

Effects of ACA Expansion of Dependent Coverage on Hospital-Based Care of Young Adults With Early Psychosis

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Objective: Since 2010, the Affordable Care Act has required private health plans to extend dependent coverage to adults up to age 26. Because psychosis often begins in young adulthood, expanded private insurance benefits may affect early psychosis treatment. The authors examined changes in insurance coverage and hospital-based service use among young adults with psychosis before and after this change.

Methods: The study included a national sample (2006–2013) of discharges and emergency department visits. Using a difference-in-differences study design, the authors compared changes in insurance coverage (measured as payer source), per capita admissions, and 30-day readmissions for psychosis before and after ACA dependent coverage expansion among targeted individuals (ages 20–25) and a comparison group (ages 27–29).

Results: After dependent coverage expansion, hospitalization for psychosis among young adults was 5.8 percentage

points more likely to be reimbursed by private insurance among the targeted age group (ages 20–25), compared with the slightly older age group (ages 27–29). Dependent coverage expansion was not associated with changes in overall insurance coverage, per capita admissions, or 30-day readmission for psychosis.

Conclusions: Although dependent coverage expansion was unrelated to changes in use of hospital-based treatments for psychosis among young adults, care was more likely to be covered by private insurance, and coverage of these hospitalizations by public insurance decreased. This shift from public to private insurance may reduce public spending on young-adult treatments for early-episode psychosis but may leave young adults without coverage for rehabilitation services.

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For individuals with early-onset psychosis, early identification paired with comprehensive treatment may improve outcomes (1–3). One barrier to identification and continuous comprehensive treatment is lack of health insurance, which is known to delay access to health care and which can hamper access to effective, but costly, medications (4). Psychosis onset often occurs during young adulthood, a period when patients may have lost insurance coverage available to them throughout childhood. For example, children may age out of Medicaid coverage at age 18. In contrast with older adults who have confirmed schizophrenia diagnoses, individuals with early-onset psychosis are unlikely to meet the disability criteria for Supplemental Security Income (SSI) because early-onset psychosis may not be sufficient to establish an impairment that prevents work and is expected to last at least a year (5, 6). Although the 2014 expansion of Medicaid to low-income adults under the Affordable Care Act has increased coverage rates, states that did not expand

Medicaid typically only cover parents, and then at very low income-eligibility limits.

Under the Affordable Care Act (ACA), since September 2010 insurers have been required to extend eligibility for

HIGHLIGHTS

- The Affordable Care Act (ACA) allowed young adults to stay on parents' private insurance plans until age 26—prime years for emerging psychosis.
- The ACA's dependent coverage expansion was associated with a greater likelihood that psychosis hospitalizations for young adults were covered by private insurance and a lower likelihood that they were covered by public insurance.
- The ACA's dependent coverage expansion was not associated with changes in the rate of hospitalizations for psychosis or rehospitalizations for young adults.

TABLE 1. Characteristics of inpatient discharges and emergency department visits for schizophrenia or psychosis among young adults, by age group and sample (national and California)^a

Characteristic	Ages 20–25	Ages 27–29
Inpatient discharges		
National (2006 Q1–2013 Q4)		
Quarterly discharge rate per 100,000 population	20.8	26.3
Female (%)	34.0	38.0
Payer source (%)		
Private or other insurance	27.2	17.7
Self-pay	10.4	9.20
Medicare or Medicaid	62.2	72.9
California (2005 Q1–2013 Q4)		
Quarterly discharge rate per 100,000 population	37.1	40.1
Readmitted within 30 days (%)	34.4	36.4
Psychiatric hospital (%)	39.2	35.8
Female (%)	31.7	34.6
Payer source (%)		
Private or other insurance	32.9	23.2
Self-pay	7.01	5.89
Medicare or Medicaid	60.1	70.9
Emergency department visits		
National (2006 Q1–2013 Q4)		
Quarterly visit rate per 100,000 population	38.2	43.0
Female (%)	31.4	34.7
Payer source (%)		
Private or other insurance	25.7	17.3
Self-pay	24.4	21.7
Medicare or Medicaid	49.4	60.8
California (2005 Q1–2013 Q4)		
Quarterly visit rate per 100,000 population	35.0	37.6
Female (%)	28.6	31.2
Payer source (%)		
Private or other insurance	28.1	20.1
Self-pay	33.4	31.5
Medicare or Medicaid	38.5	48.4

^a Individuals with co-occurring substance use disorders were excluded from the analyses. Payer source is the primary expected payer. Medicare or Medicaid includes Medicare, Medicaid, county, and, in California, other indigent programs. Private or other insurance includes private (commercial) insurance plans, workers' compensation, other government programs, and any other payer source. For national data, weights provided by the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project were used when calculating the numerators to extrapolate samples to the universe of hospital or emergency department visits and to account for the change in sampling design of the Nationwide Inpatient Sample.

coverage to adult children up to age 26 under a parent's private insurance plan. This reform is especially important for young adults with serious mental illness, a group that often lacks private insurance through an employer, a spouse's employer, or an educational institution. Saloner and Lê Cook (7) found that among patients with a "possible mental health disorder," the expansion in dependent coverage increased insurance coverage by 13 percentage points and significantly increased use of mental health treatment. Other studies found that after dependent coverage expansion, fewer young adults were uninsured when hospitalized for psychiatric diagnoses and significant increases occurred in

behavioral health inpatient admissions among the targeted age group (8, 9). These studies did not focus on serious mental illness, despite ample reasons to believe that care needs, insurance status and coverage type, and access to care are likely to differ by diagnosis. Although one prior study reported on individuals with diagnoses of psychosis, the study was focused on mental health more broadly, did not examine insurance coverage for patients with psychosis, and included an expansive set of diagnoses not expected to be predictive of emerging schizophrenia (e.g., dementia) (8).

Considering insurance coverage among young adults, one would expect uninsured patients with emerging psychosis to join a parent's private plan if possible. For individuals with Medicaid or potential Medicaid access (possibly through SSI), the effect is less clear. Medicaid may cover services many private insurers exclude, including assertive community treatment, supported employment, and supported education. Out-of-pocket costs are also likely to be lower under Medicaid. Yet, when deciding whether to enroll in Medicaid, patients and their families may be unaware of differences in benefits and cost sharing between private and public insurance plans. Regardless of insurance type, increases in insurance coverage among individuals with early-onset psychosis not only may reduce the financial burden on patients and their families but also may lead to earlier identification and more comprehensive treatment.

If outpatient and inpatient treatment for psychosis are substitutes for one another, then expanded insurance coverage may decrease inpatient admissions as individuals receive comprehensive treatment in the outpatient setting. In contrast, if outpatient and inpatient treatment are complements, one would expect inpatient use to increase as insurance coverage expands because of the reduced out-of-pocket cost. These effects are complicated to disentangle. For patients with less severe symptoms, these services may be substitutes for one another, leading to reduced inpatient care; whereas for patients with the most serious symptoms, these services may be complements, with patients requiring both inpatient treatment and comprehensive outpatient treatment.

To learn how coverage and treatment for young adults with early-onset psychosis changed after the dependent coverage provisions took effect, but before Medicaid expansion was implemented in 2014, we examined young adults' use of hospital-based care for schizophrenia and psychosis, including changes in payer source (private insurance, public insurance, or uninsured), the population rate of inpatient admissions and emergency department (ED) visits, and rates of 30-day readmissions.

METHODS

Data

We examined inpatient stays and emergency care by using the 2006–2013 National Inpatient Sample (prior to 2012, the Nationwide Inpatient Sample [NIS]) and the Nationwide Emergency Department Sample (NEDS) from the Agency

for Healthcare Research and Quality's Healthcare Cost and Utilization Project (HCUP) (10). Prior to 2012, the NIS included data on all hospital inpatient stays from a stratified sample of approximately 20% of U.S. community hospitals. Starting in 2012, the NIS approximates a 20% stratified sample of hospital inpatient stays from all U.S. community hospitals. Data from years prior to 2012 contain a modified discharge weight to account for a change in the sampling design of the NIS (11). The NEDS contains data on hospital-based ED visits and approximates a 20% stratified sample of hospital-owned EDs for all years.

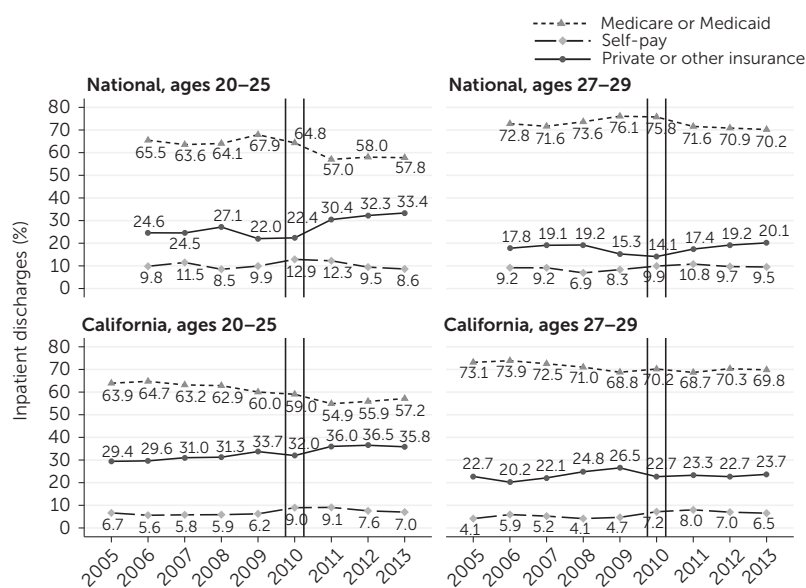
We supplemented these analyses with data from California, which offer several advantages. California includes a complete census of discharges and ED visits. All California-licensed hospitals, including acute psychiatric and chemical dependency recovery facilities, are included. California's unique patient identifier permitted examination of the 30-day readmission rate for the entire duration of our study. For California samples, we used hospital discharge records in the 2005–2013 Patient Discharge Database and the 2005–2013 Emergency Department Database, which provide more details compared with the California HCUP state data.

Annual population estimates by county, sex, and age were drawn from U.S. Census Bureau data. We used ICD-9-CM diagnosis codes to identify records with a primary diagnosis of psychosis or schizophrenia (diagnosis codes 297.xx, 298.1, 298.3–298.9, and 295.xx). We considered both a psychosis and a schizophrenia diagnosis because of evidence that in about two-thirds of incident psychosis cases the first listed diagnosis is "psychosis" (12). For our main analysis, we considered only patients without a co-occurring substance use disorder (diagnosis codes 292.xx, 303–305.05, and 305.2–305.93) because of concerns that the specialized needs of individuals with substance use disorders complicate the interpretation of results on service utilization. Hereafter, we refer to this diagnostic group as "psychosis." In recognition of the importance of comorbidities in the real world of service delivery, we included individuals with substance use disorders in supplemental analyses.

Data Set Construction

The baseline unit of analysis for our study was cell, defined by sex, age group (20–25 years or 27–29 years), time (quarter), and payer source. In the analyses using California data, cells also were defined by California county. We combined 35 primarily rural counties that participate in the California County Medical Services Program into a single "county." Patients age 26 were excluded because they could be in both the target and comparison group in a calendar year. For outcomes expressed

FIGURE 1. Payer source for inpatient discharges before and after coverage expansion, by age group and sample (national and California)^a

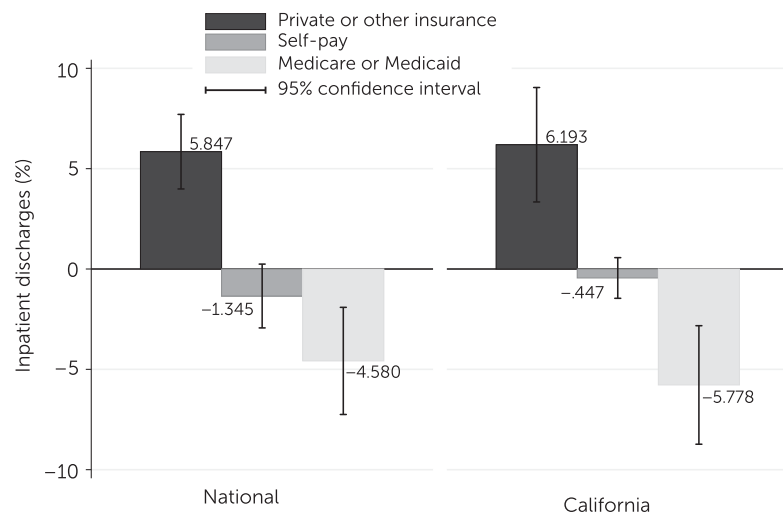


^a Payer source is the primary expected payer for inpatient discharges with a principal diagnosis of schizophrenia or psychosis. Individuals with a co-occurring substance use disorder were excluded from the analyses. Before expansion: national, January 2006–March 2010; California, January 2005–March 2010. After expansion, October 2010–December 2013. Medicare or Medicaid includes Medicare, Medicaid, county, and, in California, other indigent programs. Private or other insurance includes private (commercial) insurance plans, workers' compensation, other government programs, and any other payer source.

as a rate per 100,000 persons in a cell, cell numerators contained counts of discharges (from an inpatient or ED setting) and cell denominators contained the total population in that cell. For outcomes expressed as a percentage of discharges, numerators contained counts of discharges and denominators contained the total number of discharges in that cell. For national data, HCUP-provided weights were used to calculate numerators that estimated the universe of discharges and to account for the change in sampling design of the NIS.

Outcomes

Primary expected payer source was classified into three categories: commercial or other insurance, self-pay, and Medicare or Medicaid. Service use outcomes included the rates per 100,000 population in each cell of inpatient discharges and ED visits. For California, we also considered 30-day any-cause readmissions (13). Following the methodology used by Podulka et al. (14), we defined a readmission as an inpatient admission for any cause within 30 days of an index discharge. Readmissions could be counted toward multiple index discharges in cases where there was more than one index discharge in the 30 days preceding that admission. We calculated the percentage readmitted in each time period (i.e., quarter) by dividing the total readmissions in that period by the total index discharges over the same time frame.

FIGURE 2. Estimated differential change in payer source for inpatient discharges before and after coverage expansion, by age and sample^a

^a Payer source is the primary expected payer for inpatient discharges with a principal diagnosis of schizophrenia or psychosis. Estimated differences between change in primary expected payer source (%) for younger adults (ages 20–25) and the reference group (ages 27–29) are shown. Individuals with co-occurring substance use disorders were excluded from the sample. The national sample included 128 cells representing 32 quarters × two age groups × two sexes. The California sample included 5,040 cells representing 36 quarters × two age groups × two sexes × 35 counties. Before expansion: national, January 2006–March 2010; California, January 2005–March 2010. After expansion, October 2010–December 2013. National estimates were as follows: private or other insurance, 5.847% (95% confidence interval [CI]=3.989–7.705, $p<.001$); self-pay, -1.345% (95% CI=-2.935 to .245, $p=.096$); and Medicare or Medicaid, -4.58% (95% CI=-7.249 to -1.910, $p=.001$). California estimates were as follows: private or other insurance, 6.193% (95% CI=3.342–9.045, $p<.001$); self-pay, -.447% (95% CI=-1.460 to .567, $p=.372$); and Medicare or Medicaid, -5.778% (95% CI=-8.731 to -2.825, $p<.001$).

Statistical Analyses

We defined a preimplementation period from the beginning of the study period (January 1, 2005, for California data and January 1, 2006, for national data) to March 31, 2010, and a postimplementation period of October 1, 2010, to December 31, 2013. We defined quarters 2 and 3 of 2010 (April 1, 2010–September 30, 2010) as an interim period because some large insurers extended dependent coverage before September 23, 2010, to prevent gaps in coverage for new graduates (15). For national data, we estimated the following linear regression model: $E(Y_{ikt}) = \beta_0 + \text{age-20-to-25}_i + \text{quarter}_t + \text{female}_{ik} + \beta_1(\text{age-20-to-25}_i \times \text{interim}_t) + \beta_2(\text{age-20-to-25}_i \times \text{post}_t)$ for which Y_{ikt} is a given outcome (e.g., rate of discharges per 100,000 population) for age group i , sex k , and quarter t . The term age-20-to-25_i represents an indicator variable coded as 1 for ages 20–25 and 0 for ages 27–29. Quarter_t is a set of indicator variables for each quarter (excluding the first) to control for secular trends. We developed two interaction terms: interim_t (coded as 1 for April 1, 2010–September 30, 2010 and 0 otherwise) × age-20-to-25_i and post_t (coded as 1 for October 1, 2010, onwards and 0 otherwise) × age-20-to-25_i . For California analyses, we added county_j indicator

variables to control for local factors. In regression analysis, cells were weighted by the cell denominator.

First, we tested whether the percentage of discharges from each of the three payer source categories differed before and after the dependent coverage provisions came into effect and across the two age groups. We then tested for changes in the national rate of inpatient discharges; the national ED visit rate; and, for California, inpatient discharge rate, ED visit rate, and the percentage readmitted in 30 days. To test for difference in associations by sex, we included interactions with sex in some models. The analyses using data from California were approved by the California Committee for the Protection of Human Subjects. Yale University's Human Investigation Committee declared this study exempt from review and deemed it exempt from the need for consent because it used secondary data. Data for this project were provided subject to data use agreements with the California Office of Statewide Health Planning and Development and the Agency for Healthcare Research and Quality's HCUP. We used Stata 14.2 for all analyses.

RESULTS

Descriptive Characteristics

Table 1 displays outcomes for the samples with inpatient discharges and ED visits. The quarterly national inpatient discharge rates for our main diagnostic sample were 20.8 per 100,000 population for ages 20–25 and 26.3 per 100,000 population for ages 27–29. The national distribution of payer source indicates that private insurance was more common among those ages 20–25, compared with those ages 27–29 (27.2% versus 17.7%). Generally, quarterly discharge rates were higher per capita in California, compared with national rates, which may be attributable to the fact that the California data, unlike the national data, included all psychiatric hospitals.

Association of Dependent Coverage Expansion With Payer Source

During the period preceding the dependent coverage expansion, the percentage of discharges that were paid by public coverage was relatively stable (Figure 1). After implementation of the dependent coverage expansion, public coverage declined for adults ages 20–25, with concurrent increases in private insurance. The changes after 2010 were smaller in the 27–29 age group.

Figure 2 presents the results of the regression models predicting payer source; bars represent the change in payer source after dependent coverage expansion (versus before)

for patients ages 20–25 (versus patients ages 27–29). After September 2010, the percentage of discharges that were privately insured rose significantly more in the targeted group (ages 20–25), compared with the group ages 27–29. The magnitude of this difference was 5.8 percentage points ($p < 0.001$) in the national data, suggesting a 21% increase relative to the overall proportion of 27%. There were no significant associations between the dependent coverage expansion and the percentage of discharges that were self-pay nationally or in California. However, the dependent coverage expansion was associated with a significant decrease in the percentage of discharges that were paid by public coverage both nationally (-4.6 percentage points, $p < 0.001$) and in California (-5.8 percentage points, $p = 0.001$). Results were similar by sex [a table and figure in an online supplement to this article present results by sex].

Association of Expansion With Rate of Discharges, Readmission, and ED Visits

No change in trends of inpatient discharge rates or readmission rates for either age group was observed at the time of the dependent coverage expansion (Figure 3). There were no statistically significant associations between the dependent coverage expansion and quarterly rates of inpatient discharges nationally or 30-day readmission rates in California (Figure 4). Results for ED visits were similar to results for inpatient discharges [see online supplement], except that the decrease in public coverage in the national data was not statistically significant.

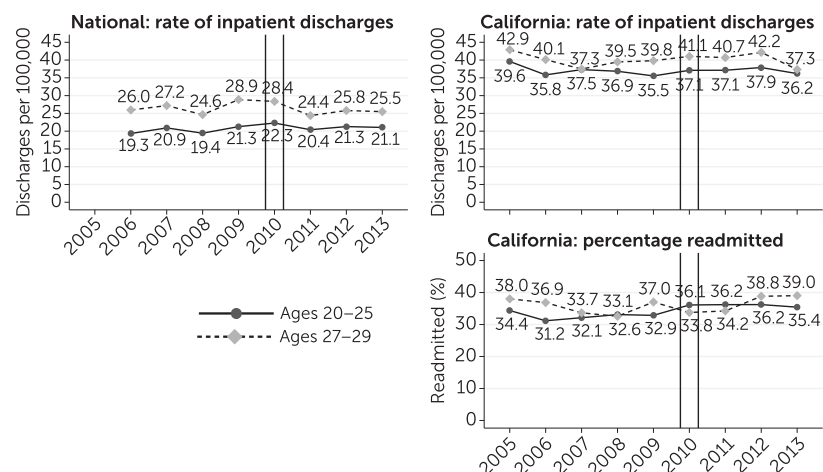
Co-occurring Substance Use Disorder

When we included individuals with co-occurring substance use disorder in our cohort of adults with schizophrenia or psychosis diagnoses, we found that results were similar, along with a statistically significant decline in this population for inpatient discharges characterized as self-pay (-1.6 percentage points, $p = 0.047$) [see online supplement].

DISCUSSION

After the ACA required private health plans to extend coverage to adult dependents up to age 26, private insurance was significantly more likely to cover young adults' hospital stays for psychosis among the targeted age group. The share of hospitalizations covered by private insurance grew by 5.8 percentage points more among patients ages 20–25, compared with patients ages 27–29, an increase of more than 20% relative to the mean of 27% during the preexpansion period. Notably, some individuals in the targeted age group likely did not have access to a parent's private plan,

FIGURE 3. Inpatient quarterly discharge rates (national and California) and percentage readmitted (California) before and after coverage expansion, by age group^a



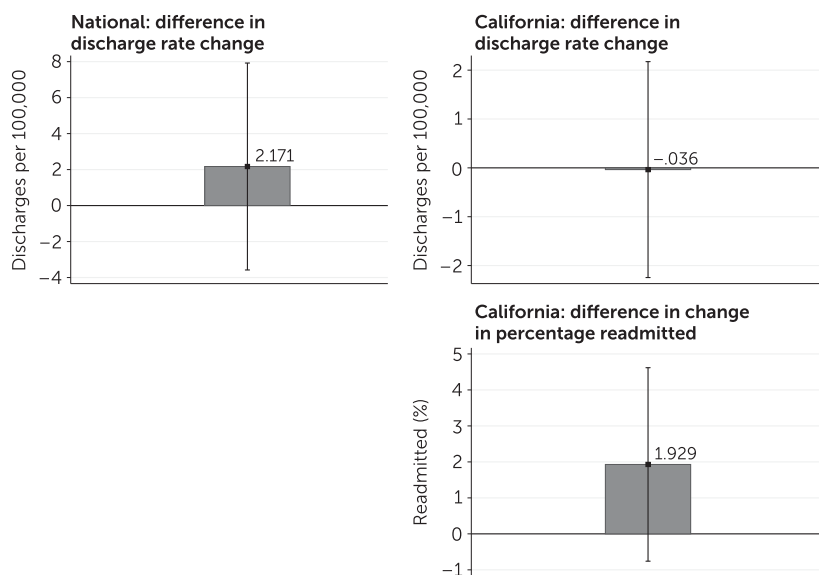
^a Average quarterly rates of inpatient discharges are rates of discharges with a principal diagnosis of schizophrenia or psychosis per 100,000 population. Individuals with co-occurring substance use disorders were excluded from the numerator in all cases. The average quarterly rate for the specified year is presented. The percentage readmitted reflects the percentage of all index discharges with a principal diagnosis of schizophrenia or psychosis that were readmitted for any cause within 30 days. Before expansion: national, January 2006–March 2010; California, January 2005–March 2010. After expansion, October 2010–December 2013.

suggesting a relatively high uptake rate among those eligible for a parent's plan. The increase in private insurance coverage was not associated with a decrease in self-pay patients, but it was associated with a decrease in publicly insured patients.

Although the ACA's goal was to increase insurance coverage among young adults, we found that the increases in privately insured psychosis hospitalizations all came from hospitalizations covered by public programs, with no significant change in uninsured or self-pay hospitalizations. Generally, patients with early-onset psychosis chose to apply for Medicaid prior to the dependent coverage expansion, but after expansion they chose to remain on their parents' private insurance policy. Because we did not know secondary insurance sources, it is also possible that these individuals had both private and Medicaid coverage, but private insurance was the primary payer source for hospitalizations. Why these patients chose private versus public coverage is unclear. Compared with Medicaid, private coverage may increase access to some office-based providers or inpatient facilities and may carry less stigma (16). Yet important components of coordinated specialty care, which may improve outcomes for patients with early-onset psychosis, particularly supported employment and education, may not be covered by private plans (17).

Researchers have studied the shift of privately insured individuals to publicly insured coverage when Medicaid or other public programs expand (i.e., "crowd-out" of private coverage) (18). Crowd-out raises the cost of expanding public insurance coverage. Our study is one of the few to document that access to private coverage can shift services

FIGURE 4. Estimated differential change in quarterly rate of inpatient discharges (national and California) and percentage readmitted (California) among patients ages 20–25 before and after coverage expansion^a



^aEstimated changes in quarterly rate of inpatient discharges per 100,000 persons and percentage readmitted with a principal diagnosis of schizophrenia or psychosis; differences between younger adults (ages 20–25) and the reference group (ages 27–29) in the estimated changes in discharges and readmissions are shown. National sample included 128 cells representing 32 quarters $\times$ two age groups $\times$ two sexes. California sample included 5,040 cells representing 36 quarters $\times$ two age groups $\times$ two sexes $\times$ 35 counties. Individuals with co-occurring substance use disorders were excluded from the sample. Before expansion: national, January 2006–March 2010; California, January 2005–March 2010. After expansion, October 2010–December 2013. Differences for discharge rate, national estimates (top left): 2.171 (95% confidence interval [CI]=–3.580 to 7.920, $p=.152$). Differences for discharge rate, California estimates (top right): –0.036 (95% CI=–2.245 to 2.174, $p=.788$). Differences for percentage readmitted, California estimates (bottom right): 1.929 (95% CI=–.759 to 4.618, $p=.455$).

from public to private coverage (i.e., “crowd-in”). Prior work found a similar effect for births after dependent coverage expansion, with an increase in births covered by private insurance and a reduction in births covered by Medicaid (19). In the case of psychosis, the cost implications of such a change are likely to be favorable to states struggling to finance Medicaid in an era of expanding Medicaid enrollees and rising health care costs. The study period coincided with increasing attention to early-onset psychosis, with promising results from trials such as the RAISE (Recovery After an Initial Schizophrenia Episode) projects, combined with increased access to payment for treatments via expanded insurance coverage. Yet we found little evidence of change in hospital-based care for psychosis over the period studied. It will be important for future research to consider whether this finding changed after funds from the Substance Abuse and Mental Health Services Administration’s mental health block grants were specifically earmarked for evidence-based early psychosis interventions.

One strength of this study was its ability to isolate associations with dependent coverage expansion, because the expansion preceded other major changes in insurance coverage that were implemented mainly in 2014. The ACA

provisions allow states to extend Medicaid coverage to residents earning less than 138% of the federal poverty level, and as of March 2019, a total of 37 states had expanded. Results would likely be different if our study had focused on the period after Medicaid expansion. Since 2014, state health insurance exchanges have offered subsidized private insurance plans for individuals with incomes under 400% of the federal poverty level. By using data through 2013, our study avoided confounding with these changes, but after 2014 there may be interactive effects of coverage expansion through varied policies.

Our study was subject to several limitations. First, we could not directly measure whether admissions represented a first episode of psychosis. However, for adults in the age ranges studied, admissions are likely to be relatively early in the course of psychotic disorders. Second, we lacked data on outpatient service use or pharmacy utilization. Understanding what happens after patients leave the hospital is an area ripe for examination to help interpret persistently high rates of readmission in this population. In our study, we could not determine whether the lack of a change in inpatient admissions was truly no change or rather the net effect of some young adults using more services and others using fewer services because of greater access to outpatient and medication treatment. Because we could not identify states in the national data, we could not control for state-specific effects of the 2008 recession. Finally, as we noted above, some adults in our study held both private insurance through a parent and obtained Medicaid coverage for services not typically covered by private plans. In practice, it is unlikely that most families are aware of this possibility.

CONCLUSIONS

In this national study of young adults using hospital-based care for psychosis, we found that the ACA expansion of dependent coverage was associated with a meaningful increase in private insurance as the primary payer source, alongside a reduction in public insurance. This change may have important implications for state Medicaid financing. Further studies are needed to examine the effects of these changes in insurance coverage on outpatient and medication treatment for early treatment for psychosis.

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