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ORIGINAL ARTICLE

Availability of Youth Services in U.S. Mental Health Treatment Facilities

Janet R. Cummings[1] · Brady G. Case[2,3,4] · Xu Ji[1] · Steven C. Marcus[5,6]

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Abstract Despite concern about access to mental health (MH) services for youth, little is known about the specialty treatment infrastructure serving this population. We used national data to examine which types of MH treatment facilities (hospital- and community-based) were most likely to offer youth services and which types of communities were most likely to have this infrastructure. Larger ($p < 0.001$) and privately owned ($p < 0.001$) facilities were more likely to offer youth services. Rural counties, counties in which a majority of residents were nonwhite, and/or counties with a higher percentage of uninsured residents were less likely to have a community-based MH treatment facility that served youth ($p < 0.001$).

Keywords Children and adolescents · Access to services · Mental health facilities

✉ Janet R. Cummings
jrcummi@emory.edu

[1] Department of Health Policy and Management, Rollins School of Public Health, Emory University, 1518 Clifton Road NE, Atlanta, GA 30322, USA

[2] Health Services Research Program, Bradley Hospital, East Providence, USA

[3] Department of Psychiatry and Human Behavior, Alpert Medical School of Brown University, Providence, USA

[4] Department of Health Services, Policy and Practice, Brown School of Public Health, Providence, USA

[5] Center for Health Equity Research & Promotion, Philadelphia Veterans Affairs Medical Center, Philadelphia, USA

[6] School of Social Policy & Practice, University of Pennsylvania, Philadelphia, USA

Introduction

Although one in five youth have suffered from a mental health (MH) disorder resulting in severe impairment at some point during their lifetime (Merikangas et al. 2010), less than half have ever received any MH treatment (Merikangas et al. 2011). Concern among policymakers, researchers, and practitioners has increasingly focused on poor availability of youth MH services as an impediment to care. For example, a White House report released in January 2013 emphasized the importance of "making sure students and young adults get treatment for MH issues" (The White House 2013). Developing strategies to achieve this goal will require a thorough understanding of the current MH treatment system. Yet, limited information exists concerning a key component of the system that provides MH care for our nation's youth-specialty MH treatment facilities.

Specialty MH treatment facilities provide services across the continuum of care in inpatient, residential, and/or outpatient settings, and they constitute key components of the broader MH treatment infrastructure that serves youth (Stroul 2002). Hospitals that offer inpatient MH treatment for youth provide services to those with very severe MH symptoms that require a highly restrictive treatment environment (Burns et al. 1999; American Academy of Child and Adolescent Psychiatry 1989). Inpatient hospitalization may be required for those who experience symptoms that pose a danger to themselves (e.g., suicidal ideation, eating disorders) or to others. Inpatient hospitalization may also be needed for an individual to be monitored during an acute episode when their mental illness is deteriorating (Mental Health America 2015).

Community-based MH treatment facilities also have a unique role within the broader youth-serving infrastructure by offering a range of evidence-based practices from which

youth in ongoing recovery may benefit. More specifically, these facilities typically offer psychotropic medication management, individual psychotherapeutic approaches, family therapy, and other psychosocial interventions that can benefit youth with MH disorders that vary by type and severity (Substance Abuse and Mental Health Services Administration 2014; Hoagwood et al. 2001). The availability of services beyond medication management is especially important for children and adolescents because practice guidelines for many common youth MH disorders (e.g., anxiety and disruptive behavioral disorders) recommend psychosocial interventions as first-line treatment in lieu of or concurrent with medication (Birmaher et al. 2007; Subcommitee on Attention-Deficit/Hyperactivity Disorder Steering Committe on Quality Improvement and Management 2011; Connolly and Bernstein 2007). The breadth of services offered also enables these entities to serve as an important complement to other components of the community-based MH care system for youth, such as primary care settings and schools (Burns et al. 1995). In fact, although data indicate that the number of MH visits for children and adolescents has increased in recent years in primary care settings (Olfson et al. 2014), most pediatricians believe it is their responsibility to assess and refer rather than provide MH services for disorders other than attention-deficit/hyperactivity disorder (Heneghan et al. 2008; Stein et al. 2008). Furthermore, evidence-based MH programs in schools generally do not target specific clinical syndromes for youth (Rones and Hoagwood 2000).

In addition to the array of services offered by specialty community-based MH treatment facilities, another important function of these entities is that they help constitute the de-facto safety-net system for low-income youth with MH disorders. More specifically, over 90 % of MH treatment facilities that offer outpatient care accept Medicaid (Substance Abuse and Mental Health Services Administration 2014). In contrast, only 4 out of 10 office-based psychiatrists accept Medicaid (Bishop et al. 2014), and only 3–8 % of patient caseloads for psychiatrists in solo or group practice are covered by Medicaid (Jacobs et al. 2005). Access to services for low-income populations is especially paramount for the nearly half of youth that are insured through Medicaid and other public programs (39 %) or that are uninsured (8 %) (The Henry J. Kaiser Family Foundation 2013).

In spite of the critical role of specialty MH facilities in the child MH services infrastructure, little is known about which of these facilities are most likely to offer youth services. Data indicate that approximately three-fourths of stand-alone outpatient MH treatment facilities provide youth services, while less than half of hospital-based MH treatment facilities serve this population (Substance Abuse and Mental Health Services Administration 2014). As the U.S. MH care system evolves, it is important to understand whether there are systematic differences in the types of facilities that offer youth services. The implementation of the Mental Health Parity and Addiction Equity Act (MHPAEA) of 2008 and the Affordable Care Act (ACA) of 2010 will continue to improve the level of coverage for MH services among those with health insurance and expand insurance coverage to previously uninsured populations. Against the backdrop of these insurance expansions, the role of state governments in the organization and delivery of MH services has declined (Honberg et al. 2011) and MH treatment facilities and organizations are consolidating across the United States (Bogira 2009; Santilli 2012; Hill 2012). Consequently, understanding whether there are systematic differences in the characteristics of youth-serving facilities (e.g., ownership status and size) would provide an important foundation to assess how ongoing trends in this system may affect the accessibility of youth MH services in the coming years.

There is also limited information about the geographic availability of youth-serving specialty MH treatment facilities and the characteristics of areas in which these facilities are most likely to be located. Although research has found that nearly two-fifths of counties lack youth-serving MH facilities that provide outpatient care (Cummings et al. 2013), no comparable numbers are available for youth-serving hospital-based facilities. Concerns about bed shortages for youth in several regions of the country (Geller and Biebel 2006) have emerged in the context of a 60 % decline in the total number of inpatient psychiatric beds per capita in U.S. general and psychiatric hospitals between 1990 and 2008 (Substance Abuse and Mental Health Services Administration 2013; Centers for Disease Control and Prevention 2013). Information about geographic gaps in the availability of youth-serving hospital-based MH treatment facilities will provide a point of reference to assess how the consolidation within this infrastructure affects the geographic availability of youth services in the coming years.

In addition to describing the extent to which geographic gaps exist in the specialty MH treatment infrastructure for youth, it is also important to know whether certain types of communities are more likely to experience these gaps. Prior research has documented reduced access to community-based MH safety-net resources in rural (versus urban/suburban) counties, and in counties with a higher percentage of racial/ethnic minorities (Cummings et al. 2013a, b). Yet, to understand the variation in the availability of community-based MH facilities that serve youth, it is important to examine additional correlates that include the age distribution of the population and the health insurance status of low-income populations in a community. An examination of a more robust set of correlates

would inform which types of communities are least likely to have these crucial resources for the youth population and, consequently, which communities may experience the greatest supply-side constraints in the face of ongoing insurance expansions for MH services.

Using data from a national survey, this study addresses several gaps in the literature pertaining to youth service availability in hospital- and community-based MH treatment facilities. First, we examine the facility-level correlates associated with the provision of MH services for the youth population. Second, we provide descriptive information about the geographic accessibility of youth-serving MH treatment facilities. And finally, we examine the county-level correlates associated with the geographic availability of youth-serving MH treatment facilities. The findings from these analyses are discussed in light of current trends in the behavioral health care system.

Methods

Data

Data come from the 2008 National Survey of Mental Health Treatment Facilities (NSMHTF), which was sponsored by the Substance Abuse and Mental Health Services Agency to provide information on facilities that met the following criteria: (1) a formal establishment by law, regulation, charter, license, or agreement; (2) an established organizational structure, including a staffing structure; (3) a primary goal for all or part of the facility of improving the MH of its clientele; (4) a clientele with psychiatric, psychological, or associated social adjustment impairments; and (5) provision of MH services (National Survey of Mental Health Treatment Facilities 2008).

The sampling framework for the NSMHTF was developed from fourteen sources of information, including state mental health agencies and the National Council for Community Behavioral Healthcare (National Survey of Mental Health Treatment Facilities 2008). Six types of facilities were included in the survey: psychiatric hospitals, nonfederal general hospitals with a separate psychiatric inpatient unit, residential treatment centers for children with emotional disturbance, residential treatment centers for adults, freestanding outpatient facilities, and multisetting (non-hospital based) MH facilities. Individual and small group practices, general hospitals without a psychiatric inpatient unit, military facilities not operated by the Veterans Administration, Indian Health Service facilities, and correctional facilities were excluded from the survey. The survey was mailed to the facility director, and completed by the director or a staff member of the facility's administrative office.

Measures from the Area Health Resources File (AHRF) and the Dartmouth Atlas Project were merged with the NSMHTF (AHRF 2011; The Dartmouth Atlas of Health Care 2008). The AHRF is a county-level dataset with information about health care resources and sociodemographic characteristics. The Dartmouth Atlas Project provides information about geographic units of analysis that were created to study geographic variations in health care utilization and spending. In this study, we use the Hospital Service Area (HSA), which was developed to capture the local health care markets for hospital care (The Dartmouth Atlas of Health Care 2013). The nation is divided into 3436 HSAs.

Analytic Sample

A response rate of 74 % was achieved from the 13,068 facilities that were surveyed in the NSMHTF. Of the 1680 psychiatric hospitals and non-federal general hospitals (i.e., hospital-based facilities) that responded to the survey, we excluded 11 facilities located in Washington D.C. or in a U.S. territory, 117 facilities owned by the Veterans Affairs (because of the unique population they serve and because none of these facilities offered youth services), and 19 facilities missing information on key measures [i.e., whether it served youth ($n = 9$) and county-level sociodemographic characteristics ($n = 10$)]. These exclusions yielded for analysis a sample of 1533 hospital-based facilities. Of the 6365 stand-alone outpatient and multisetting facilities (i.e., community-based facilities) that responded to the survey, we excluded 29 facilities located in Washington D.C. or in a U.S. territory, 229 facilities owned by the Veterans Affairs, and 73 facilities missing information on key measures [i.e., whether it served youth ($n = 27$) and county-level sociodemographic characteristics ($n = 46$)]. These exclusions yielded a sample of 6034 community-based MH treatment facilities for analysis.

Measures

Facility-Level Measures

The first dependent variable was created using a question in which survey respondents were asked to indicate whether the facility provided services for those less than 18 years of age. Using the response to this question, we created a dichotomous indicator denoting facilities that provided any services for youth versus those that did not.

Facility-level independent variables included a categorical measure of ownership status (publicly owned; privately owned, for profit; and privately owned, not-for-profit), a measure of facility type as appropriate for each sample (hospital-based facilities: psychiatric hospital

versus general hospital with a psychiatric inpatient unit; community-based facilities: stand-alone outpatient facility versus multi-setting facility), a dichotomous measure of religious affiliation (yes, no), and a categorical measure of patient volume at the facility. For hospital-based treatment facilities, the measure of facility volume was created from a survey item that asked for the number of clients receiving MH services in a 24-h hospital inpatient care setting on April 30 of the survey year. For community-based facilities, this measure was created from a survey item that asked for the number of clients actively enrolled in an outpatient or partial care setting on April 30. The distribution of each measure was examined, and tertiles were used to classify facility patient volume as small, medium, or large. Among hospital-based facilities, small facilities included those with less than 15 clients; medium sized facilities included those with 15–39 clients; and large facilities included those with at least 40 clients in an inpatient setting on April 30. Among community-based facilities, small facilities included those with fewer than 130 clients; medium sized facilities included those with between 130 and 547 clients; and large facilities included those at least 548 clients enrolled in an outpatient or partial care setting on April 30.

County-Level Measures

Using the indicators denoting whether facilities offered youth services and the facility zip code, we aggregated these measures to the county-level to assess the number of each type of facility within the county. Based on this information, we created four dichotomous indicators for whether a county had: (1) any hospital-based MH treatment facility; (2) any hospital-based MH treatment facility that serves youth; (3) any community-based MH treatment facility; and (4) any community-based MH treatment facility that serves youth. We also created a measure of the number of youth-serving community-based MH treatment facilities in the county per 50,000 residents to examine in supplemental analyses.

County-level independent variables that assess local sociodemographic characteristics were created using the most recent year of data available in the AHRF preceding the facility survey year. Data from all U.S. counties were used to create categorical measures comprised of county-level quartiles of the percentage of residents that were: (1) living below the federal poverty level; (2) less than or equal to the age of 19; (3) enrolled in Medicaid; and (4) uninsured. Because the distribution of racial/ethnic composition is heavily skewed, a categorical measure was created to capture variation in the right tail of the distribution. The percentage of nonwhite residents (including Hispanics and racial minority groups) in the county was classified as: (1) $<$10 % of residents (42.4 % of all U.S. counties); (2) from 10 % to $<$25 % of residents (25.9 % of all U.S. counties); (3) between 25 and 50 % (22.1 % of U.S. counties); and (3) $\geq$50 % of residents (9.6 % of U.S. counties). Finally, we created an indicator for rural counties versus urban or suburban counties (2000), using the US Census Bureau definition of non-Core-Based statistical areas (United States Census Bureau 2015).

Analytic Strategy

Facility-Level Analysis

To provide contextual information about the specialty MH facilities in this sample, we describe the types of services offered in these settings-including MH and substance abuse treatments, supportive practices, and emergency services. In addition, we present descriptive information about service availability for low-income populations and non-English speaking populations. We used χ^2 tests to compare the likelihood that each type of service is offered in facilities that do and do not offer youth services.

To implement the first research objective, we examined the bivariate association between each facility-level characteristic and youth service provision using adjusted Wald tests. Next, we estimated logistic regression models to calculate the model-adjusted difference in the likelihood that youth services were offered by each type of facility. These regression models included each facility-level characteristic, county-level sociodemographic characteristics, county-level insurance coverage, and state indicators to control for unobserved differences in the state fiscal and mental health policy environment. Regressions also included indicators for facilities with missing values on a given covariate. Findings from sensitivity analyses that limited each sample to facilities with complete data on model covariates were similar in direction and significance to those presented below.

Standard errors were clustered at the county-level and marginal effects were estimated using the "margins" command in Stata Statistical Software (2013). We present the model-adjusted percentage point difference in the likelihood that facilities offer youth services for each category of a given measure relative to its reference group, holding the other covariates at their observed values.

County-Level Analysis

To describe the gaps in the geographic availability of this infrastructure, we calculated the percentage of counties and HSAs that had *any youth-serving* MH treatment facility as well as the percentage of counties and HSAs that had *any* MH treatment facility. To calculate these percentages, we

aggregated facility-level information to each of these geographic units of analysis using the county code in the NSMHTF and the ZIP code to HSA crosswalk file from the Dartmouth Atlas of Health Care (2008).

To achieve the third research objective, we first examined the bivariate association between each county-level variable and the availability of *any* youth-serving MH facility in the county using adjusted Wald tests. Next, we estimated logistic regression models to examine the association between each county-level characteristic and the likelihood that a county had any youth-serving MH treatment facility. These regression models included county-level measures of sociodemographic characteristics, insurance coverage, total population, and state indicators. We used the "margins" command to estimate the model-adjusted difference in the percentage of counties that have *any* youth-serving MH treatment facility for each covariate value relative to its reference group (i.e., adjusted percentage point difference), holding the other covariates at their observed values.

In supplemental analyses, we also examined the association between each county-level characteristic and the number of facilities per 50,000 residents in a given county using a two part model. This model was estimated with a logistic regression in the first stage, and an ordinary least squares with a log link and gamma distribution in the second stage. We estimated the marginal effects using the combined results from the two-part model, which can be interpreted as the model-adjusted difference in the number of youth serving facilities per capita for each covariate.

The Emory Institutional Review Board (IRB) determined that this study did not require IRB review because it was not classified as human subjects research.

Results

Types of Services Offered and Populations Served in Specialty MH Treatment Facilities

Descriptive information about the types of services offered by the specialty MH facilities in this sample is presented in Table 1. More than 95 % of hospital-based facilities and nearly three-quarters of community-based facilities offered psychotropic medication management services (Table 1). A range of psychotherapeutic and psychosocial services were also commonly provided in specialty MH treatment facilities. In community-based MH treatment facilities, for example, most facilities offered cognitive behavior therapy (87.2 %), interpersonal therapy (82.8 %), group therapy (79.8 %), couples counseling/family counseling (68.6 %), and family psychoeducational services (63.1 %). Compared to facilities that did not serve youth, facilities that offered youth services were more likely to offer every type of service that was examined ($p < 0.001$).

When examining service availability for vulnerable populations in specialty MH treatment facilities (Table 2), more than nine-tenths of hospital- and community-based facilities accepted Medicaid, and approximately seven-tenths offered services at no charge to those who cannot pay. Moreover, nearly half of hospital-based (49.1 %) and community-based facilities (45.9 %) offered services in Spanish. Compared to facilities that did not serve youth, youth-serving facilities were more likely to accept Medicaid ($p < 0.01$) and more likely to provide services in Spanish ($p < 0.01$).

Facility-Level Correlates Associated with Youth Service Provision

When examining which hospital-based facilities were most likely to offer youth services, results indicated that facility type, ownership status, and size were each correlated with youth service availability. More than half of psychiatric hospitals offered youth services, compared only to three-tenths of general hospitals with an inpatient psychiatric unit (Table 3). This difference remained sizeable and significant in the adjusted comparison (adjusted difference $= -18.3$ percentage points; $p < 0.001$). The adjusted comparisons also indicated that larger (vs smaller) hospital-based facilities and privately owned not-for profit and for-profit facilities (vs publically owned facilities) were more likely to offer youth services ($p < 0.001$). Additional tests indicated that the availability of youth services did not significantly differ between private for-profit and private not-for-profit facilities.

In supplemental analyses, we estimated stratified regressions for psychiatric hospitals and general hospitals with an inpatient psychiatric unit. These analyses revealed that the association between ownership status and youth service availability differed by hospital type. Although privately owned psychiatric hospitals were more likely to offer youth services than publicly owned psychiatric hospitals, private for-profit ownership (versus public ownership) was negatively associated with youth service availability (a 10.4 % point decrease, $p < 0.05$) among general hospitals with a psychiatric inpatient unit.

Turning next to community-based facilities, approximately three-fourths of stand-alone outpatient facilities and multisettings facilities offered youth services. As with hospital-based facilities, privately (vs publicly) owned and larger (vs smaller) community-based facilities were more likely to offer youth services ($p < 0.001$; Table 2). More specifically, regression results indicated that private for-profit ownership (versus public ownership) was associated with a 23.1 % point increase ($p < 0.001$) and private not-

Table 1 Types of services provided at specialty mental health treatment facilities

	Hospital-based facilities[+]			Community-based facilities[‡]		
	Total (N = 1533) %	Offer youth services		Total (N = 6034) %	Offer youth services	
		No[±] (n = 940) %	Yes[±] (n = 593) %		No[±] (n = 1467) %	Yes[±] (n = 4567) %
Mental health treatments offered[a,b]						
Psychotropic medication management	95.6	95.3	96.1	74.4	70.1	75.8***
Cognitive behavior therapy	79.0	73.4	87.8***	87.2	73.3	91.6***
Interpersonal therapy	81.1	78.1	85.8***	82.8	67.5	87.7***
Behavior modification	52.4	45.5	63.3***	60.5	44.9	65.4***
Couples counseling or family therapy	54.5	44.1	71.0***	68.6	36.6	78.8***
Group therapy	94.9	94.3	96.0	79.8	73.8	81.7***
Supportive practices[c,d]						
Family psychoeducation	65.2	58.7	74.3***	63.1	46.1	68.7***
Therapeutic foster care	1.3	0.8	2.1	9.5	0.6	12.4***
Multisystemic therapy	14.9	12.2	18.6**	21.3	8.6	25.5***
Functional family therapy	19.3	12.2	29.1***	26.8	6.5	33.5***
Any substance abuse services offered	49.5	40.4	63.9***	53.5	50.4	54.5**
Emergency services offered						
Emergency walk-in service available[e,f]	61.4	55.2	71.2***	38.2	29.1	41.1***
Offsite acute intervention team[g,h]	19.7	17.3	23.5**	29.5	24.8	31.0***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[+] Hospital-based facilities include psychiatric hospitals and nonfederal general hospitals with a separate psychiatric inpatient unit

[‡] Community-based facilities include stand-alone outpatient and multisetting (non-hospital based) facilities

[±] Statistical tests were conducted using Chi square tests

[a,c,e,g] Total does not add to 1533 hospital-based facilities due to missing values: [a] n = 2, [c] n = 403, [e] n = 3, [g] n = 17

[b,d,f,h] Total does not add to 6034 community-based facilities due to missing values: [b] n = 22, [d] n = 1005, [f] n = 4, [h] n = 98

for-profit ownership (vs public ownership) was associated with a 14.7 % point increase ($p < 0.001$) in the likelihood that facilities serve youth. Community-based facilities with a religious affiliation were also more likely to offer youth services than those without a religious affiliation (model-adjusted difference = 22.2 % points; $p < 0.001$).

Geographic Availability of Youth-Serving MH Treatment Facilities

The percentage of counties (25.8 %) and HSAs (28.9 %) with *any* hospital-based MH facility was more than twice as high as the percentage of counties (12.4 %) and HSAs (12.4 %) that had at least one youth-serving hospital-based facility (Table 4). However, the difference between the geographic availability of all MH facilities and youth-serving MH facilities was not as pronounced for community-based facilities. Nearly two-thirds of counties (65.7 %) and HSAs (65.8 %) had *any* community-based MH facility, compared to 62.3 % of counties and 61.3 % of HSAs that had at least one youth-serving community-based facility.

County-Level Correlates Associated with the Geographic Availability of Youth-Serving Facilities

The most important correlate associated with county-level availability of a youth-serving hospital based facility was whether the county is in an urban or suburban (versus rural) area (Table 5). Just over one-fifth of urban/suburban counties had one of these resources, compared to only 1 % of rural counties ($p < 0.001$); this difference remained sizeable and significant in the adjusted comparison. Counties with a higher percentage of uninsured residents

Table 2 Service availability for low-income and non-English speaking populations at specialty mental health treatment facilities

	Hospital-based facilities			Community-based facilities		
	Total (N = 1533) %	Offer youth services		Total (N = 6034) %	Offer youth services	
		No[±] (n = 940) %	Yes[±] (n = 593) %		No[±] (n = 1467) %	Yes[±] (n = 4567) %
Payments accepted						
Medicaid[a,b]	92.1	89.7	96.1***	91.0	88.8	91.7***
Sliding scale fee[c,d]	33.6	30.6	38.2**	77.5	68.8	80.3***
Services offered at no charge to those who cannot pay[e,f]	69.6	70.2	68.5	72.4	75.6	71.4**
Private insurance accepted[a,b]	95.2	93.8	97.4***	79.6	65.6	84.1***
Services offered in other language[g,h]						
Spanish	49.1	46.1	53.9**	45.9	39.1	48.1***
Other	25.0	25.5	24.2	13.8	14.9	13.4

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[±] Statistical tests were conducted using Chi square tests

[a,c,e,g] Total does not add to 1533 hospital-based facilities due to missing values: [a] n = 21, [c] n = 79, [e] n = 55, [g] n = 9

[b,d,f,h] Total does not add to 6034 community-based facilities due to missing values: [b] n = 92, [d] n = 99, [f] n = 133, [h] n = 39

were also less likely to have youth-serving hospital-based MH treatment facility in the unadjusted and adjusted comparisons. The model-adjusted probability of having any youth-serving hospital-based facility was more than 10 % points lower ($p < 0.001$) in counties classified in the second, third, and fourth quartile of the percentage of uninsured residents, compared to counties classified in the lowest quartile of the percentage of uninsured residents.

When examining the distribution of youth-serving community-based MH treatment facilities across counties, demographic characteristics and insurance coverage were associated with the geographic availability of these resources (Table 5). Counties with a higher percentage of children and adolescents ($p < 0.05$) and counties with a higher percentage of residents enrolled in Medicaid ($p < 0.001$) were *more* likely to have any youth-serving community-based facility. Supplemental analyses (not shown) revealed that the percentage of residents enrolled in Medicaid was also positively correlated with the number of youth-serving community-based facilities per capita in a given county ($p < 0.001$). On the other hand, counties with a higher percentage of racial/ethnic minorities ($p < 0.01$), rural counties ($p < 0.05$), and/or counties with a higher percentage of uninsured residents ($p < 0.05$) were less likely to have any youth-serving community-based facility. For example, the model-adjusted probability of having any youth-serving community-based facility was 12.1 % points *lower* ($p < 0.01$) in counties with more than 50 % of Nonwhite residents compared to counties in which less than 10 % of the residents were Nonwhite.

Discussion

We found that youth-serving hospital- and community-based MH facilities commonly provide an array of psychotherapeutic and psychosocial services in addition to psychotropic medication management, and that the vast majority of these facilities offer services to low-income populations. We observed systematic differences in the types of facilities that offer youth services—with larger, privately-owned facilities being the most likely to serve this population. Lastly, we identified substantial geographic gaps in the youth-serving specialty MH treatment infrastructure and key county-level correlates associated with the availability of these facilities across communities.

When examining the types of facilities that were most likely to serve youth, results indicated that privately-owned for-profit and non-profit MH treatment facilities were more likely to serve this population than publicly owned facilities. Since the time of this survey, there have been reports of increased investment in privately owned, for-profit corporations expanding their role in the organization and delivery of specialty MH services, as investors have identified this as a sector with the potential to offer high margins of return and growth opportunities (Hill 2012; Kutscher 2013). At the same time, the role of the public sector in the organization and delivery of services has declined. State mental health agencies experienced more than $4.4 billion in budget reductions between 2008 and 2013 (National Association of State Mental Health Program Directors 2014) resulting in an estimated 9 %

Table 3 Facility-level characteristics associated with youth service availability in specialty mental health treatment facilities

	Hospital-based facilities[+] (N = 1533)			Community-based facilities[‡] (N = 6034)		
	# of facilities	% that serve youth[§] (unadjusted)	Percentage point difference[±] (adjusted)	# of facilities	% that serve youth[§] (unadjusted)	Percentage point difference[±] (adjusted)
Facility type						
Psychiatric hospital	611	52.5 % (Ref)	(Ref)	–	–	–
General hospital with separate psychiatric inpatient unit	922	29.5 %***	−18.3 %***	–	–	–
Freestanding outpatient facility	–	–	–	4992	76.4 % (Ref)	(Ref)
Multisetting, non-hospital facility	–	–	–	1042	72.4 %**	−3.5 %*
Ownership type[a,b]						
Public	478	33.9 % (Ref)	(Ref)	1561	69.0 % (Ref)	(Ref)
Private, for profit	279	48.8 %***	14.6 %***	315	83.2 %***	23.1 %***
Private, not-for-profit	770	38.1 %	14.1 %***	4151	77.7 %***	14.7 %***
Facility patient volume						
Small (<33rd percentile)	333	17.7 % (Ref)	(Ref)	1364	65.6 % (Ref)	(Ref)
Medium (33rd–66th percentile)	384	34.9 %***	12.9 %***	1370	78.5 %***	15.2 %***
Large (>66th percentile)	387	56.6 %***	23.1 %***	1409	81.1 %***	20.7 %***
Missing information on volume	429	42.2 %***	18.0 %***	1891	76.9 %***	12.0 %***
Religious affiliation[c,d]						
No religious affiliation	1269	39.0 % (Ref)	(Ref)	5586	74.7 % (Ref)	(Ref)
Has religious affiliation	249	36.6 %	−4.8 %	386	90.7 %***	22.2 %***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[§] Statistical tests were conducted using adjusted Wald tests

[±] Adjusted percentage point difference based on results from logistic regression models that control for all covariates in the table, county socio-demographic characteristics, county-level insurance coverage, and state indicators; N = 15 hospital-based facilities and N = 14 community-based facilities were excluded from each respective regression model due to perfect prediction (e.g., all facilities in a specific state offered youth services)

[a,c] Total does not add to 1533 hospital-based facilities due to missing values: [a] n = 6, [c] n = 15

[b,d] Total does not add to 6034 community-based facilities due to missing values: [b] n = 7, [d] n = 62

Table 4 Geographic availability of specialty mental health treatment facilities in the United States

	County (N = 3141)		Hospital service area (N = 3436)	
	Any youth serving facility (%)	Any facility (%)	Any youth serving facility (%)	Any facility (%)
Hospital-based facility	12.4	25.8	12.4	28.9
Psychiatric hospital	7.3	12.8	7.0	12.6
General hospital with inpatient psychiatric unit	6.9	20.1	6.8	22.4
Community-based facility	62.3	65.7	61.3	65.8
Freestanding outpatient facility	55.5	59.5	55.1	60.2
Multi-setting, non-hospital facility	15.3	18.7	15.2	19.0

Data are from the National Survey of Mental Health Treatment Facilities (2008), the Area Health Resource Files, and the Dartmouth Atlas of Health Care

Table 5 County-level characteristics associated with the geographic availability of youth-serving specialty mental health treatment facilities

	# of counties (N = 3141)	Hospital-based facilities		Community-based facilities	
		% Counties with any facility[§] (unadjusted)	Percentage point difference[±] (adjusted)	% Counties with any facility[§] (unadjusted)	Percentage point difference[±] (adjusted)
Percentage of county residents living in poverty					
1st quartile (<10.8 %)	780	16.4 % (Ref)	(Ref)	66.9 % (Ref)	(Ref)
2nd quartile (10.8–14.1 %)	783	13.4 %	2.7 %***	61.7 %*	−1.3 %
3rd quartile (14.1–18.2 %)	786	14.4 %	6.0 %***	63.4 %	1.0 %
4th quartile (≥18.2 %)	792	5.4 %***	4.6 %***	57.3 %***	1.5 %
Percentage of county residents who are Nonwhite					
0–10 %	1333	6.8 % (Ref)	(Ref)	59.5 % (Ref)	(Ref)
10–25 %	814	15.7 %***	2.9 %***	67.9 %***	0.9 %
25–50 %	693	17.9 %***	4.8 %***	63.1 %	−2.5 %
50 % and higher	301	15.3 %***	3.2 %	57.8 %	−12.1 %**
Percentage of county residents who are ≤19					
1st quartile (<26.5 %)	783	10.7 % (Ref)	(Ref)	57.0 % (Ref)	(Ref)
2nd quartile (26.5–28.2 %)	789	13.8 %	−3.1 %	65.2 %***	4.2 %
3rd quartile (28.2–30.1 %)	784	14.8 %*	−1.2 %	66.2 %***	5.0 %*
4th quartile (≥30.1 %)	785	10.2 %	−4.1 %	60.9 %	7.2 %*
Percentage uninsured					
1st quartile (<13.4 %)	793	22.8 % (Ref)	(Ref)	76.7 % (Ref)	(Ref)
2nd quartile (13.4–16.9 %)	782	9.5 %***	–10.2 %***	66.9 %***	−4.4 %
3rd quartile (16.9–20.9 %)	781	9.4 %***	–11.8 %***	55.7 %***	−15.1 %***
4th quartile (≥20.9 %)	785	7.8 %***	−13.8 %**	49.8 %***	−16.6 %***
Percentage insured with Medicaid					
1st quartile (<14.3 %)	739	12.5 % (Ref)	(Ref)	52.2 % (Ref)	(Ref)
2nd quartile (14.3–19.4 %)	774	16.3 %*	3.2 %**	66.5 %***	14.5 %***
3rd quartile (19.4–25.2 %)	810	14.0 %	1.5 %	66.3 %***	16.3 %***
4th quartile (≥25.2 %)	818	7.1 %***	−1.8 %	63.5 %***	17.4 %***
Urban/suburban and rural location					
Location in urban/suburban county	1786	21.0 % (Ref)	(Ref)	72.2 % (Ref)	(Ref)
Location in rural county	1355	1.0 %***	−24.0 %***	49.2 %***	−4.6 %*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[§] Statistical tests were conducted using adjusted Wald tests

[±] Adjusted percentage point difference based on results from logistic regression models that control for all covariates in the table, total population in county, and state indicators; N = 8 counties (in Connecticut) and N = 39 counties (8 in Connecticut, 3 in Delaware, 5 in Rhode Island, 23 in Wyoming) were excluded from each regression model, respectively, due to perfect prediction (i.e., all counties in a specific state had availability of the respective type of youth-serving facility)

reduction in the number of state psychiatric hospital beds, the closure of state psychiatric hospitals, and a reduction of community-based MH programs (Honberg et al. 2011; Bogira 2009; National Association of State Mental Health Program Directors 2014). Future studies should examine the implications of these structural changes for the accessibility of specialty MH services for youth in general, as well as for low-income youth in particular.

When examining the geographic availability of specialty MH treatment facilities, only 12 % of counties have a hospital-based MH treatment facility that *serves youth* compared to one-fourth of counties have *any* hospital-based MH treatment facility. In addition, nearly all of the youth-serving hospital-based facilities are located in urban and suburban areas. These findings provide important baseline information to assess how ongoing trends in the

behavioral health care system—particularly consolidation—may affect the geographic accessibility of hospital-based MH services for youth in the coming years. The consolidation of multiple hospital-based MH facilities into fewer facilities could result in a reduction of the geographic accessibility of youth services. (O'Regan 2013) Therefore, future studies should assess the extent to which geographic access to youth services in hospital-based facilities is diminished as a result of the ongoing consolidation of facilities and organizations.

Unlike youth service availability for the hospital-based infrastructure, youth service availability in community-based MH treatment facilities minimizes county-level geographic gaps. While only 48 % of counties with any hospital-based MH facility have at least one hospital-based facility that serves youth, 95 % of counties with any community-based MH treatment facility have at least one of facility serving youth. These findings highlight the need to leverage other health care resources to address the geographic gaps in counties that are least likely to have these specialty facilities—that is rural counties, counties in which more than half of the population is Nonwhite, counties with a higher percentage of uninsured residents, and/or counties with a lower percentage of Medicaid enrollees. The need to leverage additional resources to address these gaps is especially critical as health insurance coverage for MH services continues to expand under the MHPAEA and the ACA (Garfield et al. 2011).

One strategy to leverage existing resources would entail the expansion of specialty MH services for youth in existing primary care safety-net facilities such as federally qualified health centers and rural health clinics. This strategy may be particularly beneficial for communities that lack sufficient population density to support a specialty MH treatment facility. However, it is important to bear in mind that the availability of psychotherapeutic services is especially important for youth because these services are often recommended as first-line treatments for many common youth MH disorders (Birmaher et al. 2007; Subcommitee on Attention-Deficit/Hyperactivity Disorder, Steering Committe on Quality Improvement and Management 2011; Connolly and Bernstein 2007). Thus, if the expansion of MH services in other settings (e.g., primary care safety-net facilities) is considered as a mechanism to improve geographic access to MH care, these findings highlight the need to be cognizant of the range and types of services most specialty MH facilities provide and the resources required to provide similar services in these other settings.

Several study limitations are noted. Because the data are cross-sectional, causality cannot be determined in the associations estimated in the regression analysis. Second, the age of the data poses another limitation. However, these findings provide an important baseline to examine how current trends in the behavioral health care system may affect the accessibility of youth MH services. Another data limitation is the inclusion of general hospitals in the sample only if they had a separate inpatient psychiatric unit. Thus, the data do not include general hospitals that admit psychiatric patients to general medical units (Mansbach et al. 2003) or general hospitals with outpatient MH services if these facilities do not have a separate psychiatric inpatient unit. In addition, it is not possible to ascertain from the survey data whether a given facility provides services for youth in a specific setting. For example, although a psychiatric hospital may offer treatment in an inpatient and outpatient setting, services for youth may only be provided in one of these settings. Lastly, the available data provide information about service availability at the facility level, and do not include information about the number of individuals that received any particular service.

Notwithstanding limitations, this study provides the first available information about the differences in the types and locations of specialty MH treatment facilities that serve youth, and the extent to which gaps exist in the geographic availability of this infrastructure. These data provide an important foundation to understand the state of the specialty MH system for our nation's youth, and for future research to assess how trends in the behavioral health care system will continue to affect the accessibility of youth MH services.

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