Screening for Behavioral Health Issues in Children Enrolled in Massachusetts Medicaid

WHAT'S KNOWN ON THIS SUBJECT: Use of behavioral health (BH) screens in pediatrics have increased identification of children with BH issues. Screening rates increased in Massachusetts after it was mandated, as did the volume of some mental health services.

WHAT THIS STUDY ADDS: This is the first study of children after Massachusetts mandated behavioral screening began. Almost 40% of children who screened positive were newly identified. Being male, having a BH history, and being in foster care predicted a positive screen.

abstract

OBJECTIVES: To understand mandated behavioral health (BH) screening in Massachusetts Medicaid including characteristics of screened children, predictors of positive screens, and whether screening identifies children without a previous BH history.

METHODS: Massachusetts mandated BH screening in particularly among underidentified groups. 2008. Providers used a billing code and modifier to indicate a completed screen and whether a BH need was identified. Using MassHealth claims data, children with ≥300 days of eligibility in fiscal year (FY) 2009 were identified and categorized into groups based on first use of the modifier, screening code, or claim. Bivariate analyses were conducted to determine differences among groups. BH history was examined by limiting the sample to those continuously enrolled in FY 2008 and 2009. Multivariate logistic regression was used to determine predictors of positive screens.

RESULTS: Of 355 490 eligible children, 46% had evidence of screening. Of those with modifiers, 12% were positive. Among continuously enrolled children (FY 2008 and FY 2009) with evidence of screening, 43% with positive modifiers had no BH history. This "newly identified" group were more likely to be female, younger, minority, and from rural residences ($P < .0001$). Among children with modifiers; gender (male), age (5–7), being in foster care, recent BH history, and Hispanic ethnicity predicted having a positive modifier.

CONCLUSIONS: The high rate of newly identified Medicaid children with a BH need suggests that screening is performing well, particularly among underidentified groups. To better assess screening value, future work on cost-effectiveness and the impact on subsequent mental health treatment is needed. *Pediatrics* 2014;133:46–54

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KEY WORDS

behavioral health, screening, primary care, medicaid

ABBREVIATIONS

BH—behavioral health
CPT—Current Procedural Terminology
FY—fiscal year
ICD-9—*International Classification of Disease, Ninth Revision, Clinical Modification*
PSC—Pediatric Symptom Checklist
SFY—state fiscal year

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Today 1 in 5 children suffers from mental health problems, but <30% receive treatment.[1,2] Mental health screening in primary care is a major strategy for identifying mental health issues and supporting treatment of children and youth.[3,4] National organizations are recommending regular behavioral health (BH) screening at well-child visits,[4–6] and several states have incorporated enhanced BH screening as part of their Early Periodic Screening and Diagnostic Testing protocols.[7,8]

In Massachusetts, as part of the court-ordered remedy in the class action suit *Rosie D versus Patrick*,[9] the state mandated BH screening in primary care for all children up to 21 years of age who were covered by MassHealth (Medicaid). As of January 2008, providers were required to conduct BH screening with validated tools at well-child visits, and reimbursement was provided.[10] Although the recommendation was to screen at well-child visits, consistent with Early Periodic Screening and Diagnostic Testing regulations, screens were also reimbursed if used at interperiodic visits (non-well-child visits).[11] In July 2008, providers were also directed to indicate whether screening had identified a BH need by using a specific modifier. Although use of the modifier was mandated, denial of payment for claims lacking modifiers was not enforced until 2011.[11,12]

To support screening, the state provided a menu of 8 validated tools from which providers could select (see Supplemental Table 5).[12] All are self-administered questionnaires that can be filled out by parents or patients, and most are available in a variety of languages. According to MassHealth, the most commonly used screeners are the Pediatric Symptom Checklist (PSC)[13] for school-age children, the Youth-PSC for adolescents, and the Parent's Evaluation of Developmental Status[14] for younger children. Generally, screens are given to families before seeing their provider. Once in the examination room, the provider scores the tool, discusses results, and determines a disposition.[15,16]

From the commencement of screening, the number of screens billed using the screening code for MassHealth eligible members aged 0 to 21 years climbed steadily.[10] In the only study of the impact of the policy thus far, there was some indication that the overall volume of specific mental health services provided to children and youth had also increased (eg, mental health assessment).[10] To date, however, there have been no studies examining the clinical and demographic characteristics of screened children, differences between children who had BH needs identified and those who did not, or the extent to which implementation of the mandatory screening identified new cases (children without previous mental health history). In this study, we use MassHealth claims data to address these questions.

METHODS

Data were extracted from the Medicaid State Information System on January 29, 2012. The data set covered state fiscal years (SFY) 2006 to 2011 (July 2005–June 2011) and included eligibility, encounter, medical, and pharmacy files for all children. The data were deidentified by MassHealth before delivery and unique study identifiers were provided. This study was approved by the Cambridge Health Alliance Institutional Review Board in 2011.

Sample

To increase the likelihood that providers had begun screening and using modifiers to indicate whether a BH need was identified, we constructed our sample using SFY 2009 data (1 year after the modifier scheme became mandatory). For sample derivation, see Fig 1.

Screening was documented by the presence of a 96110 Current Procedural Terminology (CPT) code. BH need was noted by the presence of a specific modifier attached to the screening CPT code (U2,4,6) which we define as "positive modifier." A modifier code (U1,3,5) was also used to note that no BH need was identified which we define as "negative modifier." All children with ≥300 days of eligibility in SFY 2009 who were <16 years of age were identified. The 390 383 children were then categorized into 1 of 6 mutually exclusive groups of children based on their service use in SFY 2009: (1) ≥1 BH screen with a "negative" modifier and no screens with a "positive" modifier, (2) ≥1 BH screen with a "positive" modifier, (3) ≥1 BH screen but no modifiers reported, (4) children with well-child care but no claim for a BH screen, (5) children without well-child visits or BH screens, and (6) children with eligibility but no claims or encounters.

An index or "salient" screening visit date was assigned to children and youth based on the date of the first negative modifier (for those without positive modifiers; group 1), the first positive modifier (for group 2), and the first use of 96110 for those without any modifiers (group 3). For groups without screening claims, the first well-child visit (group 4) or the first claim or encounter (group 5) was used as the salient visit. We excluded group 6 (no claims or encounters in SFY 2009) from further study because they had no data from which to examine utilization. Group 6 children (n = 34 893; 9% of the sample) were more likely to be in the 11- to 13-year-old category and to have unknown race and were less likely to be in foster care compared with other groups.

To ensure that we could capture past BH utilization billed to Medicaid, we further

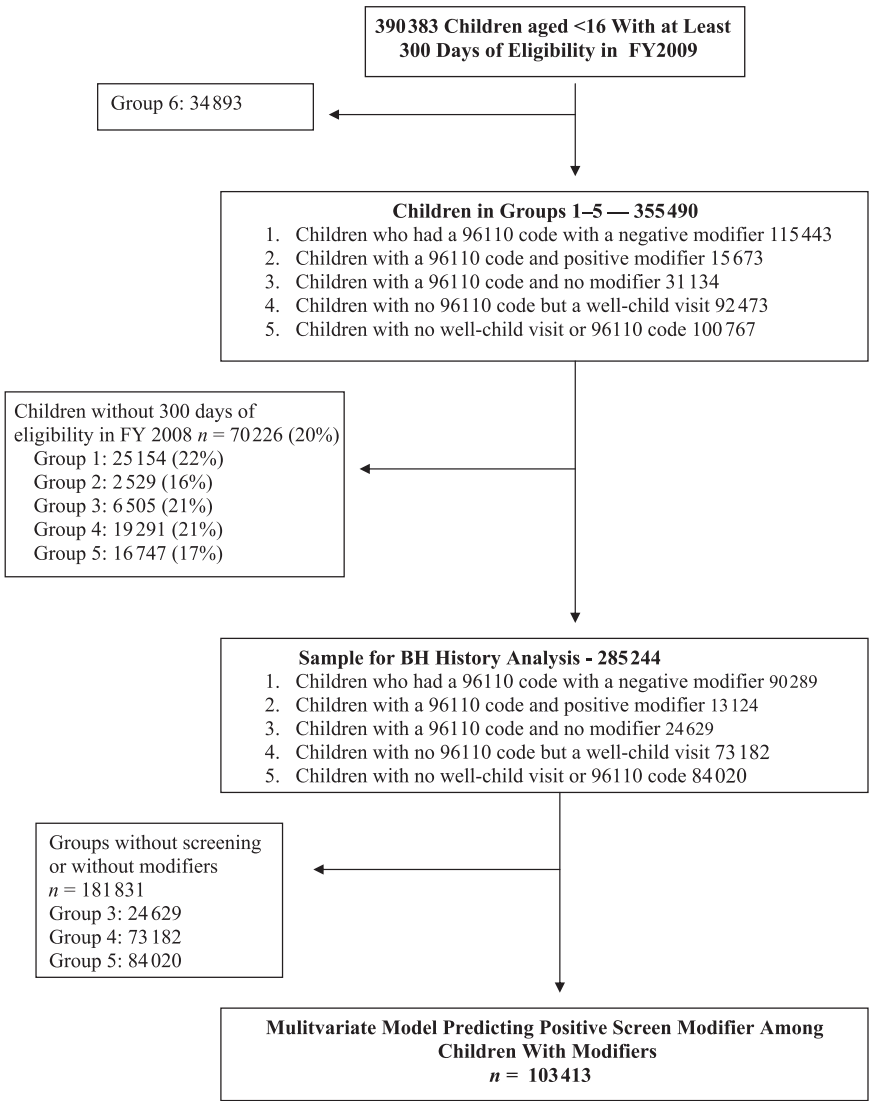

FIGURE 1
Derivation of the sample.

limited our sample to SFY 2009 children with ≥300 days of eligibility in SFY 2008. This created a group of children and youth with near-continuous enrollment for both years and a range of 301 to 729 days of coverage before the salient visit. This decreased our sample to 285 244, and enrollee loss was similar across all 5 groups (15%–21%). Children who did not meet the SFY 2008 eligibility requirement were more likely to be female, aged <5 years, of unknown race, and in foster care, and they were less likely to be Hispanic or multiracial ($P < .0001$ for all).

Variables

Independent variables of interest included race/ethnicity (white, African American, Asian, Hispanic, Native American, multiracial, and unknown), urban/rural residence based on zip code coding from the Rural-Urban Commuting Area Codes,[17] foster care, age (as continuous and categorical variables: <5, 5–7, 8–10, 11–13, 14–16), and gender. Recent BH history was defined as having any claim before the salient visit with a mental health diagnosis (*International Classification of Disease, Ninth Revision, Clinical Modification* [ICD-9-CM] codes 290–319); or CPT codes indicating any ≥1 of the following: (1) psychiatric services such as diagnostic interviews, psychopharmacology management, and psychotherapy (90801–90899); (2) health behavioral assessment and intervention services (96100–96103, 96105, 96111, 96115–96120, 96125, 96150–96155) or other mental health professional codes (Healthcare Common Procedural Codes; Healthcare Common Procedural Codes H codes); or (3) any claim for psychopharmacology (identified by

medication generic name; see later discussion for details). In addition, the Massachusetts Behavioral Health Partnership provided additional Healthcare Common Procedural Codes codes introduced in Massachusetts to track remedy services for the *Rosie D vs Patrick* lawsuit (Children's Behavioral Health Initiatives services) including S9484 and S9485 (crisis intervention) and T1027, T1017, and T2022 (family counseling and case management).

Psychopharmacology agents were defined using the HMO Research Network[18] and the Mental Health Research Network[19] categories for drugs based on National Drug Codes. This included Attention-Deficit Disorder (Other) (nonstimulant medications), antidepressants, antianxiety (other) (nonbenzodiazepines), anticonvulsants, antipsychotic (first generation), antipsychotic (second generation), benzodiazepines, Combo (all combination psychotropic medications), hypnotic (other) (eg, zolpidem), lithium, and stimulants (a full list of study medications is available on request). Drugs with possible dual use were excluded, including antidepressants used primarily for migraines and enuresis in children (imipramine, amitriptyline), antidepressants used for sleep (doxepin, trazodone) when no other psychiatric medication was being used and there was no mental health ICD-9-CM code, and anticonvulsants unless accompanied by any mental health ICD-9-CM code. For example, if a patient had a bipolar diagnosis on any previous visit and also used an anticonvulsant, they were included as using psychopharmacology.

Analysis

Descriptive statistics for demographic and clinical characteristics were generated for each of the 6 groups using SAS 9.3.[20] Intergroup differences were assessed by using χ^2 statistics and a type I error of .01. Groups were also compared with respect to the proportion with a BH history. Children with positive modifiers and BH history were compared with children with positive modifiers and no BH history. Finally, we used multivariate logistic regression to determine predictors of having a positive modifier (versus not) in SFY 2009 among those children screened and having modifier codes.

We imputed race data for our final model using SAS PROCMI and all available independent and dependent variables given the large number of children with unknown race/ethnicity. To verify our analyses with imputed data, we compared our results to regression models using race data without imputation (with and without the unknown category) and found that all 3 versions yielded similar results. Because data were not available linking children and youth to particular primary care providers or practices, we were unable to conduct analyses or adjust results for clustering within clinic or sites.

RESULTS

Sample Characteristics

The initial sample of children and youth aged <16 years (up to 15 years and 364 days) meeting eligibility requirements in FY 2009 was 390 383. The mean age was 7.8 years, and 48.6% were girls (Table 1). Of the 131 116 cases with modifiers; 12.0% were positive. The 6 groups differed significantly on age, race, gender, and foster care eligibility. Those who had claims for screens and only negative modifiers (group 1) had the largest proportion of children <5 years of age (41.2%), although the average age was youngest for those who had claims for screens but no reported modifiers (group 3). Those with claims for screens and ≥1 positive modifier were least likely to be female (39.2%). Overall, only 1.3% of children and youth were in foster care; those with positive modifiers were more likely to be in foster care (3.2%), and those without utilization were least likely (0.2%).

Recent Past BH History

More than a quarter of children and youth (29.3%) had some evidence of BH utilization or diagnoses before their salient visit (Table 2). The most common marker of past BH history was an ICD-9-CM diagnosis (26.5%), and 7.4% had been prescribed ≥1 psychotropic medications. Children with positive screens were substantially more likely than those with negative screens to have any recent BH history or to have a claim for psychotropic medication. Children in groups 3 through 5 had BH histories more similar to group 1 (negatives) than group 2 (positives).

The proportion of children with recent past BH history increased with age as did the proportion of children with past claims for psychopharmacology regardless of screening group (Fig 2). However, the rate of recent previous BH history was higher for those with a positive modifier compared with other children. For example, 53.9% of 5-year-olds and 63.3% of 13-year-olds with positive modifiers had a past BH history compared with 19.1% of all other 5-year-olds and 33.2% of all other 13-year-olds.

Characteristics of "Newly" Identified Children and Youth

Children and youth with a positive modifier but no recent past BH history were considered "newly" identified. Compared with positively screened children with a BH history, positively screened children who were newly identified were less likely to be male, were on average younger, more likely to be Asian, less likely to be white, and less likely to be in foster care (Table 3).

TABLE 1 Group Characteristics, n = 390 383 in FY 2009: Percent

Characteristic[a]	Total Groups 1–6, n = 390 383	Group 1 Negative Modifier,[b] n = 115 443	Group 2 Positive Modifier, n = 15 673	Group 3 Screen Without Modifier, n = 31 134	Group 4 Well-Child Visit Without Screen, n = 92 473	Group 5 No Well-Child Visit or Screen, n = 100 767	Group 6 No Encounters or Claims, n = 34 893
Gender							
Male	51.4	49.9	60.8	50.9	51.2	51.9	51.7
Female	48.6	50.1	39.2	49.1	48.8	48.1	48.3
Age, y							
<5	31.7	41.2	35.3	37.3	37.3	15.7	20.8
5–7	17.6	17.0	18.0	17.2	16.7	19.2	17.1
8–10	17.0	15.1	17.1	14.6	15.1	20.6	19.6
11–13	16.4	14.0	15.8	13.7	14.8	20.3	20.5
14–16	17.4	12.8	13.7	12.5	16.2	24.2	22.1
Mean (SD)	7.79 (4.9)	6.70 (5.0)	7.29 (4.8)	6.64 (4.9)	7.30 (5.02)	9.51 (4,4)	9.08 (4.6)
Race/ethnicity							
White	28.0	28.6	31.4	25.2	27.9	28.7	25.7
Asian	3.5	3.4	1.4	3.8	4.4	3.1	3.2
African American	9.2	7.9	8.2	11.2	10.2	9.3	9.1
Hispanic	16.9	17.5	20.2	19.5	15.6	16.7	15.2
Native American	0.2	0.2	0.1	0.1	0.2	0.2	0.1
Multiracial	2.5	2.7	3.0	2.8	2.8	2.4	1.4
Unknown	39.7	39.8	35.8	37.4	39.0	39.7	45.2
Urban (n = 386 101)	97.3	97.2	97.5	99.0	97.4	96.8	97.0
Foster care: yes	1.3	1.3	3.2	1.0	1.5	1.4	0.2
≥300 d of eligibility in FY 2008	73.1	78.2	83.7	79.1	79.1	83.4	Not applicable
Well-child visit in FY 2009	70.7	98.1	96.8	97.9	100	0	0

[a] $P < .0001$ for all characteristics using χ^2 statistics.

[b] Modifier used to code whether a BH issue was or was not identified.

TABLE 2 BH History (n=285 244): Percent

Characteristic[a]	All, n = 285 244	Group 1 Negative Modifier,[b] n = 90 289	Group 2 Positive Modifier, n = 13 124	Group 3 Screen Without Modifier, n = 24 629	Group 4 Well-Child Visit Without Screen, n = 73 182	Group 5 No Well-Child Visit or Screen, n = 84 020
Any history (includes all of the following)	29.3	26.7	61.2	26.2	29.3	28.2
Psychopharmacology	7.4	5.2	16.5	4.8	7.4	9.1
Previous psychiatric visit[c]	14.5	13.1	35.6	10.8	14.6	13.8
Previous health or behavioral assessment[d]	2.9	2.8	8.6	2.9	3.4	1.7
Previous nonphysician mental health visit[e]	4.8	4.2	10.8	5.3	5.2	3.9
Any mental health diagnosis (ICD-9-CM 290–319)	26.5	24.3	57.7	23.6	26.7	24.6

[a] $P < .0001$ for all characteristics using χ^2 statistics.

[b] Modifier used to code whether a BH issue was or was not identified.

[c] Claims with CPT codes 90801–90899.

[d] CPT codes 96100–96103, 96105, 96111, 96115–96120, 96125, 96150–96155.

[e] Healthcare Common Procedural H codes plus S9484 and S9485 (crisis intervention) and T1027, T1017, and T2022 codes (family counseling and case management).

Predictors of a Positive Modifier

In logistic regression analyses of continuously enrolled children with documented screening and modifiers (n = 103 413; Table 4) we found that being male, being age 5 to 7 years, being Hispanic, being from an urban zip code, being in foster care, and having a BH history were predictive of having a positive modifier. Being age 14 to 16 years and of Asian race reduced the odds of having a positive modifier.

DISCUSSION

In this study of MassHealth children after the implementation of mandated BH screening, 12.0% of all screened children with modifiers were identified as having a BH issue. This is similar to rates reported elsewhere (12%–14%)[21] and to national reports in which 12% of children with Medicaid were identified as having BH issues.[22] Almost 40% of children with positive modifiers did not have a recent BH history (5097), suggesting that BH screens are identifying large numbers of children with problems who had not received recent treatment. This is consistent with the results of several smaller clinical studies. One study noted that only 43% of adolescents who screened positive for emotional health issues had used mental health services in the 3 months before screening,[23] and another found that only 35% of children identified by the PSC were already in mental health counseling[15]

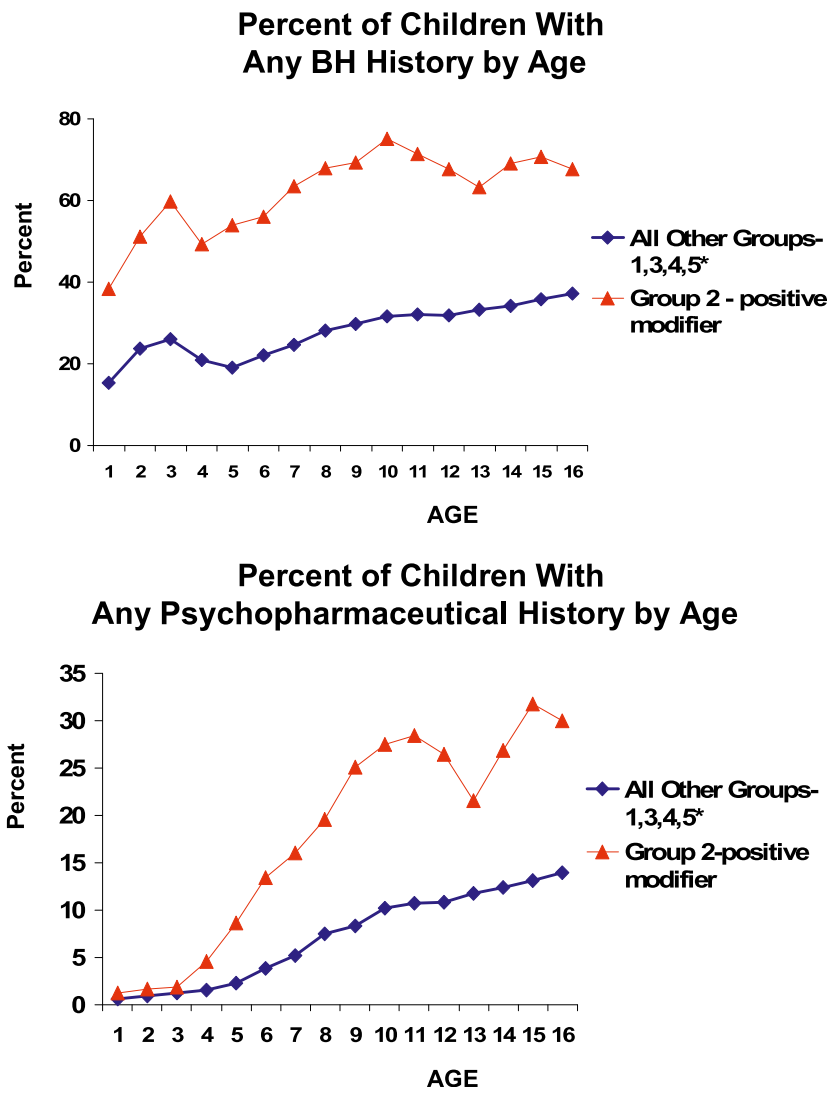

FIGURE 2
BH by age. *1, negative modifier; 3, screen no modifier; 4, well-child visit no screen; 5, no well-child visit and no screen.

Newly identified children were more likely to be female, younger, and minority compared with identified children with a recent BH history. This supports the benefits of screening both for identifying children among those who have historically received fewer services and for early identification.[24–26] The fact that more than half of the children identified by the screens had a recent BH history may suggest that screening was not necessary for these children. However, we argue that even for children who have received or are receiving services, a positive screen can provide an opportunity to revisit issues, reconnect children to BH care, assess current regimens and communicate with mental health providers. This is particularly important given recommendations calling for care integration in patient-centered medical homes.[27]

It is also interesting to note that approximately a quarter of children without positive modifiers had a BH history. Recognizing that these children were likely to have received treatment of some type in the recent past, it is possible that their symptoms had been reduced by the time of screening and that they were not identified for this reason. However, because other studies have shown that positive screens have been associated with being in treatment, this finding does have implications for the sensitivity of the modifiers.[15] More work is needed to understand the potential disconnect between screen score and whether a provider chooses to use a "positive" modifier.

More than half of children with utilization in SFY 2009 (54%) did not have evidence of screening. It is unclear whether this reflects the lack of screening or merely the lack of documentation. For children without well-child visits, it is unlikely that screening took place during other visits given time constraints inherent in acute care visits unless the visit was for a mental health problem. However, 26% of children with well-child visits also did not have documentation of screening. Because MassHealth is reimbursing for screening, we posit that this reflects a lack of screening rather than missing claims. However, detailed chart reviews are necessary to better understand whether this is actually the case.

Given that this is the first study using the screening modifier as a proxy for BH issue identification, it was important to validate the relationship between the "positive" modifier and other factors related to risk for mental health issues. In this study, the positive modifier was related to being in foster care and male gender. Children in foster care have been found to be at higher risk for mental health issues than other children insured by Medicaid.[28–32] Male patients, particularly school-age and adolescent, with Medicaid insurance have been shown to receive mental health services at higher rates than female patients,[22,26,33] and most studies with the PSC have found rates of positive

TABLE 3 Comparisons of Children With Positive Modifiers,[a] With and Without BH History (n = 13 124): Percent

Characteristic[b]	Positive Modifier No History, n = 5097 (38.8)	Positive Modifier With History, n = 8013 (61.1)
Gender		
Male	55.5	64.6
Female	44.5	35.4
Age, y		
<5	38.6	24.0
5–7 y	21.1	18.5
8–10	13.9	21.3
11–13	14.4	19.0
14–16	12.1	17.2
Mean (SD)	6.9 (4.6)	8.5 (4.5)
Race/ethnicity		
White	25.5	36.2
Asian	2.0	1.0
Black	8.5	7.8
Hispanic	23.3	19.0
Native American	0.1	0.2
Multiracial	2.9	3.4
Unknown	37.6	32.4
Urban (n = 13 018)	98.2	96.8
Foster care: yes	1.2	4.3

[a] Modifier used to code whether a BH issue was or was not identified.
[b] $P < .0001$ for all characteristics using χ^2 statistics.

screening that are 50% to 100% higher for male than for female respondents.[21] Additionally, BH history was shown to increase by year of age for children with positive modifiers to a far greater extent than it did in all other groups. Although some proportion of the children who were screened without modifiers are likely to have merited positive modifiers (false-negatives), in this study, their profile resembled that of children with negative modifiers. Therefore, we suspect that the use of a positive modifier is a sensitive indicator of BH issues.

TABLE 4 Predictors of Positive Modifier[a] on BH Screen in Children With Modifiers (n = 103 413)

Characteristic	Odds Ratio	95% Confidence Interval
Gender		
Female	1.00	
Male	1.36	1.31–1.42
Age, y		
<5	1.00	
5–7	1.09	1.03–1.15
8–10	1.00	0.95–1.06
11–13	0.97	0.92–1.03
14–16	0.89	0.84–0.95
Race/ethnicity[b]		
White	1.00	
Asian	0.88	0.78–0.99
Black	1.03	0.97–1.10
Hispanic	1.15	1.10–1.21
Native American	1.08	0.96–1.22
Multiracial	1.03	0.93–1.14
Rural	1.00	
Urban	1.19	1.03–1.15
Foster care		
No	1.00	
Yes	1.53	1.36–1.73
Previous BH history		
No	1.00	
Yes	4.21	4.05–4.38

[a] Modifier used to code whether a BH issue was or was not identified.
[b] Race/ethnicity missing/unknown data were imputed using SAS PROCMI program.

It was somewhat surprising that 14- to 17-year-olds had a lower risk of having a positive modifier given the known incidence of affective disorders in adolescents. It is important to note that the BH recommended screens include developmental assessments, which is likely to account for the higher risk of a positive modifier in the younger age groups.

Whether the positive modifier is synonymous with a "positive" screening score (above a validated cutpoint on a particular screen) is not known because screening results are not reported on claims. Discrepancy between positive score and modifier might be due to clinician oversight (simply not documenting the appropriate modifier or to decision-making at the screening visit (things are not actually problematic despite a high score, or visa versa). More research is needed to understand the specificity and sensitivity of the modifier and its relationship to actual scores on validated screens.

Use of modifiers could also be affected by attitudes toward particular racial or ethnic populations. Physicians may be more or less likely to label a child with BH issues, or may have more or less confidence in screen results, depending on the patient or parent's racial or ethnic identification. Although the recommended screening tools were available in many languages, not all translations may have been available at all sites, and differences in dialect within language groups could make them more or less valid. For example, we noted that Asian children were less likely than any other racial/ethnic

groups to have a positive modifier. This phenomenon has also been identified in other studies.[15] They were also more likely to have had a well-child visit without a screen having been reported, suggesting that available language translations of recommended tools might have been missing. Additionally, we found that Hispanic children were at higher risk for positive modifiers, although previous studies have found Hispanic individuals as a group to underreport BH symptoms compared with other ethnic groups.[22,34,35] One previous study even suggested that a lower cutpoint on the PSC would be needed to identify Mexican American children.[35]

Although other studies report a relationship between race/ethnicity and positive scores on the PSC,[15,34,36] there has been no attempt to separate the impact of socioeconomic status. In this study of children insured by Medicaid (ie, controlling for socioeconomic status), race/ethnicity predicted positive modifiers, and minority children were more likely to be among those newly identified by BH screens. Screening may thus have some potential for decreasing disparities in identification.

Given that this study uses MassHealth claims data, information is not available on a variety of demographic variables that might play an important role in screening, such as language of care and other social determinants of health.[37–39] MassHealth children may not be representative of children with commercial insurance. Additionally, the number of children with unknown race data (39%) found in Medicaid data limits our ability to fully understand the relationship of race to BH issues and screening.[40] However, our results using imputed data did not change from those with the original categories, which included unknown.

Although we have begun to establish the validity of the positive screening modifier, more work is needed to understand physicians' use of the modifier and its relationship to screening scores. We recognize that some children lacking a BH screening CPT code may have actually been screened but documentation is lacking. We also recognize that by limiting our sample to a continuously enrolled population, we excluded a substantial group of children, thereby potentially biasing our sample to some extent. However, to fully understand previous BH history, it was important to minimize chance of non-Medicaid utilization.

CONCLUSIONS

This study is the first to demonstrate that the mandatory MassHealth BH screening policy is associated with the identification of large numbers of newly identified children and also with re-identifying children with previous BH issues. Newly identified children are more likely to be from groups that have historically received fewer treatment services, underscoring the opportunity that screening provides for engagement or reengagement in needed mental health services. However, to fully understand the value of screening, future research is needed to determine whether newly identified children receive mental health services in a timely fashion.

REFERENCES

1. Merikangas KR, He JP, 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):75–81
2. Merikangas KR, He JP, Burstein M, et al. Service utilization for lifetime mental disorders in U.S. adolescents: results of the National Comorbidity Survey—Adolescent Supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry*. 2011;50(1):32–45
3. American Academy of Pediatrics, Subcommittee on Attention-Deficit/Hyperactivity Disorder and Committee on Quality Improvement. Clinical practice guideline: treatment of the school-aged child with attention-deficit/hyperactivity disorder. *Pediatrics*. 2001;108(4):1033–1044
4. Appendix S4: The Case for Routine Mental Health Screening. *Pediatrics*. 2010;125 (suppl 3):S133–S139
5. New Freedom Commission on Mental Health. *Achieving the Promise: Transforming Mental Health Care in America. Final Report*. Rockville, MD: Department of Health and Human Services; 2003
6. *Bright Futures in Practice: Mental Health*. Vol. I: *Practice Guide*. Arlington, VA: National Center for Education in Maternal and Child Health; 2002
7. Minnesota Department of Health. Developmental and social-emotional screening of young children (0–6 years of age) in Minnesota. Available at: www.health.state.mn.us/divs/fh/mch/devscrn. Accessed October 11, 2009
8. Semansky RM, Koyanagi C, Vandivort-Warren R. Behavioral health screening policies in Medicaid programs nationwide. *Psychiatr Serv*. 2003;54(5):736–739
9. The Remedy: The Pathway to Home-Based Services. Northampton, MA: Center for Public Representation, 2007. Available at Rosie D. Reforming the Health Care System in Massachusetts website: http://rosied.org/Default.aspx?pageId=84564. Accessed July 26, 2013
10. Kuhlthau K, Jellinek M, White G, Vancleave J, Simons J, Murphy M. Increases in behavioral health screening in pediatric care for Massachusetts Medicaid patients. *Arch Pediatr Adolesc Med*. 2011;165(7):660–664
11. Executive Office of Health and Human Services Comonwealth of Massachusetts. Billing for the administration and scoring of a standardized behavioral-health screen. 2012. Available at: www.mass.gov/eohhs/gov/commissions-and-initiatives/cbhi/screening-for-behavioral-health-conditions/behavioral-health-screening-tools/billing.html. Accessed December 15, 2012
12. Executive Office of Health and Human Services Commonwealth of Massachusetts. The MassHealth-Approved Screening Tools.

2012. Available at: www.mass.gov/eohhs/gov/commissions-and-initiatives/cbhi/screening-for-behavioral-health-conditions/the-masshealth-approved-screening-tools. Accessed July 26, 2013

13. Pediatric Symptom Checklist. 2012. Available at: www.massgeneral.org/psychiatry/services/psc_home.aspx. Accessed November 16, 2012
14. PEDStest.com. Available at: www.pedstest.com/default.aspx. Accessed May 21, 2012
15. Hacker KA, Myagmarjav E, Harris V, Suglia SF, Weidner D, Link D. Mental health screening in pediatric practice: factors related to positive screens and the contribution of parental/personal concern. *Pediatrics*. 2006;118(5):1896–1906
16. Hacker K, Adair R, Brooks B, Schonwald A, Straus J. Implementing state-wide behavioral health screening in children, challenges and lessons learned. Presented at the American Public Health Association Annual Conference; October 25–29, 2008; San Diego, CA; 2008
17. Washington, Wyoming, Alaska, Montana and Idaho (WWAMI) Rural health research center. Rural-urban commuting area codes (RUCAs) 2012. Available at: http://depts.washington.edu/uwruca/index.php Accessed December 26, 2012
18. HMO Research Network. HMO Research Network, 2012. Available at: www.hmoresearchnetwork.org/home.htm. Accessed December 28, 2012
19. Mental Health Research Network. Available at: https://sites.google.com/a/mhresearchnetwork.org/mhrn/home. Accessed December 27, 2012
20. SAS OnlineDoc, Version 9.3 [computer program]. Cary, NC: SAS Institute Inc; 2002–2006
21. Jellinek MS, Murphy JM, Little M, Pagano ME, Comer DM, Kelleher KJ. Use of the Pediatric Symptom Checklist to screen for psychosocial problems in pediatric primary care: a national feasibility study. *Arch Pediatr Adolesc Med*. 1999;153(3):254–260
22. Pastor PN, Reuben CA, Duran CR. *Identifying Emotional and Behavioral Problems in Children Aged 4–17 Years: United States, 2001–2007* (National Health *Statistics Reports no. 48)*. Atlanta, GA: National Center for Health Statistics, Centers for Disease Control and Prevention;2012
23. Burnett-Zeigler I, Ilgen M, Valenstein M, et al. Prevalence and correlates of alcohol misuse among returning Afghanistan and Iraq veterans. *Addict Behav*. 2011;36(8):801–806
24. Howell E, McFeeters J. Children's mental health care: differences by race/ethnicity in urban/rural areas. *J Health Care Poor Underserved* 2008(19):237–247
25. Alegría M, Chatterji P, Wells K, et al. Disparity in depression treatment among racial and ethnic minority populations in the United States. *Psychiatr Serv*. 2008;59(11):1264–1272
26. Hacker K, Drainoni ML. Mental health and illness in Boston's children and adolescents: one city's experience and its implications for mental health policy makers. *Public Health Rep*. 2001;116(4):317–326
27. Dickinson WP, Miller BF. Comprehensiveness and continuity of care and the inseparability of mental and behavioral health from the patient-centered medical home. *Fam Syst Health*. 2010;28(4):348–355
28. Steele JS, Buchi KF. Medical and mental health of children entering the Utah foster care system. *Pediatrics*. 2008;122(3):e703–e709
29. dosReis S, Zito JM, Safer DJ, Soeken KL. Mental health services for youths in foster care and disabled youths. *Am J Public Health*. 2001;91(7):1094–1099
30. Harman JS, Childs GE, Kelleher KJ. Mental health care utilization and expenditures by children in foster care. *Arch Pediatr Adolesc Med*. 2000;154(11):1114–1117
31. Blumberg E, Landsverk J, Ellis-MacLeod E, Ganger W, Culver S. Use of the public mental health system by children in foster care: client characteristics and service use patterns. *J Ment Health Adm*. 1996;23(4):389–405
32. Woods SB, Farineau HM, McWey LM. Physical health, mental health, and behaviour problems among early adolescents in foster care. *Child Care Health Dev*. 2013;38(2):220–227
33. Temkin-Greener H, Clark KT. Ethnicity, gender, and utilization of mental health services in a Medicaid population. *Soc Sci Med*. 1988;26(10):989–996
34. Harris KM, Edlund MJ, Larson S. Racial and ethnic differences in the mental health problems and use of mental health care. *Med Care*. 2005;43(8):775–784
35. Jutte DP, Burgos A, Mendoza F, Ford CB, Huffman LC. Use of the Pediatric Symptom Checklist in a low-income, Mexican American population. *Arch Pediatr Adolesc Med*. 2003;157(12):1169–1176
36. Bernal P, Estroff DB, Aboudarham JF, Murphy M, Keller A, Jellinek MS. Psychosocial morbidity: the economic burden in a pediatric health maintenance organization sample. *Arch Pediatr Adolesc Med*. 2000;154(3):261–266
37. Silver J, Dicker S. Mental health assessment of infants in foster care. *Child Welfare*. 2007;86(5):35–55
38. Raviv A, Sharvit K, Raviv A, Rosenblat-Sten S. Mothers' and fathers' reluctance to seek psychological health for their children. *J Child Fam Stud*. 2009;18(2):151–162
39. Banta JE, James S, Haviland MG, Andersen RM. Race/ethnicity, parent-identified emotional difficulties, and mental health visits among California children. *J Behav Health Serv Res*. 2013;40(1):5–19
40. Llanos K, Palmer L. *Using Data on Race and Ethnicity to Improve Health Care Quality for Medicaid Beneficiaries*. Hamilton, NJ: Center for Health Care Strategies; 2006