

Racial-Ethnic Differences in Psychiatric Diagnoses and Treatment Across 11 Health Care Systems in the Mental Health Research Network

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Objective: The objective of this study was to characterize racial-ethnic variation in diagnoses and treatment of mental disorders in large not-for-profit health care systems.

Methods: Participating systems were 11 private, not-for-profit health care organizations constituting the Mental Health Research Network, with a combined 7,523,956 patients age 18 or older who received care during 2011. Rates of diagnoses, prescription of psychotropic medications, and total formal psychotherapy sessions received were obtained from insurance claims and electronic medical record databases across all health care settings.

Results: Of the 7.5 million patients in the study, 1.2 million (15.6%) received a psychiatric diagnosis in 2011. This varied significantly by race-ethnicity, with Native American/Alaskan Native patients having the highest rates of any diagnosis (20.6%) and Asians having the lowest rates (7.5%). Among patients with a psychiatric diagnosis, 73% (N=850,585)

received a psychotropic medication. Non-Hispanic white patients were significantly more likely (77.8%) than other racial-ethnic groups (odds ratio [OR] range .48–.81) to receive medication. In contrast, only 34% of patients with a psychiatric diagnosis (N=548,837) received formal psychotherapy. Racial-ethnic differences were most pronounced for depression and schizophrenia; compared with whites, non-Hispanic blacks were more likely to receive formal psychotherapy for their depression (OR=1.20) or for their schizophrenia (OR=2.64).

Conclusions: There were significant racial-ethnic differences in diagnosis and treatment of psychiatric conditions across 11 U.S. health care systems. Further study is needed to understand underlying causes of these observed differences and whether processes and outcomes of care are equitable across these diverse patient populations.

Psychiatric Services 2016; 67:749–757; doi: 10.1176/appi.ps.201500217

It is estimated that at least 25% of adults 18 and older in the United States suffer from some type of psychiatric condition at any time (1). The most common conditions are depression and anxiety (1). Psychiatric conditions lead to greater disability than other chronic illnesses and cost the United States as much as \$300 billion annually (2,3). A number of reports, most of which rely on survey responses from both patients and providers, have detailed racial-ethnic differences in diagnosis of psychiatric conditions (4). In general, survey-reported rates of depression are lower for non-Hispanic black and Hispanic patients than their non-Hispanic white counterparts (5,6). In contrast, across a number of settings, including community and academic medical centers, non-Hispanic black and Hispanic patients are more than three times as likely as non-Hispanic whites to have a diagnosis of schizophrenia (7–10).

Treatment for psychiatric conditions also varies by race-ethnicity. Individuals with any psychiatric condition and from racial-ethnic minority groups are less likely than non-Hispanic whites to receive a medication for their condition (5,11–13). Like the findings for diagnoses, findings of most of the treatment studies are also based on survey reports from patients and providers. The evidence that exists for the accuracy of patient-reported medical treatment is mixed and depends on the treatment being delivered (14,15). Major treatment modalities, such as surgery, are much more accurately reported than is the receipt of a prescription for a condition (16). Physician-reported care practices are much less studied, with the limited evidence suggesting that physician self-reported treatment does not match that recorded in the medical record (17,18).

The few published studies that have examined actual prescription patterns (rather than data gathered from

surveys) have found conflicting results. One found lower prescription rates for veterans with serious mental illness who were from racial-ethnic minority groups compared with their non-Hispanic white counterparts (11), whereas a large study of Medicaid patients from 42 states suggested that the off-label use of antipsychotic drugs is greater among racial-ethnic minority groups (19). These disparate findings are likely due to a number of differences among patient populations, treatment practices, and health care system guidelines. Racial-ethnic variation in the use of psychotherapy is even less well understood. As in the pharmacotherapy literature, there are equivocal findings about differences in psychotherapy use by persons in racial-ethnic minorities (20–23).

We designed this study to address two major gaps in the literature. First, most available evidence for racial-ethnic differences in mental health care is based on national surveys asking patients and caregivers to self-report their own care and asking providers to self-report their practices (24–26). By contrast, our study used medical and pharmacy record data on rates of diagnoses, medications dispensed, and formal psychotherapy sessions attended. Second, the few studies using electronic medical records (EMRs) to examine diagnosis and treatment patterns are from a narrow cross-section of providers and systems, relatively small samples of patients from racial-ethnic minorities, and reflect a large proportion of patients receiving federally subsidized care (Veterans Health Administration [11] and Medicaid [19]). Using data from 2011, we designed our study to expand the evidence for racial-ethnic differences in psychiatric diagnosis and treatment in a large, geographically diverse and racially and ethnically representative sample of over 7.5 million patients enrolled in 11 health care systems across the United States.

METHODS

Settings

Data for this study were obtained from the Mental Health Research Network (MHRN), a nationwide consortium of public-domain research centers based in large, not-for-profit health care systems in the United States. At the time that data analyses were conducted, these systems provided both private (primarily commercial) and subsidized public insurance coverage and health care to over ten million people living in 11 states (27). All health care systems have meaningful use-compliant EMRs. Table 1 provides basic descriptors for each of the systems included in this study.

EMRs, insurance claims, and other data systems were organized in a virtual data warehouse (VDW) for all systems to facilitate population-based research (28). Protected health information remains at each health care system, but sites apply common data definitions and formats to ensure equivalent deidentified data for analysis. Only frequencies are shared between institutions for analyses. Institutional review boards at each health care system approved the methods for this study.

Patients

Patients were selected for the study if they had been continuously enrolled members of their health plan for at least ten months in 2011, had medical and prescription drug coverage for at least ten months of that year, and were age 18 years or older (N=7,523,956). Of this population, 15.6% had at least one psychiatric diagnosis in 2011 (N=1,169,993). This group of patients was the basis for analyses of medication and formal psychotherapy utilization.

Measures

Race and ethnicity. Self-reported race-ethnicity was obtained from the VDW. All health care systems were implementing meaningful use requirements (29) to collect self-reported race-ethnicity from their members in 2011. Typically, new and current members were asked to complete a self-report form that included separate questions for both their race and ethnicity. These forms were included in both membership applications and at clinical outpatient visits. Responses from both sources were entered into the EMR by health care system staff. Choices for race and ethnicity recorded by the VDW are standardized across health care systems and follow national recommendations for mutually exclusive race categories (30,31).

Regardless of the race category they endorsed, patients self-reporting Hispanic ethnicity were considered Hispanic according to recommendations from a national survey of Hispanics living in the United States that found that Hispanic people considered themselves a race of people and not an ethnicity (31). If a patient's records contained two or more race categories (rather than a single category of "mixed race"), they were assigned the least prevalent race category in the U.S. population. For example, if a patient indicated being both Native Hawaiian/other Pacific Islander and non-Hispanic black, the person was categorized as Native Hawaiian/other Pacific Islander in our analyses. The strategy was used to maximize our ability to understand differences in diagnoses and treatment for patients in the least represented racial-ethnic minority groups. This is a convention used for VDW data analyses (28).

Psychiatric diagnoses. Data for psychiatric diagnoses were obtained from all encounters in both EMRs and insurance claims. Claims data contained information from contracted facilities and physicians who billed the health care systems. We abstracted diagnoses made by any health care provider in primary care, psychiatry, emergency department, and inpatient settings for our analyses. Standard ICD-9 codes were used to define the following psychiatric conditions: depression, bipolar disorder, anxiety, attention-deficit disorders, autism spectrum disorders, schizophrenia, other psychoses, substance use disorders, and dementia. Patients were counted in each category for which they had a diagnosis. This meant that patients could be counted more than once in our analyses if they had multiple psychiatric conditions.

Pharmacy records. Information on filled pharmacy prescriptions was extracted from EMRs and pharmacy claims. We collected information on drugs in the following classes: antidepressants, stimulants, lithium, anti-convulsants, first- and second-generation antipsychotics, benzodiazepines, other hypnotics, and other anxiolytics. Results for pharmacotherapy were referred to as rates of “receiving” a drug for a psychiatric condition, which meant that the patient or caregiver paid for (filled) the prescription.

Psychotherapy treatment. Procedure codes were captured by claims or EMRs data. We defined formal psychotherapy treatment with Current Procedural Terminology codes: diagnostic interviews and assessments; individual psychotherapy, insight-oriented, at least 45–80 minutes; and individual psychotherapy, interactive with equipment/devices/nonverbal communication, at least 45–80 minutes. We excluded any treatment that was less than 30 minutes or that was clearly designated as medication management only. In the health care systems included in this study, visits of less than 30 minutes are rarely used for formal psychotherapy. We did not exclude visits where medication management occurred; however, we required that there also be an indication of psychotherapy.

Analyses

Rates of diagnosis, pharmacy fills, and psychotherapy treatment were adjusted for health care site and presented across a number of psychiatric conditions by race-ethnicity. These rates were compared statistically with the use of odds ratios (ORs) and 95% confidence intervals with non-Hispanic whites as the referent group. Data are presented for all psychiatric conditions combined and individually for anxiety, depression, bipolar disorders, schizophrenia, and other psychoses. Autism spectrum disorders, attention-deficit disorders, substance use disorders, and dementia diagnoses were included only in the analyses of overall rates of psychiatric conditions because of their low prevalence in our population.

RESULTS

Patients

Table 1 presents descriptive statistics for patients included in the study and the systems in

TABLE 1. Descriptive statistics for 11 U.S. health systems in the Mental Health Research Network^a

Characteristic	System 1	System 2	System 3	System 4	System 5	System 6	System 7	System 8	System 9	System 10	System 11	All systems
Membership (N patients)	426,139	337,298	2,310,099	2,428,482	153,871	394,894	568,768	479,045	147,648	176,734	100,978	7,523,956
Psychiatric condition	19.7	20.0	14.0	14.8	9.5	16.9	17.6	20.6	9.3	13.7	15.2	15.5
Women	55.5	53.4	53.1	52.9	51.9	54.0	53.7	52.8	56.6	53.6	55.4	53.4
Age												
18–39	32.3	33.1	34.8	36.7	34.1	32.5	39.4	36.8	24.7	37.7	31.9	35.4
40–64	50.9	48.0	46.5	46.4	46.9	48.2	50.7	55.9	51.1	51.8	46.1	48.0
≥65	16.9	18.9	18.7	16.9	19.0	19.3	9.9	7.3	24.2	10.5	22.0	16.6
Race-ethnicity												
White	52.1	76.0	50.5	36.1	24.8	58.3	46.3	20.5	55.8	36.7	60.6	44.7
Asian	6.1	4.6	16.9	9.3	34.9	2.2	2.2	.9	3.0	5.0	.5	9.7
Black	3.2	2.6	7.0	9.3	.9	3.4	3.7	1.7	34.1	38.9	6.6	7.7
Hispanic	3.3	5.1	15.9	32.4	4.8	9.9	.5	.9	1.3	3.3	6.1	16.6
Native Hawaiian/other	.8	.6	.7	.7	22.9	.2	.03	.02	.04	.09	.01	1.0
Pacific Islander												
Native American/Alaskan	1.2	.7	.4	.3	.9	.6	.4	.05	.5	.3	.08	.4
Native												
Mixed	—	—	—	.01	—	—	.6	.03	.7	.07	—	.1
Unknown	33.4	10.5	9.5	11.9	10.7	25.3	46.3	75.9	4.7	15.7	26.1	19.8
Annual income <\$40,000	45.4	51.5	26.0	25.9	21.8	22.4	25.2	17.2	45.5	23.5	58.2	27.9
Coverage												
Medicare	18.9	21.2	20.2	18.5	3.6	20.8	8.2	4.0	22.1	0	18.7	17.0
Medicaid	.7	1.3	1.2	1.9	7.5	.8	2.6	0	0	0	0	1.5
Commercial	75.2	75.1	78.6	75.1	78.5	73.6	85.1	96.0	74.7	86.8	66.3	78.4
Other	5.2	2.4	0	4.4	10.4	4.8	0	0	3.2	13.2	14.9	3.2

^a With the exception of membership, all values are percentages. Annual income was calculated at the census block level and reflects statistics for the entire membership, including children in each health care system. Coverage reflects the entire membership, including children.

which they were treated. Of the 7,523,956 patients in the study, 45% were non-Hispanic white, 17% were Hispanic, 10% were Asian, 8% were non-Hispanic black, 1% were Native Hawaiian/other Pacific Islander, <1% were Native American/Alaskan Native, <1% were of mixed race-ethnicity, and 20% were of unknown race-ethnicity. Patients were primarily 40–64 years old (48%) and had an estimated annual income above \$40,000 (72%), and 19% had Medicare or Medicaid insurance (or the combination) as their primary coverage for health care.

Diagnoses

Table 2 presents descriptive statistics in addition to ORs with confidence intervals adjusted for health care site for comparisons of diagnosis rates by race-ethnicity. The overall diagnosis rate for any psychiatric condition was 15.6% (N=1,169,993). Specifically, 20.6% among Native American/Alaskan Natives (highest), 19.8% among non-Hispanic whites, 14.3% among Hispanics, 13.5% among non-Hispanic blacks, 9.1% among Native Hawaiian/other Pacific Islanders, 14.6% among mixed race-ethnicity, 7.5% among Asians (lowest), and 12.0% among those with unknown or missing race-ethnicity. In general, compared with non-Hispanic whites, most persons from racial-ethnic minorities had lower rates of diagnosed psychiatric conditions (ORs ranged from .36 among Asians to .72 among Hispanics). The exception was Native American/Alaskan Native patients, who had slightly higher rates of diagnoses (OR=1.03). Although diagnoses for specific psychiatric conditions, such as depression and schizophrenia, appeared to mirror these findings, there was one clear exception. Non-Hispanic blacks were nearly twice as likely as non-Hispanic whites to receive a schizophrenia diagnosis (OR=1.98).

Pharmacotherapy

Rates of receiving a psychotropic medication when diagnosed as having a psychiatric condition are shown in Table 3. Of all patients with a psychiatric diagnosis in 2011, 73% (N=850,585) received a psychotropic medication in the same year. Across psychiatric conditions, after adjustment for health care site, persons in racial-ethnic minorities were less likely than non-Hispanic whites to receive a psychotropic medication (ORs ranged from .48 among Asians to .81 among Native American/Alaskan Natives). In general, this pattern was the same when individual psychiatric conditions were examined, with the exception of schizophrenia and other psychosis. Only non-Hispanic black patients were less likely than whites to receive medication (OR=.65) for their schizophrenia, and only Asian (OR=.84) and non-Hispanic black (OR=.86) patients were less likely than non-Hispanic whites to receive a medication for other psychosis. Native American/Alaskan Natives had similar rates of receiving a medication compared with non-Hispanic whites for almost all psychiatric conditions except depression.

Formal Psychotherapy

Rates of receiving formal psychotherapy for any psychiatric condition are shown in Table 4. Thirty-four percent (N=548,837) received formal psychotherapy. This is less than half the rate of receiving a psychotropic medication (73%). Unlike diagnoses and pharmacotherapy, there were no clear differences in receiving formal psychotherapy across racial and ethnic groups. Across combined psychiatric conditions, after adjustment for health care site, only Asians (OR=.93) had lower rates of formal psychotherapy use in comparison with non-Hispanic whites. Compared with non-Hispanic whites, the remaining groups of patients had similar rates (Hispanics, OR=.99) or higher rates of receiving formal psychotherapy (ORs ranged from 1.10 among Native Hawaiian/other Pacific Islanders to 1.55 among patients with mixed-race heritage).

This overall pattern varied widely by specific psychiatric condition. For example, persons from any racial-ethnic minority group were more likely than non-Hispanic whites to receive formal psychotherapy for their depression (ORs ranged from 1.04 for Asians to 1.42 for patients with mixed race heritage). However, rates of receiving formal psychotherapy for bipolar disorder were generally lower for those in minority groups than for non-Hispanic whites (ORs ranged from .82 for Native Hawaiian/other Pacific Islanders to .67 for Asians and Hispanics). Interestingly, non-Hispanic blacks had the same rates of formal psychotherapy compared with whites for their bipolar disorder (in contrast to lower rates of medication use for this disorder). Except for Hispanics, persons of all other minority races-ethnicities were more likely than non-Hispanic whites to receive formal psychotherapy for their schizophrenia (ORs ranged from 1.67 among Native Hawaiian/other Pacific Islanders to 2.64 among non-Hispanic blacks).

DISCUSSION

We found that the prevalence rates for depression and anxiety diagnoses among insured patients at 11 large private, not-for-profit health care systems across the United States were lower among racial-ethnic minority patients compared with non-Hispanic whites. This finding is consistent with some previous reports (5). The one exception was Native American/Alaskan Native members whose prevalence rates for these conditions were similar to those of non-Hispanic whites. Some of these differences were pronounced; for example, Asian patients were more than two-thirds less likely than non-Hispanic white patients to receive a diagnosis of depression. As in previous studies, we also found that non-Hispanic blacks were nearly twice as likely as non-Hispanic whites to receive a diagnosis of schizophrenia (7).

In regard to pharmacotherapy for these conditions, we found wide variation in rates of use for depression and anxiety across races-ethnicities, with non-Hispanic whites consistently higher in use than all other races and ethnicities. Asians not only were much less likely than others to

receive a diagnosis of depression but also, when diagnosed, were much less likely than non-Hispanic whites to receive a medication to treat this condition. In contrast with findings from a decade ago, we found no significant differences in use of psychotropic drugs across racial-ethnic groups with schizophrenia and other psychosis (11,32,33). One reason for this difference may be that the previous studies focused on patients in the Veterans Health Administration (7,11,34) or Medicaid (19,35,36) systems, which tend to serve the most disadvantaged patients. The one exception to this finding was for non-Hispanic blacks, who were still less likely than whites to receive a medication for their schizophrenia even though they were nearly twice as likely as whites to receive this diagnosis. Finally, with respect to bipolar disorder, there were still large differences between racial-ethnic minorities and non-Hispanic whites in the likelihood of receipt of medication. This difference was most pronounced for Native Hawaiian/other Pacific Islanders (OR=.51) and non-Hispanic blacks (OR=.54).

We also found that the likelihood of receiving formal psychotherapy for any psychiatric condition, regardless of racial-ethnic heritage, was much lower than the likelihood of receiving pharmacotherapy (34% versus 73%). This difference is consistent with the recent trends in treatment of psychiatric conditions reported by Olfson and colleagues (37,38). Across psychiatric conditions, formal psychotherapy rates were similar (Asians and Hispanics) or higher for racial-ethnic minority groups compared with non-Hispanic whites. Most of these differences were primarily due to variation in rates of formal psychotherapy treatment for depression and schizophrenia. This is consistent with reports in the literature that non-Hispanic black patients were more likely than non-Hispanic white patients to prefer psychotherapy over medications for treatment of their depression (22).

Although we found large statistical differences by race-ethnicity in receiving formal psychotherapy for schizophrenia treatment (non-Hispanic blacks were 2.64 times more likely to receive formal psychotherapy than whites), it was difficult to determine whether these differences were clinically meaningful because the overall rate of psychotherapy treatment for serious

TABLE 2. Rates of psychiatric diagnoses in 2011 across 11 U.S. health systems in the Mental Health Research Network^a

Diagnosis and race-ethnicity	N	Rate (%)	OR	95% CI	p
Any psychiatric diagnosis					
White	665,538	19.8	—	—	—
Asian	54,694	7.5	.36	.35–.36	<.001
Black	78,361	13.5	.69	.69–.70	<.001
Hispanic	179,109	14.3	.72	.71–.72	<.001
Native Hawaiian/other Pacific Islander	6,801	9.1	.47	.46–.48	<.001
Native American/Alaskan Native	6,074	20.6	1.03	1.01–1.06	<.001
Mixed	719	14.6	.64	.59–.69	<.001
Unknown or missing data	178,697	12.0	.44	.43–.44	<.001
Anxiety disorder					
White	302,080	9.0	—	—	—
Asian	27,581	3.8	.43	.42–.43	<.001
Black	33,219	5.7	.65	.64–.65	<.001
Hispanic	92,265	7.4	.83	.82–.83	<.001
Native Hawaiian/other Pacific Islander	2,901	3.9	.47	.46–.49	<.001
Native American/Alaskan Native	2,869	9.7	1.09	1.05–1.14	<.001
Mixed	333	6.8	.68	.60–.76	<.001
Unknown or missing data	83,374	5.6	.47	.47–.48	<.001
Depressive disorder					
White	423,981	12.6	—	—	—
Asian	29,764	4.1	.32	.32–.33	<.001
Black	47,161	8.1	.68	.67–.69	<.001
Hispanic	107,791	8.6	.70	.69–.70	<.001
Native Hawaiian/other Pacific Islander	3,909	5.2	.46	.44–.47	<.001
Native American/Alaskan Native	3,754	12.8	.99	.96–1.03	ns
Mixed	476	9.7	.66	.60–.73	<.001
Unknown or missing data	104,889	7.0	.42	.41–.42	<.001
Bipolar disorder					
White	36,778	1.1	—	—	—
Asian	1,810	.2	.24	.23–.25	<.001
Black	3,982	.7	.65	.63–.67	<.001
Hispanic	5,605	.5	.44	.42–.45	<.001
Native Hawaiian/other Pacific Islander	217	.3	.33	.29–.38	<.001
Native American/Alaskan Native	430	1.5	1.34	1.21–1.47	<.001
Mixed	23	.5	.65	.43–.98	<.001
Unknown or missing data	8,006	.5	.41	.40–.42	<.001
Schizophrenia spectrum disorder					
White	7,565	.2	—	—	—
Asian	1,322	.2	.77	.72–.81	<.001
Black	2,505	.4	1.98	1.89–2.07	<.001
Hispanic	2,177	.2	.72	.68–.75	<.001
Native Hawaiian/other Pacific Islander	99	.1	.67	.54–.75	<.001
Native American/Alaskan Native	70	.3	1.18	.93–1.50	ns
Mixed	7	.2	.88	.42–1.86	ns
Unknown or missing data	1,360	.2	.43	.40–.46	<.001
Other psychosis					
White	14,158	.4	—	—	—
Asian	1,328	.2	.50	.47–.53	<.001
Black	2,337	.4	1.13	1.08–1.19	<.001
Hispanic	2,679	.2	.61	.58–.63	<.001
Native Hawaiian/other Pacific Islander	108	.1	.51	.42–.62	<.001
Native American/Alaskan Native	97	.3	.80	.66–.98	<.001
Mixed	11	.2	.34	.24–.79	<.001
Unknown or missing data	2,758	.4	.33	.32–.35	<.001

^a The overall diagnosis rate for any psychiatric condition was 15.6% (N=1,169,993). Rates are presented for 7,523,956 adults 18 years and older. Odds ratios and confidence intervals, adjusted for health care site, are presented for the comparison of non-Hispanic whites (reference group) with other racial-ethnic groups of patients.

TABLE 3. Psychotropic medication fill rates for various psychiatric conditions in 2011 for members of 11 U.S. health systems in the Mental Health Research Network^a

Diagnosis and race-ethnicity	N	Rate (%)	OR	95% CI	p
Any psychiatric diagnosis					
White	665,538	77.8	—	—	—
Asian	54,694	63.3	.48	.47–.49	<.001
Black	78,361	65.4	.53	.52–.54	<.001
Hispanic	179,109	66.8	.57	.56–.57	<.001
Native Hawaiian/other Pacific Islander	6,801	63.8	.48	.45–.50	<.001
Native American/Alaskan Native	6,074	74.0	.81	.76–.86	<.001
Mixed	719	61.5	.63	.54–.73	<.001
Unknown or missing data	178,697	66.2	.58	.57–.58	<.001
Anxiety disorder					
White	302,080	82.3	—	—	—
Asian	27,581	66.7	.41	.40–.42	<.001
Black	33,219	74.0	.59	.57–.61	<.001
Hispanic	92,265	73.2	.57	.56–.58	<.001
Native Hawaiian/other Pacific Islander	2,901	72.8	.48	.44–.53	<.001
Native American/Alaskan Native	2,869	81.7	.94	.86–1.04	ns
Mixed	333	68.6	.70	.55–.89	<.001
Unknown or missing data	83,374	72.3	.58	.57–.60	<.001
Depressive disorder					
White	423,981	83.0	—	—	—
Asian	29,764	69.5	.45	.44–.46	<.001
Black	47,161	71.6	.50	.49–.51	<.001
Hispanic	107,791	72.8	.53	.53–.54	<.001
Native Hawaiian/other Pacific Islander	3,909	70.8	.49	.45–.53	<.001
Native American/Alaskan Native	3,754	80.6	.85	.78–.92	<.001
Mixed	476	68.4	.66	.54–.81	<.001
Unknown or missing data	104,889	72.0	.58	.57–.59	<.001
Bipolar disorder					
White	36,778	92.1	—	—	—
Asian	1,810	91.3	.79	.67–.94	<.001
Black	3,982	86.2	.54	.48–.59	<.001
Hispanic	5,605	88.9	.68	.62–.74	<.001
Native Hawaiian/other Pacific Islander	217	88.5	.51	.33–.78	<.001
Native American/Alaskan Native	430	90.0	.80	.58–1.11	ns
Mixed	23	82.6	.90	.31–2.66	ns
Unknown or missing data	8,006	86.8	.50	.46–.55	<.001
Schizophrenia spectrum disorder					
White	7,565	91.0	—	—	—
Asian	1,322	92.7	1.17	.93–1.47	ns
Black	2,505	87.2	.65	.56–.75	<.001
Hispanic	2,177	90.1	.87	.73–1.03	ns
Native Hawaiian/other Pacific Islander	99	91.9	1.13	.53–2.44	ns
Native American/Alaskan Native	70	85.7	.64	.32–1.26	ns
Mixed	7	85.7	1.09	.13–9.09	ns
Unknown or missing data	1,360	82.1	.45	.37–.53	<.001
Other psychosis					
White	14,158	76.4	—	—	—
Asian	1,328	74.1	.84	.73–.96	<.001
Black	2,337	74.3	.86	.77–.95	<.001
Hispanic	2,679	78.9	1.10	.99–1.22	ns
Native Hawaiian/other Pacific Islander	108	77.8	.99	.62–1.59	ns
Native American/Alaskan Native	97	71.1	1.01	.63–1.64	ns
Mixed	11	.0	—	—	—
Unknown or missing data	2,758	71.4	.69	.62–.76	<.001

^a The overall psychotropic medication sold rate for any psychiatric condition was 72.7% (N=850,585). Fill rates are presented for 1,169,993 adults 18 years and older. Odds ratios and confidence intervals, adjusted for health care site, are presented for the comparison of non-Hispanic whites (reference group) with other racial-ethnic groups of patients. The denominator for each rate (percentage) reflects the number of patients of a certain race-ethnicity with a psychiatric condition. For example, there were 665,538 non-Hispanic white patients diagnosed as having any psychiatric condition. Of these patients, 77.8% received pharmacotherapy.

mental illness was very low (0%–3%). Although pharmacotherapy is the treatment of choice for serious mental illness, there are clinical recommendations that suggest, especially at the first onset of symptoms, that psychotherapy can be very effective (39,40). Our data suggest that this is an opportunity for improving services for these patients.

Our study does not provide answers to why racial-ethnic differences in the diagnosis and treatment of psychiatric conditions persist, especially for non-Hispanic black patients. There are many patient- and provider-level factors that could contribute to these findings. There is some evidence that certain cultures prefer complementary and alternative medicine (such as herbal remedies) to allopathic pharmacotherapy for treatment of depression or anxiety (41,42). In addition, other factors, such as immigration status (43), language preference (23), socioeconomic status (11), and subsidized insurance coverage (23), have all been related to whether a patient is diagnosed as having a psychiatric condition and is subsequently prescribed medication.

Provider-level factors also have been shown to account for differences in diagnosis and treatment of psychiatric conditions. For example, some reports indicate that when providers are presented with the same mental health symptoms (such as irritability, violent outbursts, and anger), they are more likely to diagnose non-Hispanic blacks as having bipolar disorder or schizophrenia, whereas non-Hispanic whites often receive a diagnosis of major

depression for these same symptoms (44,45). In addition, limited access to therapists who speak the patient's preferred language likely determines whether or not these patients receive psychotherapy.

There were a number of limitations with this study that should be considered when interpreting our findings. Because we did not have individual-level data to analyze, we could not account for other factors that have been shown to determine racial-ethnic minority differences in diagnosis and treatment of psychiatric conditions, such as socioeconomic status and acculturation or generational status (7,11,23,46). If we had adjusted for these factors, we may have found different results. To this point, a large study from national data sources found that patient self-reported, unadjusted rates of utilization of psychotherapy services were lower for Hispanics when compared with non-Hispanic whites and blacks (23). However, when these rates were adjusted for other demographic factors, English language preference and not Hispanic ethnicity was the strongest determinant of the use of psychotherapy.

Finally, 20% of our sample were missing data on self-reported race and ethnicity. There are a number of reasons for this, including patient refusal to provide this information, health care system staff failure to enter paper-based responses into the EMR, or patients not having an outpatient visit during the time that the health care systems enacted data collection in response to meaningful use requirements (29).

TABLE 4. Psychotherapy rates for various psychiatric conditions in 2011 for members of 11 U.S. health systems in the Mental Health Research Network^a

Diagnosis and race-ethnicity	N	Rate (%)	OR	95% CI	p
Any psychiatric diagnosis					
White	665,538	33.4	—	—	—
Asian	54,694	30.2	.93	.91–.94	<.001
Black	78,361	35.7	1.13	1.12–1.15	<.001
Hispanic	179,109	30.7	.99	.98–1.00	ns
Native Hawaiian/other Pacific Islander	6,801	35.3	1.10	1.05–1.15	<.001
Native American/Alaskan Native	6,074	39.5	1.26	1.21–1.32	<.001
Mixed	719	53.4	1.55	1.37–1.76	<.001
Unknown or missing data	178,697	41.6	.90	.89–.91	<.001
Anxiety disorder					
White	302,080	10.8	—	—	—
Asian	27,581	10.2	.99	.97–1.02	ns
Black	33,219	10.7	.99	.97–1.01	ns
Hispanic	92,265	10.6	1.05	1.03–1.06	<.001
Native Hawaiian/other Pacific Islander	2,901	10.6	1.04	.97–1.12	ns
Native American/Alaskan Native	2,869	12.7	1.18	1.11–1.26	<.001
Mixed	333	16.1	1.38	1.16–1.64	<.001
Unknown or missing data	83,374	13.1	.93	.91–.94	<.001
Depressive disorder					
White	423,981	14.6	—	—	—
Asian	29,764	14.4	1.04	1.02–1.06	<.001
Black	47,161	16.6	1.20	1.18–1.22	<.001
Hispanic	107,791	14.4	1.08	1.07–1.10	<.001
Native Hawaiian/other Pacific Islander	3,909	16.5	1.13	1.06–1.20	<.001
Native American/Alaskan Native	3,754	16.2	1.10	1.04–1.17	<.001
Mixed	476	25.4	1.42	1.23–1.63	<.001
Unknown or missing data	104,889	19.2	.94	.93–.95	<.001
Bipolar disorder					
White	36,778	1.9	—	—	—
Asian	1,810	1.2	.67	.63–.72	<.001
Black	3,982	1.9	1.00	.96–1.05	ns
Hispanic	5,605	1.1	.67	.64–.70	<.001
Native Hawaiian/other Pacific Islander	217	1.3	.82	.33–.78	<.001
Native American/Alaskan Native	430	2.5	1.35	1.18–1.54	<.001
Mixed	23	1.5	1.00	.60–1.68	ns
Unknown or missing data	8,006	1.9	.81	.78–.84	<.001
Schizophrenia spectrum disorder					
White	7,565	.3	—	—	—
Asian	1,322	.6	1.82	1.63–2.03	<.001
Black	2,505	.8	2.64	2.43–2.85	<.001
Hispanic	2,177	.3	1.04	.96–1.13	ns
Native Hawaiian/other Pacific Islander	99	.4	1.67	1.19–2.36	<.001
Native American/Alaskan Native	70	.1	2.38	1.12–5.03	<.001
Mixed	7	.0	—	—	—
Unknown or missing data	1,360	.3	.88	.79–.98	<.001
Other psychosis					
White	14,158	.4	—	—	—
Asian	1,328	.7	1.69	1.53–1.86	<.001
Black	2,337	.8	1.97	1.83–2.13	<.001
Hispanic	2,679	.4	1.06	.98–1.14	ns
Native Hawaiian/other Pacific Islander	108	.6	1.75	1.32–2.33	<.001
Native American/Alaskan Native	97	.2	1.02	.63–1.65	ns
Mixed	11	.0	—	—	—
Unknown or missing data	2,758	.5	.78	.72–.84	<.001

^a The overall psychotherapy rate for any psychiatric condition was 34.3% (N=548,837). Psychotherapy rates are presented for 1,169,993 adults 18 years and older. Odds ratios and confidence intervals, adjusted for health care site, are also presented for the comparison of non-Hispanic whites (referent group) with other racial-ethnic groups of patients. The denominator for each rate (percentage) reflects the number of patients with a psychiatric condition and of a certain race-ethnicity. For example, there were 665,538 non-Hispanic white patients diagnosed as having any psychiatric condition. Of these patients, 33.4% received psychotherapy.

Results for patients with unknown or missing race (Tables 2–4) were in the middle range of results across different racial-ethnic groups. This suggests that the group of patients with unknown or missing data includes patients of all racial-ethnic groups and that the findings would be unlikely to change if they were added to the known categories of patients. Another limitation related to the race-ethnicity data is that we cannot verify whether the information was self-reported by all patients. It is likely that some of these data are not self-reported because the health care systems in the study were in the process of implementing self-reported member demographic characteristics. There is evidence that EMR race-ethnicity data may not reflect a patient's self-reported preferences (47).

In spite of these limitations, this study shows compelling evidence of persistent racial-ethnic differences in the diagnosis and treatment of depression, bipolar disorder, and schizophrenia in a large sample of insured patients across 11 states. This was especially true for non-Hispanic black patients, who, compared with whites, were more likely to be diagnosed as having schizophrenia and less likely to use medication but more likely to use formal psychotherapy for this mental health condition.

CONCLUSIONS

Our findings filled two important gaps in the literature: first, most population-based studies of psychiatric diagnosis rates and treatment in the United States have been based on patient self-report or providers' reports on their practices and not on objective sources such as EMRs; second, the studies that have examined electronic sources of information have done so in populations using subsidized health care. Our study, in combination with other recently published work (4,5,8,19,26,37,38,46), provides a more complete picture of the differences among racial-ethnic groups in the United States with respect to diagnosis and treatment of major psychiatric conditions. Further research is necessary to understand how patient preferences and provider practices determine the differences we have reported.

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Funding was provided by National Institute of Mental Health award U19MH092201 in support of the Mental Health Research Network.

The authors report no financial relationships with commercial interests.

Received May 31, 2015; revision received November 1, 2015; accepted November 20, 2015; published online April 15, 2016.

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