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Disparities in Psychiatric Emergency Department Boarding of Children and Adolescents

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IMPORTANCE Since the COVID-19 pandemic, emergency department boarding of youth with mental health concerns has increased.

OBJECTIVE To summarize characteristics (including gender, age, race, ethnicity, insurance, diagnosis, and barriers to placement) of youth who boarded in emergency departments while awaiting inpatient psychiatric care and to test for racial, ethnic, and gender disparities in boarding lengths and inpatient admission rates after boarding. Secondarily, to assess whether statewide demand for inpatient psychiatric care correlated with individual outcomes.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional analysis included administrative data collected from May 2020 to June 2022 and represented a statewide study of Massachusetts. All youth aged 5 to 17 years who boarded in Massachusetts emergency departments for 3 or more midnights while awaiting inpatient psychiatric care were included.

EXPOSURE Boarding for 3 or more midnights while awaiting inpatient psychiatric care.

MAIN OUTCOMES AND MEASURES Emergency department boarding length (number of midnights) and whether inpatient care was received after boarding. Statistical analyses performed included logistic and gamma regressions; assessed gender, racial, and ethnic disparities; and correlations between statewide demand for psychiatric care and boarding outcomes.

RESULTS A total of 4942 boarding episodes were identified: 2648 (54%) for cisgender females, 1958 (40%) for cisgender males, and 336 (7%) for transgender or nonbinary youth. A total of 1337 youth (27%) were younger than 13 years. Depression was the most common diagnosis (2138 [43%]). A total of 2748 episodes (56%) resulted in inpatient admission, and 171 transgender and nonbinary youth (51%) received inpatient care compared with 1558 cisgender females (59%; adjusted difference: −9.1 percentage points; 95% CI, −14.7 to −3.6 percentage points). Transgender or nonbinary youth boarded for a mean (SD) of 10.4 (8.3) midnights compared with 8.6 (6.9) midnights for cisgender females (adjusted difference: 2.2 midnights; 95% CI, 1.2-3.2 midnights). Fewer Black youth were admitted than White youth (382 [51%] and 1231 [56%], respectively; adjusted difference: −4.3 percentage points; 95% CI, −8.4 to −0.2 percentage points). For every additional 100 youth boarding statewide on the day of assessment, the percentage of youth admitted was 19.4 percentage points lower (95% CI, −23.6% to −15.2%) and boarding times were 3.0 midnights longer (95% CI, 2.4-3.7 midnights).

CONCLUSIONS AND RELEVANCE In this cross-sectional study, almost one-half of 3 or more midnight boarding episodes did not result in admission, highlighting a need to understand the effects of boarding without admission. Gender and racial disparities were identified, suggesting the need for targeted resources to reduce boarding and promote equitable access to care.

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Supplemental content

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In 2021, the American Academy of Pediatrics, American Academy of Child and Adolescent Psychiatry, and Children's Hospital Association declared a "...national emergency in child and adolescent mental health."[1] Rates of depression and anxiety among children and adolescents have increased since the COVID-19 pandemic,[2] and the fraction of youth with psychiatric emergency department (ED) visits has increased substantially.[3] Youth may wait multiple days for inpatient psychiatry placement, known as ED boarding.[4] In Massachusetts in December 2022, 45% of pediatric psychiatric ED visits resulted in boarding for at least 12 hours.[5]

Although ED boarding was a problem long before the COVID-19 pandemic,[6] boarding has increased since the pandemic, and our understanding of demographic and clinical characteristics of youth who board is limited.[3,4] Further, not all youth who board are admitted to an inpatient psychiatry unit,[7] and rates of inpatient admission after boarding may have decreased in recent years.[8] Youth who board without receiving inpatient care have generally received less mental health care than they would have received in an inpatient setting,[9] potentially putting them at risk of worse outcomes.

Using a statewide dataset from Massachusetts,[10] we assessed prolonged ED boarding for youth awaiting inpatient psychiatric care. Our primary objective was to test for gender, racial, and ethnic disparities in boarding durations and inpatient admission rates; we hypothesized that racial, ethnic, and gender minority youth would board longer with lower admission rates than their peers. Secondarily, we sought to assess the correlation between statewide demand for inpatient psychiatric care and individual boarding length and inpatient admission. We hypothesized that higher demand in the setting of limited inpatient bed availability would be associated with longer boarding and lower rates of admission after boarding.

Key Points

Question Are there racial, ethnic, or gender disparities in length of boarding or likelihood of inpatient admission for youth who board in emergency departments while awaiting inpatient psychiatric care?

Findings In this cross-sectional study including 4942 episodes of youth boarding for at least 3 midnights, transgender and nonbinary youth were 9.1% less likely to be admitted and boarded 2.2 days longer than cisgender females; these differences were statistically significant. Black youth were 4.3% less likely to be admitted than their White peers, also statistically significant.

Meaning There is a high need for targeted resources to reduce boarding and promote equitable access to care.

Methods

The Harvard Longwood and Massachusetts Department of Mental Health institutional review boards approved this study with waivers of consent, owing to the use of deidentified data, its collection for nonresearch purposes, and the study involving no more than minimal risk. We followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines (eMethods 2 in Supplement 1).[11]

Dataset

In Massachusetts, EDs report children and adolescents who board 48 or more hours while awaiting inpatient psychiatric care to the state.[10] These reports form the Expedited Psychiatric Inpatient Admission database, created by the Commonwealth of Massachusetts to research and mitigate ED boarding. We cross-sectionally analyzed reports from May 2020 to June 2022 of episodes involving youth aged 5 to 17 years, across all hospitals. In some months, reporting was required at 60 or 24 hours[12]; for consistency, we included only youth who boarded 3 or more midnights. We excluded 29 episodes (0.58%) with missing gender or primary diagnosis or where the boarding hospital closed.

We used demographic information, including gender (cisgender female, cisgender male, and transgender or nonbinary), age at evaluation (children [5-12 years] and adolescents [13-17 years], consistent with how inpatient care is commonly divided),[13,14] insurance, and race and ethnicity (reported by hospital placement teams). Race and ethnicity categories were as follows: (1) Asian, non-Hispanic, (2) Black, non-Hispanic, (3) Latinx or Hispanic, (4) White, non-Hispanic, (5) other, non-Hispanic, and (6) unknown. For several fields (race, ethnicity, and diagnosis), the category of other was on the forms submitted by hospital placement teams, and additional granularity was not available. To mitigate potential bias, we conducted sensitivity analyses imputing unknown race and ethnicity values (eMethods 1 in Supplement 1).[15] We grouped insurance status as (1) non-Medicare public insurance (eg, Medicaid), (2) commercial insurance, (3) no insurance, and (4) other, including Medicare and dual Medicare/Medicaid coverage.

For each patient, a primary diagnosis was selected from a list or designated as other. Generally, diagnosis was based on ED intake notes, although sources may have varied across hospitals. Hospital placement teams reported a primary barrier to inpatient placement for each patient, which was selected from several categories or listed as other, which included free-text responses. We grouped barriers as (1) bed availability/no barriers, (2) aggression/assaultive risk, and (3) other. We reported the number of episodes with "COVID" in the free-text field for "other" barrier. Additionally, reports indicated whether the state's Department of Children and Families[16] had an active case for the patient, encompassing anything from a voluntary request for assistance to state custody.

Day of week and season (fall: September-November; winter: December-February; spring: March-May; summer: June-August) were based on the initial evaluation date.

We categorized boarding hospitals by presence of an inpatient child psychiatry unit.[17] We assessed differences by hospital type using 5 predefined, mutually exclusive cohorts (academic medical centers, teaching hospitals, community hospitals with high portions public funding, community hospitals without high portions public funding, and specialty hospitals) (eTable 1 in Supplement 1).

Outcomes

We evaluated 2 outcomes: ED boarding length and whether a patient was admitted to an inpatient unit after boarding. Boarding length was defined as the number of midnights between a patient's initial ED evaluation and the date they left the ED due to admission, transfer, or discharge. Inpatient admissions included admissions to medical and psychiatry inpatient units. Although medical floor boarding likely does not provide the same care as inpatient psychiatric care, it has been deemed preferable to ED boarding by the Academy of Consult Liaison Psychiatry and can likely provide more services.[18-20] Youth were designated as not receiving inpatient care if the hospital placement team reported that they no longer required inpatient care and could be discharged to a lower level of care (eg, home, residential program).

Statistical Analysis

We summarized demographic, clinical, and hospital characteristics overall and by outcome. For race, ethnicity, and gender, we calculated joint tests of significance for length of stay (analysis of variance [ANOVA] tests) and admission (χ^2 tests). We summarized characteristics of youth in the top quartile and decile of boarding compared with the full sample and tested for significant differences using χ^2 tests.

To assess gender, racial, and ethnic disparities, we followed the Institute of Medicine definition of all differences except those due to need (operationalized as primary diagnosis and age) or preference.[21] We estimated disparities in rates of inpatient admission after boarding using logistic regressions, controlling for age group and primary diagnosis. We also controlled for year and calendar month due to strong seasonal trends.[22] Groups with the largest portions of youth were used as comparison groups (ie, cisgender female and White non-Hispanic). We used gamma regressions with log-link functions when calculating disparities in boarding length due to right skew. Our dataset only included youth who boarded for 3 or more midnights. To align this with the gamma distribution, we used boarding time beyond 3 midnights. We reported average marginal effects and Wald tests for regressions. Additionally, because diagnosis may partially reflect clinician racial bias rather than clinical status,[23] we conducted sensitivity analyses excluding primary diagnosis from regressions. We also conducted sensitivity analyses comparing transgender and nonbinary with all cisgender youth. For length of stay, we conducted sensitivity analyses using ordered logistic regressions to avoid distributional assumptions of gamma models.

To test the association between overall demand for inpatient care and individual outcomes, we calculated the total number of youth boarding on each date. Then, we graphed the association between the number of youth boarding 3 or more midnights statewide on the day of ED evaluation and the proportion of youth who were admitted. We graphed the correlation between statewide demand and boarding lengths (5th, 50th, and 95th percentiles). We graphed these associations using local *t*-based approximation, with 10% of observations used for a local regression estimate at each time point. We evaluated the associations between overall demand for inpatient care and individual outcomes using regressions with terms for hundreds of youth boarding statewide on the day a patient was evaluated. We estimated logistic regressions for inpatient admission and gamma regressions for boarding length, controlling for age group and primary diagnosis.

All *P* values were 2-sided, and a significance level of .05 was used for all analyses. Analyses were completed in Stata/MP, version 16.1 (StataCorp), and R, version 4.3.1 (R Project for Statistical Computing).

Results

Characteristics of Children and Adolescents Who Boarded

There were 4942 episodes of youth aged 5 to 17 years boarding for 3 or more midnights in Massachusetts between May 2020 and June 2022, excluding 29 episodes (0.58%) with missing primary diagnosis or gender or where the boarding hospital closed (n <11). Of the 4942 episodes, 2648 (54%) were for cisgender females, 1958 (40%) were for cisgender males, and 336 (7%) were for transgender or nonbinary youth. A total of 1337 youth (27%) were younger than 13 years. Depression was the most common diagnosis (2138 [43%]). The top barrier to placement was bed availability or no barriers (3262 [66%] combined), and the second-greatest barrier was aggression or assaultive risk (600 [12%]). Twenty-five episodes (0.51%) included the COVID-19 pandemic as a primary barrier. Most youth (3659 [74%]) had Medicaid or public Health Safety Net insurance. A total of 884 episodes (18%) were missing race and ethnicity data. The Department of Children and Families had an active case for 1445 children's families (29%) (**Table 1**).

A total of 2290 boarding episodes (46%) occurred at community hospitals with high portions of public funding. Fewer youth were evaluated on weekend days (Saturday, 430 [9%]; Sunday, 407 [8%]) and during the summer (680 [14%]) than on weekdays (Monday through Friday, 4105 [82%]) and during other seasons (winter, 1310 [27%]; spring, 1689 [34%]; fall, 1263 [26%]) (eTable 2 in Supplement 1). A smaller percentage of Black youth (48 [6%]) had commercial insurance than White youth (554 [25%]). Insurance and diagnostic group by gender, race, and ethnicity are available in eTable 3 in Supplement 1.

Disposition and Boarding Length

A total of 2194 episodes (44%) did not result in inpatient care. A higher proportion of cisgender females received inpatient care (1558 [59%]) than cisgender males (1019 [52%]) or transgender or nonbinary youth (171 [51%]). A total of 82 Asian, non-Hispanic youth (69%) were admitted compared with 382 (51%) Black, non-Hispanic youth. Youth with psychotic disorders or depression were admitted more frequently (108 [68%] and 1316 [62%], respectively) than youth with impulse control/conduct disorders or developmental disorders (198 [44%] and 88 [48%] admitted, respectively). The percentage of youth admitted varied by the primary barrier to placement: 278 youth (46%) with a primary barrier of aggression/assaultive risk were admitted compared with 84 youth (60%) with acuity (eg, severity of psychiatric or behavioral symptoms) (**Figure 1**).

Table 1. Characteristics of Children and Adolescents Who Boarded 3 or More Midnights While Awaiting Inpatient Psychiatric Care[a]

Characteristic	No. of episodes (%)	Characteristic	No. of episodes (%)
Full sample	4942 (100)	Primary diagnosis	
Gender		Depression	2138 (43)
Cisgender female	2648 (54)	Other[b]	744 (15)
Cisgender male	1958 (40)	PTSD	568 (11)
Transgender or nonbinary	336 (7)	Impulse control/conduct disorder	451 (9)
Age, y		ADHD	262 (5)
5-12	1337 (27)	Anxiety	238 (5)
13-17	3605 (73)	Bipolar	197 (4)
Race and ethnicity		ASD/ID/PDD	184 (4)
Asian, non-Hispanic	118 (2)	Psychotic disorder	160 (3)
Black, non-Hispanic	750 (15)	Primary barrier to placement	
Latinx/Hispanic	809 (16)	Bed availability	2702 (55)
White, non-Hispanic	2193 (44)	Aggression/assaultive risk	600 (12)
Other,[b] non-Hispanic	188 (4)	No barriers	560 (11)
Unknown	884 (18)	Other[c]	330 (7)
Insurance		Acuity	139 (3)
Medicaid/HSN/MBHP	3659 (74)	Unsuccessful prior admission	131 (3)
Commercial	1207 (24)	Medical	116 (2)
Uninsured	43 (1)	Disposition	90 (2)
Medicare, dual, or other	33 (1)	Single room	89 (2)
State agency involvement		ASD/ID/PDD	64 (1)
Active case with the Department of Children and Families	1445 (29)	Lack of insurance	52 (1)
Year of initial evaluation		Sexualized behavior	44 (1)
2020 (May-Dec)	840 (17)	Disposition	
2021 (Jan-Dec)	2575 (52)	Received inpatient care	2748 (56)
2022 (Jan-June)	1527 (31)	Did not receive inpatient care	2194 (44)

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder; HSN, Health Safety Net; ID, intellectual disability; MBHP, Massachusetts Behavioral Health Plan; PDD, pervasive developmental disorder; PTSD, posttraumatic stress disorder.

[a] Excludes 29 youth with missing gender or primary diagnosis, or whose boarding hospital closed.

[b] No additional information was available on the other category.

[c] Other primary barrier to placement includes free-text responses.

Summer was the season in which the highest percentage of youth in our sample were admitted (427 [63%]). A higher percentage of boarding episodes at hospitals with inpatient child psychiatry units resulted in admission compared with hospitals without child psychiatry units (928 [60%] vs 1820 [54%]) (eFigure 1 in Supplement 1). Over the study period, the number of youth boarding increased and admission rates decreased, without clear trends in barriers to placement or primary diagnoses (eFigure 2 in Supplement 1); in addition, boarding times increased (eFigure 3 in Supplement 1).

The median (IQR) boarding length was 7 (11-17) midnights, including the 3 midnights required for dataset inclusion. Children boarded disproportionately longer than adolescents: 1337 youth (27%) were ages 5 to 12, but they comprised 42% of youth in the top decile of boarding time. Cisgender females, youth with internalizing diagnoses, and youth with Medicaid or Health Safety Net insurance were in the top quartile or decile of boarding times less likely than their peers (**Table 2**). Median boarding times were above average for youth who presented on Mondays or Tuesdays, boarded at a pediatric hospital, and/or boarded at a hospital with an inpatient child psychiatry unit (eFigure 1 in Supplement 1). Boarding times were similar between youth who were admitted and those who were not (eFigure 4 in Supplement 1).

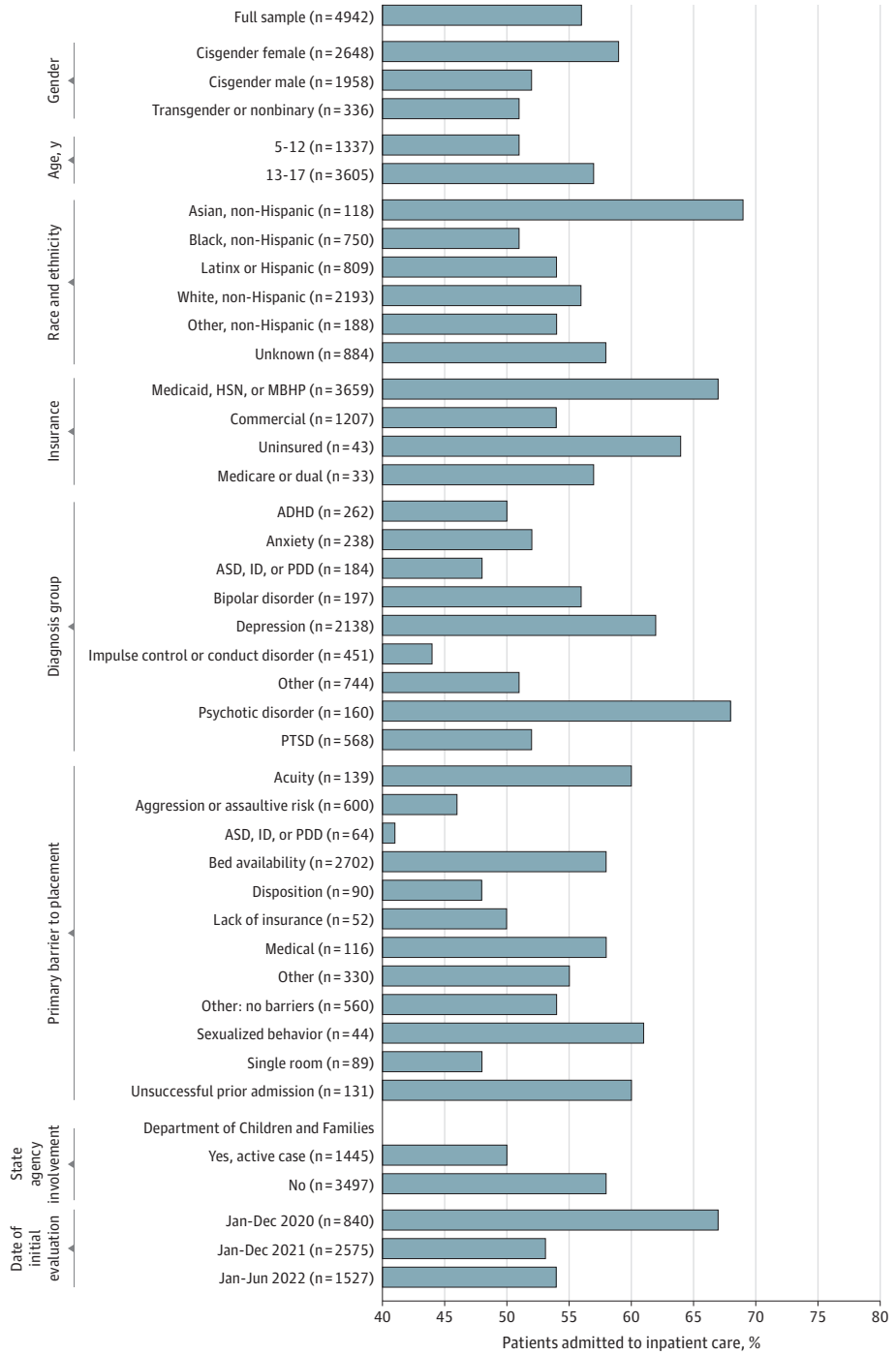
Disparities

In unadjusted significance tests, admission rates varied by race, ethnicity, and gender, as did boarding length.

We found gender-based disparities in both inpatient admissions and boarding lengths after controlling for age group and primary diagnosis (**Figure 2**). A total of 2748 episodes (56%) resulted in inpatient admission, and 171 transgender and nonbinary youth (51%) received inpatient care compared with 1558 cisgender females (59%). Compared with cisgender females, transgender and nonbinary youth had lower admission rates by 9.1 percentage points (95% CI, −14.7 to −3.6 percentage points) and boarded 2.2 midnights longer (95% CI, 1.2-3.2 midnights; unadjusted mean [SD], 8.6 [6.9] midnights for females; 10.4 [9.4] midnights for transgender and nonbinary youth). Findings were similar when comparing transgender and nonbinary youth to all cisgender youth, although with slightly lower magnitudes (eTable 4 in Supplement 1).

For racial and ethnic disparities, after adjusting for age and diagnosis, 4.3% fewer Black youth (382 [51%]) were admitted than White youth (1231 [56%]; 95% CI, −8.4% to −0.2%). Youth whose race was unknown boarded 1.3 days longer than White youth (95% CI, 0.7-1.9 days; unadjusted mean [SD], 10.0 [8.4] and 8.8 [7.1] midnights, respectively). Disparities estimates had

Figure 1. Inpatient Admission Rates After Boarding by Patient Demographics and Clinical Characteristics



ADHD indicates attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder; HSN, Health Safety Net; ID, intellectual disability; MBHP, Massachusetts Behavioral Health Plan; PDD, pervasive developmental disorder; PTSD, posttraumatic stress disorder.

slightly larger magnitudes when not controlling for diagnosis (eFigure 5 in Supplement 1).

In sensitivity analyses, length of stay results were comparable using ordered logistic (vs gamma) regressions (eTable 5 in Supplement 1), and results were qualitatively similar using imputed race and ethnicity (eTable 6 in Supplement 1).

Statewide Demand

Statewide demand was strongly correlated with individual outcomes (**Figure 3**). For every 100 additional youth boarding across Massachusetts on the day a child or adolescent was assessed, the percentage of youth admitted was 19.4 percentage points lower (95% CI, −23.6% to −15.2%) and boarding times

Table 2. Characteristics of Children and Adolescents in Top Quartile and Decile of Boarding Length

Characteristic	No. (%)		
	Full sample: 3+ midnights	Top 25% board time: 11+ midnights[a]	Top 10% board time: 17+ midnights[b]
No. of children and adolescents	4942 (100)	1326 (100)	551 (100)
Gender			
Cisgender female	2648 (54)	641 (48)	244 (44)
Cisgender male	1958 (40)	569 (43)	256 (46)
Transgender or nonbinary	336 (7)	116 (9)	51 (9)
Age group, y			
5-12	1337 (27)	445 (34)	232 (42)
13-17	3605 (73)	881 (66)	319 (58)
Race and ethnicity			
Asian, non-Hispanic	118 (2)	36 (3)	12 (2)
Black, non-Hispanic	750 (15)	214 (16)	96 (17)
Latinx/Hispanic	809 (16)	201 (15)	73 (13)
White, non-Hispanic	2193 (44)	557 (42)	229 (42)
Other,[c] non-Hispanic	188 (4)	37 (3)	13 (2)
Unknown	884 (18)	281 (21)	128 (23)
Insurance type			
Medicaid/HSN/MBHP	3659 (74)	≥902 (≥68)[d]	≥351 (≥64)[d]
Commercial	1207 (24)	397 (30)	178 (32)
Uninsured	43 (1)	16 (1)	<11 (≤1)[d]
Medicare, dual, or other	33 (1)	<11 (≤1)[d]	<11 (≤1)[d]
State agency involvement			
Active case with the Department of Children and Families	1, 445 (29)	418 (32)	171 (31)
Primary diagnosis			
ADHD	262 (5)	92 (7)	48 (9)
Anxiety	238 (5)	53 (4)	22 (4)
ASD/ID/PDD	184 (4)	64 (5)	31 (6)
Bipolar	197 (4)	45 (4)	16 (3)
Depression	2138 (43)	487 (37)	178 (32)
Impulse control/conduct disorder	451 (9)	134 (10)	53 (10)
Other[e]	744 (15)	232 (18)	101 (18)
Psychotic disorder	160 (3)	47 (4)	16 (3)
PTSD	568 (11)	172 (13)	86 (16)

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder; ID, intellectual disability; PDD, pervasive developmental disorder; PTSD, posttraumatic stress disorder.

[a] χ^2 Tests assessing differences in the distribution of characteristics between children and adolescents with boarding times in the top 25% and lower 75% were significant ($P < .05$) for all characteristics except for involvement of the Department of Children and Families.

[b] χ^2 Tests assessing differences in the distribution of characteristics between children and adolescents with boarding times in the top 10% and lower 90% were significant ($P < .05$) for all characteristics except for involvement of the Department of Children and Families.

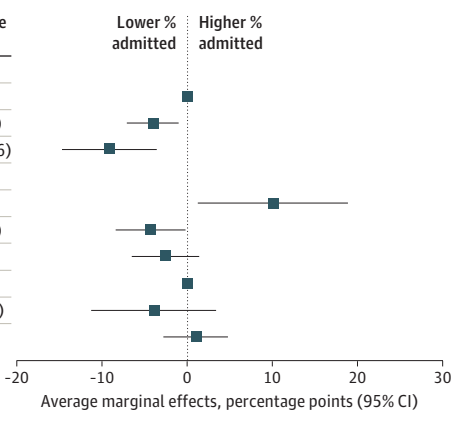
[c] No additional information was available on the other category.

[d] Exact value is censored to ensure that no cell sizes with n<11 are identifiable.

[e] Other primary diagnosis includes free-text responses.

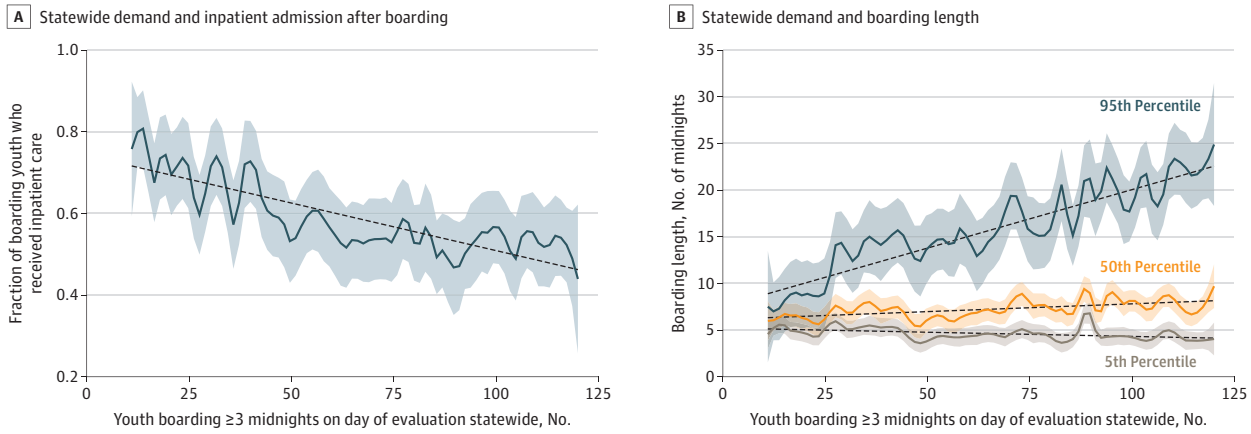
Figure 2. Gender and Racial and Ethnic Disparities in Inpatient Admission and Emergency Department Boarding Length

Characteristic	Patients, No.	Average marginal effects, percentage points (95% CI)
Gender		
Cisgender female	2648	0 [Reference]
Cisender male	1958	-4.0 (-7.1 to -1.0)
Transgender or nonbinary	336	-9.1 (-14.7 to -3.6)
Race and ethnicity		
Asian, non-Hispanic	118	10.1 (1.2 to 18.9)
Black, non-Hispanic	750	-4.3 (-8.4 to -0.2)
Latinx or Hispanic	809	-2.6 (-6.5 to 1.4)
White, non-Hispanic	2193	0 [Reference]
Other, non-Hispanic	188	-3.9 (-11.3 to 3.4)
Unknown	884	1.0 (-2.8 to 4.8)



Disparities regressions control for the listed demographic (gender or race and ethnicity), year, calendar month of evaluation, and primary diagnosis. Results are similar when we do not control for diagnosis and are shown in eFigure 5 in Supplement 1. In joint Wald tests, admission rates varied by race and ethnicity ($P = .03$) and gender ($P < .001$), as did boarding length ($P < .001$ both for race and ethnicity and for gender).

Figure 3. Association of Statewide Demand With Rates of Inpatient Admission and Boarding Length



Smoothed using local *t*-based approximation with span of 0.1, such that 10% of observations were used in each local regression (ie, the width of the sliding window).

were 3.0 days longer (95% CI, 2.4-3.7 midnights) (eTable 7 in Supplement 1).

Discussion

In this descriptive cross-sectional analysis of administrative data, we identified 4942 episodes of youth boarding for 3 or more midnights in a Massachusetts ED while awaiting inpatient psychiatric care between May 2020 and June 2022. Almost one-half of the episodes did not result in inpatient admission. Transgender youth faced substantial disparities, as they boarded longer and had lower admission rates than cisgender females.

On the surface, the high prevalence of boarding suggests a need for more inpatient child psychiatry beds. Although we do need to better understand inpatient bed supply and operational capacity, boarding is a symptom of unmet need across the continuum of care.[24] Reducing boarding will also require innovation and resources in outpatient care and non-ED crisis support.

Not all youth with psychiatric ED visits require inpatient care.[25,26] Nationally from 2018 to 2020, only 22% of such visits resulted in inpatient admission.[27] All youth in our study were determined to need inpatient psychiatric care; however, after boarding for several days, only 56% received that care. This is noteworthy because little direct mental health care is provided in EDs.[9] Further research is needed to understand the consequences of not receiving inpatient care after boarding. Improving access to outpatient care and non-ED crisis support could allow for faster safe discharges of youth who are ultimately determined to be safe to go home.

The strong association between discharge rates and statewide demand for inpatient care indicates that admissions decisions are partially due to bed availability, not just clinical need. Although decreased severity may accompany ED visit volume increases, we expect that this minimally impacts our findings because all youth boarding for multiple days with an active inpatient bed search likely have a high level of severity. A 2018 to 2020 study[28] of youth presenting with psychiatric concerns at 8 North Carolina EDs found that daily ED demand did not impact disposition. In the current study, which was restricted to youth who were determined to need inpatient care, we found an association between likelihood of discharge and statewide demand for inpatient care, suggesting that inpatient bed constraints do impact disposition for the subset of youth who need inpatient care.

Our study is the first, to our knowledge, to assess disparities in boarding and admission rates for transgender and nonbinary youth, and we found substantial disparities in both. Many inpatient child psychiatry units require transgender youth to have a single room,[29] which likely contributes to disparities given the already limited bed availability.

Our finding that Black youth had lower admission rates after boarding than their peers supports similar findings from a study in the southeastern US.[7] The reasons for racial and ethnic disparities are likely multifactorial. One potential contributor is diagnostic bias, in which Black youth are incorrectly labeled to have externalizing diagnoses.[23] We found that the gap in admission rates by race grew when we did not control for diagnosis. Black youth were more likely to have public insurance than White youth; therefore, improving Medicaid mental health coverage could help reduce disparities. Future research could help clarify the association between payer and inpatient psychiatry admission.

Children 12 years and younger boarded for longer and were admitted less frequently than those older than 12 years, consistent with findings from youth boarding on a medical inpatient unit.[30] Directing resources toward evidence-based prevention and safe diversion from inpatient units, and ensuring that beds are available for the age groups who need them most, could help reduce ED boarding of children.

In efforts to mitigate boarding and improve access, Massachusetts is implementing a roadmap for behavioral health reform, including crisis teams, help lines, stabilization beds, and community behavioral health centers.[31]

Limitations

Our study had several limitations. First, Massachusetts-based findings may not generalize to other states. Massachusetts is in the top 5 states of per-capita health care expenditures[32] and child psychiatrists.[33] Despite this, we found that many youth board in Massachusetts EDs; this may be more pronounced in states with fewer health care resources. Second, our study encompassed 30 months after the start of the COVID-19 pandemic. Findings need to be interpreted in the setting of associated changing need and health care system changes. Only 25 episodes (0.51%) included the COVID-19 pandemic as a primary barrier to placement, suggesting that COVID-19 positivity was not a major contributor to individual boarding. However, we did not know COVID-19 statuses for all youth, and other pandemic protocols may have impacted placement. Third, our sample included youth who board 3 or more midnights and not all youth with mental health ED visits. Thus, our disparities analyses did not include differences in likelihood of boarding 3 or more midnights given an ED visit. That said, it described youth with the longest boarding times, who likely experienced the most barriers to placement. We could not differentiate medical floor boarding from inpatient psychiatry admission, although as a lower bound, 81% of episodes with admission involved transfer to a different facility, indicating admission to inpatient psychiatry. Because some children who board on inpatient medicine may not be ultimately admitted to inpatient psychiatry (1 study[30] estimated that one-half were ultimately transferred to inpatient psychiatry), the percentage of youth receiving inpatient psychiatric care was likely lower than the 56% who we identified as receiving any inpatient care. Among youth determined to no longer need inpatient care, we could not observe whether they were discharged to home, a residential program, or a partial hospital program. Without an individual identifier, we could not ascertain repeat visit frequency. We could not differentiate severity within diagnostic groups. We did not know with certainty that demographics were up to date or self-reported. There may have been systematic differences between youth with known and unknown race and ethnicity. Further, reporting practices may have varied across sites.

Conclusions

In this statewide cross-sectional study of children and adolescents boarding in Massachusetts EDs while awaiting inpatient psychiatric care, almost one-half of 3 or more midnight boarding episodes did not result in inpatient admission. Black youth, young children, cisgender males, and gender-diverse youth were less likely to be admitted than their peers. These data can help guide further research and development of policies to reduce boarding and ensure equity in access to inpatient care.

ARTICLE INFORMATION

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Concept and design: Overhage, Lê Cook, Rosenthal, Benson.
Acquisition, analysis, or interpretation of data: Overhage, Lê Cook, Rosenthal, McDowell, Benson.
Drafting of the manuscript: Overhage, Lê Cook.
Critical review of the manuscript for important intellectual content: Overhage, Lê Cook, Rosenthal, McDowell, Benson.
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