

MENTAL ILLNESS AND BARRIERS TO HEALTH CARE ACCESS



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EXECUTIVE SUMMARY

Statement of Problem

Access to health care in the United States is major concern, despite the fact that the country spends more per capita on health care than any other country. Individuals with mental illness may face greater access problems than the general population.

Research Question

- Does mental illness predict greater difficulties with access to health care?

Methodology

The 2004 National Health Interview Survey (NHIS) was used to examine the barriers to health care among individuals reporting a mental illness diagnosis. Nine questions relating to health access problems were drawn from the survey and combined into an access index. Multivariate analysis using STATA version 9 was used to model the relationship between the access index as a function of mental illness, controlling for demographics, insurance, health, education, income, geographic region and education variables. Due to the low response rate for earnings in the sample, two regression models were used, one that included earnings and one that did not.

Conclusions

Health care access was significantly greater for respondents who reported a mental illness diagnosis than those who did not report a mental illness diagnosis in both models. Omitting earnings from the regression model changed the significance for some variables. In the model without earnings, health care access was significantly greater for African-Americans than the other racial groups, while access problems were significantly greater for Caucasians in the model that included earnings. Hispanics showed significantly less access problems than Caucasians in both models, which is contradictory to available data. Education and age were also affected by earnings. Those with less than a high school education had significantly greater access problems than those with more than a high school education in the model that excluded earnings, while those with more than high school had significantly greater access problems than high school graduates. Access problems were significantly less as age increased in the model without earnings, but age was insignificant in the model with earnings included. The West region had significantly greater access problems than did the other three regions in both models. Descriptive statistics showed that respondents who reported a mental illness diagnosis were more likely to be female, have some type of government insurance or no insurance, earn less income, have less education and have greater access problems across all nine access measures.

Recommendations

- The contradictions found in this study compared to data presented in the literature for health care access among Hispanics should be explored. Citizenship status, language issues and clinics/offices Hispanics utilize for health care could be examined in order to find more information about the factors that affect access.
- Regional differences that contradict data in the literature should be examined. Changes in the demographics of the population in a particular region may be a factor.
- Earnings as a factor in access should be further explored to determine its impact upon those with mental illness. The low response rate to the question impacted the results of the regression analysis as it limited the number of observations.
- Given the small r^2 value, research is needed to evaluate other factors that might affect health care access for people with mental illness.

STATEMENT OF THE PROBLEM

Access to health care is a major concern in the United States, despite the fact that the country spends more per capita on health care than any other country (National Center for Health Statistics [NCHS] Health 2005). In 2003 the United States spent \$1.7 trillion on health or an average of \$5,671 per person (NCHS, Health 2005).

Individuals with mental illness may face greater access problems than the general population. The presence of mental illness may exacerbate underlying medical conditions through non-compliance with treatment, and the ramifications of untreated chronic health conditions such as heart disease, diabetes and cancer can accelerate the spread or severity of the disease or cause premature death (World Health Organization [WHO] Mental Health Fact sheet, 2001).

This study examines potential barriers to health care for those with mental illness compared to those without mental illness. While there has been some research on the relationship between access to health care and mental illness (Long, S.K, Coughlin, T.A. & Kendall, S.J., 2002; Druss, B.G, and Rosenheck, R.A., 1998; Norquist, G and Wells, K. 1991), these studies focused on populations in certain areas of the United States, included individuals with diagnoses other than mental illness in the sample (in addition to those with a mental illness diagnosis), or examined a single access issue such as health insurance. This study uses a nationally representative sample to examine several access measures to general medical care, as well as mental health services among those who reported a mental illness diagnosis, controlling for several socio-economic variables.

Mental Disorders and Barriers to Health Care Access

An individual's perception of the need for health care can be used as a measure of health care access. This perception may include difficulties or delays in obtaining care and problems getting care as soon as needed. Difficulties with getting care when individuals perceive they are sick or injured may indicate significant barriers to health care (NCHS, Healthcare Disparities, 2005).

Health insurance can also be used as a measure of health care access. Insurance is important for preventive care and for timely treatment of illness and injury (NCHS, Racial Disparities, 2005). Uninsured persons are more likely to forego needed health care due to cost concerns (NCHS, Health, 2005). According to reports by the Institute of Medicine (2003, 2004) uninsured persons are more likely to die prematurely, be diagnosed at later disease stages due to delays in getting health care and less likely to receive preventative and prenatal care.

LITERATURE REVIEW

Mental Illness

“Mental disorders are health conditions that are characterized by alterations in thinking, mood, or behavior (or some combination thereof) associated with distress and/or impaired functioning.” (Surgeon General Report, Chapter 1, page 5, 1999). In the United States, the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) is used to diagnose mental disorders, and divides mental disorders into 16 major diagnostic classifications (DSM-IV, 1994). The National Health Care Interview (NHIS) survey used in this paper utilized the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes, which use the same coding system as the DSM -IV, but used different groupings for mental

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disorders. The DMS-IV codes for mental disorders, which range from 290-319, are a small part of the ICD-9-CM coding system. (DSM website, 2005). The ICD-9-CM is the official coding system that the United States requires medical personnel and hospitals to use to code medical conditions, injuries and death (NCHS website, 2005).

Prevalence

Mental disorders are common in the United States, with about 26.2 % of Americans diagnosed with a mental disorder over a 12 month period (Kessler, R.C, Chie, W.T., Demler, O., & Walters, E., 2005). Using 2004 Census Bureau population estimates for ages 18 and over, this percentage is about 57.7 million people.

Economic Costs of Mental Illness

The direct and indirect costs of mental illness are substantial. Untreated mental illness can lead to lost work productivity, unemployment, relationship problems, negative affects upon children in their care, entry into the criminal justice system, homelessness, and lost productivity for family members who provide care (Surgeon General Report, 1999; President's New Freedom Commission, Final Report, 2003; WHO, 2001). According to the Final Report, the estimated yearly indirect cost of mental illness is \$79 billion, with \$63 billion attributed to loss of productivity. Indirect costs also include \$12 billion in mortality costs (lost productivity due to premature death) and almost \$4 billion in productivity losses for those incarcerated and the time of those who provide family care (Final Report, 2003). For 1997 the United States spent more that \$71 billion in direct costs on treating mental disorders (Final Report, 2003).

The Uninsured

According to the U.S. Census Bureau Income, Poverty and Health Insurance Coverage Report (2005), the number of uninsured people increased from 45.0 million in 2003 to 45.8 million in 2004, and the overall uninsured rate was 18.9 %. The report also found that the percentage of people covered by employment-based health insurance decreased from 60.4 % in 2003 to 59.8 % in 2004, and the percentage of people covered by government health insurance programs increased from 26.6 million (76.8 million) to 27.2 % (79.1 million).

Racial Disparities

Race, age and economic disparities in uninsured rates exist. The 2005 Census Report found that the uninsured rates for African-Americans, Caucasians, Asians and Hispanics were 19.7%, 11.3%, 16.8% and 32.7%, respectively. The uninsured rate for Asians decreased 2.2 % in 2003, while the uninsured rate for Hispanics rose .5 million in 2004. Income levels also impact the likelihood of insurance coverage (Census Report, 2005). As income levels increased, insurance coverage also increased, with 91.6 % for households with incomes at \$75,000 or greater compared to 75.7 % for households with annual incomes of less than \$25,000 (Census Report, 2004).

Regional Differences

Regional differences exist in the numbers of uninsured. The Midwest had the lowest uninsured rate in 2004 at 11.9 %, followed by the Northeast (13.2 %), the West (17.4 %), and the South (18.3 %) (Census Report, 2005).

Age

The percentage of uninsured decreased with age. For 2003, adults 18-24 were most likely to be uninsured and adults 55-64 were least likely to be uninsured. For the same year, 17 % of people under age 65 reported having no insurance (NCHS, Health 2005).

METHODOLOGY

Objective

This study used 2004 National Health Interview Survey (NHIS) to examine the barriers to health care among individuals who reported a mental illness diagnosis, compared to those without a mental illness diagnosis. The NHIS is a large, annual survey that collects information on a variety of health care categories. Nine questions relating to access problems were drawn from the survey and combined into an access index. Descriptive statistics and multivariate analysis using STATA version 9 was used to model the relationship between the access index as a function of mental illness from the survey, controlling for demographics, insurance, health status, education, income, geographic region and education variables. The results obtained for the various socio-economic variables were compared to data found in the literature review.

Research Question

- Does mental illness predict greater difficulties with access to health care?

Dependent Variable

In this study the dependent variable is access to health care. Nine health care questions in the survey asked the respondents if health care was delayed or not if health care was not obtained due to cost.

Mental Disorders and Barriers to Health Care Access

Table 1: Health Access Survey Questions

Variable	Questions
Access 1	Have you delayed getting care because you could not get through on the telephone?
Access 2	Have you delayed getting care because you could not get an appointment soon enough?
Access 3	Have you delayed getting care because you had to wait too long to see a doctor?
Access 4	Have you delayed getting care because the clinic/doctor's office was not open when you needed care?
Access 5	Have you delayed getting care because you did not have transportation?
Access 6	Was there any time you did not get prescription medicines because you could not afford it?
Access 7	Was there any time you did not get mental health care or counseling because you could not afford it?
Access 8	Was there any time you did not get dental care, including check-ups, because you could not afford it?
Access 9	Was there any time you did not get eyeglasses because you could not afford it?

These access variables were combined to create an access index, after tetrachoric correlations (Table 2) between all of the access measures were found to be positively and highly correlated along two axes, access (Access problems 1-5) and cost (Access problems 6-9). These nine health access variables were measured using dummy variables as *Access 1* if the respondent reported a delay in getting medical care because they could not get through on the telephone; *Access 2* if the respondent reported that they could not get an appointment soon enough; *Access 3* if the respondent reported that they had to wait too long too see a doctor; *Access 4* if the clinic/doctor's office was not open when they needed health care; *Access 5* if the respondent reported that they did not have transportation; *Access 6* if the respondent reported that they could not afford prescription medicines; *Access 7* if the respondent reported that they could not afford mental health care or counseling; *Access 8* if the respondent reported they that could not afford dental care, including check-ups; and *Access 9* if the respondent reported that they could not afford eyeglasses.

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Table 2: Tetrachoric Correlations Among Health Care Access Problems

Variable	Access 1	Access 2	Access 3	Access 4	Access 5	Access 6	Access 7	Access 8	Access 9
Access 1	1								
Access 2	.9173	1							
Access 3	.848	.8507	1						
Access 4	.8222	.8596	.8212	1					
Access 5	.733	.7296	.728	.7723	1				
Access 6	.6045	.5512	.5321	.5883	.6791	1			
Access 7	.5423	.4871	.5045	.5496	.6854	.8689	1		
Access 8	.4948	.4653	.447	.4888	.6056	.8546	.8291	1	
Access 9	.4939	.4874	.4431	.4993	.6503	.8194	.8212	.8589	1

n=31,051

Independent Variables

- Age – 18 and over
- Sex
- Race (Caucasian, Other, African-American and Hispanic)
- Income level (\$0 to \$75,000+)
- Type of insurance coverage (private, government, no insurance)
- Health status change over the past 12 months (Better or Worse/About the Same)
- Geographic region (Northeast, Midwest, South and West)
- Education Level (High School or less, High School graduate-diploma or GED, More than High School-some college to Ph.D)
- Mental Illness Diagnosis

Age is the age in years of the respondent and ranges from 18 to 85+, while *female* is a dummy variable that indicates the respondent is female. Race is measured with dummy variables as *African-American* if the respondent identified themselves as non-Hispanic; *Caucasian* if the respondent identified themselves as non-Hispanic; *Hispanic* if the respondent identified themselves as Hispanic; and *other* if the respondent identified themselves as a race other than the race categories listed above, or a combination thereof. Income is measured by *earnings* at 11 levels: \$0-\$4,999; \$5,000-\$9,999; \$10,000-\$14,999; \$15,000-\$19,999; \$20,000-\$24,999; \$25,000-\$34,999; \$35,000-\$44,999; \$45,000-\$54,999; \$55,000-\$64,999; \$65,000-\$74,999; \$75,000. Health insurance is also measured with dummy variables with *no*

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insurance if the respondent reports no insurance; *government insurance* if the respondent reports any type of state, federal or other government insurance; and *private insurance* if the respondent reports employee-sponsored or other self-pay insurance. The change in health status over the past 12 months is measured by a dummy variable as *worsehealth* if the respondent self-reports that their health status is about the same or worse than 12 months ago. Geographic region of the country is measured with dummy variables using *northeast*, *midwest*, *south* and *west*. The regions are the same as used by the U.S. Census Bureau. Dummy variables are used to measure education at three intervals: *less than high school*, *high school graduate* and *more than high school*. *Mental illness* is a dummy variable used to indicate the respondent reported a mental illness diagnosis in the survey.

Sample Design and Data Source

The survey data used were obtained from the 2004 NHIS, conducted annually since 1957. It is the largest household survey in the United States and collects information from the civilian non-institutionalized population on a variety of health topics, including health status, access and barriers to care, risk factors, health behaviors and demographic information. The U.S. Census Bureau conducted the survey in both English and Spanish in a confidential interview.

A stratified multistage probability design was used. The sample was drawn from counties in all 50 states plus the District of Columbia. The NHIS 2004 data consists of 36,579 households, with 94,460 persons in 37,466 families. The final response rate for the adult sample component was 72.5% (overall response rate-86.5% times the sample adult response rate-83.8%).

Sample Weight information

Weights based upon design, ratio, non-response and post-stratification adjustments (adjusted to Census control totals for sex, age and race) are provided. According to NHIS survey documentation, national estimates of all person-level variables can be made using these weights.

The survey consists of a basic module that includes the family core, sample adult core and sample child core questionnaires. These questionnaires yield the Household-Level, Family-Level, Person-Level and two injury/poison datasets. The family core questions collect information on every person in the family and serves as a sampling frame from which the individuals for the sample adult core (age 18 and over) and sample child core were chosen from each family in the survey. The sample adult core consists of 31,326 randomly selected adults, one from each of the 36,579 households in the survey.

The person level dataset consist of variables derived from the six sections that make up the family core, collected on every adult age 18 and over. It contains eight sections that contain more specific questions, but covers many of the same subjects as the family core.

For this study, the family, person-level and sample adult datasets were merged in order to gather information from the survey questions used for analysis in this study. The merged dataset used as a sampling frame in this study contains the sample adult core of 31,326 adults ages 18 and over. Questions obtained from each person in the sample adult core in the areas of demographics, insurance, education, income and geographic region were obtained from the family and person-level datasets, while the

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diagnoses and health care access information was obtained from the sample adult dataset questions.

Except for the mental health diagnosis information, all of the socio-economic information was obtained from everyone in the adult sample core. Not all of the adults in the survey were asked to report whether or not they had a mental illness diagnosis. These individuals were identified through a series of questions related to difficulties in daily activities. In the adult sample core questions, the survey included a series of 12 questions that asked if the respondent had difficulties with various physical activities such as lifting, walking, standing; difficulty shopping, going out to movies or sporting events; or difficulty participating in social activities such as visiting friends, attending clubs/meetings or going to parties. Respondents who answered yes to having difficulty with any of these activities were then asked to identify the condition that caused the limitation. These conditions included various medical problems (i.e. cardiac, asthma, kidney disease) and mental illness.

Respondents who reported a mental illness diagnosis as the cause of one or more functional limitations identified in the 12 questions were drawn from the merged adult sample to examine their health care access responses in comparison to the rest of the sample who did not report a mental illness diagnosis.

The survey divided the mental illness diagnoses into two groups. Group 1 mental illness diagnoses contain ICD-9 codes 300-302; 306-314; 799.2, which include neurotic disorders, personality disorders and other non-psychotic mental disorders. Examples of disorders in this category include depression and anxiety. Group 2 mental illness diagnoses contain ICD-9 codes 293-299, which include

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organic psychotic conditions, other psychoses and childhood psychoses. Examples of disorders in this category include schizophrenia and bi-polar disorder. Group 1 contained 761 respondents who reported they were diagnosed with a mental disorder and Group 2 contained 35 respondents who reported they were diagnosed with a mental disorder. Seven respondents reported diagnoses in both categories. Due to the low number in Group 2, this study combined the two categories for a total of $n = 789$, or 2.5%. The seven people who reported diagnoses in both categories were not counted twice. Given the prevalence of mental illness discussed in the literature review, it is assumed that this percentage would have been much higher, had each person in the adult sample core been asked if they had a mental illness diagnosis.

Since both categories of disorders used in this survey are identified on Axis I of the DSM-IV TR and in the ICD-9 coding as mental disorders (excluding substance abuse and mental retardation/developmental disabilities), it is hypothesized that the categories are probably differentiated by severity of the disorders included in each category. While anxiety disorder in Group 1 is more prevalent at 18.1% (Kessler, et.al, 2005), schizophrenia in Group 2 affects about one percent of the population (Surgeon General Report, 1999) is considered to be the most severe and chronic mental disorder (National Institute of Mental Health [NIMH], Schizophrenia Fact sheet, 2001).

RESULTS

Tables 3 and 4 present descriptive statistics for respondents who reported a mental illness diagnosis and those who did not report a mental illness diagnosis. The average number of access problems reported per person for those who reported a

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mental illness diagnosis is 1.6, while the average number for those who did not report a mental illness diagnosis is less than one, at .461.

Respondents who reported a mental illness diagnosis showed greater access problems across all nine access measures when they were examined separately (Figure 1). All four of the cost measures of access showed the largest difference between the two groups. Of those who reported a mental illness diagnosis, 31.7% reported problems with the cost of medication, versus 8.8% of those without a mental illness diagnosis. While 20.9% of those with a mental illness diagnosis reported that they could not afford mental health counseling, only 2.1% of those who did not report a mental illness diagnosis indicated cost was a factor. Dental care cost problems was reported at a rate of 36% for those who reported a mental illness diagnosis; only 12.1% of those who did not report a mental illness diagnosis indicated a problem. For eyeglasses, 24.1% of those who reported a mental illness diagnosis versus 7.1% of those who did not reported an issue with cost.

Similarly, the other five access measures also illustrated greater access problems for those who reported a mental illness diagnosis than those who did not. Problems accessing the doctor by telephone (7.6%), getting an appointment (15.3%), waiting too long to see a doctor (13.1%), clinic/office not open when an appointment is needed (8.8%) and no transportation (11.2%) were greater for those with a mental illness diagnosis. For those who did not report a mental illness diagnosis, 2.3% of the respondents reported problems accessing the doctor by telephone, 4.9% reported problems getting an appointment, 4.5% reported problems waiting too long to see a

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doctor, 2.4% reported problems with the clinic/office not open when an appointment was needed, and 1.8% reported transportation problems.

Females comprise 62.3% of those who reported a mental illness diagnosis compared to 55.5% for those who did not. The average age is 46.5 for those who reported a mental illness diagnosis and 47.1 for those who did not.

Education levels were different between the two groups. Of those who reported a mental illness diagnosis 44.3% had more than a high school education, 29.2% reported a high school diploma or GED, and 25.6% reported less than a high school education. For those who did not report a mental illness diagnosis, the percentages for those who had more than a high school education, a high education and less than a high school education were 51.5%, 28.3 and 18.9%, respectively. The percentage who reported that their health was the same or worse over the past 12 months was similar in both groups, with 85% for those who reported a mental illness diagnosis and 83% for those who did not.

The breakdown for type of insurance was very different between the two groups. The majority of those with a mental illness diagnosis reported some type of government insurance at 48.4%, while 17.3% reported no insurance and 42.8% reported private insurance. In contrast, only 28.3% of those who did not report a mental illness diagnosis had some type of government insurance, while 16.8% reported no insurance and the majority (64.9%) had private insurance.

Race percentages are similar between those who reported a mental illness diagnosis and those who did not. Caucasians, African-Americans, Hispanics and Other comprise 71%, 11%, 15.3% and 2.2%, respectively, for those who reported a

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mental illness diagnosis. The same racial groups comprise 64.3%, 14%, 17.8% and 3%, respectively, for those who did not report a mental illness diagnosis.

The results for earnings indicated that 41.5% of respondents who reported a mental illness diagnosis and 50.1% of the respondents who did not, answered “I don’t know” or “refused” to a question concerning the amount of their earnings during the previous 12 months. This high non-response rate to this question affected the results of the regression analysis which are discussed later in this study. Of those respondents who reported a mental illness diagnosis, their reported income was between \$15,000-\$19,999, while the reported income from those who did not report a mental illness diagnosis was between \$20,000-\$24,000.

Table 3: Summary Statistics for Health Care Access Among Persons With Mental Illness

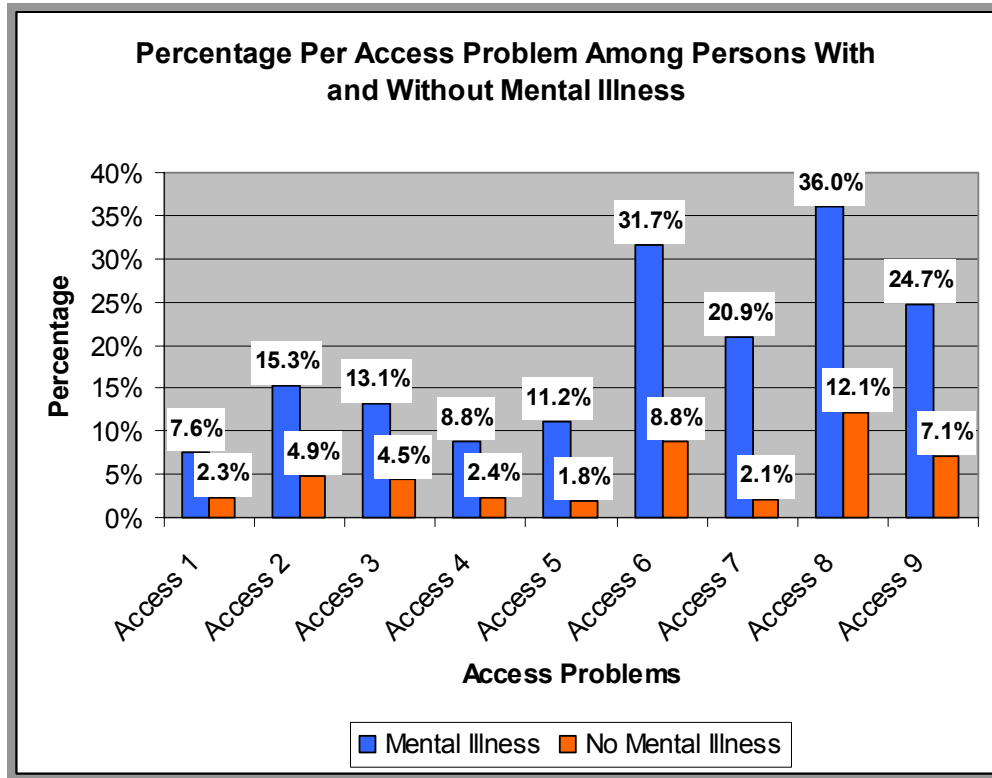
Variable	Observations	Mean	Standard Deviation
Access Index	777	1.684	1.931
Access 1	782	.076	.266
Access 2	782	.153	.360
Access 3	783	.131	.338
Access 4	783	.088	.283
Access 5	783	.112	.310
Access 6	781	.317	.465
Access 7	782	.209	.407
Access 8	783	.360	.480
Access 9	781	.247	.431
Northeast	789	.134	.341
Midwest	789	.268	.443
South	789	.385	.486
West	789	.211	.408
Hispanic	789	.153	.360
Caucasians	789	.713	.452
African-American	789	.110	.313
Other	789	.022	.149
Private insurance	789	.428	.495
No insurance	789	.173	.379
Government Insurance	789	.484	.500
Worsehealth	789	.844	.361
Less than High school	789	.256	.436
High School Graduate	789	.292	.455
More Than High School	789	.443	.497
Age	789	46.5	15.3
Female	789	.623	.484
Earnings	328	4.54	2.68

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Table 4: Summary Statistics for Health Care Access Among Persons Without Mental Illness

Variable	Observations	Mean	Standard Deviation
Access Index	30,274	.461	1.04
Access 1	30,340	.023	.152
Access 2	30,337	.048	.215
Access 3	30,335	.045	.209
Access 4	30,335	.024	.153
Access 5	30,340	.017	.132
Access 6	30,342	.088	.283
Access 7	30,336	.021	.144
Access 8	30,330	.121	.326
Access 9	30,327	.071	.256
Northeast	30,537	.174	.379
Midwest	30,537	.227	.418
South	30,537	.364	.481
West	30,537	.233	.423
Hispanic	30,537	.178	.383
Caucasians	30,537	.643	.478
African-American	30,537	.140	.347
Other	30,537	.037	.189
Private insurance	30,537	.649	.477
No insurance	30,537	.168	.374
Government Insurance	30,537	.281	.449
Worsehealth	30,537	.830	.375
Less than High school	30,537	.189	.392
High School Graduate	30,537	.283	.450
More Than High School	30,537	.515	.499
Age	30,537	47.1	17.9
Female	30,537	.554	.497
Earnings	15,702	5.76	2.86

FIGURE 1:



Percentages may reflect access problems by a respondent in more than one category
 Mental Illness n=789
 No Mental Illness n=30,537

- Access 1 - Could not reach the doctor by telephone
- Access 2 - Could not get an appointment when they needed one
- Access 3 - Had to wait too long to see a doctor
- Access 4 - Office was not open when they needed health care
- Access 5 - No transportation
- Access 6 - Could not afford prescriptions
- Access 7 - Could not afford mental health care or counseling
- Access 8 - Could not afford dental care
- Access 9 - Could not afford eyeglasses

Due to the low response rate for the question about earnings, regression analyses were completed with earnings (Table 5) and without earnings in the model (Table 6). Different results were found due to the differences in the number of observations between the two models. The number of observations in model that included earnings was decreased by nearly half from 31,051 to 15,966. Unobserved heterogeneity is indicated by the small r^2 value in both models.

Mental Disorders and Barriers to Health Care Access

Some results were the same for each regression model. In both models, access problems for respondents who reported a mental illness diagnosis were significantly greater than those who did not report a mental illness diagnosis. Gender and insurance results were also the same. Females showed significantly greater access problems than males and those with government insurance and no insurance had significantly greater access problems than those with private insurance. Respondents who reported their health during the past 12 months to be worse or about the same had significantly less access problems than those who reported better health in both models. Also, Hispanics had significantly less access problems than Caucasians, and less access problems than African-Americans and Other, but not at a significant level.

The significance of age, education, race and region were affected by earnings. In the model that included earnings, access problems decreased as age increased, but not at a significant level. In the model that did not include earnings, access problems significantly decreased as the age of the respondent increased. Access problems decreased significantly as earnings rose when earnings were included in the model. In the model with earnings, those with a high school diploma or GED had significantly less access problems than those with more than a high school education. In the model without earnings, respondents with less than a high school education had significantly greater access problems than did those with more than a high school education, and respondents with a high school diploma or GED had significantly less access problems than did those with more than a high school education.

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With region in the model with earnings, respondents who live in the Northeast region of the United States had significantly less access problems than the West. The Northeast also had less access problems than the other two regions, but not significantly. The South and Midwest had less access problems than did the West, but not significantly. In the model without earnings, the Northeast region again showed significantly less access problems than did the West region as well as the Midwest and South regions, albeit at an insignificant level. The Midwest region also showed significantly less access problems than did the West region.

Hispanics had significantly less access problems than did Caucasians, as in the model that included earnings. However, in the model without earnings, African-Americans had significantly greater access problems and Other had significantly less access problems than did Caucasians. For all race groups, Hispanics had less access problems.

Table 5: Regression Coefficients of Factors Affecting Health Care Access (including earnings)

Access Index	Coefficient	t	P Value Significance p < .05
Northeast	-.064	-2.37	.018
Midwest	-.044	-1.71	
South	-.036	-1.50	
Hispanic	-.088	-3.07	.002
African-American	-.006	-0.26	
Other	-.060	-1.43	
No insurance	.662	20.58	.000
Government Insurance	.114	3.49	.000
Worsehealth	-.089	-3.87	.000
Less than High School	-.024	-.72	
High School Graduate	-.053	-2.74	.006
Age	-.000	-1.01	
Female	.172	10.14	.000
Earnings	-.030	-9.34	.000
Mental Illness	1.163	11.00	.000
Constant	.598	13.69	.000

Observations 15,966

R² = 0.1073

Weight (wtfa) used in the model

Includes earnings

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Table 6: Regression Coefficients of Factors Affecting Health Care Access (without earnings)

Access Index	Coefficient	t	P Value Significance p < .05
Northeast	-.063	-3.38	.001
Midwest	-.038	-2.09	.037
South	-.011	-0.63	
Hispanic	-.086	-4.07	.000
African-American	.044	2.24	.025
Other	-.072	-2.38	.017
No insurance	.674	20.58	.000
Government Insurance	.178	9.88	.000
Worsehealth	-.079	-4.69	.000
Less than High School	.052	2.59	.010
High School Graduate	-.029	-2.15	.032
Age	-.004	-10.15	.000
Female	.164	13.83	.000
Mental Illness	1.14	16.32	.000
Constant	.494	17.96	.000

Observations 31,051

R² = 0.0934

Weight (wtfa) used in the model

Does not include earnings

CONCLUSIONS

The results of the regression analysis, both with and without earnings in the model indicate that individuals who reported a mental illness diagnosis experience significantly more barriers to health care than those without a mental illness diagnosis. Also, females and those with government insurance or no insurance had significantly less access to health care than those with private insurance in both models. The Northeast region had significantly less access problems than did the West and Hispanics had significantly less access problems than did Caucasians in both models. The inclusion of earnings in the regression model affected the results of other variables.

Several results found in this model contradict expectations for problems with access to health care. The findings for Hispanics in both models contradict data collected by the Census Bureau and the National Center for Health Statistics that indicate Hispanics have the largest uninsured rate of the racial groups examined in

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this analysis. As discussed in the literature review, uninsured persons are less likely to seek medical treatment; therefore, the expectation is that Hispanics would report greater access problems. This result may be due to Hispanics not seeking medical treatment due to immigration status, possibly utilizing special clinics or language issues. These factors were not examined in the study, but warrant further consideration.

Regional differences in both models for the South and West regions are consistent with Census data presented in the literature review that these two regions reported the highest rates of uninsured persons. Results from both models indicate that respondents in the Northeast region reported the lowest number of uninsured, whereas Census data found the Midwest region to have the lowest numbers of uninsured persons.

Significantly less access problems were found for respondents who reported their health during the past 12 months to be worse or about the same. This result was unexpected as the normal expectation would be the opposite. It is unclear why those who report better health over the past 12 months would report more access problems.

As discussed earlier, the inclusion of earnings into regression model affected the results. The number of observations was decreased by nearly half when earning was included in the model. Nearly half of the respondents who reported a mental illness diagnosis and those who did not report a mental illness diagnosis refused to answer the question or responded that they did not know the amount of their earnings over the past 12 months.

Limitations

Due to the complexity of health care access, neither the NHIS survey, nor this study may capture all of the issues related to barriers to care, as indicated by the small r^2 value. Given the small r^2 found in this study, around 89% of the sample variability in the model including earnings and about 91% of the variability in the model without earnings could be explained by other factors.

This survey relies upon the accuracy of the respondent to report whether or not they had a mental illness diagnosis, not upon a clinical diagnosis by a qualified practitioner. Not all respondents in the survey were asked whether or not they had a mental illness diagnosis. The number of respondents who reported a mental illness diagnosis was limited to those who indicated they had a limitation in one or more areas of daily living. Additionally, the sample does not include data on military personnel, individuals residing in institutions, or the homeless, so generalizations should not be made to those populations.

RECOMMENDATIONS

Further research is needed to measure the factors that affect health care access to those with mental illness. It is recommended that research focus on the following areas:

1. The contradictions found in this study compared to data presented in the literature review for health care access among Hispanics should be explored. Citizenship status, language issues and clinics/offices Hispanics utilize for health care could be examined in order to find more information about the factors that affect access.

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2. Regional differences that contradict data in the literature should be examined. Changes in the demographics of the population in a particular region may be a factor.
3. Earnings as a factor in access should be further explored to determine its impact upon those with mental illness and its relationship to other variables in the model. The low response rate to the earnings question impacted the results of the regression analysis as it limited the number of observations.
4. Given the small r^2 value, research is needed to evaluate other factors that might affect health care access for people with mental illness.

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Appendix 1: Geographic Regions

REGION	STATES
Northeast	Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania
Midwest	Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Kansas, Nebraska
South	Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Oklahoma, Arkansas Texas
West	Washington, Oregon, California, Nevada, New Mexico, Arizona, Idaho, Utah, Colorado, Montana, Wyoming, Alaska Hawaii

From the National Health Interview Survey Description