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## Mental health service use by Medicaid-insured children and adolescents in primary care safety-net clinics

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### Abstract

**OBJECTIVE:** Little is known about the role of primary care safety-net clinics, including federally qualified health centers and rural health clinics, in providing mental health services to youth. This study examines correlates and quality of care of mental health care for youth treated in these safety-net settings.

**METHODS:** We used Medicaid claims data (2008–2010) from nine states to identify youth initiating ADHD medication (N=6,433) and youth with an incident depression diagnosis (N=13,209). We identified those that received: (1) no ADHD or depression-related visits from a primary care safety-net clinic (reference); (2) some (but less than most) visits from these clinics; (3) most visits from these clinics. We examined correlates of mental health treatment in these settings, and whether mental health visits in these settings were correlated with quality measures using bivariate and regression analyses.

**RESULTS:** Only 13.5% of youth initiating ADHD medication and 7.2% of youth with an index depression diagnosis sought any treatment in primary care safety-net clinic. Those living in more urbanized counties were less likely to receive mental health treatment in a primary care safety-net clinic ( $p<0.01$ ). Those who received the majority of mental health treatment in a primary care safety-net clinic (versus no mental health treatment in these settings) had lower care quality on five of six measures ( $p<0.01$ ).

**CONCLUSION:** As investment in the expansion of mental health services in primary care safety-net clinics continues to grow, future research should assess whether these resources translate into improved mental health care access and quality for Medicaid-enrolled youth.

### INTRODUCTION

Mental health (MH) disorders are common and undertreated among youth.<sup>1,2</sup> Medicaid is the largest insurer of youth,<sup>3</sup> and research has identified a number of access-related barriers to MH treatment for Medicaid-enrolled youth.<sup>4–8</sup> Researchers and policymakers have

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highlighted the potential of federally qualified health centers (FQHCs) and rural health clinics (RHCs) -- collectively referred to as primary care safety-net clinics -- to address access-related barriers to MH treatment.<sup>9,10</sup> FQHCs and RHCs are safety-net facilities that provide primary care to underserved populations, including Medicaid enrollees. These clinics are located in federally designated Health Professional Shortage Areas, receive favorable reimbursement rates from Medicaid, and are eligible for participation in federal initiatives such as loan repayment programs.<sup>11,12</sup> These two programs differ from one another on a couple of key dimensions; whereas FQHCs have greater requirements than RHCs for staffing and service offerings, RHCs must be located in non-urbanized areas.<sup>11,12</sup> Over 10,000 FQHC sites and 4,100 RHCs deliver primary care to communities across the country.<sup>13</sup>

Primary care safety-net clinics have the potential to improve access-related barriers to mental health treatment for Medicaid-enrolled youth. First, these clinics can address geographic barriers to care, as more than three-fourths of counties that lack any specialty mental health treatment facility have at least one primary care safety-net clinic.<sup>7</sup> Second, for some families, these clinics may help reduce stigma associated with seeking services in a separate mental health specialty setting.<sup>10</sup> Lastly, FQHCs are required by law to offer enabling services to address access-related barriers such as transportation, translation/interpretation, and insurance enrollment.<sup>14,15</sup>

Research has reported that the percentage of FQHCs that offer specialty MH services onsite has increased substantially in the past two decades.<sup>16,17</sup> There is, however, little information about the role of primary care safety-net clinics in providing mental health services to Medicaid-enrolled youth. We address this gap by using Medicaid claims data to identify two cohorts of youth with attention deficit hyperactivity disorder (ADHD) and depression, two of the most common mental health disorders in the child and adolescent population.<sup>1,2</sup> In each cohort, we describe the percentage that received mental health care in a primary care safety-net clinic, and examine the correlates associated with mental health-treatment seeking in these settings. We also examine several measures of care quality for each cohort in primary care safety-net settings.

## METHODS

### Data

Data came from the 2008–2010 Medicaid Analytic eXtract (MAX) Files for nine states (Alabama, Georgia, Kentucky, Louisiana, Missouri, North Carolina, Tennessee, Texas, and Virginia). The MAX Files include information on Medicaid eligibility, health care utilization, and enrollee demographic characteristics. Researchers have evaluated the completeness and accuracy of managed care data in the MAX files for each state,<sup>18–20</sup> and the states included in this study have sufficiently complete managed care claims for use in data analysis.

The MAX Files with enrollee information were merged with three additional files to obtain taxonomy codes that could be used to identify visits in primary care safety-net clinics. These files included: the Centers for Medicare and Medicaid Services (CMS) MAX Provider Characteristics (MAXPC) file;<sup>21</sup> the National Provider Identifier (NPI) Data File;<sup>22</sup> and the

CMS Provider of Services (POS) file.<sup>23</sup> We also merged measures from the Area Health Resources File (AHRF).<sup>24</sup>

## Cohorts

We used specifications from the Healthcare Effectiveness Data and Information Set (HEDIS) guidelines<sup>25</sup> and prior literature<sup>26</sup> to derive a cohort of youth (age 6 to 12) with a diagnosis of ADHD (i.e., at least two claims with an ADHD diagnosis code [ICD-9-CM codes 314.00, 314.01]) that initiated ADHD medication for the first time between January 1, 2010 and February 28, 2010 (N=6,433). We identified those with continuous Medicaid enrollment from the time they were first observed in the database through the end of the treatment initiation period (with an allowable administrative gap up to 30 days) and without a fill for an ADHD medication for at least 120 days prior to medication initiation (i.e., the HEDIS-defined exclusion period).<sup>25</sup>

Next, we derived a cohort of youth (age 5 to 17) with an incident diagnosis of depression between January 1, 2010 and August 8, 2010 (N=13,209). Our cohort included those with at least two claims with a depression diagnosis code (ICD-9-CM codes 296.2, 296.3, 300.4, 311) on different days in 2010. We identified those: with continuous Medicaid enrollment from the time they were first observed in the database through the end of the study period (with an allowable administrative gap up to 30 days); and without any encounters with a depression diagnosis code or a fill for an antidepressant medication for at least 90 days prior to the index diagnosis (i.e., the exclusion period used in prior literature<sup>27</sup>). In both cohorts, we excluded those with dual Medicare eligibility, an inpatient claim for mental health or substance abuse, multiple county codes, and/or missing information on control variables.

## Safety-net Measure

To derive measures of mental health treatment in primary care safety-net clinics, we used: codes from the MAX files, including place of service codes (03, 50, 53, 72), type of program codes (03, 04), revenue codes (521, 522, 524, 525, 527, 528), and procedure code (T1015); taxonomy codes from the MAXPC file and NPI Data File (261QF0400X, 261QR1300X); and provider category codes (12, 21) from the CMS POS file. Using these codes, we created two categorical variables for ADHD- and depression-related visits (i.e., visits with a primary or secondary diagnosis of one of these respective conditions). The first measure identified those who did not receive any ADHD or depression-related visits from any primary care safety-net clinic (FQHC and/or RHC) (reference), those who received some (but less than the majority) ADHD- or depression-related visits from a primary care safety-net clinic, and those who received the majority of ADHD- or depression-related visits from a primary care safety-net clinic. Next, we classified youth in each cohort into those who did not receive any ADHD or depression-related visits from a primary care safety-net clinic (reference); those who received any ADHD- or depression-related visits from an FQHC; and those who received all of their ADHD- or depression-related visits that occurred in a primary care safety-net clinic exclusively from a RHC (i.e., no visit in an FQHC). Bivariate and regression analyses examining correlates associated with mental health treatment in primary care safety-net settings using this second measure are availability in an Online Supplement. For those who received any ADHD- or depression-related visits in a primary care safety-net

facility, we also provide information in the online appendix about psychotherapy visits received inside and outside of these primary care safety-net settings (See Online Supplement).

### Quality of care

Based on HEDIS specifications and prior literature,<sup>25,26</sup> we derived three measures to assess adequate follow-up care and medication continuity after the child initiated ADHD medication. The first measure assessed *adequate follow-up care in the initiation phase* of ADHD medication treatment (i.e. the first 30 days after initiating medication), which was defined as at least one visit with a healthcare provider during this time period. The second measure assessed *continuous medication treatment*, which was defined by HEDIS as those who filled medication for 210 of the 300 day continuation and maintenance (C&M) phase following the 30 day medication initiation period.<sup>28</sup> We analyzed this outcome measure for a subgroup with continuous Medicaid enrollment in the C&M phase [N=5,968]. The third measure assessed *adequate follow-up care in the C&M phase*, which was defined as receiving at least two additional healthcare visits in the 300-day C&M phase. This outcome measure was assessed for those with continuous enrollment and continuous medication in the C&M phase [N=2,370].

In the cohort with an index depression diagnosis, we used specifications from prior research<sup>29</sup> to create indicators for those that received: *minimally adequate psychotherapy* (four individual, family, and/or group psychotherapy sessions outside of an inpatient setting in the 12 weeks following initiation of treatment); *minimally adequate medication treatment* (antidepressant medication for 84 out of the 144 days following initiation); and *minimally adequate treatment*, defined as the receipt of minimally adequate psychotherapy or minimally adequate medication treatment.

### Covariates

**Individual-level measures**—We assessed predisposing (age, gender, race/ethnicity), enabling (health plan type<sup>29,30</sup>), and need-related characteristics (basis of eligibility and comorbidities) that may be correlated with the receipt of mental health treatment in a primary care safety-net clinic and/or the quality of care received.<sup>31</sup> (See Table 2 and Online Supplement for details).

**County-level measures**—Contextual-level enabling characteristics<sup>29</sup> included the percentage of county residents living in an urban area (2000)<sup>32</sup> and living in poverty (2008). We also examined the per capita (100,000) number of primary care safety-net clinics (FQHCs and RHCs) (2008), primary care physicians (2010), and psychologists (2009).

### Analysis

We conducted bivariate analyses using Wald tests and multivariate analyses using generalized ordered logistic regressions to examine the correlates of mental health treatment in a primary care safety-net clinic. Next, we conducted bivariate analyses using Wald tests and multiple logistic regression analyses to examine whether the receipt of mental health care in one of these settings was correlated with quality measures. Regression models

controlled for covariates described above; these analyses also included state indicators and standard errors were clustered at the county-level.

## RESULTS

### Receipt of mental health visits in primary care safety-net setting

Among the cohort that initiated ADHD medication, 4.0% received some (but not the majority) ADHD-related visits in a primary care safety-net clinic and 9.5% received the majority of ADHD-related visits in one of these settings (Table 1). Most of those that received any treatment in one of these clinics sought care exclusively in a RHC.

A smaller percentage of those with depression received care in a primary care safety-net clinic (Table 1). Specifically, 2.8% received some (but not the majority) of their depression-related visits and 4.4% received the majority of their depression-related visits in a primary care safety-net clinic, respectively. Just under half of those that sought care in a primary care safety-net clinic received treatment exclusively in an RHC.

### Correlates Associated with Mental Health Treatment in a Primary Care Safety-net Clinic

**Child-level correlates**—In the cohort initiating ADHD medication, bivariate analyses (Table 2) indicated that those with diagnosed co-morbid conditions including oppositional defiant disorder/ conduct disorder ( $p<0.001$ ), other mental health disorders (i.e., anxiety, bipolar disorder, schizophrenia/psychoses, and other mental health conditions;  $p<0.001$ ), and asthma ( $p<0.001$ ) were less likely to receive most ADHD-related visits in a primary care safety-net clinic. In the depression cohort, bivariate analyses indicated that those with any diagnosis of major depression ( $p<0.001$ ) or dysthymia (no major depression,  $p<0.05$ ) were less likely to receive most depression-related visits in a primary care safety-net setting. These findings remained statistically significant in regression analyses (Table 3) controlling for other child- and county-level correlates; the marginal effects indicate that those with co-morbid diagnoses in the ADHD cohort and those with more severe depression-related diagnoses in the depression cohort were less likely to receive the majority of visits for each respective condition in a primary care safety-net setting.

Plan type was also significantly associated with mental health-related visits in a primary care safety-net setting. In each cohort, bivariate results (Table 2) indicated that those enrolled in a comprehensive managed care plans and mixed plans were less likely to receive the majority of their ADHD- or depression-related visits (compared to no visits) in a primary care safety-net setting ( $p<0.001$ ). These associations remained significant in regression analyses (Table 3).

**County-level correlates**—In both cohorts, bivariate analyses (Table 2) indicated that those who lived in counties with a lower percentage of residents living in urban areas, higher percentage of residents living in poverty, more primary care safety-net facilities per capita, and fewer primary care physicians and psychologists per capita were more likely to receive the majority of their ADHD- or depression-related visits in a primary care safety-net setting (all  $p$ -values  $< 0.001$ ). In regression analyses, the findings associated with county percentage

living in an urban area remained negative and significant, and the finding associated with primary care safety-net clinic supply remained positive and significant (Table 3).

### Quality Measures across Safety-net Settings

The bivariate and multivariate analyses revealed mixed findings when examining measures of care quality across health care settings. Compared to those that did not receive any ADHD-related visits in a primary care safety-net clinic, regression results controlling for individual- and community-level characteristics (Table 4) indicated that those who received *some* (but not most) of their ADHD-related visits in one of these clinics were 7.9 percentage points (95% CI=1.5, 14.2) more likely to receive adequate follow-up care in the initiation phase and 7.6 percentage points (95% CI=1.4, 13.8) more likely to continue medication. Conversely, those who received the majority of ADHD-related visits in a primary care safety-net clinic were 27.7 percentage points (95% CI= -32.5, -23.0) and 24.3 percentage points (95% CI= -31.4, -17.3) less likely to receive adequate follow-up care in the initiation phase or the C&M phase of medication treatment, respectively, and 6.6 percentage points (95% CI= -11.2, -2.1) less likely to continue medication than those who received no ADHD-related visits in one of these settings.

Findings from the bivariate and multivariate comparisons were also mixed for the cohort with a depression diagnosis. Compared to those with no depression-related visits in a primary care safety-net clinic (Table 5), regression results indicated that those who received some (but not most) of their depression-related visits and those who received the majority of their depression related visits in a primary care safety-net clinic were 9.3 percentage points (95% CI=5.8, 12.9) and 4.0 percentage points (95% CI=0.9, 7.1) more likely to receive minimally adequate pharmacotherapy, respectively. On the other hand, those who received the majority of depression-related visits in a primary care safety-net clinic were 19.9 percentage points (95% CI=-25.3, -14.5) and 9.5 percentage points (95% CI= -14.6, -4.4) less likely to receive minimally adequate psychotherapy and *any* minimally adequate treatment (psychotherapy or pharmacotherapy) than those without any depression-related visits in one of these settings, respectively.

## DISCUSSION

Children living in less urbanized counties were more likely to receive mental health treatment in a primary care safety-net clinic, which adds to prior literature highlighting the potential of primary care safety-net clinics to fill gaps in the mental health treatment system outside of urban areas.<sup>7</sup> Our findings also shed light on the role of RHCs in this infrastructure, as more than half of youth initiating ADHD medication in a primary care safety-net clinic sought treatment exclusively from an RHC (versus an FQHC). Because they are required to be located in non-urbanized areas,<sup>11</sup> many RHCs serve populations living in communities with extremely limited (if any) mental health care resources.<sup>5</sup>

Medicaid-enrolled youth who received most of their ADHD visits in a primary care safety-net clinic were less likely to have diagnosed co-morbid mental health disorders, and those who received most depression-related visits in a primary care safety-net were less likely to have any diagnosis of major depression than those who received no care in these settings.



Together, these findings add to prior literature that indicates primary care safety-net clinics may serve those with less severe mental health needs than those treated in other settings.<sup>16</sup> Another possible explanation, however, may involve coding practices. If primary care safety-net providers are less likely to code secondary mental health diagnoses (regardless of the underlying severity of mental health needs), this may also account for some of the differences in diagnosed comorbidities in the ADHD cohort.

Our results also indicate that youth enrolled in comprehensive managed care plans and mixed plans were less likely to receive most ADHD or depression care in primary care safety net settings. This association may be explained by multiple mechanisms including greater enrollment in comprehensive and mixed plans in urban areas<sup>33</sup> (where RHCs are less commonly a site of treatment) and more complete coding practices by providers in areas and states served by comprehensive managed care plans.<sup>34</sup>

Those who received most visits for their respective mental health disorder from a primary care safety-net clinic had lower care quality on five of the six outcome measures examined compared to those that did not receive treatment from these settings. These findings diverge from prior literature reporting that patients treated in primary care safety-net clinics (FQHCs in particular) receive comparable quality of care relative to national averages or relative to those treated in other physician offices.<sup>35, 36</sup> Our findings may represent unmeasured differences in child- or family-level characteristics (such as need or preferences for services) between those seeking care in different settings. It is also possible that primary care safety-net clinics have fewer staff with specialty training needed to serve youth with mental health needs. Nevertheless, it is worth noting that the outcome measures were either based on specifications from the HEDIS performance measurement database<sup>28,37</sup> or clinical guidelines.<sup>38,39</sup> Thus, these measures represent important targets that any healthcare setting or provider should aim to achieve.

The results also suggest that primary care safety-net clinics played a relatively small role in the provision of mental health services to youth during the study period. The percentage of primary care safety-net clinics offering specialty mental health services has increased in recent years,<sup>18</sup> and the federal government has invested considerable resources to help primary care safety-net clinics expand their capacity to offer mental health services.<sup>40</sup> In FY2017, the Health Resources and Services Administration awarded more than \$200 million for behavioral health expansion grants to 1,178 health centers and 13 rural health organizations to increase access to substance abuse and mental health services.<sup>40–42</sup> Future studies should assess whether this investment has translated into an expansion of behavioral health services in primary care safety-net settings for the child and adolescent population.

There are several limitations to acknowledge. First, the data are several years old and the findings from these states may not generalize to other states. Second, there were unmeasured organization-level characteristics, including the demographic composition of the practice/clinic (e.g., age composition) or whether the practice/clinic had any collaborative care relationships with mental health providers outside the practice. Third, coding errors in administrative claims databases may result in measurement error.<sup>43</sup> Lastly, because the data are cross-sectional, causality cannot be inferred from these analyses.

## CONCLUSION

This study examined the role of primary care safety-net clinics in the provision mental health services to Medicaid-enrolled youth. Children in less urbanized areas were more likely to receive their mental health care in these settings. Nevertheless, these facilities served a relatively small percentage of Medicaid-enrolled youth seeking mental health treatment. As investment in the expansion of mental health services in the primary care safety-net grows, it will be critical to assess whether additional resources translate into improved mental health care access and quality for this population.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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## References

1. Merikangas KR, He J-P, Brody D, Fisher PW, Bourdon K, Koretz DS. Prevalence and treatment of mental disorders among US children in the 2001–2004 NHANES. *Pediatrics*. 2010;125(1):75. [PubMed: 20008426]
2. Merikangas KR, He J-P, Burstein M, et al. Lifetime prevalence of mental disorders in U.S. adolescents: Results from the National Comorbidity Survey Replication-Adolescent Supplement (NCS-A). *J. Am Acad Child Adolesc Psychiatry*. 2010;49(10):980–989. [PubMed: 20855043]
3. American Academy of Pediatrics (2017). “Medicaid Facts.” Retrieved November 1, 2018, from [https://www.aap.org/enus/Documents/federaladvocacy\\_medicaidfactsheet\\_all\\_states.pdf](https://www.aap.org/enus/Documents/federaladvocacy_medicaidfactsheet_all_states.pdf).
4. Bishop TF, Press MJ, Keyhani S, Pincus HA. Acceptance of insurance by psychiatrists and the implications for access to mental health care. *JAMA Psychiatry*. 2014;71(2):176–181. [PubMed: 24337499]
5. Cummings JR, Allen L, Clennon J, Ji X, Druss BG. Geographic access to specialty mental health care across high- and low-income US communities. *JAMA Psychiatry*. 2017;74(5):476–484. [PubMed: 28384733]
6. Cummings JR, Case BG, Ji X, Marcus SC. Availability of youth services in U.S. mental health treatment facilities. *Admin Policy Ment Health*. 2016;43(5):717–727.
7. Cummings JR, Wen H, Ko M, Druss BG. Geography and the Medicaid mental health care infrastructure: implications for health care reform. *JAMA Psychiatry*. 2013;70(10):1084–1090. [PubMed: 23965816]
8. Syed S, Gerber BS, Sharp L. Traveling towards disease: Transportation barriers to health care access. *J. Community Health*. Vol 382013:976–993. [PubMed: 23543372]
9. Foundation KF. Community health centers: Opportunities and challenges of health reform. 2010; <https://www.nhchc.org/wp-content/uploads/2011/09/KaiserCHCsandhealthreformAug2010.pdf>. Accessed August 7, 2018.
10. Proser M, Cox L. Health centers’ role in addressing the behavioral health needs of the medically underserved. 2004; <http://www.nachc.org/wp-content/uploads/2015/06/BHReport04.pdf>. Accessed October 18, 2018.
11. National Association of Rural Health Clinics. RHC overview: What is a rural health clinic? 2018; <https://narhc.org/about-us/rhc-overview/>. Accessed November 1, 2018.



12. Taylor J. The primary care safety net: Strained, transitioning, critical. Washington D.C.: National Health Policy Forum. 2010; [https://www.nhpf.org/uploads/announcements/BP79\\_PrimaryCareSafetyNet\\_09-28-10.pdf](https://www.nhpf.org/uploads/announcements/BP79_PrimaryCareSafetyNet_09-28-10.pdf). Accessed October 18, 2018.
13. Health Resources and Services Administration. Health Center Program. 2017; <https://bphc.hrsa.gov/about/healthcenterfactsheet.pdf>. Accessed August 8, 2018.
14. Solutions MH. Improving commercial reimbursement for community health centers. 2007; <http://www.nachc.org/wp-content/uploads/2015/06/CHCReimbursement.pdf>. Accessed August 7, 2018.
15. 42 U.S. Code § 254b - Health centers. <https://www.law.cornell.edu/uscode/text/42/254b>.
16. Wells R, Morrissey JP, Lee IH, Radford A. Trends in behavioral health care service provision by community health centers, 1998–2007. *Psychiatr Serv*. 2010;61(8):759. [PubMed: 20675833]
17. Shin P, Msc J, Mauery D. The role of community health centers in providing behavioral health care. *J Behav Health Serv Res*. 2013;40(4):488–496. [PubMed: 23963817]
18. Vivian LH Byrd AHD, Rosalie Malsberger, Ashley Zlatinov. Assessing the Usability of MAX 2008 Encounter Data for Enrollees in Comprehensive Managed Care. 2012.
19. Vivian LH Byrd AHD. Assessing the Usability of Encounter Data for Enrollees in Comprehensive Managed Care Across MAX 2007–2009. 2012.
20. LewinGroup. Evaluating Encounter Data Completeness-For Researchers using the Centers for Medicare & Medicaid Services Chronic Condition Data Warehouse (CCW). 2012.
21. Centers for Medicare and Medicaid Services. MAX Provider Characteristics. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MAXPC.html>. Accessed August 17, 2018.
22. HIPAASpace.com. NPI Data Fields. <https://www.hipaaspace.com/documentation/Databases/NPI.html>. Accessed October 1, 2018.
23. Centers for Medicare and Medicaid Services (CMS). Provider of Service File. 2010; <https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Provider-of-Services/POS2010.html>. Accessed February 1, 2017.
24. Area Health Resources Files. Rockville, MD: US Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions;2011–2012.
25. National Committee for Quality Assurance. Summary Table of Measures, Product Lines and Changes. HEDIS 2016; [https://www.ncqa.org/wp-content/uploads/2018/08/20150701\\_HEDIS\\_2016\\_List\\_of\\_Measures.pdf](https://www.ncqa.org/wp-content/uploads/2018/08/20150701_HEDIS_2016_List_of_Measures.pdf). Accessed October 22, 2018.
26. Cummings JR, Ji X, Allen L, Lally C, Druss BG. Racial and ethnic differences in ADHD treatment quality among Medicaid-enrolled youth. *Pediatrics*. 2017;139(6).
27. Stein BD, Sorbero MJ, Dalton E, et al. Predictors of adequate depression treatment among Medicaid-enrolled youth. *Soc Psychiatry Psychiatr Epidemiol*. 2013;48(5):757–765. [PubMed: 23589098]
28. National Committee on Quality Assurance. HEDIS Archives. 2014; <http://www.ncqa.org/hedis-quality-measurement/hedis-measures/hedis-archives>. Accessed November 1, 2016.
29. Simon GE, Von Korff M, Rutter CM, Peterson DA. Treatment process and outcomes for managed care patients receiving new antidepressant prescriptions from psychiatrists and primary care physicians. *JAMA Psychiatry*. 2001;58(4):395–401.
30. Wells KB, Sherbourne C, Schoenbaum M, et al. Impact of disseminating quality improvement programs for depression in managed primary care: a randomized controlled trial. 2000;283(2):212–220.
31. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995:1–10.
32. US Census Bureau. Census 2000 geographic terms and concepts. <http://www.census.gov/geo/reference/pdfs/glossry2.pdf>. Accessed May 20, 2015.
33. Silberman P, Poley S, James K, and Slifkin R. Tracking Medicaid managed care in rural communities: A fifty-state follow-up. *Health Affairs*. 2002; 21(4): 255–263. [PubMed: 12117138]
34. Geruso M, and Layton T. Upcoding: Evidence from Medicare on squishy risk adjustment. *Journal of Political Economy*. 2019. Epub ahead of print. 10.1086/704756

35. Shi L, Lebrun-Harris LA, Chen LR, et al. Preventive counseling services during primary care visits: A comparison of health centers versus other physician offices. *J Health Care Poor Underserved*. 2015;26(2):519–535. [PubMed: 25913348]
36. Shi L, Lebrun LA, Zhu J, et al. Clinical quality performance in U.S. health centers. *Health Serv. Res.* 2012;47(6):2225–2249. [PubMed: 22594465]
37. National Quality Measures Clearinghouse. Antidepressant Medication Management. In: Agency for Healthcare Research and Quality, ed. Vol 2017. Rockville, MD. 2013.
38. Birmaher Boris, Brent David, AACAP Work Group on Quality Issues. Practice parameter for the assessment and treatment of children and adolescents with depressive disorders. *J. Am Acad Child Adolesc Psychiatry*. 2007;46(11):1503–1526. [PubMed: 18049300]
39. Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement Management. ADHD: clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *Pediatrics*. 2011;128(5):1007–1022. [PubMed: 22003063]
40. Paradise J, Rosenbaum S, Markus A, et al. Community Health Centers: Recent Growth and the Role of the ACA. 2017; <https://www.kff.org/report-section/community-health-centers-recent-growth-and-the-role-of-the-aca-issue-brief/>. Accessed August 8, 2018.
41. Health Resources and Services Administration. FY 2017 Access Increases in Mental Health and Substance Abuse Services (AIMS) Supplemental Funding Technical Assistance. 2017; <https://bphc.hrsa.gov/programopportunities/fundingopportunities/supplement/>.
42. U.S. Department of Health and Human Services. HRSA awards ~200 million to health centers nationwide to tackle mental health and fight the opioid overdose crisis. 2017; <https://www.hhs.gov/about/news/2017/09/14/hrsa-awards-200-million-to-health-centers-nationwide.html>. Accessed August 8, 2018.
43. O'Malley KJ, Cook KF, Price MD, Wildes KR, Hurdle JF, Ashton CM. Measuring diagnoses: ICD code accuracy. *Health Serv. Res.* 2005;40(5p2):1620–1639. [PubMed: 16178999]

**HIGHLIGHTS**

- We examined correlates and quality of care of mental health treatment for Medicaid-enrolled youth treated in primary care safety-net settings (including federally qualified health centers and rural health clinics).
- Only 13.5% of youth initiating ADHD medication and 7.2% of youth with an index depression diagnosis sought mental health treatment in primary care safety-net clinic.
- Those living in less urbanized counties were more likely to receive mental health treatment in a primary care safety-net clinic.
- Those who received the majority of mental health treatment (versus none) in a primary care safety-net clinic generally received lower care quality.

**Table 1:** Percentage of Medicaid-enrolled youth that received mental health-related visits in a primary care safety-net setting (including federally qualified health centers and rural health clinics)

	Medicaid-enrolled youth initiating ADHD medication (N=6,433)		Medicaid-enrolled youth with index depression diagnosis (N=13,209)	
	N	%	N	%
Received ADHD- or depression-related visits in any primary care safety-net clinic (FQHC and/or RHC)				
No visits in safety-net clinic	5,566	86.5	12,266	92.9
Some visits (but less than the majority) in safety-net clinic	256	4.0	365	2.8
Majority of visits in safety-net clinic	611	9.5	578	4.4
Received ADHD- or depression-related visits in FQHC or RHC				
No visits in safety-net clinic	5,566	86.5	12,266	92.9
Any visits in FQHC	354	5.5	482	3.6
Any visit in RHC (no FQHC visit)	513	8.0	461	3.5

Notes: Abbreviations: FQHC – federally qualified health center; RHC – rural health clinic; SD -- standard deviation

**Table 2:**

Characteristics of Medicaid-enrolled youth receiving ADHD-related visits (N=6,433) or depression-related visits (N=13,209), by safety-net setting

	ADHD-related visits in any primary care safety-net facility (FQHC or RHC)				Depression-related visits in any primary care safety-net facility (FQHC or RHC)							
	No visits in safety-net [N=5,566]	Some (but less than majority) visits in safety-net [N=256] ±	Majority visits in safety-net [N=611] ±	No visits in safety-net [N=12,266]	Some (but less than majority) visits in safety-net [N=365] ±	Majority visits in safety-net [N=578] ±	N	%				
<i>Demographics</i>												
Race/ethnicity, %	N	%	N	%	N	%	N	%				
Non-Hispanic White	2,560	46.0	129	50.4	354	57.9	5,770	47.0	219	60.0	325	56.2
Black	1,703	30.6	75	29.3	134	21.9	3,863	31.5	78	21.4	131	22.7
Hispanic	827	14.9	35	13.7	75	12.3	1,828	14.9	54	14.8	89	15.4
Other/ Unknown	476	8.6	17	6.6	48	7.9	805	6.6	14	3.8	33	5.7
Age (Mean ± SD)	8.2 ± 1.6		8.0 ± 1.6*		8.2 ± 1.6		12.8 ± 3.0		13.8 ± 2.6		13.3 ± 2.8	
Female, %	1,786	32.1	79	30.9	203	33.2	6,685	54.5	245	67.1	355	61.4
<i>Plan type, %</i>												
Fee-for-service (no carve-out)	362	6.5	31	12.1**	127	20.8	1,346	11.0	68	18.6	116	20.1
Primary care case management (no carve-out)	1,011	18.2	35	13.7*	186	30.4	1,656	13.5	60	16.4	174	30.1
Comprehensive managed care plan (no carve-out) <sup>a</sup>	2,517	45.2	114	44.5	158	25.9	7,311	59.6	195	53.4*	202	34.9
Mixed plans <sup>b</sup>	1,676	30.1	76	29.7	140	22.9	1,953	15.9	42	11.5	86	14.9
<i>Eligibility type, %</i>												
Blind, disabled, or foster care <sup>c</sup>	967	17.4	65	25.4**	91	14.9	2,843	23.2	65	17.8**	77	13.3
<i>Mental health comorbidity, %</i>												
ADHD	5,566	100.0	256	100.0	611	100.0	3,947	32.2	90	24.7**	182	31.5
Any depressive disorder	240	4.3	24	9.4**	28	4.6	12,266	100.0	365	100.0	578	100.0

	ADHD-related visits in any primary care safety-net facility (FQHC or RHC)				Depression-related visits in any primary care safety-net facility (FQHC or RHC)			
	No visits in safety-net [N=5,566]	Some (but less than majority) visits in safety-net [N=256] ±	Majority visits in safety-net [N=611] ±	No visits in safety-net [N=12,266]	Some (but less than majority) visits in safety-net [N=365] ±	Majority visits in safety-net [N=578] ±	N	%
Depression NOS only	-	-	-	5,670	103	351	60.7	28.2
Dysthymia (no major depression)	-	-	-	1,443	25	51	8.8	6.9
Any major depression diagnosis	-	-	-	5,153	237	176	30.5	64.9
<i>Mental health comorbidity, %</i>								
Oppositional defiant disorder / conduct disorder	962	56	59	3,034	81	99	17.1	22.2
Other mental health disorder	1,852	104	159	6,218	225	259	44.8	61.6
<i>Physical health comorbidity, %</i>								
Asthma	915	35	70	1,615	53	73	12.6	14.5
<i>County-level characteristics (Mean ± SD)</i>								
Percentage living in urban area	68.5 ± 28.8	58.4 ± 33.3	49.7 ± 30.3	67.4 ± 30.5	54.3 ± 33.4	53.9 ± 32.4	32.4	33.4
Percentage living in poverty	16.9 ± 6.1	17.4 ± 5.5	18.5 ± 5.4	16.5 ± 6.3	17.5 ± 5.8	18.5 ± 6.1	6.1	5.8
Primary care safety-net clinic per 100K	2.9 ± 5.4	7.4 ± 9.6	11.0 ± 11.8	3.7 ± 7.4	9.5 ± 13.5	10.4 ± 13.4	13.4	13.5
Primary care physicians per 100K	61.5 ± 28.2	55.1 ± 28.3	48.7 ± 25.8	62.4 ± 29.6	55.1 ± 32.0	51.8 ± 27.7	27.7	32.0
Psychologists, per 100K	16.7 ± 18.0	15.3 ± 17.7	10.7 ± 15.2	18.7 ± 19.1	14.8 ± 16.0	14.1 ± 16.7	16.7	16.0

Notes: Abbreviations: FQHC – federally qualified health center; RHC – rural health clinic; SD – standard deviation

\*  $p < 0.05$

\*\*  $p < 0.01$

\*\*\*  $p < 0.001$



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<sup>±</sup>Bivariate analyses were conducted using Wald tests to compare the value of each measure or category for those that received some or the majority of their ADHD- or depression-related visits in a primary care safety-net clinic to those that did not receive any in these settings (the reference group).

<sup>a</sup>We used monthly information about plan enrollment to measure health plan type. This category includes children who were enrolled in a comprehensive managed care plan for their entire observation period.

<sup>b</sup>This category includes those that were enrolled in more than one plan type during the observation period (including behavioral health plans).

<sup>c</sup>Reference category includes children eligible for Medicaid based on household income, classification as “medically needy”, and/or other criteria specified in each state’s Section 1115 waiver.

**Table 3:**

Regression results examining the association between characteristics of Medicaid-enrolled youth and the receipt of ADHD-related visits (N=6,433) or depression-related visits (13,209) in a primary care safety-net setting

	ADHD-related visits in any primary care safety-net facility (FQHC or RHC)			Depression-related visits in any primary care safety-net facility (FQHC or RHC)		
	Adjusted Percentage Point Difference <sup>±</sup>	95% CI	Adjusted Percentage Point Difference <sup>±</sup>	95% CI	Adjusted Percentage Point Difference <sup>±</sup>	95% CI
<b>Demographics</b>						
Race/ethnicity						
Non-Hispanic White (Reference)	--	--	--	--	--	--
Black	0.3	-1.0, 1.5	0.2	-1.8, 2.2	-0.4	-1.4, 0.5
Hispanic	-0.8	-3.1, 1.5	0.1	-3.6, 3.8	1.1	-0.5, 2.6
Other/ Unknown	-1.2	-3.1, 0.7	1.8	-1.3, 4.9	-0.6	-2.2, 1.0
Age	-0.3	-0.6, 0.0002	0.02	-0.4, 0.5	0.2	0.1, 0.3
Female	-0.3	-1.1, 0.6	0.1	-1.2, 1.4	1.1	0.5, 1.7
<b>Plan type</b>						
Fee-for-service (no carve-out) (Reference)	--	--	--	--	--	--
Primary care case management (no carve-out)	1.5	-0.5, 3.6	-3.1	-6.3, 0.04	0.3	-1.3, 2.0
Comprehensive managed care plan (no carve-out) <sup>a</sup>	2.9	0.6, 5.3	-9.0	-11.9, -6.1	0.5	-0.5, 1.6
Mixed plans <sup>b</sup>	1.9	-0.2, 4.0	-5.8	-8.7, -3.0	0.6	-0.5, 1.8
<b>Eligibility type</b>						
Blind, disabled, or foster care (versus other eligibility type) <sup>c</sup>	2.9	1.2, 4.6	-2.0	-4.8, 0.8	-0.8	-2.0, 0.4
<b>Mental health comorbidity</b>						
ADHD	--	--	--	--	0.5	-0.2, 1.1
Any depressive disorder	4.1	1.3, 6.9	-0.1	-3.2, 3.0	--	--

	ADHD-related visits in any primary care safety-net facility (FQHC or RHC)			Depression-related visits in any primary care safety-net facility (FQHC or RHC)		
	Majority visits in safety-net (Intercept=3.9%)			Some (but less than majority) visits in safety-net (Intercept=2.8%)		
	Adjusted Percentage Point Difference ±	95% CI	Adjusted Percentage Point Difference ±	95% CI	Adjusted Percentage Point Difference ±	95% CI
Depression NOS only (Reference)	--	--	--	--	--	--
Dysthymia (no major depression)	--	--	0.1	-1.5, 1.6	-2.4	-4.3, -0.5
Any major depression diagnosis	--	--	1.7	1.1, 2.4	-2.7	-3.7, -1.6
Conduct disorder / oppositional defiant disorder	1.6	-0.1, 3.4	-3.7	-6.2, -1.3	0.03	-0.7, 0.8
Other mental health disorder	1.6	0.5, 2.7	-1.9	-3.6, -0.2	0.9	0.3, 1.6
<i>Physical health comorbidity</i>						
Asthma	-0.8	-2.2, 0.7	-2.1	-4.1, -0.03	0.2	-0.7, 1.2
<i>County-level characteristics</i>						
Percentage living in urban area	-0.3	-1.1, 0.5	-2.3	-3.8, -0.9	-0.6	-1.1, -0.1
Percentage living in poverty	-0.4	-1.0, 0.3	-0.4	-1.8, 0.9	0.001	-0.5, 0.5
Primary care safety-net clinic per 100K	1.8	1.1, 2.5	3.6	2.4, 4.8	0.5	0.2, 0.9
Primary care physicians per 100K	0.2	-0.6, 1.0	-0.9	-2.4, 0.6	0.01	-0.5, 0.5
Psychologists, per 100K	-0.4	-1.1, 0.3	0.8	-0.9, 2.4	-0.1	-0.6, 0.3

Notes: Abbreviations: FQHC – federally qualified health center; RHC – rural health clinic.

± Generalized ordered logistic regression was estimated with state indicators; standard errors were clustered at the county level.

<sup>a</sup>We used monthly information about plan enrollment to measure health plan type. This category includes children who were enrolled in a comprehensive managed care plan for their entire observation period.

<sup>b</sup>This category includes those that were enrolled in more than one plan type during the observation period (including behavioral health plans).

<sup>c</sup>Reference category includes children eligible for Medicaid based on household income, classification as “medically needy”, and/or other criteria specified in each state’s Section 11115 waiver.



