

## Mental Illness in Elementary-School-Aged Children

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**We conducted a retrospective analysis of 1992 hospital discharge data to determine the incidence of mental illness hospitalizations among elementary-school-aged children and to analyze differences in hospital use by selected population characteristics. We analyzed population-based records of hospitalizations of 6- to 12-year-olds ( $n = 4,460$ ) with a principal diagnosis of mental illness and calculated relative risks (RRs) for hospitalization by sex, race/ethnicity, and payment source. Mental illnesses accounted for 8.1% of hospitalizations and 28.9% of hospital days for 6- to 12-year-olds. Hospital charges totaled \$85 million. Boys had a higher risk of mental illness hospitalization than girls (RR 1.96; 95% confidence interval [CI] 1.84–2.08). Latino children had a lower risk than whites (RR 0.22; 95% CI 0.20–0.24), as did children in the “Asian/other” group (RR 0.12, 95% CI 0.10–0.15). Inpatient hospitalizations for mental illness have a major impact on hospital morbidity for elementary-school-age children. Boys are overrepresented and Latinos and Asians/others are underrepresented among mental illness hospitalizations. Clinical implications for these findings and barriers to the delivery of inpatient mental health care are discussed.**

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The mental health needs of children in the United States remain largely unmet or underserved.<sup>1,2</sup> Prevalence estimates in both industrialized and developing countries suggest that as many as 14% to 20% of children and teenagers meet criteria for one or more mental health disorders,<sup>3,4</sup> findings that hold true for young people in the United States.<sup>3</sup> According to utilization data, only 20% to 40% of US children and teenagers receive the inpatient or outpatient mental health services they require.<sup>2,5</sup> In this article, we examine inpatient psychiatric hospitalization of elementary-school-age children (aged 6 to 12 years) in an effort to better understand the intensive services provided to this age group.

Inpatient hospitalization for the treatment of childhood mental illnesses is generally limited to children who are unsafe or acutely disturbed, who require skilled observation and assessment throughout the day, or who need rapid intervention during crisis situations. Additional reasons for inpatient care include accessibility to general hospital services, controlled initiation of psychotropic medication, treatment for severe psychosomatic disorders, and links with outpatient services.<sup>6</sup> One review of hospital admissions from the late 1970s and early 1980s

showed that hospitalized children had a high incidence of a history of assaultive and suicidal behavior, poor academic performance, noncompliant behavior, organic involvement, and multiple family disruptions and separations.<sup>7</sup> Another review noted that in most studies boys hospitalized for mental illness outnumbered girls and that common primary diagnoses for those hospitalizations included the spectrum of behavior disorders (e.g., attention-deficit disorder, adjustment disorder, conduct disorder) and emotional disorders (e.g., major depression, dysthymia).<sup>8</sup> Many of these children are followed by multiple community agencies, and many are the victims of neglect or abuse.<sup>6</sup> Previous studies of the hospitalization of children for mental illness have focused on the use of general hospitals for child psychiatric inpatient treatment,<sup>9,10</sup> length of stay,<sup>11–18</sup> and the effect of insurance benefits on hospital use.<sup>19,20</sup>

Limited data, however, are available on race and ethnic differences in hospitalization rates for children. Two studies found that 72% to 82% of psychiatric hospitalizations were for whites.<sup>20,21</sup> One of the studies found no difference between blacks and whites or between Hispanic/other groups and whites in the probability of children using inpatient services for child psychiatric

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disorders.<sup>20</sup> Our literature review did not uncover any population-based data addressing racial and ethnic differences in hospitalizations for mental illness among children of elementary school age.

We conducted this population-based descriptive epidemiologic study to evaluate recent patterns of hospitalization for mental illness among young school-age children in California. We were interested in identifying the psychiatric diagnoses resulting in hospitalization, the racial/ethnic and sex differences in the relative risk (RR) for hospitalization, and the financial effect of the hospitalizations on the health care delivery system.

## Methods

We obtained data on all hospital discharges from non-federal, acute care hospitals in California during 1992 from the California Office of Statewide Health Planning and Development. Records were selected for all patients aged 6 to 12 years with a principal discharge diagnosis of mental illness according to *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)* codes 290 through 319. We identified 4,460 hospital discharges that met our selection criteria.

The 11 state hospitals operated by the Department of Developmental Services and the Department of Mental Health, which serve the more severely mentally disordered and developmentally disabled clients, are not represented in the above data, so we obtained data on hospitalizations for 6- to 12-year-olds from those institutions to create a more complete picture of childhood mental illness hospitalizations. The Department of Mental Health reported a total of 19 children aged 6 to 12 years discharged in 1992, and the Department of Developmental Services reported a total of 32 children aged 6 to 12 years.

For our study, we reclassified *ICD-9-CM* codes into broader diagnostic categories, primarily by using criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R)*.<sup>22</sup> Each of the seven diagnostic categories—depressive, disruptive behavior, anxiety, adjustment, psychotic, impulse control, and bipolar disorders—contained  $\geq 100$  cases and together accounted for 89.5% of mental illness diagnoses. The remaining *ICD-9-CM* codes were analyzed separately.

We divided race into four racial/ethnic groups and coded each group: white, African American, Latino (Hispanic), and Asian/other (Native American/Eskimo, Asian, other). We also divided the expected payment source into four groups and coded each group: fee-for-service (self-pay and private insurance), Medi-Cal (Medicaid), health maintenance organizations (HMO) and prepaid health plans (PHP), and other (e.g., Civilian Health and Medical Program of the Uniformed Services, Short-Doyle funds). We followed guidelines of the Office of Statewide Health Planning and Development and coded patients receiving services through an HMO/PHP but covered by Medi-Cal as Medi-Cal. Because Kaiser Permanente Hospitals and Shriners Chil-

dren's Hospitals are exempted by the state guidelines from reporting hospital charges, we excluded cases from those institutions ( $n = 43$ ) from analyses of mean and total hospital charges. For hospitalizations of more than 365 days ( $n = 3$ ), total hospital charges covered only the last 365 days.<sup>23</sup>

Data on the subset of hospital discharges containing unique identifiers were analyzed to compare children with one hospitalization for mental illness in 1992 and those with more than one hospitalization for mental illness in that year. Percentages by race/ethnicity and sex were calculated for 1,932 children with one mental illness hospitalization in 1992 and for 350 children with multiple mental illness hospitalizations. (The records of 33 children were not included in the latter calculation because they contained inconsistencies in sex or racial/ethnic coding across hospitalizations.) Of these 350 children, we further analyzed the diagnoses of the 285 children with two hospitalizations for mental illness in 1992.

We calculated hospitalization rates and RRs by using population numbers obtained from the 1992 intercensal projections for the population aged 6 to 12 years (from the State of California Department of Finance). Estimates for the population of children eligible for Medi-Cal used to calculate the RRs by payment source were obtained from the Medical Care Statistics Section of the Fiscal Forecasting and Data Management Branch, California Department of Health Services. Race-/ethnic, payment source-, and sex-specific RRs for hospitalization were estimated with a 95% confidence interval (CI). We used SPSS for Windows,<sup>24</sup> SAS,<sup>25</sup> and Epi Info<sup>26</sup> for data analysis.

An additional analysis was conducted using 1996 hospital discharge data to ascertain if major changes in hospital utilization for mental illness in the elementary-school-age population occurred between 1992 and 1996. We identified 4,878 hospital discharges that met our selection criteria. Rates were calculated using the 1996 intercensal projection for the population aged 6 to 12 years. Ethnicity and race were coded separately in 1996 hospital discharge data. To make 1992 and 1996 data comparable, all children of Hispanic ethnicity were coded as Latino. Children of non-Hispanic or unknown ethnicity were coded based on race: white, African-American, and Asian/other (Native American/Eskimo/Aleut, Asian/Pacific Islander, other). Those whose race ( $n = 55$ ) and sex ( $n = 2$ ) were unknown were not included in the rates and RRs by sex and racial/ethnic group.

## Results

In 1992 in California, 4,460 (8.1%) of the 54,827 hospital discharges of children aged 6 to 12 years were for a primary diagnosis of mental illness. Most of these discharges (>85%) were from psychiatric hospitals. These 4,460 hospitalizations accounted for more than \$85 million in hospital charges and 89,916 days of hospitalization. The hospital stay (mean  $\pm$  SD) was  $20.2 \pm 23.8$  days, and the hospital charge per stay was \$19,334  $\pm$  \$17,613. The discharge rate for cases of mental illness

TABLE 1.—Demographic Characteristics of Hospitalizations for Mental Illness in Children of Elementary-School Age, California, 1992

Characteristic	No. (%)*
<i>n</i> . . . . .	4,460
Age (y)	
6–8 . . . . .	1,025 (23.0)
9–10 . . . . .	1,185 (26.6)
11–12 . . . . .	2,250 (50.4)
Sex	
Female . . . . .	1,460 (32.7)
Male . . . . .	3,000 (67.3)
Race/Ethnicity	
White . . . . .	3,232 (72.5)
African American . . . . .	556 (12.5)
Latino . . . . .	560 (12.6)
Asian . . . . .	55 (1.2)
Other . . . . .	26 (0.6)
Native American . . . . .	14 (0.3)
Unknown . . . . .	17 (0.4)
Expected payment source	
Medi-Cal . . . . .	1,882 (42.2)
Fee for service . . . . .	1,127 (25.3)
HMO/PHP . . . . .	900 (20.2)
Other . . . . .	550 (12.3)

\*Some totals do not add up to 100.0% due to rounding of percentages. One case is missing a payment source.

alone was 1.4 per 1,000 children aged 6 to 12 years. Mental illness accounted for 14.7% of all hospital charges and 28.9% of all hospital days in this group.

The seven major diagnostic categories accounted for 3,991 hospitalizations, with depressive disorders alone accounting for 2,356 hospitalizations (52.8% of the total). Fifteen diagnoses accounted for 368 of the 469 remaining hospitalizations, among them anxiety disorders of childhood or adolescence (*n* = 55); postconcussion syndrome (*n* = 52); other disorders of infancy, childhood, or adolescence (*n* = 44); substance abuse disorders (*n* = 28); pervasive developmental disorders (*n* = 28); eating disorders (*n* = 27); and unspecified impulse control disorders (*n* = 23). Additional categories included other specified organic brain syndromes (chronic, *n* = 20), somatoform disorders (*n* = 17), organic affective syndrome (*n* = 16), schizophrenia (*n* = 14), organic personality syndrome (*n* = 13), tic disorders (*n* = 12), dissociative disorders (*n* = 11), and mental retardation (*n* = 8).

Boys accounted for more than two-thirds of the hospitalizations, and white children accounted for almost three-fourths (Table 1). Medi-Cal was the largest single payment source; fee-for-service and HMO/PHP combined covered a somewhat higher percentage of hospital stays. More than half of the hospitalizations were for children aged 11 to 12 years.

Data (not shown) were obtained from the 2,781 cases (62%) containing unique identifiers—encrypted social

security numbers that are unique to each patient but cannot be followed back to actual social security numbers. These identifiers allowed hospitalizations for a single child to be linked across time. Of children with unique identifiers, 83.5% experienced one, 13.3% experienced two, and 3.2% experienced three or more hospitalizations for mental illness in 1992. The cohort of children with one mental illness hospitalization in 1992 was 68.1% male, 71.5% white, 12.7% African American, 13.0% Latino, 2.4% Asian/other, and 0.4% race unknown. Children with multiple hospitalizations in 1992 were 69.7% male, 73.1% white, 15.4% African American, 10.3% Latino, and 1.1% Asian/other.

Of the 285 children with two hospitalizations for mental illness in 1992, 260 had principal diagnoses that fit into the seven major diagnostic categories. For the majority (63.8%) of those 260 children, diagnostic categories were consistent for the two admissions. Specifically, 103 children were hospitalized twice for depressive disorders, 28 children twice for disruptive behavior disorders, 11 children twice for anxiety disorders, 7 children twice for adjustment disorder, 7 children twice for psychotic disorders, 6 children twice for impulse control disorders, and 4 children twice for bipolar disorders. The remaining 94 children (36.2%) had diagnoses falling into two different diagnostic categories on the two occasions.

The RR of hospitalization for mental illness was significantly higher for boys than girls (RR 1.96; 95% CI 1.84–2.08). The RRs for each diagnostic group are presented in Table 2. The highest RRs for boys were for impulse control and disruptive behavior disorders. Bipolar, psychotic, depressive, and anxiety disorders had smaller elevations in the risk of hospitalization for boys compared with girls. No sex difference was found in the RR of hospitalization for adjustment disorder.

We found significant differences in the RR of hospitalization for mental illness among racial/ethnic groups (Table 3). RRs for all psychiatric diagnoses were significantly lower for the Latino and Asian/other groups than for whites. Our data combine Asian children with other groups to create a population-based estimate as reflected in Tables 3 and 4; however, census data reveal that the vast majority of the Asian/other group are, in fact, Asian. We calculated a proportional hospitalization ratio for mental illness ([observed hospitalizations/expected hospitalizations] × 100) for hospitalized Asians alone compared with hospitalized whites aged 6–12 years and found that Asians had a ratio of 14.6%, which is consistent with the RR for the Asian/other group. This suggests that our findings are consistent with a decreased risk of hospitalization for mental illness among Asian children, although data on Asian/other children combined may overestimate the risk related to Asian children alone. The overall risk of mental illness hospitalization for African-American children was not significantly different from that for white children.

After we stratified the data by Medi-Cal payment status (Table 4), the RR of hospitalization for mental illness for

TABLE 2.—Relative Risk of Hospitalization for Mental Illness by Diagnosis and Sex, Children Aged 6 to 12 years, California, 1992

Diagnosis and Sex	No. Hospitalizations	Hospitalization Rate (per 1,000 Population)	RR	95% CI
All mental illness diagnoses				
Female	1460	0.9	1.00	
Male	3000	1.8	1.96	1.84–2.08
Depressive disorders				
Female	840	0.5	1.00	
Male	1,516	0.9	1.72	1.58–1.87
Disruptive behavior disorders				
Female	116	0.1	1.00	
Male	591	0.4	4.85	3.98–5.92
Anxiety disorders				
Female	120	0.1	1.00	
Male	163	0.1	1.29	1.02–1.64
Adjustment disorder				
Female	113	0.1	1.00	
Male	125	0.1	1.05	0.82–1.36
Psychotic disorders				
Female	52	0.0	1.00	
Male	117	0.1	2.14	1.55–2.97
Impulse control disorders				
Female	20	0.0	1.00	
Male	110	0.1	5.24	3.25–8.43
Bipolar disorders				
Female	33	0.0	1.00	
Male	75	0.0	2.16	1.44–3.26

the Latino and Asian/other groups remained significantly lower than the risk for whites in both Medi-Cal and non-Medi-Cal payment categories. For African-American children, however, the risk was approximately half that for whites in the Medi-Cal payment category but 28% greater in the non-Medi-Cal payment category.

Our additional analysis of 1996 hospitalization data for children aged 6 to 12 years (not shown) revealed 4,878 hospitalizations for mental illness for a rate of 1.4 hospitalizations per 1,000 population. The hospitalization rate for boys was 1.8 per 1,000, and the rate for girls was 1.0 per 1,000 (RR 1.82; 95% CI 1.72–1.93). The hospitalization rates by race/ethnicity were 1.98 per 1,000 for whites, 3.45 per 1,000 for African Americans, 0.49 per 1,000 for Latinos, and 0.55 per 1,000 for Asians/others. When compared with white children, African-American children had a higher RR of hospitalization for mental illness (RR 1.74; 95% CI 1.62–1.87), while Latino (RR 0.25; 95% CI 0.23–0.27) and Asian/other (RR 0.28; 95% CI 0.24–0.32) children had lower RRs for these hospitalizations. The seven diagnostic categories accounted for 86.6% of the hospitalizations; 43.4% of the hospitalizations were for depressive disorders.

## Discussion

Mental illnesses accounted for 8.1% of hospitalizations among elementary-school-age children (aged 6–12)

in California in 1992. While children in this age group experience relatively few acute hospitalizations compared with other age groups, the ones who are hospitalized are often treated for mental illness. The mean length of stay for mental illness hospitalizations is long, and the mean charges per hospitalization are high. As a result, these hospitalizations accounted for more than one-fourth of all hospital days in this age group and one-seventh of all hospital charges. Moreover, more than one-half of the total cost was paid by the public sector, amounting to more than \$46 million. Given the high cost of inpatient treatment for mental illness, early intervention, primary and secondary prevention, and the development of alternative levels of care would significantly decrease the financial burden of care for this age group. Further study of the utilization patterns for intensive mental health services by this younger age group are needed.

In our study, elementary-school-age boys were more likely than girls to be hospitalized for a mental illness. This finding is not surprising; behavior disturbances accounted for almost 20% of the hospitalizations and are three or four times more prevalent among boys than girls in this age group.<sup>22</sup> Depressive disorders accounted for one-half of the total hospitalizations, and almost two-thirds of those admissions were for boys (RR 1.72; 95% CI 1.58–1.87). Our expectation is that the risk for depression is the same for both sexes before puberty. The predominance of boys may reflect the greater likelihood of comorbid behavioral

TABLE 3.—Relative Risk of Hospitalization for Mental Illness by Diagnosis and Race/Ethnicity, Children Aged 6 to 12 years, California, 1992\*

Diagnosis and Race/Ethnicity	No. Hospitalizations	Hospitalization Rate (per 1000 Population)	RR	95% CI
<b>All mental illness diagnoses</b>				
White . . . . .	3,232	2.23	1.00	
African American . . . . .	556	2.20	0.99	0.90–1.08
Latino . . . . .	560	0.50	0.22	0.20–0.24
Asian/other . . . . .	95	0.27	0.12	0.10–0.15
<b>Depressive disorders</b>				
White . . . . .	1,733	1.19	1.00	
African American . . . . .	268	1.06	0.89	0.78–1.01
Latino . . . . .	309	0.27	0.23	0.20–0.26
Asian/other . . . . .	39	0.11	0.09	0.07–0.13
<b>Disruptive behavior disorders</b>				
White . . . . .	515	0.35	1.00	
African American . . . . .	103	0.41	1.15	0.93–1.42
Latino . . . . .	80	0.07	0.20	0.16–0.25
Asian/other . . . . .	7	0.02	0.06	0.03–0.12
<b>Anxiety disorders</b>				
White . . . . .	222	0.15	1.00	
African American . . . . .	34	0.13	0.88	0.61–1.26
Latino . . . . .	21	0.02	0.12	0.08–0.19
Asian/other . . . . .	5	0.01	0.09	0.04–0.23
<b>Adjustment disorder</b>				
White . . . . .	162	0.11	1.00	
African American . . . . .	37	0.15	1.31	0.92–1.88
Latino . . . . .	26	0.02	0.21	0.14–0.31
Asian/other . . . . .	12	0.03	0.31	0.17–0.55
<b>Psychotic disorders</b>				
White . . . . .	98	0.07	1.00	
African American . . . . .	30	0.12	1.76	1.17–2.65
Latino . . . . .	32	0.03	0.42	0.28–0.63
Asian/other . . . . .	6	0.02	0.26	0.11–0.58
<b>Impulse control disorders</b>				
White . . . . .	96	0.07	1.00	
African American . . . . .	21	0.08	1.26	0.78–2.02
Latino . . . . .	8	0.01	0.11	0.05–0.22
Asian/other . . . . .	3	0.01	0.13	0.04–0.41
<b>Bipolar disorders</b>				
White . . . . .	91	0.06	1.00	
African American . . . . .	9	0.04	0.57	0.29–1.13
Latino . . . . .	6	0.01	0.08	0.04–0.19
Asian/other . . . . .	2	0.01	0.09	0.02–0.37

\*Seventeen cases with unknown racial/ethnic group are not included in this table.

disorders and more lethal suicidal ideation and attempts in boys; girls may cause fewer disruptions.

The differences we found in hospital rates for selected racial/ethnic groups are, perhaps, the most important findings of the study. Few data are available on the risk or prevalence of mental disorders or the utilization of mental health services by minority elementary-school-age children. Both Latino and Asian children had a much lower risk of hospitalization for mental illness disorders than white or African-American children. This finding is consistent with reports of underutilization of inpatient

mental health care by Latino and Asian minority adult population groups.<sup>27,28</sup> Lower prevalence rates of severe psychopathology in Asian and Latino child populations may be one explanation for lower rates of care use; alternatively, factors related to race, cultural background, and socioeconomic status, including real or perceived institutional, cultural, language, or economic barriers, may contribute to different rates of care use.<sup>28</sup> Based on our data regarding economic factors, utilization rates for Latino and Asian children were unrelated to source of payment (Medi-Cal versus non-Medi-Cal).

TABLE 4.—Relative Risks of Hospitalization for Mental Illness by Medi-Cal Status and Race/Ethnicity for Children Aged 6 to 12 Years, California, 1992\*

	Medi-Cal (n = 1,873)	Non-Medi-Cal† (n = 2,569)
White . . . . .	1.00	1.00
African American . . . .	0.45 (0.40–0.51)	1.28 (1.12–1.46)
Latino . . . . .	0.16 (0.14–0.18)	0.21 (0.19–0.24)
Asian/other . . . . .	0.07 (0.05–0.09)	0.16 (0.12–0.20)

\*Data are RR (95% CI). Eighteen cases are not included, 17 of unknown racial/ethnic group and one missing a payment source.

†Includes payment sources such as Short-Doyle funds, HMO/PHPs, private insurance, and Civilian Health and Medical Program of the Uniformed Services.

In contrast, overall rates of hospitalization for mental illness within the child population of African Americans did not differ from rates of hospitalization for white children. For African Americans, however, relative rates of use of inpatient hospitalization for mental illness depended on the source of payment. Among children using Medi-Cal, rates for African Americans were lower than for white children; in contrast, the RR was greater for African Americans than for whites among those using other payment sources (which combines diverse payment sources). Higher differential admission rates for African Americans were also identified as a trend in adult use of mental health services and raise concerns regarding misdiagnosis or overdiagnosis resulting from cultural or language barriers, increased incidence of severe family problems including substance or alcohol abuse, and declining or absent mental health resources in the community.<sup>27</sup> Evidence from adult studies does not suggest that minority status is related to prevalence rates of severe mental illness, although epidemiological study of child mental health disorders and service use is needed to clarify these issues in the younger population.

Some have argued that minority adolescents disproportionately receive their mental health services from nonmedical sources, including the welfare and juvenile justice systems.<sup>29,30</sup> The same may be true for the younger population studied here. The bias toward correctional institutions instead of psychiatric care for violent adolescents has been noted among African-American youth,<sup>30</sup> as has the disproportionate share of institutional placements (foster homes, residential homes, and welfare placements) among African-American, American Indian, and Hispanic youth compared with whites.<sup>31</sup> In addition, the low rates of psychiatric hospitalization among Asian children may be associated with increases in hospitalizations for other somatic disorders, although we did not find this to be the case in a previous study of elementary-school-age children.<sup>32</sup> While it appears that no single factor explains the racial/ethnic variations in pediatric hospitalization for mental illness, care must be taken to ensure that minority children are not relegated to a lower level of psychiatric care or placement than white children.

There are several limitations to our study that deserve mention; several are inherent in using hospital discharge

data. First, the unit of analysis for our study is hospitalizations rather than hospitalized individuals because more than one-third of the records had no unique identifier. Nonetheless, a review of the remaining records demonstrated that more than 80% of children were hospitalized only once. In addition, the patterns of sex and racial/ethnic breakdowns for children with unique identifiers (either with single or multiple hospitalizations) were similar to those related to all cases, further supporting our use of hospitalization data to look at population risks. Second, our data contain only hospital charges and do not include physician charges; our estimates of the cost related to inpatient mental health treatment are therefore conservative. Third, the data in this study address only the first (principal) diagnosis; it is evident from numerous studies that mental disorders in children are highly comorbid. Diagnostic categories based on the first diagnosis alone do not fully describe the complexity of cases with multiple mental illness diagnoses or with a combination of medical and psychiatric diagnoses.

Finally, these data from 1992 are aging and may not reflect changes in the health care system under managed care. As a result, we also analyzed data for the same population using 1996 hospital discharge data, the most recent available. We found a constant rate of 1.4 hospitalizations for mental illness among elementary-school-age children per 1,000 population in both 1992 and 1996. Almost half of those hospitalizations were for depressive disorders. Sex-specific rates of hospitalization for mental illness were 1.8 per 1,000 for both years for boys, and 0.9 per 1,000 in 1992 and 1.0 per 1,000 in 1996 for girls. Rates for the various racial/ethnic groups varied somewhat between 1992 and 1996 although, as in 1992, rates were again much lower for Latinos (0.49 per 1,000) and Asians/others (0.55 per 1,000) than for whites (1.98 per 1,000) in 1996. While rates for African Americans were essentially the same as for whites in 1992, in 1996 African-American children had a hospitalization rate of 3.45 per 1,000, a rate significantly higher than the rate for white children. It is unclear what role changes in the coding of race and ethnicity in 1996 hospital data had on these race-/ethnicity-specific hospitalization rates. Nonetheless, data from 1996 confirm that hospitalizations for mental illness continue to be a significant problem in the elementary-school-age population with the changes under managed care, and that sex-specific and race-/ethnicity-specific variations are still present, and, in the case of African Americans, may be increasing.

The reliance on hospital discharge data is a strength of this study given the importance of this type of data in studies of hospital utilization.<sup>33,34</sup> In addition, periodic studies by the California Office of Statewide Health Planning and Development to maintain the quality of collected data suggest that the error rates for the variables of interest in this study (race and principal diagnosis) are acceptable.<sup>35</sup> A second strength is our use of population-based data from the largest US state, providing a sample large enough to look at illness categories across sex and racial/ethnic groups. In addition, the use

of population-based data eliminates many of the biases associated with data limited to select populations. Hospital discharge data for this study accurately reflect the hospital morbidity related to mental illness for the age group of interest for the entire state.

Health care practitioners should be aware of the impact of mental illness and mental illness hospitalization among preteen children. While these children are rarely hospitalized, their hospitalizations are often for psychiatric conditions, particularly depression. As managed health care systems continue to expand, it is vital that the mental health needs of these children are addressed through both outpatient and inpatient mental health benefits. In addition, providers and health care agencies should address these concerns through prevention programs and targeted interventions for high-risk children.

These findings also suggest that clinicians need to pay special attention to mental health issues among minority elementary-school-aged children. Patients from minority groups (particularly Latino and Asian populations) are less likely to use inpatient services for psychiatric conditions than white children but may still have the same prevalence of psychiatric conditions as white children. Consequently, minority children who need mental health services but whose families are reluctant to use psychiatric hospitalization may need to be referred to outpatient or nonmedical services that they find more acceptable. Nonmedical sources of mental health care may include schools, religious organizations, families, community organizations, and government agencies.

In summary, this population-based study shows clear disparities by race/ethnicity and sex in hospitalization for mental illness among elementary-school-age children. Not surprisingly, boys are more likely to be hospitalized than girls; however, the significant underutilization of services among Latino and Asian children and higher rates of inpatient mental health care for a population of African Americans are cause for concern. We must gain an understanding of these disparities and take steps to ensure that minority children have access to appropriate mental health services. Further research on mental health services for children of racial/ethnic minorities is needed to better understand the social, economic, behavioral, and epidemiological determinants of care. In addition, a number of steps may improve the delivery of services to these children, including the development of more responsive service delivery systems, education for the mental health community regarding cultural issues, and the training and availability of minority mental health professionals.

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