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## Kawasaki Syndrome Hospitalizations in the United States, 1997 and 2000

Robert C. Holman, MS\*; Aaron T. Curns, MPH\*; Ermias D. Belay, MD\*; Claudia A. Steiner, MD, MPH‡; and Lawrence B. Schonberger, MD, MPH\*

**ABSTRACT.** *Objective.* To estimate the incidence and describe the epidemiologic characteristics of Kawasaki syndrome (KS) among children in the United States.

*Methods.* Hospital discharge records with a KS diagnosis among patients <18 years of age were obtained from the 1997 and 2000 Kids' Inpatient Database and weighted to estimate the number and rate of KS-associated hospitalizations for the United States.

*Results.* In 2000, ~4248 hospitalizations associated with KS occurred in the United States, and the median age of patients at admission was 2 years. Children <5 years of age accounted for 3277 of these KS hospitalizations (77%) and had a KS hospitalization rate of 17.1 per 100 000 children. This rate was similar to the 1997 rate of 17.6 per 100 000 children. The KS hospitalization rate was significantly higher for infants <1 year of age than for children 1 to 4 years of age (19.8 and 16.4 per 100 000 children, respectively). The rate of KS hospitalizations among children aged <5 years was highest among Asian and Pacific Islander children and was followed by the rate for black children (39.0 and 19.7 per 100 000 children, respectively). No deaths associated with KS were reported among hospitalized children. The median charge for a KS hospitalization was \$7779 (mean \$10 725) and the total annual charges for KS hospitalizations in 2000 were approximately \$35 million among children <5 years of age.

*Conclusions.* Among children <5 years of age, the annual KS-associated hospitalization rates were similar for 1997 and 2000. The epidemiologic characteristics and hospitalization rates for KS at a national level were consistent with those reported from earlier studies, suggesting that the incidence for KS has not markedly changed in the United States during the past decade. *Pediatrics*

2003;112:495–501; *Kawasaki syndrome, Kawasaki disease, hospitalizations, epidemiology, children, infants, United States.*

ABBREVIATIONS. KS, Kawasaki syndrome; KID, Kids' Inpatient Database; HCUP, Healthcare Cost and Utilization Project; ICD-9-CM, *International Classification of Diseases, Ninth Revision, Clinical Modification*; SE, standard error; CI, confidence interval; CDC, Centers for Disease Control and Prevention; NIS, Nationwide Inpatient Sample.

Kawasaki syndrome (KS), an acute febrile illness of unknown etiology,<sup>1–3</sup> is the leading cause of noncongenital heart disease among children in the United States,<sup>3–5</sup> and it occurs predominantly among children <5 years of age.<sup>4,6–9</sup> Antecedent respiratory illness and exposure to rug cleaning, including spot cleaning, have been previously associated with KS.<sup>8,10,11</sup> Neither of these risk factors or other environmental risk factors have been consistently identified as contributing to the occurrence of KS.<sup>10,12–14</sup> In addition to younger age, epidemiologic studies suggest that the risk of developing KS is higher among boys and persons of Asian descent.<sup>6,8,9,12,13,15–23</sup>

Japan has the highest annual incidence of KS in the world, with ~112 cases per 100 000 children <5 years of age.<sup>24</sup> The highest incidence of KS in the United States has been reported for Hawaii,<sup>20,25</sup> where a hospitalization rate of 47.7 per 100 000 children <5 years of age for KS during the mid-1990s was reported.<sup>20</sup> In the continental United States, population-based and hospitalization studies have estimated an incidence of KS ranging from 9 to 19 per 100 000 children.<sup>5,12,13,20–22,26</sup>

Hospital discharge data are suitable for KS surveillance and for providing estimates of KS incidence because most young children with KS in the United States are hospitalized.<sup>12,21,22,27</sup> Previous studies have been limited to statewide data systems or smaller health care systems. In this study, we use

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data from the Kids' Inpatient Database (KID) to examine the epidemiology of KS among US children. KID is a large national all-payer hospital pediatric discharge database and is designed to generate robust national estimates of pediatric hospitalizations for both common and rare childhood conditions.<sup>28-30</sup> Using these data, we estimated the number of KS hospitalizations and hospitalization rates and approximated the incidence of KS among children in the United States.

## METHODS

Hospital discharge records were extracted from KID databases for 1997 and 2000. The Healthcare Cost and Utilization Project (HCUP) within the Agency for Healthcare Research and Quality produced the KID databases in collaboration with public and private statewide data organizations.<sup>28-30</sup> The KID sampling frame was constructed using all US short-term, non-federal, general, and specialty hospitals that had pediatric discharges in the 22 participating state databases for 1997 and in the 28 participating state databases for 2000. Ten percent of uncomplicated births and 80% of other hospitalizations for children 18 years and younger (1997) or 20 years and younger (2000) were sampled from all hospitals in the sampling frame. KID contained ~1.9 million pediatric discharges from >2500 hospitals in 22 states for 1997 and 2.5 million pediatric discharges from >2700 hospitals in 28 states for 2000. Discharge weights were provided with the KID and used in this study to obtain national estimates of hospitalizations within the United States.<sup>28,29</sup>

Pediatric hospitalizations for patients <18 years of age with an

*International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code for KS (446.1) listed as any 1 of up to 15 diagnoses on the discharge record were selected for our analysis.<sup>31</sup> We examined KS-associated hospitalizations by age group, gender, race/ethnicity, outcome, region of hospital (standard census regions of Northeast, Midwest, South, and West), admission month, type of hospital (rural, urban nonteaching, urban teaching), hospital size (small, medium, large), median household income for the patient's zip code (\$0-\$25 000, \$25 001-\$30 000, \$30 001-\$35 000, >\$35 000), and expected primary payer (Medicare, Medicaid, private insurance including health maintenance organizations, self-pay, no charge, or other). Race/ethnicity was recorded as one variable (white, black, Hispanic, Asian and Pacific Islander, American Indian, and other).<sup>28,29</sup> Accompanying diagnoses for KS hospitalizations were also examined. Because of data use restrictions or incompleteness of hospitalization records, some variables had missing information.<sup>28,29</sup> Patient's race/ethnicity was unavailable for ~30% of the KS hospitalizations for 1997 and 16% for 2000. Other variables missing information during 2000 for at least 1% of KS hospitalizations were admission month (9%), hospital charges (8%), and median household income by patient's zip code (1%).*

National estimates of the number of hospitalizations, hospital length of stay, and hospital charges associated with KS were calculated by using HCUP's weighting methodology.<sup>28,29</sup> KS hospitalization estimates were not presented if they were based on 70 or fewer unweighted observations. KS-associated hospitalization rates were calculated by using the weighted number of hospitalizations and population estimates for 1997 and 2000 from the US census data for children <18 years of age and the US natality data for infants (<1 year of age).<sup>32,33</sup> Population estimates obtained from vital records data were considered free from sampling error.

**TABLE 1.** KS-Associated Hospitalizations and Hospitalization Rates Among Children <18 Years of Age, United States, 1997 and 2000

Characteristic	KS-Associated Hospitalizations			
	1997		2000	
	Number (SE)	Rate (95% CI)*	Number (SE)	Rate (95% CI)*
Total	4420 (56)	6.4 (6.2-6.5)	4248 (49)	5.9 (5.7-6.0)
Age group (y)†				
<1	800 (43)	20.6 (18.4-22.8)	805 (41)	19.8 (17.9-21.8)
1-4	2562 (65)	16.8 (16.0-17.7)	2473 (57)	16.4 (15.6-17.1)
5-9	867 (45)	4.4 (3.9-4.8)	792 (41)	3.9 (3.5-4.3)
10-17	192 (23)	0.6 (0.5-0.8)	179 (20)	0.5 (0.4-0.7)
Children <5 y of age				
Total <5 y of age†	3361 (64)	17.6 (16.9-18.3)	3277 (57)	17.1 (16.5-17.7)
Gender				
Male	2107 (62)	21.6 (20.3-22.8)	1969‡ (55)	20.1 (19.0-21.2)
Female	1254 (53)	13.4 (12.3-14.6)	1306‡ (53)	13.9 (12.9-15.1)
Age group by gender,‡				
Male				
<1 y	541 (36)	27.2 (23.7-30.8)	509 (32)	24.5 (21.5-27.5)
1-4 y	1566 (57)	20.1 (18.7-21.6)	1459 (50)	18.9 (17.6-20.1)
Female				
<1 y	258 (26)	13.6 (10.9-16.3)	295 (28)	14.9 (12.1-17.6)
1-4 y	996 (49)	13.4 (12.1-14.7)	1011 (48)	13.7 (12.4-15.0)
Race/ethnicity§				
White (non-Hispanic)	1097 (48)	9.1 (8.3-9.9)	1280 (52)	11.4 (10.5-12.4)
Black (non-Hispanic)	455 (33)	16.9 (14.5-19.2)	535 (32)	19.7 (17.4-22.0)
Hispanic	371 (27)	11.1 (9.6-12.7)	505 (31)	13.6 (12.0-15.2)
Asian and Pacific Islander (non-Hispanic)	261 (21)	32.5 (27.3-37.7)	267 (21)	39.0 (33.0-45.0)
Region				
Northeast	751 (29)	21.9 (20.3-23.6)	757 (27)	22.3 (20.7-23.9)
Midwest	689 (36)	16.0 (14.4-17.6)	537 (40)	12.3 (10.5-14.1)
South	983 (49)	14.6 (13.2-16.1)	1022 (33)	14.9 (14.0-15.9)
West	938 (33)	20.2 (18.8-21.6)	961 (30)	21.0 (19.7-22.3)

SE indicates standard error.

\* Rates are expressed per 100 000 children.

† Because of rounding of weights, number differs by 1 from age group totals given above.

‡ In 2000, gender was not reported for 2 hospitalizations.

§ Among children <5 years of age, unweighted KS hospitalizations for American Indians/Alaska Natives was <70 for both 1997 and 2000; therefore, estimates are not provided. The "other" race/ethnicity group had 153 KS hospitalizations in 1997 and 154 hospitalizations in 2000. There were 1338 and 516 KS hospitalizations with missing/not reported race/ethnicity for 1997 and 2000, respectively.

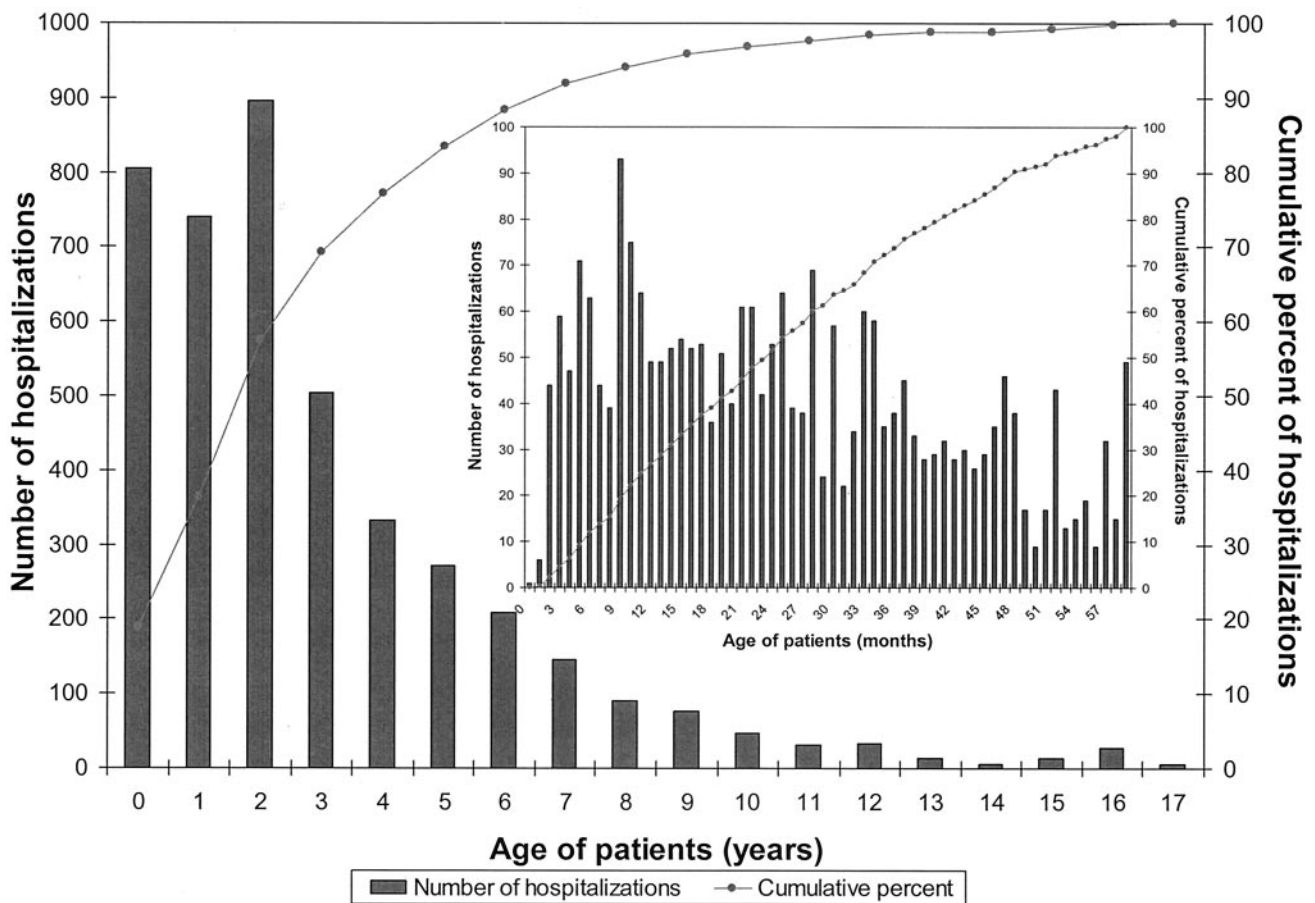


Fig 1. KS-associated hospitalizations and cumulative percent by age for children <18 years of age, KID, United States, 2000.

Hospitalization rates were expressed as the number of estimated hospitalizations per 100 000 children. Annual standard errors (SEs) and 95% confidence intervals (CIs) were calculated by using SUDAAN software to account for the sampling design of the KID.<sup>28,29,34</sup>  $\chi^2$  tests and *t* tests using ranks adjusted for survey design were used to test for significant differences for categorical and continuous variables, respectively.

## RESULTS

### Overall

During 2000, a total of 4248 (SE = 49) hospitalizations with KS were estimated among children <18 years old in the United States (Table 1). For children <5 years of age, 3277 (SE = 57) KS hospitalizations were estimated, representing 77% of KS hospitalizations among children <18 years old. The KS hospitalization rate for children <5 years of age was 17.1 (95% CI = 16.5–17.7) per 100 000 children. This rate was similar to that for 1997 (17.6 [95% CI = 16.9–18.3] per 100 000 children). Unless otherwise indicated, the following estimates of hospitalizations and hospitalization rates are for the year 2000.

### Age, Gender, Race/Ethnicity, Region, and Admission Month

The median age of children hospitalized in 2000 with KS was 2 years (quartiles = 1, 4; Fig 1). Among the <5-year-old children, ~50% of the hospitalizations occurred among those <2 years old, and 72% occurred among children <3 years old; the median

age of hospitalized children was 24 months (quartiles = 12, 37). The rate was higher for infants than for 1- to 4-year-old children (19.8 and 16.4 per 100 000 children, respectively; Table 1).

The median age for hospitalized children <5 years of age did not differ between boys and girls (22 and 24 months, respectively, *P* = .07). Most KS hospitalizations for children <5 years of age occurred among boys (60%), and their hospitalization rate was higher than that for girls (Table 1). The difference by gender was consistent for infants and children 1 to 4 years of age.

Asian and Pacific Islander children <5 years of age had the highest KS hospitalization rate, followed by non-Hispanic black children (Table 1). Non-Hispanic white and Hispanic children had the lowest rates. The number of KS hospitalizations for some race groups was underestimated because of missing race/ethnicity information.

KS hospitalization rates varied regionally (Table 1). For children <5 years of age, the rates for the Northeast and the West regions were higher than those for the South and the Midwest regions. KS hospital admissions appeared to peak in December 1997 and in February and March 2000 (Fig 2). Because of the limited number of hospitalizations when stratified by month and region, seasonality could not be examined by region.

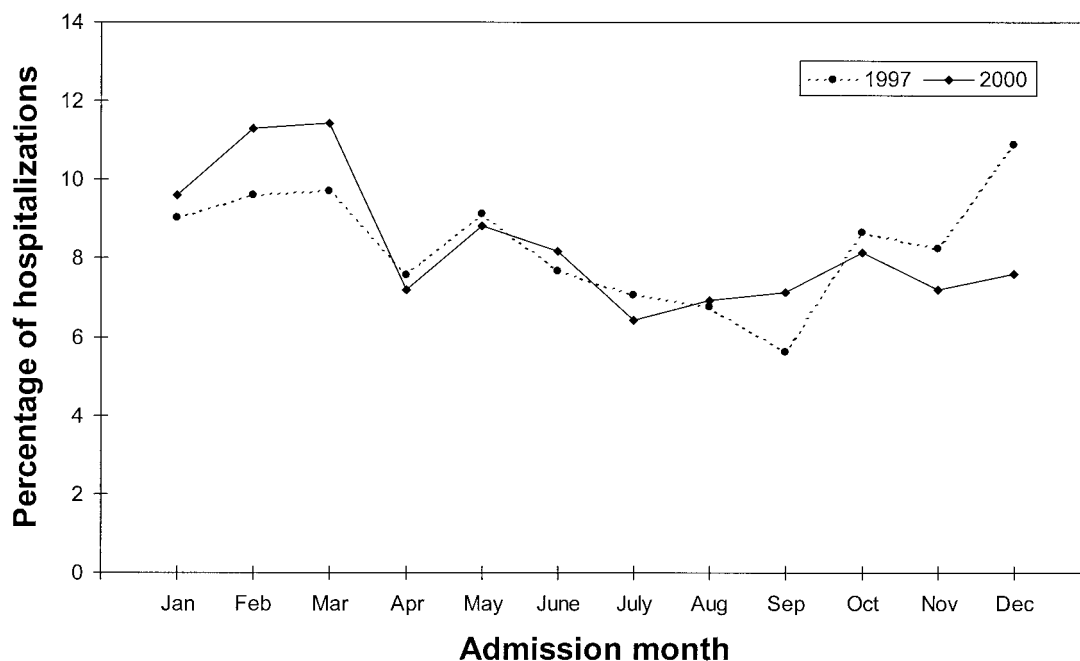


Fig 2. Percentage of KS-associated hospitalizations by admission month for children <5 years of age, KID, United States, 1997 and 2000.

TABLE 2. Hospital Type and Size, Expected Primary Payer, Median Household Income by Patient's Zip Code, Length of Stay, and Total Charges for KS-Associated Hospitalizations Among Children <5 Years of Age, United States, 1997 and 2000

Characteristic	1997		2000	
	Number of Hospitalizations (SE)*	Percent of Hospitalizations*	Number of Hospitalizations (SE)*	Percent of Hospitalizations*
Total	3361 (64)	100	3277 (57)	100
Hospital type				
Urban teaching	2127 (47)	63.3	2524 (45)	77.4
Urban nonteaching	1034 (43)	30.8	580 (29)	17.8
Rural†	—	—	—	—
Hospital size‡				
Small	833 (34)	24.8	481 (27)	14.8
Medium	951 (44)	28.3	1125 (38)	34.5
Large	1577 (47)	46.9	1656 (44)	50.8
Median household income by patient zip code				
\$0–25 000	868 (50)	27.1	219 (19)	6.8
\$25 001–30 000	525 (37)	16.4	795 (41)	24.6
\$30 001–35 000	516 (36)	16.1	821 (44)	25.4
>\$35 000	1299 (48)	40.5	1394 (50)	43.2
Primary payer				
Medicaid	972 (49)	29.0	951 (45)	29.1
Private insurance/HMO	2114 (60.8)	63.1	2113 (57)	64.7
Self-pay†	—	—	129 (17)	3.9
	Mean (Minimum, Maximum)	Median (Quartiles)	Mean (Minimum, Maximum)	Median (Quartiles)
Length of stay, days	3.5 (0, 54)	3 (2, 4)	3.4 (0, 76)	3 (2, 4)
Total charges	\$9133 (\$1, \$463 993)	\$6505 (\$4250, \$9889)	\$10 725 (\$428, \$584 958)	\$7779 (\$4998, \$11 854)

SE indicates standard error; HMO, health maintenance organization.

\* Some characteristics were not fully reported. Percentage is based on the number of hospitalizations with the reported information.

† Data for rural hospitals not presented because there were <70 unweighted hospitalizations. In 1997, the self-pay category had <70 unweighted hospitalizations and all other payer categories had <70 unweighted hospitalizations in both 1997 and 2000.

‡ For rural hospitals, small = 1–49 beds, medium = 50–99 beds, and large = 100+ beds. For urban nonteaching hospitals, small = 1–99 beds, medium = 100–199 beds, and large = 200+ beds. For urban teaching hospitals, small = 1–299 beds, medium = 300–499 beds, and large = 500+ beds.

### Hospital Type and Size, Median Household Income, and Expected Payer

Among children <5 years of age in 2000, most KS hospitalizations (95%) occurred in urban teaching and urban non-teaching hospitals and 85% occurred in medium- to large-sized hospitals (Table 2).

Among children <5 years of age, 50% of KS patients were among the \$25 001 to 35 000 income levels, and 43% were among the highest income level of \$35 001 or more. The hospital type and median household income were similar to those for children 5 to 17 years of age hospitalized with KS. Private insurance

was the expected primary payer for 65% of KS hospitalizations among children <5 years of age, whereas Medicaid was indicated for 29% of these hospitalizations. Private insurance was the expected primary payer for 72% ( $n = 699$  [SE = 38]) and Medicaid for 23% ( $n = 221$  [SE = 24]) of KS hospitalizations among 5- to 17-year-old children. Comparisons between KS hospitalizations and non-KS hospitalizations among children <5 years of age found that a higher proportion of KS hospitalizations were associated with a median income level >\$35000 (43% and 34%, respectively,  $P < .001$ ) and with private insurance (65% and 56%, respectively,  $P < .001$ ).

### Hospital Stay and Charges

An estimated 11 038 days (SE = 365) were associated with a KS hospitalization among children <5 years of age in 2000, and these days accounted for ~75% of the hospital days among children <18 years old hospitalized with KS. The median hospital stay for children <5 years old was 3 days (quartiles = 2 and 4; Table 2), a length of stay similar to that for children 5 to 17 years of age. No deaths were reported among hospitalized children with KS.

The median estimated charge for a KS hospitalization for children <5 years of age was \$7779 (mean = \$10 725, SE = \$647; Table 2), and the median charge for 5- to 17-year-old children was \$10 460 (mean = \$16 309, SE = \$959). As determined on the basis of estimated KS hospitalizations for 2000, the total estimated US hospitalization charges associated with KS for children <5 years of age was approximately \$35

million, and totaled \$51 million for children <18 years old.

### Other Conditions Associated With KS Hospitalizations

KS was listed as the principal diagnosis (first-listed) for 90% of KS hospitalizations among children <5 years of age, and for 84% of KS hospitalizations among children 5 to 17 years old. The diagnoses listed most frequently on the KS hospitalization records for children <5 years old included volume depletion (ICD-9-CM code 276.5;  $n = 489$  [SE = 34]; 15%), unspecified conjunctivitis (ICD-9-CM code 372.30;  $n = 251$  [SE = 26]; 8%), and unspecified otitis media (ICD-9-CM code 382.9;  $n = 182$  [SE = 21]; 8%).

### DISCUSSION

This study provides a robust national estimate of hospitalizations associated with physician-diagnosed KS among US children. The KS hospitalization rate for children aged <5 years was 17.6 per 100 000 children in 1997 and 17.1 per 100 000 children in 2000 in the United States. The estimated KS hospitalization rates were consistent with the KS hospitalization rates and incidence reported in previous studies within the continental United States (range: 9–19 per 100 000 children; Table 3).<sup>5,12,13,20–22,26</sup> The hospitalization rate may be adjusted to approximate the incidence of KS in the United States because previous studies have demonstrated that most young children with KS are hospitalized<sup>12,21,22,27</sup> and that the percentage of affected children hospitalized may be as high as 97%.<sup>21</sup> By conservatively reducing the hospi-

**TABLE 3.** Selected Publications With Reported Annual Incidence or Hospitalization Rate for KS Among Children <5 Years of Age in the United States

Publication	Location	Period	Incidence*	Hospitalization Rate†	Data Source
Present study	United States	2000	–	17.1	KID
		1997	–	17.6	
Chang <sup>26</sup>	California	1995–1999	15.3	–	Statewide hospital discharge records from acute-care hospitals
Gibbons et al <sup>22</sup>	Georgia	1997–1998	14.0	15.7	Chart review of cases identified from statewide hospital discharge data
Bronstein et al <sup>13‡</sup>	San Diego County, California	1994–1998	8.0–15.4 (range)	–	Chart review of cases identified from hospital discharge data
Holman et al <sup>37</sup>	United States	1997	–	17.3	Nationwide Inpatient Sample
Holman et al <sup>20</sup>	Hawaii	1994–1997	–	47.7	Statewide hospital discharge records
	Connecticut	1993–1996	–	18.8	Statewide hospital discharge records
Belay et al <sup>21</sup>	Four HMOs in West Coast states	1993–1996	19.1, 15.8, 12.2, 9.0	–	Vaccine Safety Datalink project cases for 4 HMOs
Holman et al <sup>19</sup>	Indian Health Service areas	1980–1995	4.3	4.8	American Indian/Alaska Native cases identified from the Indian Health Service Inpatient data
Taubert et al <sup>5</sup>	33 states and the District of Columbia	1984–1993	–	8.9	Survey of number of patient discharges from children's hospitals
Davis et al <sup>12§</sup>	Seattle-Tacoma area, Washington (3-county area)	1987–June 1989	15.2	–	Cases identified by using the Computerized Hospital Abstract Reporting System, passive KS surveillance, major hospital-based and private pediatric cardiology clinics, and the regional military hospital

HMO indicates health maintenance organization.

Physician-diagnosed KS was used to select records for hospital discharge and outpatient studies.

\* Annual number of children with KS per 100 000 children <5 years of age. Incidence determined from hospital discharge data does not include multiple hospitalizations for patients.<sup>13,19,22,26</sup>

† Annual number of KS hospitalizations reported per 100 000 children <5 years of age.

‡ American Heart Association clinical criteria for KS was used to select cases by Bronstein et al.<sup>13</sup>

§ CDC case criteria for KS were used to select typical KS patients by Davis et al.<sup>12</sup>

talization rates by 10% to account for multiple KS hospitalizations,<sup>12,19,22,27</sup> we estimated that the national annual incidence of KS for children <5 years of age was ~15.8 cases per 100 000 children in 1997 and 15.4 cases per 100 000 children in 2000. The proportion of the physician-diagnosed KS cases that met the Centers for Disease Control and Prevention (CDC) case criteria for KS was unknown in this study because medical records were not reviewed. This proportion was estimated to be ~79% for KS patients <5 years old in Georgia in a recently published study.<sup>22</sup> Using this percentage, the national incidence for patients likely meeting the CDC KS case criteria in 1997 and 2000 was estimated as 12.5 and 12.2 cases per 100 000 children, respectively. For both years, the estimate of the national incidence of KS for the United States was substantially lower than the KS incidence reported in Japan (111.7 per 100 000 children).<sup>24</sup>

The national estimates of KS incidence in our study for 1997 and 2000 were similar to estimates in other studies within the United States for the late 1980s and 1990s.<sup>12,13,20–22,26</sup> A study of KS cases identified during 1987–1989 in Washington State reported a KS incidence of 15.2 cases per 100 000 children among children <5 years of age.<sup>12</sup> Similarly, during 1993–1996, a KS incidence of up to 19.1 cases per 100 000 children was reported among children <5 years of age enrolled in West Coast health maintenance organizations.<sup>21</sup> In contrast to our observation that the incidence of KS has not markedly changed since the late 1980s, a recent study<sup>35</sup> using HCUP's Nationwide Inpatient Sample (NIS)<sup>36</sup> concluded that the incidence of KS increased during 1988–1997 in the United States. However, this study did not analyze NIS using the appropriate methodology, and it did not fully describe the limitations of NIS when used to estimate KS-associated hospitalizations and the incidence of KS.<sup>35–37</sup> Subsequent analysis of NIS using the appropriate methodology showed that although the annual KS rate fluctuated in the United States, it did not support the author's conclusion that it was increasing over the study period. In the present study, the annual KS rates compared with those described in previous studies within the United States<sup>12,21</sup> suggest that unlike the incidence in Japan, which was reported to have increased by >1.5 times between 1987 and 1998,<sup>24</sup> the KS incidence in the United States does not appear to be markedly changing over time.

The recent epidemiology of KS in the United States was consistent with that described in previous studies.<sup>6,8,9,12,13,16,18–20,22,26,27,38</sup> We found that KS rates were higher among younger children, the KS rate for boys was higher than that for girls, and the KS rate was highest among Asian and Pacific Islanders. In addition to these findings, we found that the KS hospitalization rate was higher for non-Hispanic black children than for non-Hispanic white children and Hispanic children. However, our findings regarding race/ethnicity must be interpreted with caution because race information was missing in ~30% of KS hospitalization records in 1997 and in 16% in

2000. We also observed that KS hospitalization rates varied by region, with higher rates in the Northeast and West regions. The higher rate in the West region may be a reflection of the greater proportion of Asian Americans living in the West as compared with the other regions.<sup>39</sup> There was a higher proportion of KS hospitalizations during the winter months, a finding similar to previously reported KS seasonality. We also found that a greater proportion of KS hospitalizations versus non-KS hospitalizations had a higher median household income, as determined by the patient's zip code, and had private insurance as the expected primary payer. These characteristics may be an indicator of a predilection of the occurrence of KS among patients with a higher socioeconomic status, as suggested in earlier studies.<sup>13,16</sup>

There are some limitations in this study. The number of KS-associated hospitalizations may have been overestimated because of the inclusion of hospitalizations for children who may not have had KS.<sup>9</sup> The proportion of physician-diagnosed KS cases in this study that would not meet the CDC case criteria for KS could only be estimated on the basis of a recently published study.<sup>22</sup> Also, possible miscoding of KS as another condition may have reduced the number of estimated KS hospitalizations. Furthermore, not all children with KS are hospitalized. Because hospitalizations could not be tracked for an individual within KID, a more precise adjustment of multiple hospitalizations was not possible for estimating the incidence of KS. In addition, other factors mentioned above may have affected the estimated incidence of KS. Patient's race/ethnicity was unavailable for ~30% of the KS hospitalizations among children <5 years of age in 1997 and for 16% in 2000. This underestimated the number of KS hospitalizations for some race/ethnicity groups and prevented more detailed analysis of the association between KS and race/ethnicity.

A unique feature of this study was the use of KID, a national pediatric inpatient database, to examine KS hospitalizations among children in the United States. KID is a large all-payer hospital discharge database specifically designed to generate robust national estimates of pediatric hospitalizations of both common and rare childhood diseases, providing a valuable new tool for pediatric hospitalization studies.<sup>28–30</sup> Using the KID, we were able to calculate robust national estimates of KS hospitalization rates for the United States.

We have shown that the epidemiology of KS among all US children was consistent with previous studies of KS among specific groups of children within the United States. Specifically, we observed that KS disproportionately affects younger children, boys, and children of Asian and Pacific Islander descent. The estimates of KS incidence in the United States were similar for 1997 and 2000, and they were similar to incidence rates reported in earlier studies. This suggests that the incidence of KS has not markedly changed in the United States since the late 1980s.

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## ON PASSIVITY

"He who passively accepts evil is as much involved in it as he who helps to perpetuate it. He who accepts evil without protesting against it is really cooperating with it."

King ML Jr. *Stride Toward Freedom*. New York, NY: Harper & Brothers; 1958

Submitted by Student

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