Administration and Policy in Mental Health and Mental Health Services Research (2019) 46:82–90
https://doi.org/10.1007/s10488-018-0895-5

ORIGINAL ARTICLE

Impacts of the Dependent Care Expansion on the Allocation of Mental Health Care

Joshua Breslau[1] · Bradley D. Stein[1] · Hao Yu[1] · Rachel M. Burns[1] · Bing Han[2]

Published online: 10 September 2018
© Springer Science+Business Media, LLC, part of Springer Nature 2018

Abstract

We examine the impact of insurance expansion under the Affordable Care Act's Dependent Care Expansion (DCE) on allocation of mental health care across illness severity, types of care and racial/ethnic groups. Evidence suggests that the increase in mental health care utilization resulting from the DCE was restricted to individuals with clinically significant mental health conditions. There is no evidence suggesting that the increase occurred disproportionately in medication-only treatment or that it increased racial/ethnic disparities. The DCE appears to have been successful in increasing utilization of mental health care among a high need group without lowering quality or increasing disparities.

Keywords Health insurance · Mental health service use · Racial/ethnic disparities

Lack of health insurance coverage has historically been one of the most significant barriers to mental health treatment during young adulthood (Collins et al. 2012; Park et al. 2006; Yu et al. 2008), the period during which many adverse consequences of mental disorders begin to occur (Breslau et al. 2008, 2011; Gibb et al. 2010). Increasing health coverage for this age group was the primary goal of the Affordable Care Act's Dependent Care Expansion (DCE), which required that all private insurance policies that include coverage for dependents extend eligibility for dependents up to age 25 (Sommers and Kronick 2012). Studies of the DCE provide an opportunity to learn about the potential impact of health insurance coverage on utilization of behavioral health care during young adulthood, and, consequently, the potential for health insurance policy to reduce the public health burden of psychiatric disorders.

Evidence to date suggests that the DCE was successful in its primary aim of increasing insurance coverage among young adults (Breslau et al. 2018; Sommers et al. 2013). In addition, early evidence suggests that though the DCE has not impacted utilization of preventive or primary care services (Shane et al. 2016), it did have a positive impact specifically on utilization of mental health treatment (Saloner and Le Cook 2014). For instance, among people with a mental health problem, treatment utilization increased after implementation of the DCE in 2010 among individuals age 18–25, relative to changes over the same time period among a slightly older age group (Saloner and Le Cook 2014). There is similar evidence that the DCE also increased psychiatric hospitalizations (Golberstein et al. 2015). These findings are consistent with prior evidence that mental health service utilization is more responsive to insurance expansions than other types of health care (Baicker et al. 2013; DeLeire et al. 2013). However, while there appears to have been an impact of the DCE on overall utilization of mental health care, its impacts on allocation of care across levels of clinical need, types of care, and racial/ethnic groups, particularly groups with low levels of utilization (Cook et al. 2014), remain unexamined.

This study examines several ways in which an increase in insurance coverage might have an adverse impact on the allocation of mental health care. Specifically, we address three questions. First, did the DCE lead to an increase in utilization by individuals with low clinical indication for care? A large proportion of mental health services are received by individuals who do not meet criteria for a mental disorder (Wang et al. 2005). Although many people without disorders may have alternate justifications for seeking care (Druss et al. 2007), the primary goal of policy is to

✉ Joshua Breslau
jbreslau@rand.org

[1] RAND Corporation, 4570 Fifth Avenue, Pittsburgh, PA 15217, USA

[2] RAND Corporation, 1776 Main Street, Santa Monica, CA 90401, USA

increase treatment among those with high levels of unmet need. There is concern that individuals with relatively low severity of mental health problems may be more capable of accessing services once the financial barrier posed by lack of insurance is removed. Second, did the DCE impact utilization of specialty mental health care or was its impact restricted to pharmacologic treatment? Clinical guidelines call for combination treatment, which includes both medication and specialty mental health care, for most mental health conditions. Third, did the DCE lead to an increase in racial/ethnic disparities in mental health care? There is evidence that the DCE did increase racial/ethnic disparities in insurance coverage, likely due to the fact that only those people whose parents or guardians are privately insured are able to benefit from it (Breslau et al. 2017). There is also evidence that removing financial barriers to care can increase rather than decrease disparities in mental health care utilization (Adams et al. 2015). The increase in disparities in coverage may have increased disparities in mental health service use. While the impact of the DCE on insurance coverage has been positive, understanding its impact on utilization, including potential adverse impacts on allocation of care, are essential for understanding its overall impact.

Methods

Sample

Data from the 2008 through 2013 samples of the National Survey of Drug Use and Health (NSDUH), a repeated cross-sectional survey of the US civilian population, were analyzed. The NSDUH sample is designed to be representative of each of the 50 US states and the District of Columbia (Center for Behavioral Health Statistics and Quality 2016). Interviews, conducted using computer-assisted structured interviews conducted in respondents' homes. Include information on mental health status and mental health service use. All data used in this study are available publicly through the Substance Abuse and Mental Health Data Archive at https://www.datafiles.samhsa.gov/. Study procedures were approved by the RAND Human Subjects Protection Committee.

Assessments

Mental Health Service Use

Indicators for utilization of mental health treatment in the past 12 months were constructed using information on the following three types of care:

1. Outpatient specialty care: The NSDUH asks respondents whether during the past 12 months they received "any outpatient treatment or counseling for any problem you were having with your emotions, nerves, or mental health at any of the places listed below?" The potential sites of treatment are listed for respondents as: an outpatient mental health clinic or center; the office of a private therapist, psychologist, psychiatrist, social worker, or counselor that was not part of a clinic; a doctor's office that was not part of a clinic; an outpatient medical clinic; a partial day hospital or day treatment program; or some other place.
2. Prescription Medication: The NSDUH asks respondents whether during the past 12 months they took "any prescription medication that was prescribed for you to treat a mental or emotional condition?"
3. Inpatient Psychiatric Treatment: Respondents are asked whether, during the past 12 months, they had "stayed overnight or longer in a hospital or other facility to receive treatment or counseling for any problem you were having with your emotions, nerves, or mental health?"

The above items were used to define the following categories of service use: medication only; outpatient treatment only; combination medication and outpatient treatment. Respondents reporting inpatient psychiatric treatment were classified as having inpatient treatment only or inpatient plus outpatient treatment. The combination categories, i.e. outpatient treatment and medication and inpatient plus outpatient treatment are considered higher quality patterns of care (Huhn et al. 2014).

Mental Health Status

Mental health status is assessed using a combination of the Kessler-6 (K6), a measure of serious non-specific psychological distress (Kessler et al. 2002, 2003), and the World Health Organization Disability Assessment Schedule (WHODAS) (Novak et al. 2010). Scores on both instruments are combined using a formula derived from a clinical calibration study to produce a single measure of severity of mental illness (Aldworth et al. 2010; Colpe et al. 2010). Scores were dichotomized into any mental illness (i.e. mild, moderate or serious mental illness) versus no mental illness.

The NSDUH also collects information on self-rated health, substance use disorders, and major depression. Self-rated health is assessed using a standard single item. Structured modules based on the World Mental Health version of the Composite International Diagnostic Instrument (Kessler and Ustun 2004) are used to assess DSM-IV criteria for alcohol and other substance abuse and dependence and for major depression.

Socioeconomic and Demographic Characteristics

Additional information was collected on respondents' age, sex, marital status, race/ethnicity, urban/rural residence, educational attainment, household size, language of interview, employment status, and income.

Statistical Analysis

Logistic regression models were used to estimate changes in service use outcomes associated with the DCE using a difference in differences (DiD) approach. Models included covariates for age group (age 19–25 vs. age 26–34), time period (Quarter 1, 2008 through Quarter 3, 2010 vs. Quarter 4, 2010 through Quarter 4, 2013) and the interaction between age group and time period. A statistically significant interaction between age group and time period, indicating differential time trends across age groups, is interpreted as an effect of the DCE. Models were adjusted for sex, marital status, race/ethnicity, education, urban/rural, household size, language of interview, employment status, poverty, self-rated health, substance use disorders, major depression, K6 and WHODAS. The difference in differences models were extended to triple difference models by including three way interactions between age group, time period and race/ethnic group (White vs. Black and White vs. Hispanic). Significant three-way interactions are interpreted as indications of heterogeneous effect of the DCE across race/ethnic groups. Our primary DiD tests were specified using a logistic regression model, which is suitable for outcomes with relatively low prevalence. Supplemental analyses of predicted marginal effects from the logistic regression model and an alternative specification of the DiD model using a linear (OLS) regression were conducted to test the robustness of the results to the model form and provide more easily interpretable estimates of population level effects.

Results

The two age groups differ in expected, age-related ways with respect to demographic and socioeconomic characteristics (Table 1). The older age group is more likely to be married, to have graduated from high school, to be employed full-time, and to have an income greater than $75,000. There are also some age-related differences in health status, including higher prevalence of substance use disorder in the younger group, and higher lifetime prevalence of major depression in the older group. There are a number of within age-group differences between the two time periods that reach statistical significance (marked by bold font), though these are small in magnitude. Notably, there is an increase over time in both age groups in the proportion with some college or a college degree and in the proportion living in poverty. Among the younger age group there is a decrease in the prevalence of substance use disorders and an increase in the prevalence of major depression and any mental illness. There are no differences across the age period in behavioral health conditions.

Trends in service use for the period 2008 through 2013, the period immediately before and after implementation of the DCE in September of 2010, are shown by age group in Fig. 1. Prescription medication is the most commonly used type of service among both age groups, followed by use of outpatient mental health treatment and then by inpatient treatment, which is used by close to 1% of the sample. Use of prescription medication was increasing in both age groups prior to 2010, when it declined slightly among the older group and continued to increase slowly among the younger group. Use of outpatient treatment declined among the older group in 2012, while slightly increasing among the younger group. Use of inpatient services declined slightly in the older group beginning in 2010, though the two age groups had very similar levels of utilization in 2013, 1.0% among the older group and 1.1% among the younger group.

Comparing service utilization for the periods before and after the DCE, without adjustment for covariates, use of mental health services increased by 0.64% points more among the 19–25 age group than it did among the 26–34 age group (0.88% vs. 0.24%; Table 2). The relative increase in the younger compared with the older age group was slightly larger for use of prescription medication (0.74% points) and slightly smaller for use of mental health outpatient treatment (0.47% points). Use of outpatient mental health treatment and prescription medication in combination saw the largest relative increase among the three patterns of outpatient care examined. There was also a small relative increase in use of inpatient psychiatric services (0.13% points), which was largely due to individuals receiving both inpatient and outpatient services as opposed to inpatient services without outpatient services.

Results of the adjusted difference in differences models are shown for the total population, and separately for those with and those without any mental illness (Table 3). In the total population, the odds of use of any mental health services and use of prescription medications increased significantly over this period among both age groups, with significantly larger increases in the younger than the older group. This pattern is similar for treatment with medication only and combination treatment; though the relative increases in the younger compared to the older group are of similar magnitude, neither reaches statistical significance. The difference-in-difference estimates for use of inpatient treatment are larger in magnitude, but do not reach statistical significance due to the low frequency of this outcome. Estimates are of similar magnitude for inpatient treatment with (OR = 1.33) or without (OR = 1.32) outpatient treatment.

Table 1 Demographics, socioeconomic characteristics, and health status of the 19–25 year old and 26–34 year old age groups, before and after implementation of the dependent care expansion

Demographics, socioeconomic characteristics and health conditions	19–25				26–34			
	Pre		Post		Pre		Post	
	%	SE	%	SE	%	SE	%	SE
Sex	50.14	0.37	49.80	0.31	50.16	0.58	49.15	0.49
Marital status								
Married	**13.45**	**0.28**	**11.84**	**0.19**	**49.61**	**0.57**	**46.29**	**0.53**
Widowed/divorced/separated	**2.07**	**0.09**	**1.86**	**0.08**	**9.51**	**0.31**	**9.31**	**0.30**
Never been married	**84.48**	**0.29**	**86.30**	**0.21**	**40.88**	**0.58**	**44.40**	**0.52**
Race/ethnicity								
NH White	**61.13**	**0.55**	**57.53**	**0.36**	59.53	0.59	58.05	0.65
NH Black	**14.11**	**0.38**	**13.93**	**0.26**	12.93	0.41	12.50	0.39
NH Native American	**0.97**	**0.07**	**1.10**	**0.06**	0.79	0.09	0.98	0.07
NH Asian	**4.46**	**0.19**	**5.24**	**0.25**	5.71	0.39	6.48	0.25
NH multiracial	**1.27**	**0.06**	**1.96**	**0.09**	1.13	0.11	1.39	0.10
Hispanic	**18.05**	**0.48**	**20.25**	**0.34**	19.90	0.56	20.61	0.54
Education								
Less than high school	**13.45**	**0.27**	**11.76**	**0.21**	**13.24**	**0.41**	**13.25**	**0.30**
High school graduate	**32.16**	**0.40**	**31.64**	**0.39**	**26.71**	**0.53**	**24.75**	**0.42**
Some college	**37.88**	**0.45**	**39.85**	**0.41**	**26.19**	**0.51**	**26.54**	**0.39**
College graduate	**16.52**	**0.31**	**16.75**	**0.31**	**33.87**	**0.64**	**35.45**	**0.39**
Urban/rural								
Large metro	**52.39**	**0.63**	**52.34**	**0.53**	54.95	0.70	55.77	0.69
Small metro	**32.36**	**0.58**	**33.66**	**0.62**	30.73	0.69	30.91	0.61
Nonmetro CBSA	**10.52**	**0.50**	**9.11**	**0.25**	9.04	0.35	8.36	0.33
Nonmetro Non-CBSA	**4.73**	**0.23**	**4.88**	**0.21**	5.29	0.30	4.95	0.29
Household size								
One	**5.73**	**0.20**	**5.08**	**0.14**	8.18	0.29	7.90	0.36
Two	**23.48**	**0.35**	**21.09**	**0.30**	23.83	0.62	24.13	0.57
Three	**26.24**	**0.43**	**26.32**	**0.27**	22.50	0.55	22.85	0.38
Four	**22.66**	**0.43**	**23.85**	**0.34**	23.25	0.52	22.79	0.47
Five	**11.68**	**0.28**	**12.96**	**0.25**	12.75	0.41	12.72	0.34
Six or more	**10.22**	**0.28**	**10.70**	**0.27**	9.49	0.30	9.62	0.29
Language of interview (Spanish)	**3.94**	**0.20**	**2.96**	**0.13**	6.71	0.31	6.23	0.28
Employment status								
Full time	**44.13**	**0.46**	**41.96**	**0.39**	**66.88**	**0.48**	**65.43**	**0.40**
Part time	**25.93**	**0.38**	**26.29**	**0.32**	**11.82**	**0.31**	**12.94**	**0.32**
Unemployed	**10.98**	**0.23**	**11.73**	**0.19**	**7.08**	**0.28**	**6.69**	**0.22**
Other	**18.96**	**0.40**	**20.02**	**0.30**	**14.22**	**0.32**	**14.94**	**0.39**
Poverty								
Living in poverty	**23.45**	**0.43**	**27.94**	**0.44**	**14.09**	**0.41**	**17.03**	**0.39**
Income up to 2× poverty	**24.44**	**0.35**	**24.91**	**0.30**	**21.81**	**0.47**	**22.74**	**0.38**
Income LT 75K/student in dorm	**32.53**	**0.44**	**27.57**	**0.34**	**36.56**	**0.52**	**33.20**	**0.51**
Income 75K or greater	**19.58**	**0.34**	**19.58**	**0.36**	**27.54**	**0.53**	**27.03**	**0.47**
Self-rated health								
Excellent	29.56	0.34	29.24	0.27	29.20	0.65	27.76	0.40
Very good	41.09	0.36	41.52	0.25	39.14	0.59	39.97	0.50
Good	23.54	0.30	23.48	0.26	24.68	0.56	24.95	0.43
Fair	5.37	0.17	5.26	0.13	6.21	0.26	6.53	0.22
Poor	0.43	0.05	0.50	0.04	0.78	0.09	0.79	0.10
Substance use disorders	**21.16**	**0.28**	**18.92**	**0.23**	14.08	0.40	13.16	0.36
Major depression								

Table 1 (continued)

Demographics, socioeconomic characteristics and health conditions	19–25				26–34			
	Pre		Post		Pre		Post	
	%	SE	%	SE	%	SE	%	SE
Prior to past year only	**5.74**	**0.14**	**5.81**	**0.13**	7.31	0.28	7.29	0.25
Past year	**8.15**	**0.18**	**8.73**	**0.15**	7.68	0.28	7.78	0.23
Any mental illness	**18.55**	**0.32**	**19.57**	**0.23**	22.26	0.44	22.73	0.42

Bold font indicates statistically significant differences across time periods within age groups

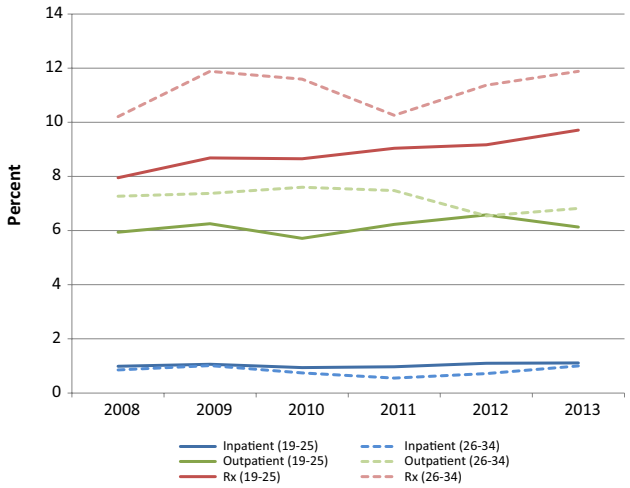

Fig. 1 Trends in MH services by age group, 2008–2013

The pattern of change in the younger group relative to the older group differs between those with and those without a mental illness. Among those without a mental illness, estimates of differences in the change between the age groups range from 0.87 (outpatient MH only) to 1.15 (combination medication and outpatient treatment) and none reach statistical significance, despite the large sample size for this sub-population. However, among those with mental illness, odds of use of any mental health treatment (OR = 1.24, 95% CI 1.05–1.46) and odds of use of prescription medication (OR = 1.19, 95% CI 1.01–1.41) increased significantly more among the younger than the older age group, consistent with an impact of the DCE. The estimated population level effects, based on predicted marginals estimated in the logistic regression model were 2.00% (95% CI −0.07 to 4.06%) and 1.35% (95% CI −0.35 to 3.06%), respectively (Estimates of population level effects based on predicted marginals for all models are available as a supplemental table). Estimates of relative increase in the younger vs the older age group are of a similar magnitude but do not reach statistical significance for use of outpatient mental health treatment and use of inpatient mental health treatment (ORs = 1.18 and 1.54 respectively). There is no evidence that the impact of the DCE was differential with respect to prescription medication as opposed to outpatient treatment.

The potential impact of the DCE on disparities in service use between Whites and Blacks or Hispanics was examined using triple difference models. Due to small sample sizes for inpatient service use, examination of disparities was limited to medication and outpatient services. No significant differential impacts on disparities were found with one exception, the comparison between Whites and Hispanics among people with no mental illness (Table 4: Results of the White vs. Hispanic comparison for the entire sample and the subsample with a mental illness are included as Supplemental Table S1 and Supplemental Table S2, respectively). Among people with no mental illness, odds of use of mental health services increased during this time period among Whites to a greater extent than it did among Hispanics, with significant ORs ranging from 1.97 (95% CI 1.11–3.49) for any mental health treatment to 2.72 (95% CI 1.10–6.74) for outpatient mental health treatment. The increase is particularly strong for treatment involving both medication and outpatient services (OR = 6.71, 95% CI 1.58–28.44). However, close consideration of the changes within each of the groups that comprise the triple difference estimate suggests that the DCE may not be responsible for the observed significant effects. In particular, the finding appears to be driven by a very large increase in use of services among the older Hispanic group. This pattern contrasts with the findings shown above, where the largest increases in service use were observed in the specific group targeted by the policy.

Two additional analyses were conducted to examine the robustness of the findings (results available from the authors). First, we tested for parallel trends in the outcomes during the pre-DCE period using 'placebo tests' (Slusky 2015), in which 2008 was examined as a placebo intervention time point. None of the placebo models found significant DiD effects. Second, we examined whether the results were sensitive to the model specification by estimating the DD models in a linear, rather than logistic regression (results available from the authors). Significant effects in the logistic model were in the same direction with p-values below 0.1 in the linear regression; none of the non-significant findings

Table 2 Prevalence of mental health services use by age group before and after the dependent care expansion in September, 2010

Type of service use	Age 19–25					Age 26–34					Difference in differences
	Before		After		Difference	Before		After		Difference	
	%	Weighted n	%	Weighted n		%	Weighted n	%	Weighted n		
Any MH service	11.08	1747	11.96	2717	0.88	13.62	2703	13.86	3902	0.24	0.64
Any MH medication	8.38	1322	9.21	2092	0.83	11.14	2212	11.23	3162	0.09	0.74
Any MH outpatient	6.01	949	6.22	1414	0.21	7.34	1456	7.08	1994	−0.26	0.47
Medication only	4.71	743	5.43	1233	0.72	6.05	1201	6.52	1835	0.47	0.25
Outpatient MH without medication	2.35	370	2.44	555	0.09	2.24	446	2.37	667	0.13	−0.04
Both outpatient MH and medication	3.67	578	3.78	859	0.11	5.09	1011	4.71	1327	−0.38	0.49
Any inpatient	1	157	1.05	239	0.05	0.86	170	0.78	218	−0.08	0.13
Inpatient with outpatient MH	0.52	81	0.56	128	0.04	0.56	112	0.48	136	−0.08	0.12
Inpatient without outpatient MH	0.48	76	0.49	111	0.01	0.3	59	0.29	82	−0.01	0.02

Positive difference in differences results indicate the percent increase in prevalence among the 19–25 age group relative to the 26–34 age group

Table 3 DD estimates of impacts of DCE on BH service use

Type of service use	Total population				No mental illness				Any mental illness			
	18–25	26–34	DD		18–25	26–34	DD		18–25	26–34	DD	
	OR	OR	OR	CI	OR	OR	OR	CI	OR	OR	OR	CI
Any mental health treatment	**1.74**	**1.55**	**1.13**	**(1, 1.28)**	1.67	1.64	1.02	(0.84, 1.24)	**1.81**	1.46	**1.24**	**(1.05, 1.46)**
Prescription medication for mental health	**1.84**	**1.59**	**1.15**	**(1.01, 1.32)**	**2.15**	**1.96**	1.10	(0.88, 1.36)	1.59	1.33	**1.19**	**(1.01, 1.41)**
Outpatient mental health treatment	1.18	1.07	1.10	(0.93, 1.3)	0.76	0.76	1.00	(0.74, 1.34)	1.51	1.28	1.18	(0.95, 1.46)
Medication only	**2.16**	**1.91**	1.13	(0.95, 1.34)	**2.77**	**2.59**	1.07	(0.83, 1.38)	**1.66**	1.41	1.18	(0.97, 1.43)
Outpatient treatment only	1.25	1.23	1.02	(0.8, 1.3)	0.72	0.83	0.87	(0.61, 1.24)	1.95	1.65	1.18	(0.87, 1.6)
Medication and outpatient treatment	1.13	1.00	1.13	(0.92, 1.39)	0.88	0.76	1.15	(0.76, 1.74)	1.24	1.11	1.11	(0.87, 1.42)
Inpatient mental health treatment	1.57	1.18	1.34	(0.91, 1.96)	1.55	1.71	0.91	(0.4, 2.07)	1.55	1.01	1.54	(0.94, 2.51)
Inpatient w/ outpatient treatment	2.33	1.75	1.33	(0.82, 2.15)			*				*	
Inpatient w/o outpatient treatment	0.86	0.65	1.32	(0.69, 2.51)			*				*	

Bold font indicates statistical significance at the p = .05 level

*Results not reported due to small sample sizes

Table 4 DDD estimates of impacts of DCE on disparities between Whites and Hispanics (no mental illness)

Service use measure	Difference: post and pre-ACA in W (19–25)	Difference: post and pre-ACA in W (26–34)	DD among Whites		Difference: post and pre-ACA in H (19–25)	Difference post and pre-ACA in H (26–34)	DD among Hispanics		DDD: W-H between age groups before and after ACA	
	OR	OR	OR	(95% CI)	OR	OR	OR	(95% CI)	OR	(95% CI)
Any mental health treatment	**1.80**	1.40	1.12	(0.9, 1.39)	1.61	**2.46**	0.57	(0.32, 1)	**1.97**	**(1.11, 3.49)**
Prescription medication for mental health	**2.29**	**1.94**	1.20	(0.95, 1.52)	**1.90**	**3.24**	0.60	(0.3, 1.2)	**2.01**	**(1.03, 3.91)**
Outpatient mental health treatment	0.82	0.55	1.18	(0.84, 1.66)	0.70	1.26	0.43	(0.18, 1.02)	**2.72**	**(1.1, 6.74)**
Medication only	**2.86**	**2.84**	1.10	(0.81, 1.47)	**2.61**	**3.26**	0.87	(0.4, 1.9)	1.26	(0.55, 2.87)
Outpatient treatment only	0.74	0.58	0.91	(0.61, 1.36)	0.82	0.80	0.72	(0.22, 2.38)	1.25	(0.35, 4.43)
Medication and outpatient treatment	1.00	0.57	1.49	(0.97, 2.28)	0.67	2.56	0.22	(0.05, 0.94)	**6.71**	**(1.58, 28.44)**

Bold font indicates statistical significance at the p = .05 level

in the logistic model had p-values below 0.1 in the linear regression models.

Discussion

The DCE, which aimed to increase health insurance coverage for young adults, has particular significance for mental health. Young adulthood is a period when physical health tends to be good and behavioral health conditions predominate as health concerns. Historically, young adulthood has also been the period during which Americans were least likely to have health insurance coverage (Collins et al. 2012). While the evidence to date suggests that the DCE has been successful in increasing insurance coverage among young adults and in increasing utilization of mental health care (Breslau et al. 2018), this study addresses several potential undesired impacts of the policy related not simply to the likelihood service use but to the types of service use affected and the allocation of care in the population. We do not find evidence that the potential adverse impacts of the DCE occurred. In fact, our findings are consistent with a positive impact of the DCE on its most directly targeted group, young adults with mental health problems. We discuss each of the three research questions in turn.

First, we observe an association of the DCE with an increase in utilization of mental health services that is specific to the population with a mental health problem, as indicated by a combination of their psychological distress and associated functional impairment. It is worth noting that the study has much greater statistical power to find associations in the group with no mental illness, which comprises close to 80% of the sample. The large sample size in the group with no mental illness adds confidence to the finding of no association. The finding that the DCE is associated with increased utilization only among those with high clinical need for mental health treatment allays concerns that increasing insurance coverage might induce utilization among those with low levels of need, crowding-out patients with more serious conditions. The evidence suggests that the DCE did have an impact on utilization of mental health services and that its impact was limited to its intended target population.

Second, we do not find evidence that the increase in coverage led primarily to an increase in treatment with medication, or, of particular concern, treatment with medication in the absence of specialty mental health care. Medication treatment is the most common form of treatment and was the only type of treatment to be significantly associated with the DCE. However, associations between the DCE and specialty care are equally large, despite not reaching statistical significance. In addition, the association of the DCE with medication-only treatment was of similar magnitude and did

not reach statistical significance. The most reasonable interpretation of the results is that any impact of the on utilization occurred across all categories of mental health care.

Third, the DCE does not appear to have affected racial/ethnic disparities in utilization of behavioral health care. There were no statistically significant differences in the impact of the DCE across groups in the overall population or, notably, in the population with a mental illness, the group among which effects of the DCE were observed. The one exception was an indication that the DCE may have increased disparities between Whites and Hispanics among people with no mental illness. This finding should be interpreted with caution because it was driven by a large increase in utilization among the older age group of Hispanics rather than an increase in utilization among the age group directly affected by the DCE.

These results should be interpreted in light of the following limitations. First, our definition of mental illness is based on a predicted probability of having a mental illness rather than direct assessment of diagnostic criteria (Aldworth et al. 2010). The assessment of mental illness in the NSDUH is calibrated to diagnoses assessed through standardized interviews, but it lacks detail that would allow identification of effects related to specific types of mental health problems. Second, the information in the survey does not allow direct examination of quality of care. Assessments of quality would require additional information on the number of visits, types of medication and specific diagnoses so that clinical guidelines could be applied. Treatment with medication in the absence of specialty mental health care is a proxy for poor quality of care, but not a definitive assessment; if poor quality care was affected we would expect an increase in this pattern of care. It is also possible that individuals who report specialty mental health care did not receive guideline concordant care. Studies with more detailed information on care are needed to further investigate the relationship between insurance expansions and quality of mental health care. Third, due to sample size limitations, differentiating effects on inpatient treatment with from inpatient treatment without outpatient treatment was not possible for the sub-population analyses. Fourth, when estimated on the prevalence scale, using predicted marginals, association that had statistically significant odds ratios were not statistically significant at the $p = .05$ level though they were similar in direction and magnitude.

Given the clear evidence that large portions of individuals with clinically significant psychiatric disorders do not receive treatment numerous policy efforts have been made to increase utilization by removing financial and other barriers to care (Mojtabai et al. 2011). However, these efforts are complicated by equally well documented problems of quality and allocation of care (Han et al. 2016). For policies to be successful they must not only increase utilization, but increase receipt of quality care by individuals with high need for care. The DCE appears to have achieved the intended positive impacts on utilization in a particularly hard to reach population, without exacerbating problems of allocation of care. These findings support the potential for policies that further expand health insurance coverage to reduce the burden of psychiatric disorders during young adulthood.

Funding This research was supported by a Grant from the National Institute on Minority Health and Health Disparities (R01 MD010274).

Compliance with Ethical Standards

Conflict of interest The authors have no conflict of interest to report.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Study procedures were approved by the Human Subjects Protection Committee of the RAND Corporation.

References

Adams, A. S., Soumerai, S. B., Zhang, F., Gilden, D., Burns, M., Huskamp, H. A., … Madden, J. M. (2015). Effects of eliminating drug caps on racial differences in antidepressant use among dual enrollees with diabetes and depression. *Clinical Therapeutics, 37*(3), 597–609. https://doi.org/10.1016/j.clinthera.2014.12.011.

Aldworth, J., Colpe, L. J., Gfroerer, J. C., Novak, S. P., Chromy, J. R., Barker, P. R., … Spagnola, K. (2010). The National Survey on Drug Use and Health Mental Health Surveillance Study: Calibration analysis. *International Journal of Methods in Psychiatric Research, 19*(Suppl 1), 61–87. https://doi.org/10.1002/mpr.312.

Baicker, K., Taubman, S. L., Allen, H. L., Bernstein, M., Gruber, J. H., Newhouse, J. P., … Finkelstein, A. N. (2013). The Oregon experiment—Effects of medicaid on clinical outcomes. *New England Journal of Medicine, 368*(18), 1713–1722. https://doi.org/10.1056/NEJMsa1212321. doi.

Breslau, J., Han, B., Stein, B. D., Burns, R. M., & Yu, H. (2017). Did the Affordable Care Act's dependent coverage expansion affect race/ethnic disparities in health insurance coverage? *Health Services Research*. https://doi.org/10.1111/1475-6773.12728.

Breslau, J., Lane, M., Nancy, S. B., & Kessler, R. C. (2008). Mental disorders and subsequent educational attainment in a US national sample. *Journal of Psychiatric Research, 42*(9), 708–716.

Breslau, J., Miller, E., Jin, R., Sampson, N. A., Alonso, J., Andrade, L. H., … Kessler, R. C. (2011). A multinational study of mental disorders, marriage, and divorce. *Acta Psychiatrica Scandinavica, 124*(6), 474–486. https://doi.org/10.1111/j.1600-0447.2011.01712.x.

Breslau, J., Stein, B. D., Han, B., Shelton, S., & Yu, H. (2018). Impact of the Affordable Care Act's dependent coverage expansion on the health care and health status of young adults: What do we know so far? *Medical Care Research and Review, 75*, 131–152.

Center for Behavioral Health Statistics and Quality. (2016). *2014 National Survey on drug use and health: Methodological resource book (Sect. 10, Editing and Imputation Report)*. Rockville, MD Retrieved from http://www.samhsa.gov/data/sites/default/files/NSDUHmrbEditAndImp2014.pdf.

Collins, S. R., Robertson, R., Garber, T., & Doty, M. M. (2012). Young, uninsured, and in debt: Why young adults lack health insurance and how the Affordable Care Act is helping: Findings from the Commonwealth Fund Health Insurance Tracking Survey of Young Adults, 2011. *Issue Brief (Commonw Fund), 14*, 1–24.

Colpe, L. J., Barker, P. R., Karg, R. S., Batts, K. R., Morton, K. B., Gfroerer, J. C., … Aldworth, J. (2010). The National survey on drug use and health mental health surveillance study: Calibration study design and field procedures. *International Journal of Methods in Psychiatric Research, 19*(Suppl 1), 36–48. https://doi.org/10.1002/mpr.311.

Cook, B. L., Zuvekas, S. H., Carson, N., Wayne, G. F., Vesper, A., & McGuire, T. G. (2014). Assessing racial/ethnic disparities in treatment across episodes of mental health care. *Health Services Research, 49*(1), 206–229. https://doi.org/10.1111/1475-6773.12095.

DeLeire, T., Dague, L., Leininger, L., Voskuil, K., & Friedsam, D. (2013). Wisconsin experience indicates that expanding public insurance to low-income childless adults has health care impacts. *Health Affairs, 32*(6), 1037–1045. https://doi.org/10.1377/hlthaff.2012.1026.

Druss, B. G., Wang, P. S., Sampson, N. A., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2007). Understanding mental health treatment in persons without mental diagnoses: Results from the National Comorbidity Survey Replication. *Archives of General Psychiatry, 64*(10), 1196–1203. https://doi.org/10.1001/archpsyc.64.10.1196.

Gibb, S. J., Fergusson, D. M., & Horwood, L. J. (2010). Burden of psychiatric disorder in young adulthood and life outcomes at age 30. *The British Journal of Psychiatry, 197*(2), 122–127. https://doi.org/10.1192/bjp.bp.109.076570.

Golberstein, E., Busch, S. H., Zaha, R., Greenfield, S. F., Beardslee, W. R., & Meara, E. (2015). Effect of the affordable care act's young adult insurance expansions on hospital-based mental health care. *American Journal of Psychiatry, 172*(2), 182–189. https://doi.org/10.1176/appi.ajp.2014.14030375.

Han, B., Compton, W. M., Mojtabai, R., Colpe, L., & Hughes, A. (2016). Trends in receipt of mental health treatments among adults in the United States, 2008–2013. *Journal of Clinical Psychiatry, 77*(10), 1365–1371. https://doi.org/10.4088/JCP.15m09982.

Huhn, M., Tardy, M., Spineli, L. M., Kissling, W., Förstl, H., Pitschel-Walz, G., … & Leucht, S. (2014). Efficacy of pharmacotherapy and psychotherapy for adult psychiatric disorders: A systematic overview of meta-analyses. *JAMA Psychiatry, 71*(6), 706–715. https://doi.org/10.1001/jamapsychiatry.2014.112.

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L. T., … Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*(6), 959–976. https://doi.org/10.1017/s0033291702006074.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., … Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry, 60*(2), 184–189. https://doi.org/10.1001/archpsyc.60.2.184.

Kessler, R. C., & Ustun, T. B. (2004). The world mental health (WMH) survey initiative version of the World Health Organization (WHO) composite international diagnostic interview (CIDI). *International Journal of Methods in Psychiatric Research, 13*(2), 93–121.

Mojtabai, R., Olfson, M., Sampson, N. A., Jin, R., Druss, B., Wang, P. S., … Kessler, R. C. (2011). Barriers to mental health treatment: Results from the National Comorbidity Survey Replication. *Psychological Medicine, 41*(8), 1751–1761. https://doi.org/10.1017/S0033291710002291.

Novak, S. P., Colpe, L. J., Barker, P. R., & Gfroerer, J. C. (2010). Development of a brief mental health impairment scale using a nationally representative sample in the USA. *International Journal of Methods in Psychiatric Research, 19*(Suppl 1), 49–60. https://doi.org/10.1002/mpr.313.

Park, M. J., Mulye, T. P., Adams, S. H., Brindis, C. D., & Irwin Jr, C. E. (2006). The health status of young adults in the United States. *Journal of Adolescent Health, 39*(3), 305–317. https://doi.org/10.1016/j.jadohealth.2006.04.017.

Saloner, B., & Le Cook, B. (2014). An ACA provision increased treatment for young adults with possible mental illnesses relative to comparison group. *Health Affairs, 33*(8), 1425–1434. https://doi.org/10.1377/hlthaff.2014.0214.

Shane, D. M., Ayyagari, P., & Wehby, G. (2016). Continued gains in health insurance but few signs of increased utilization: An update on the ACA's dependent coverage mandate. *Medical Care Research and Review, 73*(4), 478–492. https://doi.org/10.1177/1077558715617066.

Slusky, D. J. (2015). Significant placebo results in difference-in-differences analysis: The case of the ACA's parental mandate. *Eastern Economic Journal, 43*, 1–24.

Sommers, B. D., Buchmueller, T., Decker, S. L., Carey, C., & Kronick, R. (2013). The affordable care act has led to significant gains in health insurance and access to care for young adults. *Health Affairs, 32*(1), 165–174. https://doi.org/10.1377/hlthaff.2012.0552.

Sommers, B. D., & Kronick, R. (2012). The affordable care act and insurance coverage for young adults. *JAMA, 307*(9), 913–914. https://doi.org/10.1001/jama.307.9.913.

Wang, P. S., Lane, M., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2005). Twelve-month use of mental health services in the United States: Results from the national comorbidity survey replication. *Archives of General Psychiatry, 62*(6), 629–640.

Yu, J. W., Adams, S. H., Burns, J., Brindis, C. D., & Irwin, C. E. Jr. (2008). Use of mental health counseling as adolescents become young adults. *Journal of Adolescent Health, 43*(3), 268–276. https://doi.org/10.1016/j.jadohealth.2008.01.009.