

# Follow-Up Care After Emergency Department Visits for Mental and Substance Use Disorders Among Medicaid Beneficiaries

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**Objective:** This study examined whether characteristics of Medicaid beneficiaries were associated with receipt of follow-up care after discharge from the emergency department (ED) following a visit for mental or substance use disorders.

**Methods:** Medicaid fee-for-service claims from 15 states and the District of Columbia in 2008 were used to calculate whether adults received follow-up (seven and 30 days) after being discharged from the ED following a visit for mental disorders (N=31,952 discharges) or substance use disorders (N=13,337 discharges). Random-effects logistic regression was used to model the odds of receiving follow-up as a function of beneficiary characteristics.

**Results:** Receipt of follow-up varied widely across states and by beneficiary characteristics. The odds of seven- and 30-day follow-up after mental health ED discharges were lower among males; African Americans versus whites; and

beneficiaries who qualified for Medicaid on the basis of income rather than disability, beneficiaries with depression and other mood disorders compared with other psychiatric diagnoses, and (at seven-day follow-up) beneficiaries who lived in rural versus metropolitan areas. In contrast, the odds of follow-up after substance use disorder ED discharges were lower among whites (seven-day follow-up) and among beneficiaries who qualified for Medicaid on the basis of disability rather than income, who were diagnosed as having drug use disorders rather than alcohol use disorders, or who lived in metropolitan versus suburban areas (seven- and 30-day follow-ups).

**Conclusions:** State Medicaid programs have an opportunity to improve follow-up after ED visits for mental and substance use disorders, perhaps by focusing on groups of beneficiaries who are less likely to receive follow-up.

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The emergency department (ED) is a frequent source of care for individuals with mental and substance use disorders (1,2). One out of every eight ED visits involves a mental or substance use disorder diagnosis (3). For the majority of these visits, the individuals are discharged to the community (only persons who are an imminent threat to themselves or others are admitted to inpatient care), and some studies suggest that only half receive timely follow-up care after discharge (4–6).

Individuals who do not receive follow-up care after ED visits are more likely to return to the ED and experience worsening of their conditions (7,8). As a result, some service systems have taken steps to develop better linkages between EDs and community-based providers (9,10). Improving the delivery of follow-up care is particularly important to state Medicaid programs because they face budget pressures and increasing enrollment of individuals with mental health conditions and substance use disorders. In addition, consumers have expressed a need for support in obtaining follow-up care after psychiatric emergencies (11).

Surprisingly few large studies have examined the receipt of follow-up care among Medicaid beneficiaries after ED visits for behavioral health conditions. Such information would be useful for policy makers, providers, and other stakeholders to understand the magnitude of the problem and to establish a benchmark by which to measure progress. Furthermore, information is needed to understand how follow-up care may be associated with beneficiary characteristics, such as geography, race-ethnicity, and diagnosis. Such information could be valuable to target quality improvement efforts.

To fill this gap in the literature, this study used Medicaid claims data from 15 states and the District of Columbia (DC) to examine the extent to which the receipt of follow-up care after discharge from the ED for visits related to mental and substance use disorders varied by state. The study also examined whether receipt of follow-up care was related to geography, race-ethnicity, age, sex, and ED diagnosis.

## METHODS

### Data

The study used Medicaid Analytic Extract (MAX) data from calendar year 2008 (the most recent year for which data were available at the start of the analysis). MAX data are created from Medicaid eligibility and claims files that are submitted by all states and DC to the Centers for Medicare and Medicaid Services (CMS). MAX data include beneficiaries' demographic characteristics and diagnosis and procedure codes for all Medicaid-reimbursed services. Data elements are standardized across states to create comparable measures of service use. MAX data contain fee-for-service (FFS) claims submitted for billing and some managed care encounter data for services provided by health maintenance organizations (HMOs) and behavioral health organizations (BHOs).

FFS MAX data undergo data quality reviews to assess completeness and reliability. In contrast, at the time of this study, managed care encounter data did not undergo such a review. Previous analyses of the completeness and reliability of encounter data in MAX found that information is often missing for one or more managed care plans in a state (12) and that only two states had reasonably complete data from managed BHOs (13). To avoid estimating artificially low ED use or follow-up rates on the basis of incomplete data, we did not include managed care encounter data.

States with high levels of enrollment in Medicaid managed care plans and states without reliable or complete FFS data were excluded. States in which at least 75% of beneficiaries were in FFS plans were included. Therefore, 23 states with high rates of HMO or BHO enrollment were excluded because FFS data were not representative of the state Medicaid population, four states were excluded because the Medicaid eligibility or FFS data were unreliable, and eight states were excluded because there were fewer than 150 ED visits for mental or substance use disorders that resulted in discharge to the community. Within the remaining states, the study population was limited to beneficiaries who were ages 18 and older, who had full Medicaid benefits, and who were enrolled in Medicaid for the entire calendar year. Beneficiaries who were dually eligible for Medicare or who had private insurance were excluded because we did not have access to all of their claims.

Information from Medicaid eligibility files was linked to information from the Area Health Resource file to designate whether a beneficiary lived in a metropolitan area (at least one urban cluster with a population of at least 50,000); micropolitan, or suburban, area (at least one urban cluster with a population of at least 10,000 but less than 50,000); or rural area (no urban cluster of at least 10,000)—as defined by the Office of Management and Budget.

Institutional review board approval was not required for this project. A data use agreement with CMS governed the security of the data and protected the confidentiality of beneficiaries.

**TABLE 1. Demographic characteristics of Medicaid beneficiaries with mental health or substance use disorder emergency department (ED) discharges in 2008<sup>a</sup>**

| Characteristic                  | Mental health ED discharge (N=26,982) |      | Substance use disorder ED discharge (N=11,743) |      |
|---------------------------------|---------------------------------------|------|--|------|
|                                 | N                                     | %    | N  | %    |
| Sex                             |                                       |      |  |      |
| Male                            | 10,744                                | 39.8 | 6,068  | 51.7 |
| Female                          | 16,238                                | 60.2 | 5,675  | 48.3 |
| Age group                       |                                       |      |  |      |
| 15–20                           | 2,015                                 | 7.5  | 550  | 4.7  |
| 21–44                           | 15,602                                | 57.8 | 5,447  | 46.4 |
| 45–64                           | 9,214                                 | 34.1 | 5,656  | 48.2 |
| ≥65                             | 151                                   | .6   | 90   | .8   |
| Race-ethnicity                  |                                       |      |  |      |
| Non-Hispanic African American   | 8,920                                 | 33.1 | 3,324  | 28.3 |
| Non-Hispanic white              | 15,144                                | 56.1 | 6,934  | 59.0 |
| Hispanic                        | 883                                   | 3.3  | 326  | 2.8  |
| Other                           | 485                                   | 1.8  | 377  | 3.2  |
| Unknown                         | 1,550                                 | 5.7  | 782  | 6.7  |
| Medicaid eligibility category   |                                       |      |  |      |
| Adult/poverty                   | 3,877                                 | 14.4 | 1,876  | 16.0 |
| Disabled                        | 22,439                                | 83.2 | 9,575  | 81.5 |
| Child <sup>b</sup>              | 666                                   | 2.5  | 292  | 2.5  |
| Geographic setting <sup>c</sup> |                                       |      |  |      |
| Metropolitan                    | 11,146                                | 41.3 | 5,021  | 42.8 |
| Micropolitan                    | 7,887                                 | 29.2 | 3,315  | 28.2 |
| Rural                           | 7,845                                 | 29.1 | 3,383  | 28.8 |
| Unknown                         | 104                                   | .4   | 24   | .2   |

<sup>a</sup> Data were from 15 states and the District of Columbia (DC). Data from DC were not included in the substance use disorders analysis.

<sup>b</sup> Individuals in the adult/poverty category qualified for Medicaid on the basis of income rather than disability. The child category includes beneficiaries who remain in the "child" eligibility category after their 18th birthdays.

<sup>c</sup> Metropolitan areas have at least one urban cluster with a population of at least 50,000, micropolitan areas have at least one urban cluster with a population of at least 10,000 but less than 50,000, and rural areas have no urban cluster with a population of at least 10,000.

### Analyses

We used revenue and diagnosis codes to create two groups of ED discharges, one group for which the primary ED diagnosis was related to mental health and a second group for which the primary ED diagnosis was related to substance use disorder. An individual with more than one discharge could be represented multiple times, once for each ED discharge.

We then calculated seven- and 30-day follow-up rates. For ED visits that had a primary mental health diagnosis, follow-up was defined as an outpatient visit to any provider for which the primary diagnosis was related to mental health. Likewise, for ED visits that had a primary diagnosis of a substance use disorder, follow-up was defined as an outpatient visit to any provider for which the primary diagnosis was related to a substance use disorder. These definitions of follow-up care were used to ensure that the outpatient visit included some attention to the condition

**TABLE 2. Rates of follow-up after mental health emergency department (ED) discharges and substance use disorder ED discharges among Medicaid beneficiaries in 2008, by state**

| State           | ED discharge for mental health |               |                             | ED discharge for substance use disorders |               |                             |
|-----------------|--------------------------------|---------------|-----------------------------|--|---------------|-----------------------------|
|                 | N                              | Within 7 days | Within 30 days <sup>a</sup> | N  | Within 7 days | Within 30 days <sup>a</sup> |
| Total           | 31,952                         | 66.0          | 76.1                        | 13,337                                   | 66.6          | 68.7                        |
| AK              | 221                            | 80.5          | 86.0                        | 212                                      | 54.2          | 56.1                        |
| AL              | 2,294                          | 74.4          | 81.3                        | 873                                      | 80.5          | 81.0                        |
| CT              | 1,608                          | 70.9          | 80.4                        | 1,135                                    | 72.1          | 74.8                        |
| DC <sup>b</sup> | 181                            | 56.9          | 66.3                        | na                                       | —             | —                           |
| GA              | 3,506                          | 89.4          | 92.4                        | 1,273                                    | 90.3          | 90.3                        |
| IL              | 5,681                          | 42.2          | 59.9                        | 1,248                                    | 20.4          | 30.8                        |
| IN              | 990                            | 78.5          | 85.5                        | 563                                      | 68.0          | 69.8                        |
| KY              | 3,520                          | 35.4          | 53.8                        | 1,403                                    | 32.8          | 34.1                        |
| LA              | 2,447                          | 81.0          | 84.0                        | 1,081                                    | 82.4          | 82.5                        |
| MN              | 2,149                          | 73.2          | 84.1                        | 747                                      | 66.5          | 69.1                        |
| MS              | 842                            | 80.9          | 85.9                        | 392                                      | 83.2          | 83.9                        |
| NC              | 4,907                          | 77.2          | 83.6                        | 2,416                                    | 78.1          | 79.6                        |
| NH              | 574                            | 58.9          | 77.0                        | 188                                      | 91.0          | 91.5                        |
| OK              | 813                            | 75.0          | 82.3                        | 514                                      | 74.7          | 75.5                        |
| WI              | 1,041                          | 60.1          | 73.9                        | 588                                      | 61.1          | 62.6                        |
| WV              | 1,178                          | 67.3          | 76.7                        | 704                                      | 69.5          | 70.6                        |

<sup>a</sup> Includes follow-up received within seven days of discharge<sup>b</sup> Data from DC were not included in the substance use disorders analysis.

associated with the ED visit. After calculating whether follow-up occurred for each discharge, we aggregated the rates into state-level follow-up rates and used descriptive statistics to examine the distribution of follow-up across states.

We then conducted four separate multivariate random-effects logistic regression models. Each regression modeled the odds of follow-up (seven- or 30-day follow-up modeled separately) as a function of beneficiary age group, race-ethnicity, Medicaid eligibility group (adult/poverty, disabled, or child), primary ED diagnosis, and geographic setting (metropolitan, micropolitan, or rural). Each regression accounted for the clustering of beneficiaries within a state. To guard against drawing spurious conclusions that could result from making multiple comparisons, we implemented a Bonferroni correction to lower the acceptable *p* value of statistical significance from .05 to  $\leq .008$ . SAS software, version 9.3, was used to conduct the analyses.

## RESULTS

### Study Sample

The final sample included two groups of ED discharges: 31,952 discharges of beneficiaries with a primary mental health ED diagnosis in 15 states and DC and 13,337 discharges of beneficiaries with a primary substance use disorder ED diagnosis in 15 states. Data from DC were not included in the substance use disorders analysis because fewer than 150 ED discharges involved a primary diagnosis of a substance use disorder. There were a total of 26,982 unique beneficiaries with a primary mental health ED diagnosis and 11,743 beneficiaries with a primary substance

use disorder ED diagnosis (Table 1). The final sample is larger than the number of unique beneficiaries because some beneficiaries had more than one ED discharge.

The proportion of females was larger among beneficiaries with a mental health ED discharge compared with beneficiaries with a substance use disorder ED discharge, and beneficiaries with a mental health ED discharge were younger compared with beneficiaries with a substance use disorder ED discharge (Table 1). Among both beneficiaries with a mental health ED discharge and beneficiaries with a substance use disorder ED discharge, the majority were white (56% and 59%, respectively) and just over 40% lived in a metropolitan area.

### State Variation in Follow-Up After ED Discharge

Follow-up after ED discharges varied widely across states (Table 2). The rate of follow-up within 30 days ranged across states from 60% to 92% for mental health ED discharges

and from 31% to 92% for substance use disorder ED discharges. On average, about two-thirds of beneficiaries had a follow-up visit within seven days for both mental health and substance use disorder ED discharges. Follow-up rates were higher at 30 days than at seven days, but this pattern was less pronounced for substance use disorder ED discharges compared with mental health ED discharges.

Because 30-day follow-up rates subsume seven-day follow-up rates, most states in the top or bottom quartile at seven days remained in that quartile at 30 days (Table 3). Among states in the top quartile for seven-day follow-up after mental health ED discharges (Alaska, Georgia, Louisiana, and Mississippi), all but Louisiana were also in the top quartile at 30-day follow-up after mental health ED discharges. The same pattern was true for states in the bottom quartile for seven-day follow-up after mental health ED discharges (DC, Illinois, Kentucky, and New Hampshire): all but New Hampshire remained in the bottom quartile at 30-day follow-up.

For follow-up after substance use disorder ED discharges, the same states stayed in the top and bottom quartiles at seven- and 30-day follow-ups. For seven-day follow up after both mental health and substance use disorder ED discharges, three states were in the top quartile (Georgia, Louisiana, and Mississippi), and two states were in the bottom quartile (Illinois and Kentucky).

### Factors Associated With Follow-Up After ED Discharge

Several factors were associated with the odds of follow-up. As described below, the statistical significance and direction of coefficients varied depending on the ED visit diagnosis

(mental health versus substance use disorders) and follow-up time period (seven versus 30 days) (Table 4).

*Follow-up for mental health ED visits.* After the analyses controlled for other variables in the model, the odds of follow-up within seven days after mental health ED discharges were lower for men compared with women, for African Americans compared with whites, for those who lived in rural areas versus metropolitan areas, and for those who were eligible for Medicaid on the basis of income rather than disability.

Younger adults (ages 18–20) had higher odds of follow-up compared with beneficiaries between the ages of 21 and 44. The odds of seven-day follow-up were higher for ED discharges associated with a schizophrenia-related diagnosis, other nonorganic psychoses, and major depression compared with ED discharges associated with other depression diagnoses and diagnoses of other mood disorders.

The direction and statistical significance of findings for follow-up within 30 days after mental health ED discharges were generally similar, with the following differences: beneficiaries ages 65 and older were less likely than beneficiaries between the ages of 21 and 44 to receive follow-up, and geographic differences were no longer significant at a significance level of  $p \leq .008$  after a Bonferroni correction.

*Follow-up for substance use disorder ED visits.* The odds of follow-up within seven days after substance use disorder ED discharges were also related to race-ethnicity, Medicaid eligibility category, and geographic setting, but the nature of the relationships was different. African Americans and those who were eligible for Medicaid on the basis of income were more likely than whites and beneficiaries with eligibility on the basis of disability, respectively, to have a follow-up visit within seven days. The odds of follow-up after substance use disorder ED discharges, unlike the odds of follow-up after mental health ED discharges, were not significantly lower among those who lived in rural areas versus metropolitan areas. However, the odds of follow-up following a mental health ED discharge were higher among individuals who lived in micropolitan areas rather than metropolitan areas. The odds of follow-up were lower for discharges associated with an ED diagnosis of a drug use disorder compared with discharges associated with a diagnosis of alcohol use disorder. These findings were generally consistent for follow-up within 30 days of substance use disorder ED discharges, with

**TABLE 3. States in the top and bottom quartiles for follow-up after mental health emergency department (ED) discharges and substance use disorder ED discharges among Medicaid beneficiaries in 2008**

| Performance in 2000 |   |      |       |  |      |       |  |      |       |   |      |
|---------------------|---|------|-------|--|------|-------|--|------|-------|---|------|
| State               | Within 7 days of mental health ED discharge |      | State | Within 30 days of mental health ED discharge |      | State | Within 7 days of substance use disorder ED discharge |      | State | Within 30 days of substance use disorder ED discharge |      |
|                     | N   | %    |       | N  | %    |       | N  | %    |       | N   | %    |
| Bottom quartile     |   |      |       |  |      |       |  |      |       |   |      |
| KY                  | 3,520                                       | 35.4 | KY    | 3,520  | 53.8 | IL    | 1,248  | 20.4 | IL    | 1,248   | 30.8 |
| IL                  | 5,681                                       | 42.2 | IL    | 5,681  | 59.9 | KY    | 1,403  | 32.8 | KY    | 1,403   | 34.1 |
| DC                  | 181   | 56.9 | DC    | 181  | 66.3 | AK    | 212  | 54.2 | AK    | 212   | 56.1 |
| NH                  | 574   | 58.9 | WI    | 1,041  | 73.9 | WI    | 588  | 61.1 | WI    | 588   | 62.6 |
| Top quartile        |   |      |       |  |      |       |  |      |       |   |      |
| AK                  | 221   | 80.5 | IN    | 990  | 85.5 | LA    | 1,081  | 82.4 | LA    | 1,081   | 82.5 |
| MS                  | 842   | 80.9 | MS    | 842  | 85.9 | MS    | 392  | 83.2 | MS    | 392   | 83.9 |
| LA                  | 2,447                                       | 81.0 | AK    | 221  | 86.0 | GA    | 1,273  | 90.3 | GA    | 1,273   | 90.3 |
| GA                  | 3,506                                       | 89.4 | GA    | 3,506  | 92.4 | NH    | 188  | 91.0 | NH    | 188   | 91.5 |

the exception that the effect of being African American was no longer significant.

## DISCUSSION

Despite the importance of follow-up care, on average about one-quarter of mental health ED discharges and about one-third of substance use disorder ED discharges were not associated with follow-up within 30 days. The receipt of follow-up care among Medicaid beneficiaries varied widely across states: in some states fewer than half of discharges were followed by follow-up care within seven days, whereas follow-up rates exceeded 80% in other states. In addition, the receipt of follow-up was associated with beneficiary age, race-ethnicity, geographic setting, and clinical conditions. These findings suggest that some state Medicaid programs have a considerable opportunity to improve follow-up care. To our knowledge, no other data have been published on state rates of follow-up after ED discharge among Medicaid beneficiaries that could serve as a comparison with these findings. Thus our findings may serve as a benchmark for future studies and quality improvement efforts.

Overall, we found average follow-up rates that are somewhat higher than those observed in other studies. For example, one study of managed care enrollees in a single state found that 22% of substance use disorder ED discharges were associated with follow-up care within 14 days (5). One study of Medicaid beneficiaries treated in the ED for self-harm found a 30-day follow-up rate of 52% (4). Our average rates may be higher because our definition of follow-up care and the populations we included were broader than those of the two earlier studies. In addition, our study included many states and a large number of beneficiaries. In contrast, Breton and colleagues (5) used a small sample of managed care beneficiaries in a single state that was not included in our analysis. Olfson and others (4) defined follow-up as outpatient mental

**TABLE 4. Odds of follow-up for mental health ED discharges or substance use disorder ED discharges among Medicaid beneficiaries in 2008, by beneficiary characteristic**

| Characteristic   | Mental health ED discharges |           |                    |                |           |                    | Substance use disorder ED discharges |           |                    |                |           |                    |
|--|-----------------------------|-----------|--------------------|----------------|-----------|--------------------|--------------------------------------|-----------|--------------------|----------------|-----------|--------------------|
|  | Within 7 days               |           |                    | Within 30 days |           |                    | Within 7 days                        |           |                    | Within 30 days |           |                    |
|  | OR                          | 95% CI    | p                  | OR             | 95% CI    | p                  | OR                                   | 95% CI    | p                  | OR             | 95% CI    | p                  |
| Male (reference: female)                                       | .87                         | .82–.92   | <.001 <sup>a</sup> | .84            | .79–.89   | <.001 <sup>a</sup> | .92                                  | .84–1.00  | .05                | .92            | .85–1.01  | .07                |
| Race-ethnicity (reference: non-Hispanic white)                 |                             |           |                    |                |           |                    |                                      |           |                    |                |           |                    |
| Non-Hispanic African American                                  | .83                         | .78–.88   | <.001 <sup>a</sup> | .76            | .71–.81   | <.001 <sup>a</sup> | 1.21                                 | 1.09–1.35 | <.001 <sup>a</sup> | 1.15           | 1.04–1.28 | .01                |
| Hispanic   | 1.05                        | .91–1.22  | .48                | .96            | .82–1.12  | .63                | 1.34                                 | 1.04–1.74 | .03                | 1.31           | 1.01–1.69 | .04                |
| Other  | 1.02                        | .83–1.25  | .84                | 1.10           | .87–1.39  | .43                | 1.29                                 | .98–1.69  | .07                | 1.15           | .87–1.51  | .32                |
| Unknown  | .95                         | .84–1.08  | .47                | 1.00           | .87–1.15  | .99                | 1.04                                 | .85–1.27  | .72                | 1.01           | .82–1.23  | .94                |
| Age group (reference: 21–44)                                   |                             |           |                    |                |           |                    |                                      |           |                    |                |           |                    |
| 18–20  | 1.52                        | 1.34–1.72 | <.001 <sup>a</sup> | 1.48           | 1.29–1.69 | <.001 <sup>a</sup> | 1.12                                 | .84–1.5   | .45                | 1.10           | .82–1.47  | .53                |
| 45–64  | .97                         | .92–1.02  | .27                | .93            | .87–.98   | .01                | 1.09                                 | .99–1.19  | .07                | 1.09           | 1.00–1.19 | .06                |
| ≥65  | .68                         | .46–.99   | .04                | .55            | .37–.81   | <.001              | .75                                  | .44–1.27  | .29                | .67            | .4–1.11   | .12                |
| Geographic setting (reference: metropolitan area) <sup>b</sup> |                             |           |                    |                |           |                    |                                      |           |                    |                |           |                    |
| Metropolitan   | 1.03                        | .96–1.10  | .41                | .98            | .91–1.05  | .59                | 1.17                                 | 1.05–1.30 | <.001 <sup>a</sup> | 1.18           | 1.06–1.31 | <.001 <sup>a</sup> |
| Rural  | .87                         | .81–.92   | <.001 <sup>a</sup> | .92            | .85–.98   | .01                | .95                                  | .86–1.05  | .32                | .95            | .86–1.05  | .31                |
| Medicaid eligibility (reference: disabled) <sup>c</sup>        |                             |           |                    |                |           |                    |                                      |           |                    |                |           |                    |
| Adult/poverty  | .87                         | .80–.95   | <.001 <sup>a</sup> | .86            | .79–.94   | <.001 <sup>a</sup> | 1.52                                 | 1.33–1.74 | <.001 <sup>a</sup> | 1.56           | 1.37–1.78 | <.001 <sup>a</sup> |
| Child  | 1.02                        | .83–1.27  | .83                | .90            | .72–1.13  | .37                | 1.54                                 | 1.01–2.35 | .04                | 1.40           | .92–2.11  | .11                |
| Diagnostic group   |                             |           |                    |                |           |                    |                                      |           |                    |                |           |                    |
| Drug use disorders (reference: alcohol use disorders)          | –                           | –         | –                  | –              | –         | –                  | .77                                  | .70–.84   | <.001 <sup>a</sup> | .77            | .71–.84   | <.001 <sup>a</sup> |
| Schizophrenic disorders <sup>d</sup>                           | 1.39                        | 1.29–1.50 | <.001 <sup>a</sup> | 1.86           | 1.71–2.02 | <.001 <sup>a</sup> | –                                    | –         | –                  | –              | –         | –                  |
| Bipolar disorder <sup>d</sup>                                  | 1.10                        | 1.02–1.19 | .01                | 1.42           | 1.31–1.54 | <.001              | –                                    | –         | –                  | –              | –         | –                  |
| Other nonorganic psychoses <sup>d</sup>                        | 1.75                        | 1.57–1.95 | <.001 <sup>a</sup> | 1.82           | 1.62–2.05 | <.001 <sup>a</sup> | –                                    | –         | –                  | –              | –         | –                  |
| Major depression <sup>d</sup>                                  | 1.19                        | 1.08–1.32 | <.001 <sup>a</sup> | 1.42           | 1.28–1.58 | <.001 <sup>a</sup> | –                                    | –         | –                  | –              | –         | –                  |
| Other <sup>d</sup>   | .87                         | .80–.95   | <.001              | .89            | .81–.97   | .01                | –                                    | –         | –                  | –              | –         | –                  |

<sup>a</sup> After a Bonferroni correction, p values ≤.008 were considered statistically significant.

<sup>b</sup> Metropolitan areas have at least one urban cluster with a population of at least 50,000, micropolitan areas have at least one urban cluster with a population of at least 10,000 but less than 50,000, and rural areas have no urban cluster with a population of at least 10,000.

<sup>c</sup> Individuals in the adult/poverty category qualified for Medicaid on the basis of income rather than disability. The child category includes beneficiaries who remain in the "child" eligibility category after their 18th birthdays.

<sup>d</sup> Reference group is depression and other mood disorders.

health visits among adults treated in the ED for deliberate self-harm.

Receipt of follow-up care was similar within seven days for both mental health and substance use disorder ED discharges, but at 30 days, follow-up was somewhat higher for mental health discharges compared with substance use disorder discharges. In other words, between seven and 30 days, receipt of follow-up care rose by 10.1 percentage points among mental health ED discharges but by only 2.1 percentage points among substance use disorder ED discharges. This divergence between the two discharge groups may reflect that historically, many state Medicaid programs have provided limited coverage of outpatient substance abuse services (14). However, we could not directly measure the generosity of state Medicaid benefits in this study. The source of these differences merits further investigation.

Similarly, there were differences between the beneficiary characteristics associated with receipt of follow-up care for

mental health and substance use disorder ED discharges. Notably, African-American beneficiaries with ED discharges for mental health were relatively less likely than white beneficiaries to receive follow-up care; this is consistent with previous research on the delivery of general health and mental health services among Medicaid beneficiaries, which has suggested that African Americans fare worse than their white counterparts on a variety of performance metrics (15–17). In contrast, African Americans with ED discharges for substance use disorders were slightly more likely than whites to receive follow-up. A previous study found the same relationship (18). Although the underlying reasons that African Americans may be more likely to receive follow-up after a substance use disorder ED discharge are unclear, others have suggested that African Americans may be more likely to be under court order to receive treatment for substance use disorders because of their overrepresentation in the criminal justice system or it may be related to other socioeconomic factors that we could not measure by using claims data (18).



Consistent with known geographic differences in the availability of specialty behavioral health providers (19,20), the odds of follow-up after both types of ED discharges were slightly worse in rural areas compared with metropolitan areas, although the difference was not significant for substance use disorder ED discharges. In contrast, the odds of follow-up for substance use disorder ED discharges were slightly better in micropolitan (suburban) areas compared with metropolitan areas. Claims data alone cannot explain the source of these differences.

Despite the inclusion of a relatively large number of states and beneficiaries in this analysis, this study had several limitations. Our reliance on claims data limited our ability to measure factors that may be associated with the receipt of follow-up care. For example, another study suggested that having a place to live may influence receipt of follow-up care (21). In addition, we could not easily account for the state-level characteristics that may influence follow-up rates, such as the availability of behavioral health providers or the generosity of Medicaid benefits. To investigate the source of state variation in follow-up rates, we conducted several post hoc analyses by using publicly available information. Specifically, we reviewed per capita psychiatrists, per capita mental health and substance abuse state spending on community-based programs, and special state initiatives on emergency psychiatric care but did not find strong correlations with state-level follow-up rates. Because this is the first large-scale study to measure follow-up care after mental health and substance use disorder ED discharges, further research should build on these findings to identify the sources of state and beneficiary variation.

Because our findings were based on FFS claims, we cannot know to extent to which the findings are generalizable to managed care populations. Some functions provided by managed care organizations, such as care coordination, may promote follow-up care. However, the measurement of follow-up care reported in this article was endorsed by the National Quality Forum (NQF) as a quality measure and may be reported by managed care plans and other entities in the future, allowing for direct comparisons with the FFS population. In addition, states participating in the Certified Community Behavioral Health Clinic demonstration program are required to report this measure, which will allow for comparisons in the future.

Finally, in adherence to standards for performance measurement (22), the state-level follow-up rates were not “risk adjusted” for beneficiary characteristics, such as race or ethnicity. Risk adjustment at the state level for these characteristics implicitly suggests that certain subgroups of beneficiaries are not entitled to the same standard of follow-up care. Instead, it is important to observe and investigate meaningful differences in follow-up, such as those identified in our regression analyses. In addition, because the unadjusted NQF measure will be reported by managed care plans and states in the future, adjusting state-level follow-up rates by beneficiary characteristics could make them noncomparable to future reports.

## CONCLUSIONS

Receipt of follow-up care after ED discharges for mental and substance use disorders varied widely by state and may be related to several beneficiary characteristics, including age, sex, race-ethnicity, ED diagnosis, and residence in a rural or micropolitan area. Many state Medicaid programs have an opportunity to substantially improve follow-up care after ED discharges associated with mental and substance use disorders. Such efforts may wish to focus on specific groups of beneficiaries who are less likely to receive follow-up and to learn from states that have high follow-up rates. Further work is needed to identify effective practices to promote follow-up care for Medicaid beneficiaries after ED discharges for mental health conditions and substance use disorders.

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