in at least three of the four models. Lack of insurance decreased the likelihood of hospitalization in all four models.

## Discussion

The study found that psychiatrists provided 86% of visits to patients with a diagnosis of schizophrenia and that 85% of the psychiatrist visits involved antipsychotic medication. Primary care physicians provided the remaining 14% of visits, and 62% of those visits involved antipsychotic medication. Primary care physicians and psychiatrists reported virtually identical hospitalization rates after a visit by a patient with a schizophrenia diagnosis (1%).

These findings provide evidence of potential disparities in the delivery of care for U.S. outpatients with a diagnosis of schizophrenia. In at least three of the four models tested, we observed consistent differences by race-ethnicity in antipsychotic medication management and hospitalization and differences in hospitalization by insurance. The fact that these patterns appeared in both clinically heterogeneous and homogeneous groups suggests that our findings are not attributable to unobserved differences in clinical severity. In addition, the fact that these differences appeared in models controlling for physician specialty suggests that our findings are not attributable to differences in the probability of specialty care. No disparities in antipsychotic medication management and hospitalization were consistently observed by age, gender, rurality, and region.

Although multiple studies have examined race-ethnicity disparities in the prescription of first- versus second-generation antipsychotic medication (14–19), our study is the first national study to examine potential disparities in antipsychotic medica-



tion management. Our race-ethnicity findings differ from the results of the only other study of this question, which reported no racial differences in a regional sample of Medicaid recipients with schizophrenia who had not been recently hospitalized (20). It is not possible to determine whether the discrepant findings between the two studies are the result of differences in samples, operational definitions, or statistical modeling. The increased odds of antipsychotic medication management for non-Hispanic blacks may indicate that they are more likely than non-Hispanic whites to receive any antipsychotic medication. However, we suspect that the race-ethnicity differences indicate that physicians of non-Hispanic blacks were more likely to adjust their antipsychotic medications during the visit because the previously prescribed drug had serious side effects or could not be adhered to (1). The latter explanation is consistent with the odds of increased hospitalization that we observed for non-Hispanic blacks.

Our study is also the first national study to examine potential disparities in hospitalization, and our findings replicated regional findings for non-Hispanic blacks (21,22) and the uninsured (23,24). The consistencies between national and regional findings are encouraging because regional studies are often conducted in databases with a broader range of clinical covariates. The increased odds of hospitalization for non-Hispanic blacks suggests that blacks may not get high-quality outpatient care, that they lack the psychosocial support in the community needed to prevent hospitalization, or that clinicians view black patients as more dangerous and adopt a lower threshold for hospitalization (1). The decreased odds of hospitalization for noninsured patients suggest that these patients may be hospitalized too infrequently or that privately insured patients may be hospitalized too often, even in systems that are highly managed. Further research is needed to determine reasons for the relationships we observed.

The internal and external validity of our findings is subject to the following considerations. First, the diagnostic

**Table 4**

Odds ratios associated with significant ( $p < .05$ ) predictors of antipsychotic medication management and hospitalization in four logistic regression models

Predictor and model	Medication management	Hospitalization
Non-Hispanic black compared with non-Hispanic white		
Model 1 <sup>a</sup>	1.66	3.52
Model 2	1.88	6.95
Model 3	1.48 <sup>b</sup>	3.69
Model 4	1.76	6.95
No insurance compared with private insurance <sup>c</sup>		
Model 1 <sup>a</sup>	ns	<.001
Model 2	ns	<.001
Model 3	ns	<.001
Model 4	ns	<.001

<sup>a</sup> Model 1 controlled for clinical covariates in the entire sample. Model 2 controlled for clinical covariates in the cohort with no active psychotic symptoms. Model 3 controlled for clinical covariates and physician specialty in the entire sample. Model 4 controlled for clinical covariates and physician specialty in the cohort with no active psychotic symptoms.

<sup>b</sup>  $p = .10$

<sup>c</sup> All odds ratios examining the relationship of no insurance to antipsychotic medication management were nonsignificant.

accuracy of our sample was imperfect because the diagnoses relied on physician judgment rather than on objective assessment tools. Although policy analysts find it useful to generalize to patients who receive real-world diagnoses, this potential measurement error is problematic if diagnostic accuracy differed by the sociodemographic characteristics that we examined. Second, the database does not contain a comprehensive set of clinical covariates. Although further research in databases with more comprehensive clinical covariates is definitely warranted, it is encouraging that we were able to replicate our major findings for visits by patients with no active psychotic symptoms—a clinically more homogeneous population. Third, the database does not systematically sample visits in which patients with schizophrenia receive psychosocial treatment. Although smaller studies have found disparities in receipt of psychosocial treatment by age, race-ethnicity, and rurality (25,26), we cannot comment on potential national disparities for this important source of evidence-based care except to note that patients who obtain mental health care exclusively in primary care settings may be less likely to receive this important treatment. Fourth, because the unit of analysis is a single office visit, patients making frequent

visits because of illness severity may be overrepresented; however, given that each office sampled visits for a four-week period only, this source of measurement error is not likely to greatly bias findings. Even with these limitations, the database represents the most comprehensive national survey of office-based physician visits for schizophrenia over geography, population, and time.

## Conclusions

Over nine years, this study observed consistent differences by race-ethnicity in antipsychotic medication management and hospitalization, as well as differences by insurance in hospitalization, which were difficult to explain by clinical severity or specialty care treatment. It is one step to know that potential disparities exist; it is a second step to know how to address them. Further research in databases that will permit more definitive identification of disparities is needed, followed by research on their causes and consequences as the field moves toward ensuring high-quality care (27) to all individuals in this vulnerable population.

## Acknowledgments and disclosures

Support for this study was provided in part by the Western Interstate Commission for Higher Education.

Dr. Young has provided consultation to Sunovion. The other authors report no competing interests.

## References

1. Mental Health: Culture, Race, and Ethnicity—A Supplement to Mental Health: A Report of the Surgeon General. Rockville, Md, US Department of Health and Human Services, US Public Health Service, 2001
2. McGuire TG, Alegría M, Cook BL, et al: Implementing the Institute of Medicine definition of disparities: an application to mental health care. *Health Services Research* 41:1979–2005, 2006
3. Lagomasino IT, Dwight-Johnson M, Miranda J, et al: Disparities in depression treatment for Latinos and site of care. *Psychiatric Services* 56:1517–1523, 2005
4. Compton WM, Thomas YF, Stinson FS, et al: Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry* 64:566–576, 2007
5. Richardson J, Anderson T, Flaherty J, et al: The quality of mental health care for African Americans. *Culture, Medicine and Psychiatry* 27:487–498, 2003
6. Young AS, Niv N, Cohen AN, et al: The appropriateness of routine medication treatment for schizophrenia. *Schizophrenia Bulletin* 36:732–739, 2010
7. Achieving the Promise: Transforming Mental Health Care in America. Pub no SMA-03-3832. Rockville, Md, Department of Health and Human Services, President's New Freedom Commission on Mental Health, 2003
8. Young AS, Sullivan G, Duan N: Patient, physician, and treatment factors associated with poor-quality care for schizophrenia. *Mental Health Services Research* 1:201–211, 1999
9. Hing E, Gousen S, Shimizu I, et al: Guide to using masked design variables to estimate standard errors in public use files of the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey. *Inquiry* 40:401–415, 2004
10. Khaykin E, Eaton WW, Ford DE, et al: Health insurance coverage among persons with schizophrenia in the United States. *Psychiatric Services* 61:830–834, 2010
11. Hart LG, Larson EH, Lishner DM: Rural definitions for health policy and research. *American Journal of Public Health* 95:1149–1155, 2005
12. Merwin E, Snyder A, Katz E: Differential access to quality rural healthcare: professional and policy challenges. *Family and Community Health* 29:186–194, 2006
13. Grading the States: A Report on America's Health Care System for Serious Mental Illness. Arlington, Va, National Alliance on Mental Illness, 2006
14. Daumit GL, Crum RM, Guallar E, et al: Outpatient prescriptions for atypical antipsychotics for African Americans, Hispanics, and whites in the United States. *Archives of General Psychiatry* 60:121–128, 2003
15. Herbeck DM, West JC, Ruditis I, et al: Variations in use of second-generation antipsychotic medication by race among adult psychiatric patients. *Psychiatric Services* 55:677–684, 2004
16. Mark TL, Palmer LA, Russo PA, et al: Examination of treatment pattern differences by race. *Mental Health Services Research* 5:241–250, 2003
17. Opolka JL, Rascati KL, Brown CM, et al: Ethnicity and prescription patterns for haloperidol, risperidone, and olanzapine. *Psychiatric Services* 55:151–156, 2004
18. Van Dorn RA, Swanson JW, Swartz MS, et al: The effects of race and criminal justice involvement on access to atypical antipsychotic medications among persons with schizophrenia. *Mental Health Services Research* 7:123–134, 2005
19. Mark TL, Dirani R, Slade E, et al: Access to new medications to treat schizophrenia. *Journal of Health Services and Research* 29:15–29, 2002
20. Busch AB, Lehman AF, Goldman HH, et al: Changes over time and disparities in schizophrenia treatment quality. *Medical Care* 47:199–207, 2009
21. Marcus SC, Olfson M: Outpatient antipsychotic treatment and inpatient costs of schizophrenia. *Schizophrenia Bulletin* 34:173–180, 2008
22. Snowden LR, Holschuh J: Ethnic differences in emergency psychiatric care and hospitalization in a program for the severely mentally ill. *Community Mental Health Journal* 28:281–291, 1992
23. Fortney JC, Xu S, Dong F: Community-level correlates of hospitalizations for persons with schizophrenia. *Psychiatric Services* 60:772–778, 2009
24. Rabinowitz J, Bromet EJ, Lavelle J, et al: Relationship between type of insurance and care during the early course of psychosis. *American Journal of Psychiatry* 155:1392–1397, 1998
25. Lehman AF, Steinwachs DM: Patterns of usual care for schizophrenia: initial results from the Schizophrenia Patient Outcomes Research Team (PORT) client survey. *Schizophrenia Bulletin* 24:11–20, 1998
26. Dixon L, Lyles A, Smith C, et al: Use and costs of ambulatory care services among Medicare enrollees with schizophrenia. *Psychiatric Services* 52:786–792, 2001
27. Kreyenbuhl J, Buchanan RW, Dickerson FB, et al: The Schizophrenia Patient Outcomes Research Team (PORT): updated treatment recommendations 2009. *Schizophrenia Bulletin* 36:94–103, 2010