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# Hospitalizations for Injury Among Medicaid Children: California, 1992

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*Little is known about the incidence and cost of injuries for Medicaid children. This article provides data on hospital utilization and payments for injuries among Medicaid children, using the Health Care Financing Administration's (HCFA) State Medicaid Research Files. During 1992, there were nearly 17,000 injury hospitalizations for California's Medicaid children (758 per 100,000 enrollees), representing over \$93 million in program payments. The most frequent injury hospitalizations were fractures and dislocations. Disabled children and 18- to 20-year-old males experienced the highest hospital utilization rates. These findings will assist Medicaid policymakers in targeting prevention efforts to reduce incidence and program payments for children's injuries.*

## INTRODUCTION

Injuries represent a significant cost to the U.S. health care system. Based on the 1987 National Medical Expenditures Survey, medical spending on injuries in 1987 was estimated to be \$64.7 billion in 1993 dollars (Miller and Lestina, 1996). Injuries are also the leading cause of death for children (Baker and Waller, 1989; Rice, MacKenzie, and Associates, 1989). Among children 1-19 years of age, injuries cause more deaths than all diseases combined (Rodriguez and Brown, 1990). Injuries are a leading cause of childhood disability,

with an estimate of 30,000 children suffering permanent disabilities from injuries each year (Rodriguez and Brown, 1990). Among hospitalized children, injuries account for the highest proportion of discharges to long-term care facilities and the highest proportion of patients requiring home health care after discharge (Guyer and Ellers, 1990). Higher rates of mortality among children in the United States, compared with other industrialized countries, are attributable to unintentional injuries and violence (Fingerhut and Kleinman, 1995). Approximately one-fourth of the Nation's children experience an injury requiring medical attention each year, but the risks vary considerably by sex, other demographic characteristics, and cause of injury (Scheidt et al., 1995).

While estimates of spending on injuries for children have grown steadily over the years, they have varied substantially. Using data from Massachusetts between 1979 and 1982 (Malek et al., 1991), estimated an initial medical care cost of injury to children of \$5.1 billion for the Nation. For 1992, national estimates of the cost of injuries exceeded \$7.5 billion (Rodriguez and Brown, 1990; Guyer and Ellers, 1990). Injuries were the second largest source of childhood medical spending at \$12 billion in 1993, accounting for 14 percent of all childhood medical spending (Miller, Lestina, and Galbraith, 1995). Annually, an estimated 600,000 children are hospitalized for injuries (Rodriguez and Brown, 1990; Fingerhut and Gillum, 1995).

Because there are no national person-level data for Medicaid enrollees, we know

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little about the extent of injuries and their cost to the program. The Medicaid enrolled population has a higher proportion of children, 52 percent versus 28 percent, a higher proportion of African American, 29 percent versus 13 percent, Hispanic, 20 percent versus 11 percent, and a higher proportion of low-income persons below 150 percent of the Federal poverty level, 74 percent versus 24 percent, than the U.S. population (Bennefield, 1998). Research shows that injury rates for persons in these groups is greater than for other higher income and non-minority groups (Baker et al., 1992), suggesting that injuries may be more prevalent among Medicaid enrollees than in the general population.

A large proportion of total spending on childhood injuries is for inpatient hospital care (Rice, Mackenzie, and Associates, 1989). In addition, inpatient hospital services represent a large proportion of total Medicaid spending for children. For example, inpatient hospital care represented 40 percent of total Medicaid spending for children in 1994 (U.S. Department of Health and Human Services, 1996). For these reasons, the impact of injuries on Medicaid spending may be significant.

In the Healthy People 2000 Initiative, the Public Health Service set a national objective to reduce both unintentional and intentional injuries by 15 percent by the year 2000 (U. S. Department of Health and Human Services, 1990). Many injuries could be prevented (Miller, Lestina, and Galbraith, 1995; Rice, MacKenzie, and Associates, 1989; Baker, O'Neill, and Karpf, 1984; U. S. Department of Health and Human Services, 1997). One study suggests that as many as 29 percent of all childhood injury deaths could have been prevented by implementing 12 currently available strategies (Guyer and Ellers, 1990). Effective prevention measures can

reduce morbidity and mortality, constrain the growth of health care expenditures, and improve health status. However, the lack of data on injuries, particularly non-fatal injuries, has limited our ability to mount a broad-based national injury reduction effort for Medicaid children.

This initial study provides data on hospital utilization and payments for injuries among Medicaid children under the age of 21, because the most serious injuries, with the highest potential levels of Medicaid spending, are treated in an inpatient setting. Analyses of services provided in other settings will be reported later. Any effort to reduce injuries among Medicaid children will need to compare changes in injuries rates with this type of baseline data.

## METHODOLOGY

The data source for this article is HCFA's 1992 State Medicaid Research Files (SMRFs), which were developed to support research and policy analysis. Data from two types of SMRF files were used for this article. The first is the SMRF person summary file which provided information on each enrolled person, regardless of whether the enrollee used any Medicaid services in the year. The data include monthly Medicaid eligibility status for the calendar year, enrollment in a health maintenance organization (or other type or prepaid health plan), and demographic characteristics, such as age, sex, race, and ethnicity. The second is the inpatient hospital services file. This file contains a record for each hospital discharge experienced by a Medicaid enrollee during the year.<sup>1</sup> Hospital data elements include admission and discharge dates, Medicaid payment

<sup>1</sup> Hospital stays that did not result in a bill to Medicaid are not included in these data. For 5 percent of stays in 1992, there was no indication of a patient discharge. These stays were included in the study population.

amount, diagnoses, and an inpatient procedure, if any (Baugh, 1996; Benedict, 1996).

The data presented in this article are for calendar year 1992, the most current year SMRF data were available at the time this study was designed. This year serves as a base year for future analyses of trends in injury hospitalization, such as temporal changes in the incidence of injuries, the demographic characteristics of patients experiencing injuries, and the case mix of injuries by type. Out of 26 States for which SMRF data are available, California was chosen for this initial study because it had the largest Medicaid population and the second largest amount of Medicaid payments (New York was first). There was also diversity in the California Medicaid population, by race and ethnicity. Among 6.1 million enrollees in 1992, 824,000 were African American, 2.25 million were Hispanic, and 487,000 were Asian or Pacific Islanders (Health Care Financing Administration, 1993).

## Medicaid Enrollment

The SMRF person summary file was used to identify the study population. From a total Medicaid enrollment in California in 1992 of 6.2 million persons, 2.7 million persons were excluded because they were over the age of 20, and 34,000 persons with invalid dates of birth were excluded because it was not possible to determine their age. As a result of these exclusions, the enrolled population included 3.4 million children under 21 years of age. Two additional groups of children were excluded from the study population. Approximately 21,000 children who were enrolled in both Medicare and Medicaid and 400,000 children who were enrolled in prepaid (or capitated) plans were excluded because Medicaid hospital data are frequently incomplete for these individuals

(Maxfield, 1998). The final study population was approximately 3 million children under 21 years of age.

Data are presented for the following Medicaid enrollee characteristics: sex; age group (under 1 year of age, 1-5 years of age, 6-11 years of age, 12-17 years of age, and 18-20 years of age); race and ethnicity group (white, African American, Hispanic, and other)<sup>2</sup>; and Medicaid childrens' eligibility group (disabled, cash recipient, medically needy, and other).<sup>3</sup>

Counts of Medicaid enrollees were adjusted for enrollment turnover during the year. For example, a child who was eligible for Medicaid during 3 months of 1992 was counted as three-twelfths of a full year equivalent. As a result of this adjustment, the 3.0 million California Medicaid children under 21 years of age represented 2.2 million full year equivalent enrollees. On average, children were enrolled in Medicaid for three-quarters of the year, or approximately 9 months, during 1992. Throughout this article, the term enrollees will refer to full year equivalent enrollees.

## Utilization and Payments

The following analytic measures of Medicaid utilization and payments were obtained from the California 1992 SMRF inpatient hospital discharge file for children under 21 years of age: the total number of Medicaid inpatient hospital discharges; the total number of Medicaid inpatient hospital days of care, as measured by the number of days from the date

<sup>2</sup> White and African American (coded as black in the SMRF data) groups both exclude Hispanics. Other includes the following groups: American Indian, Alaskan Native, Asian, Pacific Islander, and unknown.

<sup>3</sup> The disabled include all blind and disabled cash recipient and medically needy children. Cash recipient children are those who receive Aid to Families with Dependent Children (AFDC) cash payments. Medically needy children are covered under AFDC provisions but do not receive cash payments. Other children include Ribicoff, poverty-related, foster care, and other groups of eligible children.

**Table 1**  
**Classification of Injuries, by Type of Injury<sup>1</sup>**

Type of Injury Category	ICD-9-CM Codes
Burns	940-949
Contusions and Crushing	310.2, 850-851, 920-929
Foreign Body	360.5, 360.6, 374.86, 376.6, 385.83, 930-939
Fracture and Dislocation	800-839
Late Effect	293.1, 366.2, 598.1, 709.4, 728.82, 729.6, 733.82, 905-909
Nerve and Blood Vessel <sup>2</sup>	852-854, 900-904, 950-957
Open Wound	870-887, 890-897
Other and Unspecified <sup>3</sup>	294.0, 388.11, 518.5, 860-869, 958-959, 995.0-995.3, 995.5, 995.6, 995.80-995.88
Sprain and Strain	840-848
Superficial	521.2, 910-919
Unknown <sup>4</sup>	E800-E807, E810-E838, E840-E858, E860-E869, E880-E888, E890-E929, E950-E978, E980-E999, V71.4, V71.6, 960-994.8

<sup>1</sup> Hospital stays were grouped into categories by type of injury on the basis of diagnosis codes. If a stay was identified as an injury on the basis of both the primary and secondary diagnosis codes, the stay was classified on the basis of the primary diagnosis code.

<sup>2</sup> This category includes injuries to the central and peripheral nervous system.

<sup>3</sup> Code 518.5 includes cases of pulmonary insufficiency caused by either trauma or surgery. To the extent that the cause was surgery, the number of injuries is overstated.

<sup>4</sup> If a stay contained a cause of injury code (E-code), but no type of injury code, the stay was classified as an unknown type of injury. A small number of codes from the 800-999 series that do not provide detailed information on the type of injury were also classified as unknown type of injury.

SOURCE: Baugh, D. K., Rotwein, S. et al. 1997-98.

of admission to the date of discharge; the total dollar amount of Medicaid payments for inpatient hospital care; discharges per 100,000 enrollees; days of care per 100,000 enrollees; and Medicaid payments per discharge.

## Identification of Injuries

In this article, injury hospitalizations are defined to include acute injuries, consequences of injuries, and late effects, including retained foreign bodies. Inpatient hospital diagnoses were coded using the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)* (Puckett, 1995). Discharges were identified as injuries using either the primary or the secondary diagnosis code recorded in the discharge records. In general, a discharge was identified as an injury if it contained either: a type of injury code (an ICD-

9-CM code from the 800-999 injury and poisoning code series or one of 19 codes outside the 800-999 series, such as V71.4-observation following other accident/motor vehicle, or 388.11-acoustic trauma/explosive / to ear); or a cause of injury code (an ICD-9-CM code from the E800-E999 code series which classifies external causes of injury and poisoning)<sup>4</sup>.

## Type of Injury Categories

Hospital discharges were grouped into categories by type of injury, using the ICD-9-CM codes. These categories are burns, contusions and crushing, foreign body, fracture and dislocation, late effects of injuries, nerve and blood vessel, open

<sup>4</sup> A small number of codes were omitted because they represent injuries or complications that occurred as a result of medical or surgical treatment.

**Table 2**  
**Number and Percent of California Child Medicaid Enrollees,<sup>1</sup> by Eligibility Group and Demographics: Calendar Year 1992**

Child Medicaid Enrollees	Number	Percent
<b>Total</b>	2,231,480	100.0
<b>Medicaid Eligibility Group</b>		
Disabled	47,187	2.1
Cash Recipient	1,363,559	61.1
Medically Needy	236,562	10.6
Other	584,172	26.2
<b>Race/Ethnicity Group</b>		
White	615,318	27.6
African American	316,882	14.2
Hispanic	982,243	44.0
Other	317,037	14.2
<b>Total Age Groups</b>		
Under 1 Year of Age	121,503	5.4
1-5 Years of Age	812,121	36.4
6-11 Years of Age	635,768	28.5
12-17 Years of Age	468,527	21.0
18-20 Years of Age	193,561	8.7
<b>Female</b>		
Under 1 Year of Age	59,462	2.7
1-5 Years of Age	397,960	17.8
6-11 Years of Age	312,158	14.0
12-17 Years of Age	235,423	10.6
18-20 Years of Age	128,166	5.7
Total	1,133,169	50.8
<b>Male</b>		
Under 1 Year of Age	62,041	2.8
1-5 Years of Age	414,161	18.6
6-11 Years of Age	323,610	14.5
12-17 Years of Age	233,104	10.4
18-20 Years of Age	65,395	2.9
Total	1,098,311	49.2

<sup>1</sup> Numbers of enrollees were adjusted for enrollment turnover during the course of a year. For example, a person who was enrolled in Medicaid for 3 months in 1992 was counted as three-twelfths of a full year enrollee.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

wound, other and unspecified, sprain and strain, superficial, and unknown. Table 1 presents the list of ICD-9-CM codes associated with each type of injury. If a discharge was identified as an injury on the basis of both the primary and secondary diagnoses, the stay was classified using the primary code. If a discharge contained a cause of injury code (E-code), but no type of injury code, it was classified as unknown. A small number of codes from the 800-999 series that do not provide detailed information on the type of injury were also classified as unknown.

## FINDINGS

### Overview

Table 2 presents the numbers of child Medicaid enrollees in California in 1992, by selected Medicaid eligibility and demographic characteristics. By eligibility group, cash recipients were the largest group, representing 61 percent of the total population. Other children were the second largest group, followed by medically needy and disabled children. Nearly one-half (44 percent) of eligible children were

**Table 3**  
**Inpatient Hospital Utilization and Payments for California Child Medicaid Enrollees Under 21**  
**Years of Age, by Type of Injury: Calendar Year 1992**

Type of Injury <sup>1,2</sup>	Number of Discharges	Percent of Total Discharges	Average Length of Stay (Days)	Medicaid Payments	Percent of Medicaid Payments	Medicaid Payment per Discharge
All Injuries	16,925	100.0	6.6	\$93,263,054	100.0	\$5,510
Burn	808	4.8	10.9	8,338,291	8.9	10,320
Contusion and Crushing	1,268	7.5	5.6	5,586,029	6.0	4,405
Foreign Body	475	2.8	3.8	1,484,105	1.6	3,124
Fracture and Dislocation	5,922	35.0	6.8	33,620,992	36.0	5,677
Late Effect <sup>3</sup>	241	1.4	8.2	1,705,487	1.8	7,077
Nerve and Blood Vessel	1,246	7.4	12.3	13,737,491	14.7	11,025
Open Wound	2,385	14.1	4.7	9,022,151	9.7	3,783
Other and Unspecified <sup>4</sup>	1,712	10.1	8.2	12,146,077	13.0	7,095
Sprain and Strain	120	0.7	3.7	395,436	0.4	3,295
Superficial	254	1.5	3.7	645,103	0.7	2,540
Unknown <sup>5</sup>	2,494	14.7	3.6	6,581,892	7.1	2,639

<sup>1</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury.

<sup>2</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>3</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>4</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>5</sup> These discharges contained a code for cause of injury but no code for type of injury.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

Hispanic. The white population represented 27.6 percent, while African Americans and others each represented 14.2 percent. Among enrolled children, there were nearly equal numbers of females and males. However, there were larger numbers of females in the adolescent age groups, primarily due to Medicaid eligibility for pregnant women and AFDC families.

In 1992, Medicaid children in California experienced 16,925 inpatient hospitalizations for injuries (Table 3). These injury hospitalizations represented 7 percent of the total of 234,000 hospitalizations for children in 1992 (data not shown). By type of injury, the greatest number of injury hospitalizations (5,922 or 35 percent of the total) was for fractures and dislocations, which was roughly double the number of hospitalizations for any other single type of injury.

The average length of hospital stay for all injuries was 6.6 days, but it varied from 12.3 days for nerve and blood vessel injuries to 3.6 days for unknown injuries. Average length of stay also varied by eligibility group from a high of 16.8 days for disabled children to a low of 5.5 days for cash recipient children (data not shown).

California Medicaid inpatient hospital payments for injuries to children in 1992 exceeded \$93 million (Table 3), or about 8 percent of total spending on inpatient hospital care for children. A little over one-third of payments for injuries (\$33.6 million) was for fractures and dislocations, while 15 percent (nearly \$14 million) was for nerve and blood vessel injuries. Burns (4.8 percent) and nerve and blood vessel injuries (7.4 percent) were a relatively small percent of total discharges. However, atypically long average lengths

**Table 4**

**Inpatient Hospital Discharge Rate for California Child Medicaid Enrollees Under 21 Years of Age, by Type of Injury and Medicaid Eligibility Group: Calendar Year 1992**

Type of Injury <sup>2,3</sup>	Medicaid Eligibility Group <sup>1</sup>				
	Disabled	Cash Recipient	Medically Needy	Other	All Groups
	Discharges per 100,000				
All Injuries	1,437	545	1,080	1,071	758
Burn	70	31	37	45	36
Contusion and Crushing	89	48	82	66	57
Foreign Body	59	18	23	25	21
Fracture and Dislocation	430	186	372	394	265
Late Effect <sup>4</sup>	57	6	18	16	11
Nerve and Blood Vessel	108	39	77	82	56
Open Wound	167	67	177	167	107
Other and Unspecified <sup>5</sup>	148	45	136	120	77
Sprain and Strain	8	4	8	8	5
Superficial	13	10	14	12	11
Unknown <sup>6</sup>	286	91	137	136	112

<sup>1</sup> The Medicaid eligibility group identifies the basis on which Medicaid eligibility was determined. The disabled include all blind and disabled cash recipient and medically needy children. Cash recipient children are those who receive Aid to Families with Dependent Children (AFDC) cash payments. Medically needy children are covered under AFDC provisions but do not receive cash payments. Other children include Ribicoff, poverty-related, foster care, and other groups of eligible children.

<sup>2</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury. Numbers of enrollees were adjusted for enrollment turnover during the course of a year. For example, a person who was enrolled in Medicaid for 3 months in 1992 was counted as three-twelfths of a full year equivalent.

<sup>3</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>4</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>5</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>6</sup> These discharges contained a code for cause of injury but no code for type of injury.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

of stay for these two types of injuries caused Medicaid payment per discharge (\$10,320 and \$11,025, respectively) to be approximately double the payment per discharge across all types of injuries.

**By Medicaid Eligibility Group**

Table 4 presents inpatient hospital discharges per 100,000 Medicaid child enrollees in California during 1992. The rate across all types of injuries was 758 per 100,000. However, the rate for disabled children (1,437 per 100,000) was nearly three times as high as the rate for cash recipient children (545 per 100,000). The rates for medically needy (1,080 per 100,000) and other children (1,071 per 100,000) were nearly double those of cash

recipient children. Among types of injuries, the highest discharge rate was for fractures and dislocations (265 per 100,000), followed by unknown type (112 per 100,000) and open wounds (107 per 100,000). The rate of fractures and dislocations was particularly high among disabled children (430 per 100,000), medically needy children (372 per 100,000), and other children (394 per 100,000).

Table 5 presents inpatient hospital days of care per 100,000 Medicaid child enrollees. The overall rate was 4,969 per 100,000, but there was substantial variation by Medicaid eligibility group. The rates for medically needy and other children (7,668 and 6,967 per 100,000) were slightly higher than the overall rate. However, the rate for disabled children (24,109 per

**Table 5**  
**Inpatient Hospital Days of Care Rate for California Child Medicaid Enrollees Under 21 Years of Age, by Type of Injury and Medicaid Eligibility Group: Calendar Year 1992**

Type of Injury <sup>2,3</sup>	Medicaid Eligibility Group <sup>1</sup>				
	Disabled	Cash Recipient	Medically Needy	Other	All Groups
	Days of Care per 100,000				
All Injuries	24,109	2,983	7,668	6,967	4,969
Burn	2,979	270	351	491	393
Contusion and Crushing	2,545	196	465	362	318
Foreign Body	379	74	68	80	81
Fracture and Dislocation	6,974	1,084	2,777	2,677	1,805
Late Effect <sup>4</sup>	386	54	164	116	89
Nerve and Blood Vessel	6,057	350	980	927	688
Open Wound	1,227	290	927	767	502
Other and Unspecified <sup>5</sup>	2,162	305	1,302	988	629
Sprain and Strain	38	13	31	29	20
Superficial	57	32	72	52	42
Unknown <sup>6</sup>	1,303	314	530	477	400

<sup>1</sup> The Medicaid eligibility group identifies the basis on which Medicaid eligibility was determined. The disabled include all blind and disabled cash recipient and medically needy children. Cash recipient children are those who receive Aid to Families with Dependent Children (AFDC) cash payments. Medically needy children are covered under AFDC provisions but do not receive cash payments. Other children include Ribicoff, poverty-related, foster care and other groups of eligible children.

<sup>2</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury. Numbers of enrollees were adjusted for enrollment turnover during the course of a year. For example, a person who was enrolled in Medicaid for 3 months in 1992 was counted as three-twelfths of a full year equivalent.

<sup>3</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>4</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>5</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>6</sup> These discharges contained a code for cause of injury but no code for type of injury.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

100,000) was 8 times the rate for cash recipient children (2,983 per 100,000) and nearly 5 times the overall rate. The reason for this finding is that two components of days of care rates, discharge rates and average length of stay, were much higher for disabled children than for cash recipient children. The discharge rates for disabled children was 2<sup>1/2</sup> times higher than for cash recipient children, while the average length of stay for disabled children was also 2<sup>1/2</sup> times higher. The same pattern persisted across all types of injuries. Both higher discharge rates and higher average length of stay contributed to this result. By type of injury, the highest days of care rates were observed for fractures and dislocations.

Substantial variation existed in Medicaid payment per discharge across Medicaid eligibility groups and types of injury. The average payment per child injury discharge in 1992 was \$5,510 (Table 6). The average payment per discharge for nerve and blood vessel injuries was higher at \$11,025, ranging from \$8,418 for cash recipient children to \$44,450 for disabled children. Likewise, payment per discharge for burns averaged \$10,320 for all children, but was highest for disabled children at \$50,733. For most types of injury, payment per discharge was higher for disabled children than for other groups, because of high discharge rates and high average length of stay. However, payments per



**Table 6**  
**Inpatient Payment per Discharge for California Child Medicaid Enrollees Under 21 Years of Age,**  
**by Type of Injury and Medicaid Eligibility Group: Calendar Year 1992**

Type of Injury <sup>2,3</sup>	Medicaid Eligibility Group <sup>1</sup>				
	Disabled	Non-Disabled			All Groups
		Cash Recipient	Medically Needy	Other	
	Payment per Discharge				
All Injuries	\$13,698	\$4,553	\$6,132	\$5,508	\$5,510
Burn	50,733	7,756	8,821	9,879	10,320
Contusion and Crushing	10,132	3,399	5,402	4,980	4,405
Foreign Body	5,531	3,598	2,308	2,174	3,124
Fracture and Dislocation	14,003	4,780	6,569	5,593	5,677
Late Effect <sup>4</sup>	6,217	8,213	8,665	5,724	7,077
Nerve and Blood Vessel	44,450	8,418	11,870	10,045	11,025
Open Wound	6,848	3,430	4,173	3,698	3,783
Other and Unspecified <sup>5</sup>	9,609	5,853	8,078	7,489	7,095
Sprain and Strain	3,393	2,965	3,030	3,799	3,295
Superficial	2,840	1,974	3,524	3,182	2,540
Unknown <sup>6</sup>	3,786	2,440	2,780	2,698	2,639

<sup>1</sup> The Medicaid eligibility group identifies the basis on which Medicaid eligibility was determined. The disabled include all blind and disabled cash recipient and medically needy children. Cash recipient children are those who receive Aid to Families with Dependent Children (AFDC) cash payments. Medically needy children are covered under AFDC provisions but do not receive cash payments. Other children include Ribicoff, poverty-related, foster care, and other groups of eligible children.

<sup>2</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury.

<sup>3</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>4</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

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SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

day for disabled children were comparable with those for all children (data not shown).

### By Race and Ethnicity

Discharge rates (Table 7) and days of care rates (Table 8) per 100,000 varied somewhat by race and ethnicity group, but those variations were not as noteworthy as those within race and ethnicity group by type of injury. Overall rates were slightly higher for Hispanics than for other race/ethnicity groups. The highest rates were for fractures and dislocations, while the lowest rates were for sprains and strains.

Payment per discharge did not vary substantially across race and ethnicity groups,

ranging from \$5,225 for Hispanic children to \$6,976 for other children (Table 9). In contrast, there were notable variations by type of injury across the race and ethnicity groups. For each group, the payment per discharge for nerve and blood vessel injuries was roughly double the rate for all injuries. There were two payment rates that exceeded \$16,000 per discharge. A Medicaid payment per discharge of \$16,577 for nerve and blood vessel injuries to other children was, in part, a result of a very long average length of stay of nearly 21 days (data not shown). Likewise, a payment per discharge of \$16,771 for burns to African-American children was the result of an average length of stay of 16 days.

Table 7

**Inpatient Hospital Discharge Rate for California Child Medicaid Enrollees Under 21 Years of Age, by Type of Injury and Race Ethnicity Group: Calendar Year 1992**

Type of Injury <sup>2,3</sup>	Race/Ethnicity Group <sup>1</sup>				
	White	African American	Hispanic	Other	All Groups
	Discharges per 100,000				
All Injuries	743	735	841	556	758
Burn	34	37	40	29	36
Contusion and Crushing	66	52	59	37	57
Foreign Body	22	24	22	15	21
Fracture and Dislocation	259	223	301	208	265
Late Effect <sup>4</sup>	15	10	9	7	11
Nerve and Blood Vessel	49	57	63	45	56
Open Wound	79	127	132	62	107
Other and Unspecified <sup>5</sup>	62	82	93	50	77
Sprain and Strain	7	4	5	4	5
Superficial	11	14	12	8	11
Unknown <sup>6</sup>	140	104	103	91	112

<sup>1</sup> White and African American (coded as black in the State Medicaid Research Files data) both exclude Hispanics. Other includes the following groups: American Indian, Alaskan Native, Asian, Pacific Islanders, and unknown.

<sup>2</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury. Numbers of enrollees were adjusted for enrollment turnover during the course of a year. For example, a person who was enrolled in Medicaid for 3 months in 1992 was counted as three-twelfths of a full year equivalent.

<sup>3</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>4</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>5</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>6</sup> These discharges contained a code for cause of injury but no code for type of injury.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

## By Sex and Age

By both age and type of injury, discharge rates per 100,000 for males were typically higher than for females (Table 10). Rates were slightly higher for males versus females in the youngest age groups, but were much higher for older age groups, as shown in Figure 1. For children 6-11 years of age and 12-17 years of age, the ratio between the discharge rates for males was roughly twice the rate for females, but for children 18-20 years of age, the rate for males was 5 times that for females. There were even greater differences between 18-20-year-old males and females for selected types of injuries. The rates for males in this age group were 7 to 10 times the rates for females for the following types of

injuries: open wounds, superficial, nerve and blood vessel, fracture and dislocation, other, and unspecified and late effects.

As noteworthy as the results are for discharge rates, differences in days of care rate per 100,000 for males versus females were even greater (Table 11). Again, males had much higher days of care rates per 100,000, especially for the older age groups, as shown in Figure 2. For 18-20-year-old children, the days of care rate for males (34,021 per 100,000) was 6½ times the rate for females (5,241 per 100,000). While there were some substantial differences in Medicaid payments per discharge (Table 12) between males and females for some types of injuries, small numbers of discharges may have led to the differences, in some instances. However, payments per

**Table 8**  
**Inpatient Hospital Days of Care Rate for California Child Medicaid Enrollees Under 21 Years of Age, by Type of Injury and Race/Ethnicity Group: Calendar Year: 1992**

Type of Injury 2,3	Race/Ethnicity Group <sup>1</sup>				
	White	African American	Hispanic	Other	All Groups
	Days of Care per 100,000				
All Injuries	4,719	4,871	5,239	4,716	4,969
Burn	410	596	352	287	393
Contusion and Crushing	278	261	381	255	318
Foreign Body	83	74	83	80	81
Fracture and Dislocation	1,820	1,483	1,879	1,869	1,805
Late Effect <sup>4</sup>	131	140	58	53	89
Nerve and Blood Vessel	628	661	652	946	689
Open Wound	366	676	610	261	502
Other and Unspecified <sup>5</sup>	496	598	780	449	629
Sprain and Strain	25	15	19	17	20
Superficial	37	36	50	35	42
Unknown <sup>6</sup>	445	330	375	464	400

<sup>1</sup> White and African American (coded as black in the State Medicaid Research Files data) both exclude Hispanics. Other includes the following groups: American Indian, Alaskan Native, Asian, Pacific Islanders, and unknown.

<sup>2</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury. Numbers of enrollees were adjusted for enrollment turnover during the course of a year. For example, a person who was enrolled in Medicaid for 3 months in 1992 was counted as three-twelfths of a full year equivalent.

<sup>3</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>4</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>5</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>6</sup> These discharges contained a code for cause of injury but no code for type of injury.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

day were higher for males than for females, overall and in the older age groups (12-17 years of age and 18-20 years of age).

While males 18-20 years of age represented only 3 percent of childhood Medicaid enrollees, they incurred 21 percent of Medicaid payments for injuries to children. The disproportional share of Medicaid resources was a result of much higher discharge rates, longer average lengths of stay and slightly higher Medicaid payments per day for this group than for other groups (data not shown).

## CONCLUSIONS

For Medicaid children in California in 1992, there were nearly 17,000 hospitaliza-

tions for injury, over 110,000 days of hospital care and over \$93 million in program payments, based on a broad definition of injuries to include acute injuries, consequences of injuries and late effects, including retained foreign bodies. Inpatient hospital services represented 64 percent of Medicaid spending (both inpatient hospital and ambulatory services combined) for childhood injuries in the State in 1992 (data not shown). Among California Medicaid children, nearly 1 percent (758 per 100,000) experienced an injury hospitalization, but the rate was much higher for disabled children (1½ percent) and males 18-20 years of age (over 4 percent). Across all groups of children, fractures and dislocations were the leading type of injury, accounting for nearly 6,000 hospitaliza-

**Table 9**  
**Inpatient Payment per Discharge for California Child Medicaid Enrollees Under 21 Years of Age,**  
**by Type of Injury and Race/Ethnicity Group: Calendar Year 1992**

Type of Injury <sup>2,3</sup>	Race/Ethnicity Group <sup>1</sup>				
	White	African American	Hispanic	Other	All Groups
	Payment per Discharge				
All Injuries	\$5,390	\$5,650	\$5,225	\$6,976	\$5,510
Burn	11,662	16,771	8,028	8,653	10,320
Contusion and Crushing	3,677	3,865	4,799	5,725	4,405
Foreign Body	3,108	2,347	3,114	4,477	3,124
Fracture and Dislocation	5,880	5,713	5,137	7,573	5,677
Late Effect <sup>4</sup>	7,700	12,136	4,836	6,329	7,077
Nerve and Blood Vessel	11,276	9,528	10,065	16,577	11,025
Open Wound	3,824	4,446	3,612	3,453	3,783
Other and Unspecified <sup>5</sup>	6,835	6,153	7,421	7,376	7,095
Sprain and Strain	3,806	2,694	3,210	2,674	3,295
Superficial	2,111	1,632	3,077	2,674	2,540
Unknown <sup>6</sup>	2,371	2,147	2,626	4,054	2,639

<sup>1</sup> White and African American (coded as black in the State Medicaid Research Files data) both exclude Hispanics. Other includes the following groups: American Indian, Alaskan Native, Asian, Pacific Islanders, and unknown.

<sup>2</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury.

<sup>3</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>4</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>5</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>6</sup> These discharges contained a code for cause of injury but no code for type of injury.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

tions, over 40,000 days of hospital care, and in excess of \$33 million in program payments. Nerve and blood vessel injuries ranked third in the number of hospitalizations (over 1,200), second in days of care (over 15,000), and second in program payments (\$13.7 million).

While the average payment per discharge for all injuries was \$5,510, there was substantial variation by type of injury. For all children, the most expensive were nerve and blood vessel injuries (\$11,025 per day) and burns (\$10,320). However, for disabled children, payments per discharge were much higher for all types of injuries (\$13,698). Payment rates for disabled children with nerve and blood vessel injuries (\$44,450) and burns (\$50,733) were particularly high. However, a few discharges with high payment amounts, among the relatively small numbers of discharges (33 and 51,

respectively) could have caused these high rates. In general, higher payment rates were primarily a result of longer average length of stay rather than greater service intensity, as measured by payment per day.

The consistent lack of variation in payment per day throughout the analyses probably relates to the payment system for hospital services used by the California Medical Assistance Commission (CMAC) in 1992. The payment mechanism employed a selective contracting process in which hospitals submitted bids to serve Medicaid enrollees. In 1992, most hospitals that received contracts from CMAC were reimbursed on a per diem rate basis. Therefore, the findings in this article probably reflect an average per diem rate across the hospitals serving Medicaid children, that did not vary by demographic or eligibility characteristics of the children (Hiehle, 1998).

Table 10

**Inpatient Hospital Discharge Rate for California Child Medicaid Enrollees Under 21 Years of Age, by Type of Injury, Sex, and Age Group: Calendar Year 1992**

Type of Injury <sup>1,2</sup>	Age Group					All Groups
	Under 1	1-5	6-11	12-17	18-20	
	Discharges per 100,000					
All Injuries	351	671	470	905	1,974	758
Female	277	560	318	570	833	511
Burn	20	61	10	9	11	28
Contusion and Crushing	20	39	28	40	64	38
Foreign Body	35	39	7	3	5	19
Fracture and Dislocation	91	167	163	159	190	163
Late Effect <sup>3</sup>	0	6	5	10	12	7
Nerve and Blood Vessel	37	43	19	25	44	32
Open Wound	10	39	36	58	111	49
Other and Unspecified <sup>4</sup>	32	25	25	39	110	38
Sprain and Strain	0	2	1	10	12	5
Superficial	3	16	8	7	2	10
Unknown <sup>5</sup>	29	122	17	209	271	123
Male	422	778	616	1,243	4,210	1,013
Burn	35	80	19	17	55	44
Contusion and Crushing	37	61	77	79	203	76
Foreign Body	50	45	6	9	6	24
Fracture and Dislocation	147	235	304	493	1,347	371
Late Effect <sup>3</sup>	2	7	9	19	87	15
Nerve and Blood Vessel	45	66	41	96	338	80
Open Wound	19	59	70	269	1,109	167
Other and Unspecified <sup>4</sup>	37	46	52	168	780	117
Sprain and Strain	0	1	3	12	37	6
Superficial	5	19	10	7	21	13
Unknown <sup>5</sup>	45	160	27	75	226	100

<sup>1</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury. Numbers of enrollees were adjusted for enrollment turnover during the course of a year. For example, a person who was enrolled in Medicaid for 3 months in 1992 was counted as three-twelfths of a full year equivalent.

<sup>2</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>3</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>4</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>5</sup> These discharges contained a code for cause of injury but no code for type of injury.

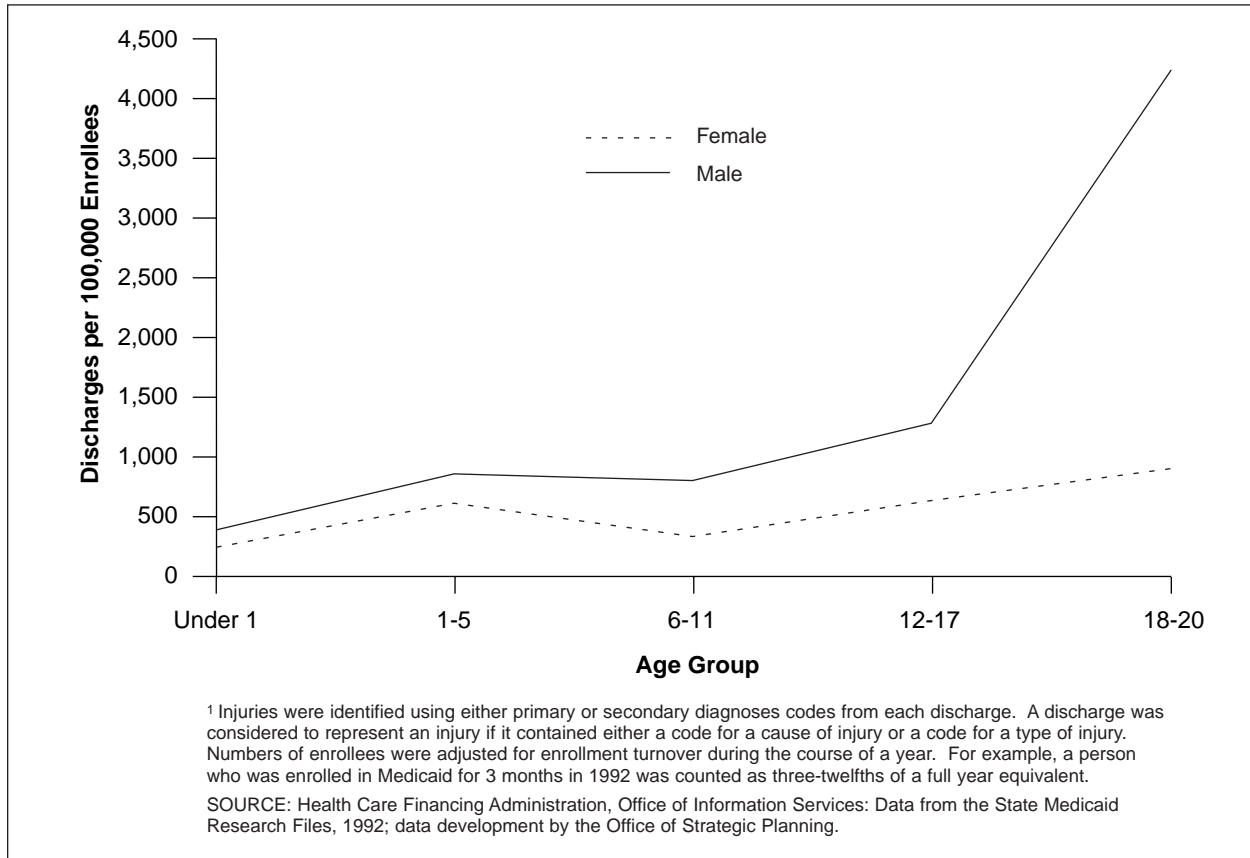
SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

There was substantial disproportionality in the share of total Medicaid inpatient hospital payments for injuries by selected groups of children. For example, disabled children represented 10 percent of all payments, but only 4 percent of injury discharges and 2 percent of child Medicaid enrollees. Similarly, males 18-20 years of age accounted for 21 percent of payments, 16 percent of discharges, and only 3 percent of enrollees, while males 12-17 years of age accounted for 18 percent of payments, 17 percent of discharges, and 10 percent of enrollees. Males accounted for approxi-

mately two-thirds of discharges, days of care, and program payments, but about one-half of enrolled children. The age distribution of enrolled males was younger than that of females. For example there were only 65,000 male enrollees in the 18-20 years of age group as compared with nearly 130,000 females. Males in the younger age groups were less prone to injury hospitalizations. Therefore, if the age distribution of males had more closely matched the age distribution of females, males would have accounted for three-fourths of program payments.

Figure 1

Inpatient Hospital Discharge Rate for California Child Medicaid Enrollees Under 21 Years of Age for Injuries,<sup>1</sup> by Sex and Age Group: Calendar Year 1992



## DISCUSSION

The data presented here show a substantial impact of injuries on Medicaid utilization and payments for children hospitalized with injuries. However, the impact was most pronounced for adolescent male and disabled children. These findings for adolescent males and the differences between male and female children in Medicaid show similar patterns to those in the literature on injury morbidity and mortality for children at the national level and in the State of California (U. S. Department of Health and Human Services, 1997; Baker et al., 1992; California Department of Health Services, 1997). These findings are also consistent with findings from the National Hospital Discharge Survey

(NHDS) on hospitalizations for injury. For 1993-94, discharge rates from the NHDS for injury among persons under age 25 were 737 per 100,000 for males, 414 per 100,000 for females, and 576 per 100,000 for all persons in this age group (U.S. Department of Health and Human Services, 1997; Fingerhut, 1998). In comparison, the rates for Medicaid children in California in 1992 were slightly higher at 1,013 per 100,000 for males, 511 per 100,000 for females, and 758 for all children. Based on the literature, injury rates for poor and near poor children, many of whom are enrolled in Medicaid, should be higher than those of the general population (Baker et al., 1992).

The high discharge rate and disproportionate spending for injuries to adolescent

**Table 11**  
**Inpatient Hospital Days of Care Rate for California Child Medicaid Enrollees Under 21 Years of Age, by Type of Injury, Sex, and Age Group: Calendar Year 1992**

Type of Injury <sup>1,2</sup>	Age Group					All Groups
	Under 1	1-5	6-11	12-17	18-20	
	Days of Care per 100,000					
All Injuries	1,883	3,936	3,323	5,665	14,964	4,969
Female	1,579	3,050	2,637	3,163	5,241	3,130
Burn	239	590	123	113	147	293
Contusion and Crushing	98	130	429	206	417	259
Foreign Body	165	161	27	8	22	77
Fracture and Dislocation	510	901	1,131	1,121	1,603	1,069
Late Effect <sup>3</sup>	0	94	23	112	49	68
Nerve and Blood Vessel	197	401	484	292	546	407
Open Wound	37	139	141	228	595	204
Other and Unspecified <sup>4</sup>	193	146	186	250	828	258
Sprain and Strain	0	10	5	28	46	16
Superficial	22	55	27	42	10	38
Unknown <sup>5</sup>	119	422	61	764	978	441
Male	2,174	4,787	3,984	8,192	34,021	6,866
Burn	271	891	232	166	702	497
Contusion and Crushing	119	268	325	427	1416	378
Foreign Body	274	154	14	33	20	86
Fracture and Dislocation	627	1,483	2,081	3,025	12,009	2,565
Late Effect <sup>3</sup>	26	41	49	194	633	110
Nerve and Blood Vessel	255	735	428	1,130	5,407	979
Open Wound	79	239	315	1,397	5,474	810
Other and Unspecified <sup>4</sup>	347	360	393	1,436	7,316	1,012
Sprain and Strain	0	4	13	50	128	24
Superficial	21	56	48	25	84	47
Unknown <sup>5</sup>	156	557	86	308	832	359

<sup>1</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury. Numbers of enrollees were adjusted for enrollment turnover during the course of a year. For example, a person who was enrolled in Medicaid for 3 months in 1992 was counted as three-twelfths of a full year equivalent.

<sup>2</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>3</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>4</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>5</sup> These discharges contained a code for cause of injury but no code for type of injury.

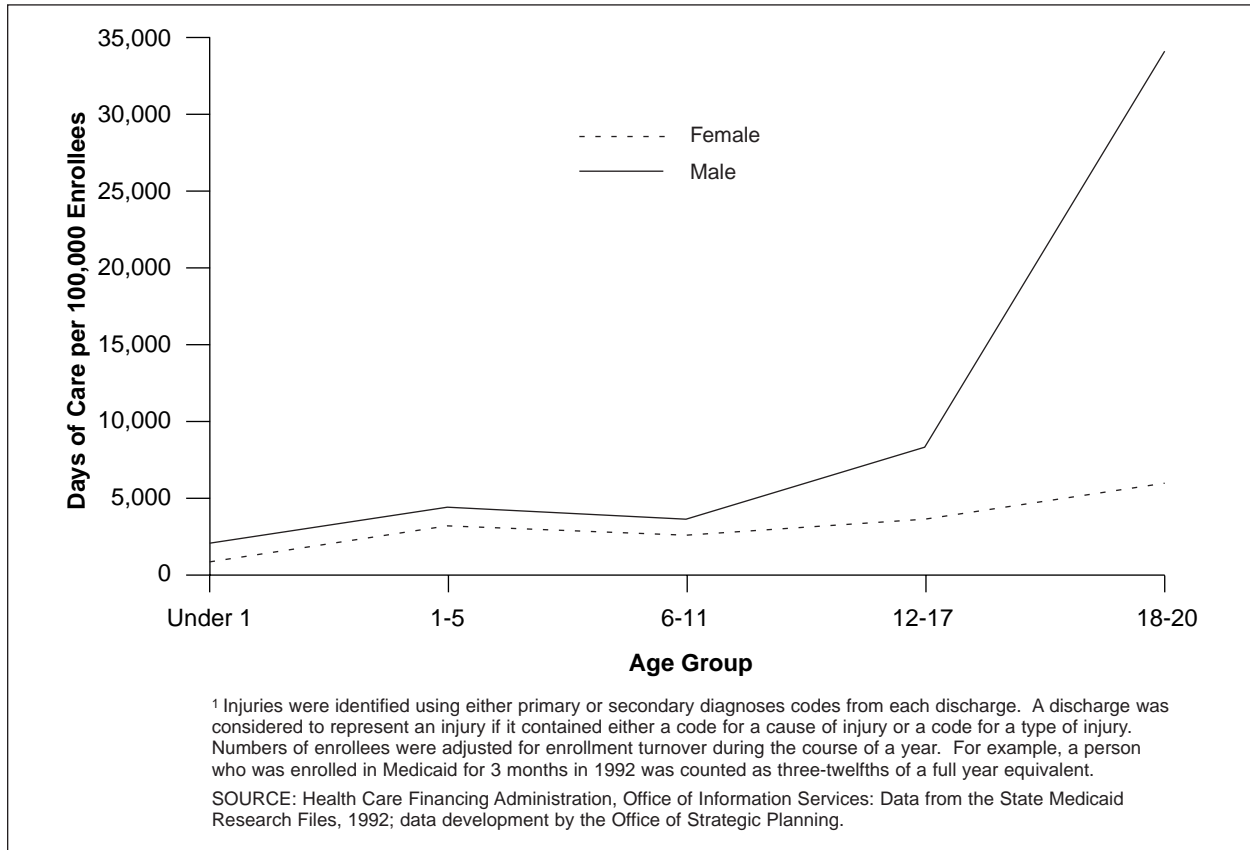
SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

males, as compared with other Medicaid children, is consistent with findings in the literature across payers, at the national level and in California (U. S. Department of Health and Human Services, 1997; Rice, MacKenzie, and Associates, 1989; Baker et al., 1992; California Department of Health Services, 1997). While this article has not examined cause of injury, the literature indicates that injury inflicted with intent to cause harm (or intentional injury) has become the leading cause of death for young African Americans and the second

leading cause of death for all Americans aged 15 to 24 (Litaker, 1996; Baker et al., 1992; Rodriguez and Brown, 1990). The proportion of deaths due to intentional injuries is much higher for adolescents aged 15 to 19 than for younger age groups (Baker et al., 1996). Data from the State of California show that the trend in intentional injuries (such as homicide and suicide) increased dramatically between 1985 and 1991. While there was a slight decline between 1991 and 1994, the increase for the 10-year period from 1985 to 1994 was

Figure 2

Inpatient Hospital Days of Care Rate for California Child Medicaid Enrollees Under 21 Years of Age for Injuries,<sup>1</sup> by Sex and Age Group: Calendar Year 1992



69 percent. The highest rates of intentional injuries were observed for children aged 16 to 20 years (California Department of Health Services, 1997). Given these factors, it will be important to examine causes of injury, including intentional injuries, for adolescent males in future research. It will also be important to monitor injury rate data for adolescent males in the coming years to determine if recent trends continue.

This analysis has taken the first step to examine the factors that led to the disproportionate number of injuries among disabled children. Among 421 disabled children in the study population, 90 percent were disabled enrollees in a month prior to the month of their initial (or only) hospital injury admission. For the remaining 10 percent, their first month of enrollment as

a disabled child was the same as the month their initial (or only) hospital injury admission. None of the study children became disabled in a month (in 1992) after the month of their initial (or only) hospital injury admission.<sup>5</sup> These findings suggest that children who had previously been granted disability status were at greater risk of experiencing injury and that injuries to these children were typically more severe, requiring longer average lengths of stay and higher program payments per discharge. Serious injury may have led to enrollment as a disabled child for a small proportion (up to 10 percent) of this population. These findings raise many

<sup>5</sup> Since enrollment data were limited to months in 1992, this analysis omitted 179 children whose initial injury hospital admission occurred before January 1992.



Table 12

**Inpatient Hospital Payment per Discharge for California Child Medicaid Enrollees Under 21 Years of Age, by Type of Injury, Sex, and Age Group: Calendar Year 1992**

Type of Injury <sup>1,2</sup>	Age Group					
	Under 1	1-5	6-11	12-17	18-20	All Groups
	Payment per Discharge					
All Injuries	\$4,841	\$4,932	\$5,766	\$5,254	\$6,495	\$5,510
Female	5,746	4,478	6,438	4,398	5,192	4,963
Burn	14,329	8,871	12,082	12,844	10,777	9,728
Contusion and Crushing	3,648	2,529	6,634	3,636	7,315	4,543
Foreign Body	3,766	3,859	2,978	1,301	3,010	3,638
Fracture and Dislocation	7,260	4,334	5,895	5,843	7,041	5,514
Late Effect <sup>3</sup>	0	12,508	3,081	9,466	4,111	8,007
Nerve and Blood Vessel	4,692	7,811	21,904	7,935	10,855	10,406
Open Wound	2,964	2,576	2,879	3,014	4,212	3,171
Other and Unspecified <sup>4</sup>	4,236	4,327	6,517	5,743	6,152	5,617
Sprain and Strain	0	3,492	2,942	2,267	2,866	2,715
Superficial	3,182	2,291	2,258	4,121	2,821	2,578
Unknown <sup>5</sup>	3,141	2,652	2,606	2,714	2,482	2,636
Male	4,272	5,245	5,431	5,650	7,001	5,795
Burn	7,013	11,166	10,278	8,327	12,084	10,710
Contusion and Crushing	2,590	4,107	3,427	4,718	6,239	4,335
Foreign Body	4,728	2,529	1,485	2,446	2,816	2,710
Fracture and Dislocation	3,114	5,044	5,776	5,167	7,538	5,751
Late Effect <sup>3</sup>	20,190	5,320	4,195	8,932	6,389	6,606
Nerve and Blood Vessel	5,070	10,811	9,282	10,719	14,427	11,285
Open Wound	2,658	3,243	3,585	4,347	4,024	3,967
Other and Unspecified <sup>4</sup>	8,913	5,483	6,679	7,632	8,583	7,590
Sprain and Strain	0	2,976	3,463	4,659	3,020	3,739
Superficial	3,813	1,883	4,442	2,068	2,000	2,510
Unknown <sup>5</sup>	2,317	2,575	2,402	2,981	2,755	2,643

<sup>1</sup> Injuries were identified using either primary or secondary diagnoses codes from each discharge. A discharge was considered to represent an injury if it contained either a code for a cause of injury or a code for a type of injury.

<sup>2</sup> Table 1 contains a list of *International Classification of Diseases, 9th Revision, Clinical Modification* diagnosis codes associated with each type of injury.

<sup>3</sup> Late effects are conditions which may occur at any time after an acute injury, and are caused by or related to the acute injury.

<sup>4</sup> These discharges contained a code for type of injury, but it was not specific.

<sup>5</sup> These discharges contained a code for cause of injury but no code for type of injury.

SOURCE: Health Care Financing Administration, Office of Information Services: Data from the State Medicaid Research Files, 1992; data development by the Office of Strategic Planning.

additional questions about the higher levels of use and payments for disabled children, which will be examined in future studies.

As noted earlier, the literature suggests that the impact of injuries is greater for lower income groups. Since Medicaid is a program that provides health care predominantly to poor and near-poor individuals, it was not possible to examine the differential impact of injuries on children in different income strata. The literature also suggests that the impact of injuries is greater for racial and ethnic minorities (Baker et al., 1992). However, racial and

ethnicity differences in these data were not profound. Since poverty is often correlated with minority status, it is likely that racial and ethnic differences, observed in other analyses, were largely absent in these data because Medicaid children are often poor. This suggests that the poor, regardless of race and ethnicity, have similar environmental risk factors for injury requiring hospitalization.

There are several important limitations to the findings of this article. First, utilization and payments of injuries to Medicaid children in the fee-for-service (FFS) sector

may be understated to the extent that other insurers paid for care or that it was provided as charity care. Second, utilization and payment data were not available for approximately 400,000 California Medicaid children (12 percent of the total in 1992) who were enrolled in prepaid plans. This means that total utilization and payments for injuries to Medicaid children are understated. This understatement, due to the missing data, was eliminated since children enrolled in prepaid plans were excluded from both the numerators and denominators of the rates. However, rates may still be biased to the extent that the experience of children in prepaid plans is different from that of children in the FFS sector. Finally, Medicaid payments may not reflect the true cost of providing care to Medicaid children.

Future study of injuries to Medicaid children will build upon the knowledge demonstrated in this article, which presents utilization and payments by type of injury. In order to use these data to support injury prevention efforts, it will be necessary to present similar data by cause of injury. Analysis by cause of injury is possible since a substantial proportion of SMRF hospital discharges contain diagnosis codes for the cause of injury. Future analyses will also build upon the findings of this article by examining data from other States and years to determine if the patterns observed here persist for other States and across years. While the literature suggests that inpatient hospital care represents a large proportion of total spending on injuries, data in this report provide an incomplete picture of the total impact of injuries, such as care rendered in emergency rooms, clinics, and physician offices. Since the SMRF data capture claims for all types of service, future work will examine the impact of childhood

injuries on Medicaid spending in outpatient settings. This ongoing research agenda should provide better information on the impact of childhood injuries on the Medicaid program and on the lives of the children it serves. This research will provide policymakers and program managers with a better understanding of the overall impact of injuries on the lives of enrolled children and program payments under Medicaid. Hopefully, this will lead to more interest in injury prevention for Medicaid children.

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