

# Letters

## RESEARCH LETTER

### Pediatric Inpatient Psychiatric Capacity in the US, 2017 to 2020

With the worsening pediatric mental health crisis, children increasingly have prolonged emergency department visits while awaiting definitive mental health care.<sup>1</sup> This has been partially attributed to inadequate availability of pediatric inpatient psychiatric beds.



#### Supplemental content

When considering outpatient, inpatient, and residential mental health facilities, fewer facilities with pediatric services are in rural vs urban areas.<sup>2</sup> However, few studies have characterized geographic variation in pediatric inpatient psychiatric beds. We evaluated US pediatric inpatient psychiatric capacity and identified state-level variation in pediatric inpatient psychiatric beds.

**Methods** | We used data from the 2017 to 2020 American Hospital Association Survey Database (AHASD), state-level demographics from 2015 to 2019 American Community Survey 5-year estimates,<sup>3</sup> hospital and population urbanicity from the 2010 Rural-Urban Commuting Area codes,<sup>4</sup> and December 2020 state Medicaid expansion status from the Kaiser Family

Foundation.<sup>5</sup> The Children's Hospital Los Angeles Institutional Review Board deemed this cross-sectional study exempt from review and informed consent because it was not human participant research. We followed the [STROBE](#) reporting guideline.

We included hospitals with at least 2 pediatric inpatient psychiatric beds at any time from 2017 to 2020. We estimated changes in hospitals with pediatric inpatient psychiatric beds and overall bed counts using linear regression. We described characteristics of hospitals with pediatric inpatient psychiatric beds in 2020 by urbanicity. Inclusion criteria and handling of missing data are detailed in eMethods in [Supplement 1](#).

We mapped pediatric inpatient psychiatric beds per 100 000 children aged 18 years or younger by state in 2020. We used Spearman correlation coefficients to assess correlations between state-level pediatric inpatient psychiatric bed counts and median household income, percentage of children in rural areas, and pediatric racial and ethnic composition to assess for inequities in access to care. We used Wilcoxon rank sum test to assess the association between bed counts and Medicaid expansion status. Two-sided  $P < .05$  was significant, and analyses were performed with R, version 4.3.1 (R Project for Statistical Computing).

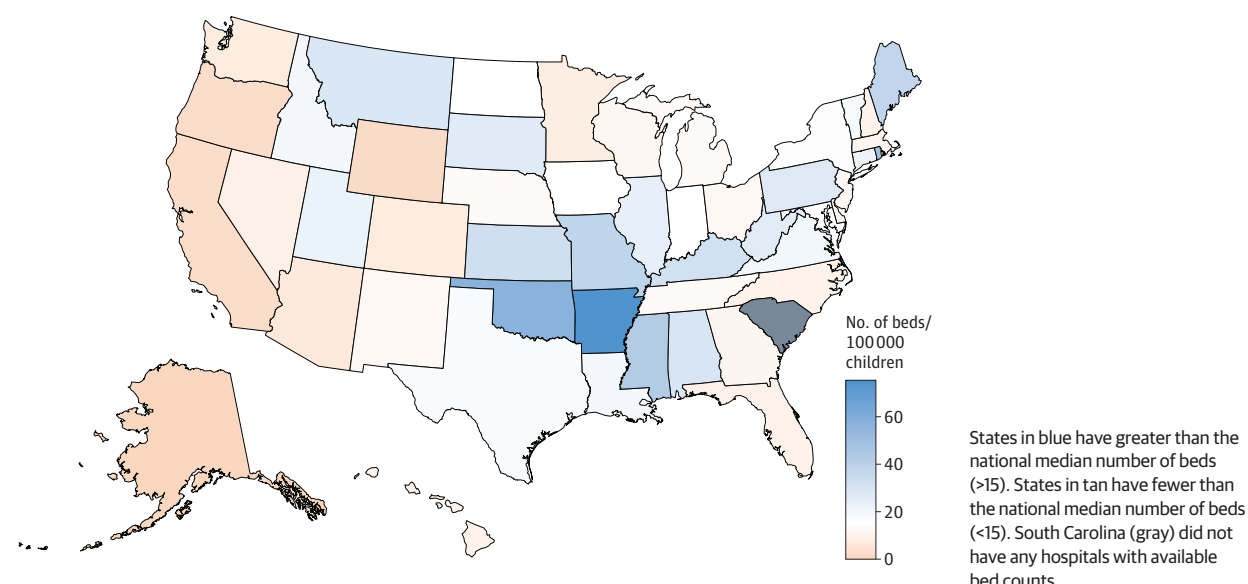
Table. Characteristics of US Hospitals With Pediatric Inpatient Psychiatric Beds By Urbanicity in 2020

Characteristic <sup>a</sup>	Overall, No. (%) (N = 400)	No. (%)		
		Urban hospitals (n = 355)	Suburban hospitals (n = 5)	Rural hospitals (n = 40)
Teaching hospital	89 (22.2)	87 (24.5)	0	2 (5.0)
Ownership				
Nonprofit	214 (53.5)	192 (54.1)	2 (40.0)	20 (50.0)
For-profit	118 (29.5)	106 (29.9)	3 (60.0)	9 (22.5)
Government	68 (17.0)	57 (16.1)	0	11 (27.5)
Hospital type <sup>b</sup>				
General medical	212 (53.0)	188 (53.0)	1 (20.0)	23 (57.5)
Children's medical	23 (5.8)	22 (6.2)	1 (20.0)	0
Freestanding general psychiatric	134 (33.5)	119 (33.5)	2 (40.0)	13 (32.5)
Freestanding children's psychiatric	31 (7.8)	26 (7.3)	1 (20.0)	4 (10.0)
Pediatric inpatient psychiatric beds, median (IQR)	20 (13-32)	20 (13-33)	28 (16-40)	15.5 (10-25)
Overall inpatient psychiatric beds, median (IQR)	65 (40-107)	67 (43-109)	28 (22-83)	49 (30-74)
Additional psychiatric services				
Psychiatric consultation/liaison	306 (76.5)	279 (78.6)	4 (80.0)	23 (57.5)
Psychiatric emergency services	271 (67.8)	247 (69.6)	2 (40.0)	22 (55.0)
Pediatric psychiatric partial hospitalization	162 (40.5)	153 (43.1)	0	9 (22.5)
Pediatric psychiatric residential treatment	74 (18.5)	67 (18.9)	1 (20.0)	6 (15.0)
Pediatric inpatient substance use disorder beds	39 (33.1)	33 (32.0)	1 (100)	5 (35.7)
Acute inpatient care integrated with behavioral health care	291 (75.2)	255 (73.9)	5 (100)	31 (83.8)

<sup>a</sup> Hospital characteristics and available services were described using the most recent year of nonmissing data for each hospital.

<sup>b</sup> Hospital type was categorized as: (1) general medical hospital (non-children's hospital with medical beds), (2) freestanding general psychiatric hospital (non-children's hospital without medical beds), (3) children's medical hospital (children's hospital with medical beds), and (4) freestanding children's psychiatric hospital (children's hospital without medical beds).

Figure. Pediatric Inpatient Psychiatric Beds per 100 000 US Children in 2020



**Results** | Of 6347 hospitals in the AHASD, 421 provided at least 2 pediatric inpatient psychiatric beds between 2017 and 2020. There was no significant change between 2017 and 2020 in hospitals with pediatric inpatient psychiatric beds (398 vs 400;  $P = .78$ ) or national pediatric inpatient psychiatric bed capacity (11 107 vs 11 276;  $P = .70$ ).

Pediatric inpatient psychiatric beds were offered most frequently at nonprofit and general medical hospitals (Table). In 2020, the majority of hospitals with pediatric inpatient psychiatric beds were urban (355 of 400 [88.8%]), representing 91.3% of bed capacity. Of 11 276 beds, 52.2% were in free-standing psychiatric hospitals (34.9% at general psychiatric hospitals, 17.3% at children's psychiatric hospitals), and 23.0% of beds were in hospitals specializing in pediatric care.

Across states, the median number of pediatric inpatient psychiatric beds per 100 000 children was 15 and ranged from 0 in Alaska to 75 in Arkansas (Figure). Higher statewide median household income ( $r = -0.42$ ;  $P = .003$ ) and higher percentage Hispanic population ( $r = -0.37$ ;  $P < .009$ ) were associated with fewer beds per capita. The percentage rural population ( $r = 0.21$ ;  $P = .15$ ), percentage minority racial groups ( $r = -0.16$ ;  $P = .28$ ), and Medicaid expansion status (Wilcoxon rank sum,  $P = .34$ ) were not associated with beds per capita.

**Discussion** | US pediatric inpatient psychiatric bed capacity did not change from 2017 to 2020, but capacity varied substantially by state. Despite increases in pediatric mental health emergency visits,<sup>6</sup> bed availability has not increased. Over 90% of pediatric inpatient psychiatric beds were in urban areas, raising concerns about access for rural children. Attention is needed to ensure national pediatric inpatient psychiatric capacity is sufficient to meet population mental health needs and that resources are equitably distributed. Study limitations include the self-reported nature of AHASD data and inability to assess need for inpatient services using this data source. Import-

tant next steps include identifying factors in geographic variability in bed capacity and assessing differences in quality of inpatient services by hospital type and location.

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**Accepted for Publication:** June 12, 2024.

**Published Online:** August 19, 2024. doi:10.1001/jamapediatrics.2024.2888

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**Author Contributions:** Dr. Cushing had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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**Acquisition, analysis, or interpretation of data:** All authors.

**Drafting of the manuscript:** Cushing.

**Critical review of the manuscript for important intellectual content:** All authors.

**Statistical analysis:** Cushing, Michelson.

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**Conflict of Interest Disclosures:** Dr Hoffmann reported receiving grants from the Pediatric Pandemic Network and the Children's Research Foundation Junior Board during the conduct of the study. Dr Michelson reported receiving a grant from the Agency for Healthcare Research and Quality. No other disclosures were reported.

**Disclaimer:** The content presented here is that of the authors and does not necessarily represent the official views of, nor an endorsement by HRSA, HHS, or the US government.

**Meeting Presentation:** Results of this study were presented at the 2023 Meeting of the Pediatric Academic Societies; April 29, 2023; Washington, DC.

**Data Sharing Statement:** See [Supplement 2](#).

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