The Impact of Changing Public Policy on Hospital Admission Patterns for California Children Age 0 to 4 - 1983 to 1997

By

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JUNE, 2000

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ACKNOWLEDGEMENTS

The authors are grateful to the California Policy Research Center, California Program on Access to Care for its financial support of this research. The views presented here are those of the authors and should not be attributed to the funding agency, its directors, officers, or staff.

Ted Clay, MS, provided critically important programming and statistical support. Kristie Kooken and Molly Bradshaw, MPH, provided valuable research support. No matter how short the timeline, they cheerfully answered questions, found references, and helped with spreadsheets. Cindie Sedik and Jennifer Gee provided excellent administrative support.

In addition to our staff who read this report, we also wish to thank the following colleagues and friends for their willingness to read it and provide invaluable feedback: Carol Miller, RN, PhD, Institute for Health Policy Studies, UCSF; Don DeMoro, Director, Institute for Health and Socio-Economic Policy, Orinda; Esther Blau, RN; Ann Troy, MD; and William Rothman, MD.

INTRODUCTION

Beginning in the mid 1980's, concern over lack of access to primary health care services for low income pregnant woman, children and youth led to a number of national and state initiatives to expand health insurance coverage. Federal initiatives in the Omnibus Budget Reconciliation Acts of 1984-87, '89, '90, and '97 expanded income eligibility for pregnant women and children through the Medicaid program. The Early and Periodic Screening Treatment and Diagnosis program (EPSDT) at the federal level established funds for low-income children for comprehensive health assessments. In all of these program expansions, California added state funds to further expand access. Most recently, the 1997 federal Balanced Budget Act allocated funds to establish the State Child Health Insurance Program (SCHIP) to further expand income eligibility to children from working families without health insurance. In California, SCHIP is known as the Healthy Families Program.

Over the same period, escalating medical and welfare costs, as well as the United States budget deficit in the 1980s and early 1990s, prompted a number of actions which also affected access to care. These included the shift of large segments of the population, including the much of the Medicaid population, from fee-for-service (FFS) care into managed care plans; establishment of a Prospective Payment System (PPS) for hospital care based on Diagnosis Related Groups (DRG) to replace FFS billings; and passage of welfare reform legislation which de-linked income support from Medicaid eligibility, pushed many poor families off welfare, and increased the numbers of the uninsured. Efforts to limit immigration, nationally and in California, resulted in decreased access to care for undocumented residents. In the private sector, a combination of corporate downsizing and a pattern of eliminating benefits for dependents of employees placed increasing numbers of working parents, spouses and their children at risk of losing health insurance coverage.

These major initiatives were instituted with no efforts to monitor the impact they would have on the health and well being of the population. Low-income women and children, particularly children of color and those from immigrant families -- the primary recipients of Medicaid, welfare, and dependent benefits -- are particularly affected by these social initiatives.

Against this background of major shifting public policies between 1983 and 1997, we undertook this long overdue analysis by examining changes in hospital utilization patterns for California's most vulnerable children between the age of 0 to 4 excluding neonates. This age group was chosen because it has the greatest need for primary and preventive care and has the highest child hospitalization rates.

The purpose of this study was to explore changes in rates and patterns of hospitalization for children 0 to 4 over the 15-year period from 1983-1997 to determine whether changes over this period could be related to changes in health policy for children. Between 1983 and 1997, California hospitals discharged 1,687,886 children age 0 to 4 excluding neonates (the study group). In this report, we focus on two variables of critical importance to policy makers that directly reflect health equity. These are the race/ethnicity of the discharged child, the anticipated payor at discharge, and the interplay between these.

At the start of Healthy Families, we do not know the impact on the child population of previous healthcare initiatives. Some recent studies have begun to examine the longitudinal impact of changing healthcare policy on the healthcare infrastructure (availability of hospitals, beds, public/private conversion, nursing staff, etc). [1 2 3 4] However, we do not know of any other study

that has examined the longitudinal impact of these major shifts in healthcare delivery on any California population.

It is hoped that findings from this study will help policy makers, insurers, providers, and consumer advocates understand changes in the overall demographics of who is hospitalized and the social costs of providing care. It will provide a baseline against which to monitor the ongoing impact of health insurance expansion efforts and related policy changes on children's health and access to care.

The first section of the report is an overview of the major initiatives in the healthcare delivery system between 1983 and today. The second section describes the methodology used to do this analysis. The third section examines from the population standpoint whether rates and patterns of hospital admission for children age 0 to 4 varied over time as a function of race/ethnicity and payor. The fourth section examines variations in population and hospital utilization for counties electing various Medicaid managed care plans.

THE CHANGING HEALTHCARE ENVIRONMENT FOR CALIFORNIA CHILDREN

FACTORS IMPACTING ACCESS TO HEALTH CARE FOR CHILDREN

During the 1990's, California initiatives to expand coverage for prenatal care, family planning services, and child health insurance put the state in the forefront compared to other states in attempting to move toward health insurance coverage for all low income woman and children. Recognizing it had a larger problem with lack of insurance for children, California added funds to the EPSDT program through state legislation to establish the Child Health and Disability Prevention Program. Expansions of eligibility for this program well beyond that in the federal legislation occurred throughout the 80's and the 90's. Expanded coverage for prenatal care to women up to 250% of poverty was accomplished through the AIM program. Increased access to family planning services was accomplished through the Family PAACT program which provided coverage for these services to poor women and men with incomes under 200% of poverty through the Medi-Cal program. Through the Healthy Families Program, California expanded eligibility for health care to children from families up to 200% of poverty and the governor has proposed a further expansion to 250% in his most recent budget proposal.

Another major factor affecting access to health care for women and children is the increasing percentage of uninsured dependents due to the loss of employee benefits through downsizing and benefit containment policies. A 1997 GAO study reports that the percent of children with private insurance decreased from 74% to 66% between 1989 and 1995.[5] The negative effects of these changes for children were mitigated by the 1991 expansion of Medicaid benefits to cover women, infants and children up to age 6 at or below 133% of poverty, and children 6 and older born after 1983 with income at or below 100% of poverty. However, despite increased Medicaid coverage, an estimated 1 million additional children were uninsured by 1995, bringing the total estimated number to 10 million.[6]

Welfare reform also can be expected to impact access to health care. The 1996 Welfare Reform Bill uncoupled eligibility for Aid to Families with Dependent Children (AFDC, now called Temporary Aid for Needy Families [TANF]) from the eligibility processes for Medicaid and food stamps.[7 8 9] Historically, 60% of children enrolled in Medicaid were found to be eligible through the AFDC eligibility process. Past studies of the Medicaid population have shown that automatic enrollment in Medicaid for people receiving AFDC led to higher Medicaid coverage levels

compared to people who had to apply separately.[7] [8] [9] California began to implement TANF in 1997.

Since then there has been a significant decline in the number of children enrolled in both TANF and Medi-Cal through 1998.[10] Child advocates hope that some effects of the loss of dependent and Medicaid coverage pursuant to welfare reform may be offset by Healthy Families. However, a new national study by the US Census Bureau indicates that the number of uninsured children in 1999 remains the same as in 1995 (about 10 million) when SCHIP was initiated, and that 20.3% of California's population remains uninsured while the national average was 15.5%.[11]

Lastly, there is a national trend to limit or eliminate health care and income support benefits for legal and/or illegal immigrants. Welfare reform legislation allows states to determine whether and the extent to which they provide Medicaid coverage to legal immigrants. In California, the 1994 passage of Proposition 187 restricted access to state funded services for undocumented residents. The Federal courts struck down this proposition in 1999,[12] but many undocumented residents have assumed it is a reality and fear deportation if they attempt to access publicly-funded services such as health care.

Thus, despite expansions of insurance coverage for children, a significant number still remain without health insurance. In 1997 there were 1.85 million uninsured California children.[13] While the uninsured growth rate had not changed significantly over the preceding three years, California children continued to be uninsured at a higher rate (18.8%) than other children in the United States (14.7%). In 1997, 18.8% of children ages 0 to 18 had no insurance while 55.7% had job-based insurance, 3.4% had privately purchased insurance, and 20.6% had Medi-Cal. A 4.6% decline occurred in Medi-Cal coverage for children ages 0 to 18 between 1995 and 1997.

Differences in health insurance coverage exist across race/ethnic groups in California, with children of color having higher uninsured rates. Non-Hispanic White children (13%) have the lowest percentage uninsured in contrast to Hispanic (30%), Asian (19%) and African American (18%) children. Non-Hispanic White (71%) and Asian (60%) children have the highest percentage of job-based insurance compared to African American (51%) and Hispanic (11%).[13]

THE SHIFT TO MEDI-CAL MANAGED CARE

The State of California began to enroll Medicaid recipients in managed care systems in the early 1970's. After serious marketing, access, and quality problems with California’s first Medicaid prepaid health care contracting program, the Waxman-Duffy Prepaid Health Plan Act and the Knox-Keene Health Care Service Plan Act were enacted in 1972 and 1975 respectively. The legislation and later amendments established contracting authority and standards for MCMC and made Knox-Keene licensing a prerequisite to a Medi-Cal Prepaid Health Plan (PHP) contract. PHPs provide AFDC-linked Medi-Cal beneficiaries who enroll in their plans with access to organized, mainstream systems of health care. Medi-Cal is California’s Medicaid program.

As the nation’s largest state and the state with the most ethnically diverse population, California began in the early 1980's to develop capitated managed care pilot projects. Dating back to 1981, early experimental service delivery models for Medi-Cal recipients included County Organized Health Systems (COHS), Primary Care Case Management (PCCM), and Geographic Managed Care (GMC). In theory, these models emphasize cost control and a move to increase provider financial risk, utilization control, case management, and prevention and health maintenance services.

It was not until the 1990's that substantial numbers of low-income families were enrolled in MCMC and, more recently, Healthy Families. In 1991 and 1992, State legislation (AB336 and AB485) enabled a significant MCMC expansion, primarily for AFDC-linked eligibles.

Before 1994, three managed care programs provided medical care to the Medi-Cal population – the PHP, PCCM and COHS programs. Now considered transitional models, PHPs and PCCMs are no longer available in counties where other managed care models are implemented. After 1992 and continuing into the present, there has been development and implementation of a GMC program in two counties, a Two-Plan Model program in twelve counties, a Fee-For-Service (FFS) MCMC program in two counties, and expansion of the COHS program into three additional counties.

In March, 1993 the California Department of Health Services (CADHS) issued a report and authorized a Two-Plan managed care model for transitioning 3.3 million patients enrolled in Medi-Cal FFS in California's twelve most populous counties into MCMC plans. Under the Two-Plan model, two HMO plans operate in each of twelve selected counties. One operates under auspices of the county government or a community based entity. The other operates as a private HMO selected by the CADHS through competitive bid. Under this plan half of the Medi-Cal AFDC (now TANF) recipients were transitioned into a new managed care models.

In 1998, California initiated the federally mandated SCHIP, included in the Balanced Budget Act of 1997. California's implementation of SCHIP, Healthy Families, is operated through the California Managed Risk Medical Insurance Board (MRMIB) within the Office of Statewide Health Planning and Development (OSHPD). By 1999, MRMIB had contracted with 27 managed health care plans statewide.

Few data are available upon which to base conclusions about the effects of managed care and MCMC in particular, on health care utilization and outcomes for the maternal and child health population, the population most affected by these changes. Published studies to date do not show consistent differences between managed care and FFS care in utilization of prenatal care,[14 15 16 17 18 19 20] birth outcomes,[21 22 23 24 25] primary care visits for children,[26 27 28 29] or childhood immunization rates.[15] For children with chronic illness, physicians have reported fewer referrals to specialists due to plan-imposed barriers.[30]

Part of the reason for inconclusive or inconsistent findings is that these studies have not accounted for the different structural features and organizational models that may affect access or quality. One study done in 1993 compared birth outcomes for Medi-Cal recipients in two California counties and found that low birthweight was significantly less prevalent for those enrolled in MCMC plans compared to those in FFS arrangements.[22]

IMPLICATIONS FOR THE FUTURE OF CHILDREN'S ACCESS TO CARE

Expansions of Medicaid eligibility begun in the mid-1980's allowed more poor children in California to access healthcare. However parallel policy changes in both the private sector (many employers have dropped dependent coverage) and the public sector (welfare reform and anti-immigrant policies) have resulted in more low-income families without health insurance.

Along with changes in insurance coverage, the systems of care also have changed. Today California is one of the most heavily penetrated managed care markets. Most employer-based healthcare plans have shifted from FFS to a variety of managed care alternatives. Similarly,

public sector insurance plans also have shifted into a variety of managed care structures. The PPS implemented in 1983 fundamentally changed the method of payment for hospital care.

As these changes have occurred, California's poor families, families of color, and immigrant families have been disproportionately impacted. Children with different race/ethnic backgrounds have different access to hospital care within and among regions. As we move into the next century, these issues certainly will affect the ability of Healthy Families to promote the health of California's children.

METHOD

DATA SOURCES

Data used for this study came from three sources:

- OSHPD provided the Family Health Outcomes Project (FHOP) with the confidential Patient Discharge Data Sets (PDDS) for the years 1993 through 1997.[31]

- County population estimates are released yearly by the California Department of Finance (DOF).[32] These have estimated county-level population by sex, race/ethnicity, and age in years.

- ZIP code (ZIP) and county values from the 1980 and 1990 census files were used to identify county of residence for discharge records lacking this information.[33]

CASE SELECTION

The PDDS was searched to identify all California residents from 30 days to 4 years old living in ZIPs between 90000 to 96162 discharged from a general acute care hospital for any reason (the study group).[34] Records lacking a valid date of birth, sex, ZIP, admission source, and discharge disposition were not examined. Delivery and newborn records were excluded.

Every PDDS record is classified using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) as to its principal and secondary diagnoses, the Diagnostic Related Group (DRG), the Major Diagnostic category (MDC), and after 1990, E-codes which classify environmental events, circumstances, and conditions as to the cause of injury, poisoning, and other adverse effects.[35]

We excluded some records based on DRG.[36] We also deleted some records with newborn principal diagnoses that had not been identified with our earlier screening.[37]

At the end of the selection process, we had 1,687,886 records for children age 0 to 4 who lived in California ZIP codes and had been discharged from general acute care hospitals between 1983 and 1997.

ANALYSIS VARIABLES

We created a series of analysis variables to classify patient demographic characteristics, clinical characteristics, and characteristics of the hospitalization.

DEMOGRAPHIC CHARACTERISTICS

- **Age**. Age was classified into three groups: 0 (less than 1 year old), 1-2 years, and 3-4 years.

- **Race/Ethnicity**. Race/ethnicity was classified as follows: White Non-Hispanic (White), Hispanic All Race (Hispanic), African American (Black), Asian, and Other.[38]

- **County of Residence**. Before 1990, OSHPD identified the ZIP and county of the hospital discharging the patient and the patient ZIP of residence, but not the patient county of residence. A master file was created with one record for every ZIP that had ever been recorded for patients of any age and for every hospital between 1983 and 1997. If the ZIP had a county identity attached, we saved that information. For those ZIPs still missing a county, we merged the 1980 and 1990 census files and assigned county of residence to PDDS records missing one.

CLINICAL CHARACTERISTICS

- **Primary Clinical Condition**. Every record was classified into one of four primary clinical conditions in the following order:

1. **Injuries (INJ)**. Software developed by FHOP[39] and the California Department of Health Services[40] (the latter based on recommended CDC injury categories[41]) was used to classify records as to whether they reflected an injury.[42]

2. **Ambulatory Care Sensitive (ACS) Condition**. The remaining cases were identified as ACS based on the principal diagnosis using the Billings classification system.[43] ACS includes diagnoses such as bronchitis, pneumonia, respiratory infections, and other diagnoses shown to be preventable through access to primary care.[44]

3. **Surgical Condition (SUR)**. All remaining cases that the DRG categorized as surgical were assigned "Surgical" as the primary clinical condition.[45]

4. **Medical Condition (MED)**. Finally, the primary clinical condition "Medical" was assigned to all remaining records.

HOSPITALIZATION CHARACTERISTICS

- **Admission Source**. The admission source was collapsed into three categories: routine, emergency room (ER), and transfer in from another other licensed healthcare facility (hospital, skilled nursing, long-term care, home care, and other facility) .

- **Payment Source**. This is the anticipated payor at time of discharge. Therefore, it is not possible to know if the child was uninsured at admission. This variable was coded into four categories: Medi-Cal, HMO/PHP, Private and other (CHAMPUS, Workers Compensation, other government), and uninsured. In the narrative, Medi-Cal and uninsured sometimes are grouped as Public Sector with HMO/PHP and Private/Other grouped as Private Sector.

- **Length of Stay (LOS)**. About 5% of discharges had a LOS of zero days; that is; the child was admitted and discharged on the same day. All records admitted and discharged on the same day were changed to a LOS of 1 day to more accurately reflect the family and social

burden of admitting and discharging a sick child. Because OSHPD coding rules require charges to be reported for the year, the LOS upper range was truncated at 365.

- **Total charges**. About 9.3% of records were missing charges over the 15-year period. This ranged from 10.9% in 1983 to 7.2% in 1997. Charges are missing non-randomly, because OSHPD does not require Kaiser and children's hospitals to report this. However, charges are reported when non-Kaiser members receive care in Kaiser facilities or Kaiser members receive care in non-Kaiser facilities. To better estimate the total economic burden of early childhood hospitalization, we imputed charges for records lacking them, using charges converted to 1997 dollars to control for inflation.[46] Hospital charges are generally much higher that actual reimbursements, and thus do not provide a clear picture of the cost of hospital care. However, charge information provides a sense of the relative cost of care, thus allowing comparison between groups of cases.

DATA SUMMARY AND ANALYSIS

The above variables were summarized to the state and county level by year and by race/ethnic and payor groups within years. Using the resulting numbers and population estimates from the DOF, we calculated rates per 10,000 population (the population rate) and 1,000 discharges (the discharge rate). Continuous variables LOS and charges were summarized by race/ethnic and payor groups within year. These summaries were output as comma delimited ASCII files and imported into Excel for preparing tables and figures.

In presenting results, figures show 1983 through 1997, and tables compare 1983 and 1997.

ACCESS TO HOSPITAL CARE FOR CALIFORNIA CHILDREN AGE 0 TO 4

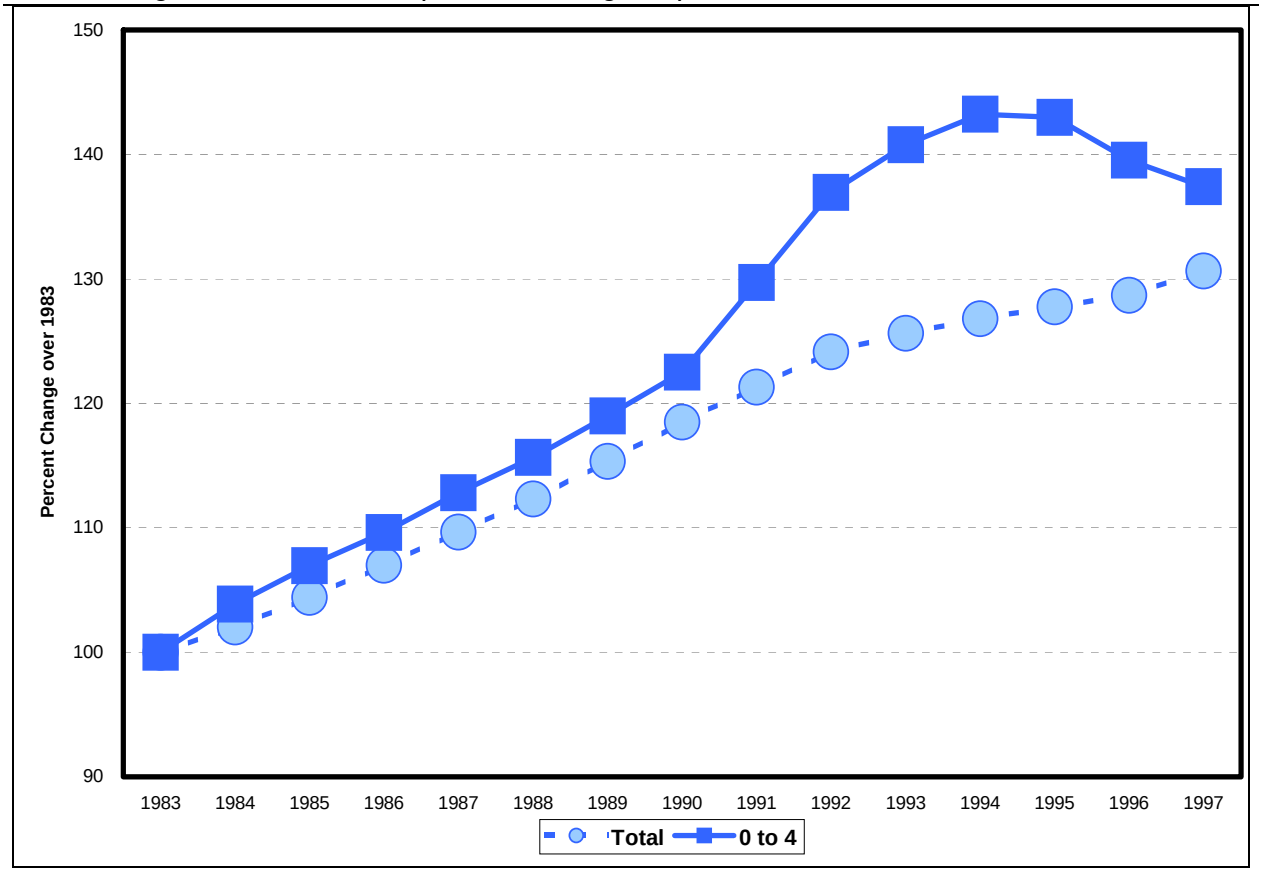
This section describes changes in hospitalization patterns between 1983 and 1997. Changes in the composition of California's child population are compared with changing characteristics of the population, trends in population-based rates for hospital discharges, and changes in population-based rates for primary clinical diagnoses for children admitted between 1983 and 1997. In some sections, race/ethnic comparisons are made as a proxy for poverty.

POPULATION CHANGE

In 1983, the DOF estimated California's total population to be about 27.4 million. In 1997, the DOF estimated the population to be about 35.8 million, a relative 31% increase over 1983. During this period, the study group population rose from about 2.0 to about 2.8 million, a 37% increase over 1983 numbers.

Figure 1 compares the annual percent change in the total population to the annual percent change in the child population. Notice that the total population increase was smooth, while the child population peaked at 43% above the 1983 number in 1993 and 1994. Thus, annual growth in the study group has been declining since 1994.

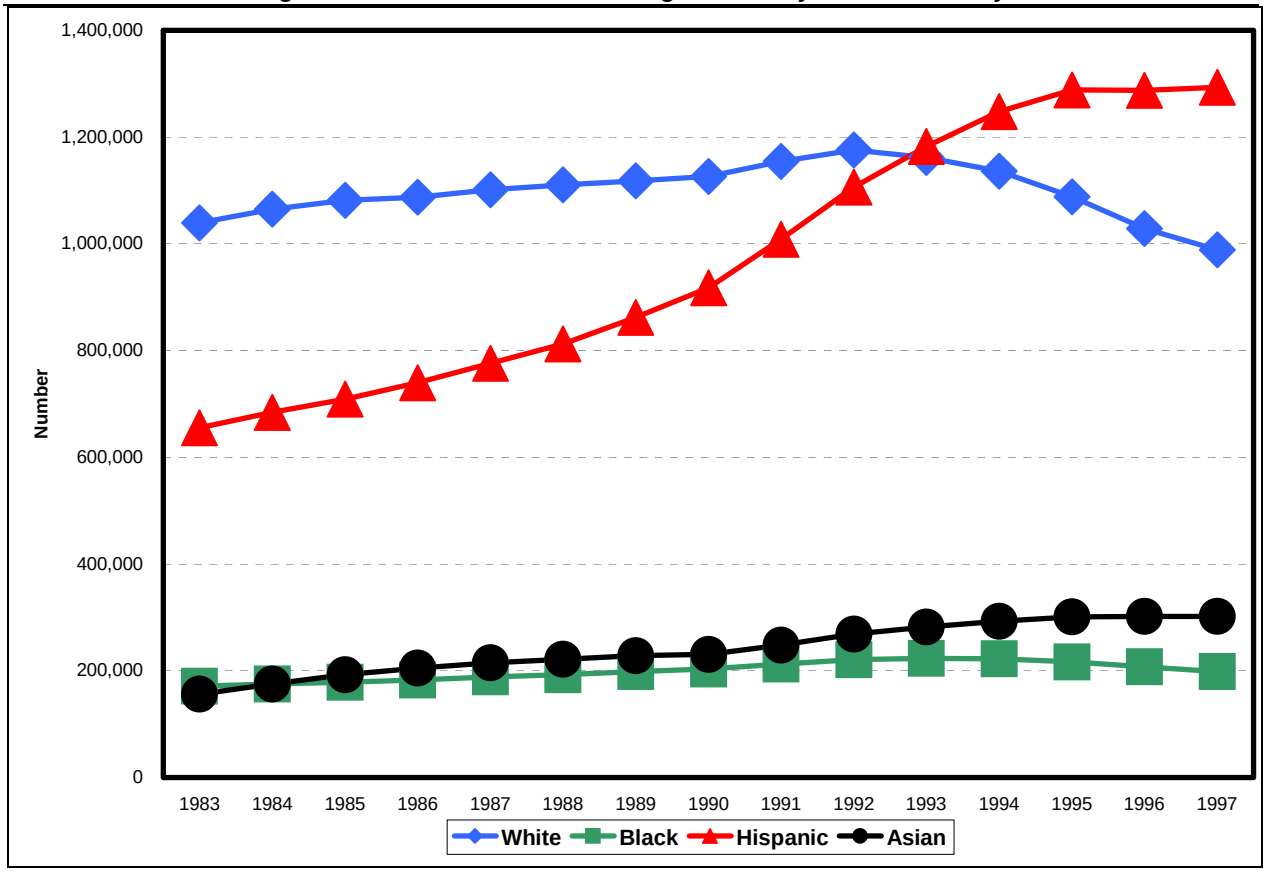
Figure 1. California Population Change Expressed as Percent of 1983 Values



The population increase was driven primarily by dramatic changes in the underlying race/ethnic distribution. Figure 2 shows this for the study group. The number of White children peaked in 1993 and declined steadily since then. By 1997, the number of White children was below the 1983 number. Similarly, the number of Black children peaked in 1993 and declined steadily since then. By 1997, the number of Black children was slightly above the 1983 number. During this time, the number of Hispanic and Asian children almost doubled. Because of their greater numbers, Hispanics drove most population growth in the study group.

In 1983, White children were the majority group at 51% of the group total. By 1997, no majority existed, and Hispanic children were the plurality (46%). As a percent of the group population, Black children dropped from 8% to 7% and Asian children increased from 8% to 11%.

Figure 2: Number of Children Age 0 to 4 by Race/Ethnicity



CHANGES IN POPULATION-BASED RATES FOR DISCHARGES AND DAYS OF CARE

Figure 3 compares the annual hospital discharge rate per 10,000 population for all age groups with that for children age 0 to 4. In 1983, the total population rate was 1,293; by 1997, it was 929. In 1983, the rate per 10,000 children age 0 to 4 was 563. This bottomed out in 1994 at 378 and increased to 412 by 1997.

Figure 3: Discharge Rate per 10,000 Population

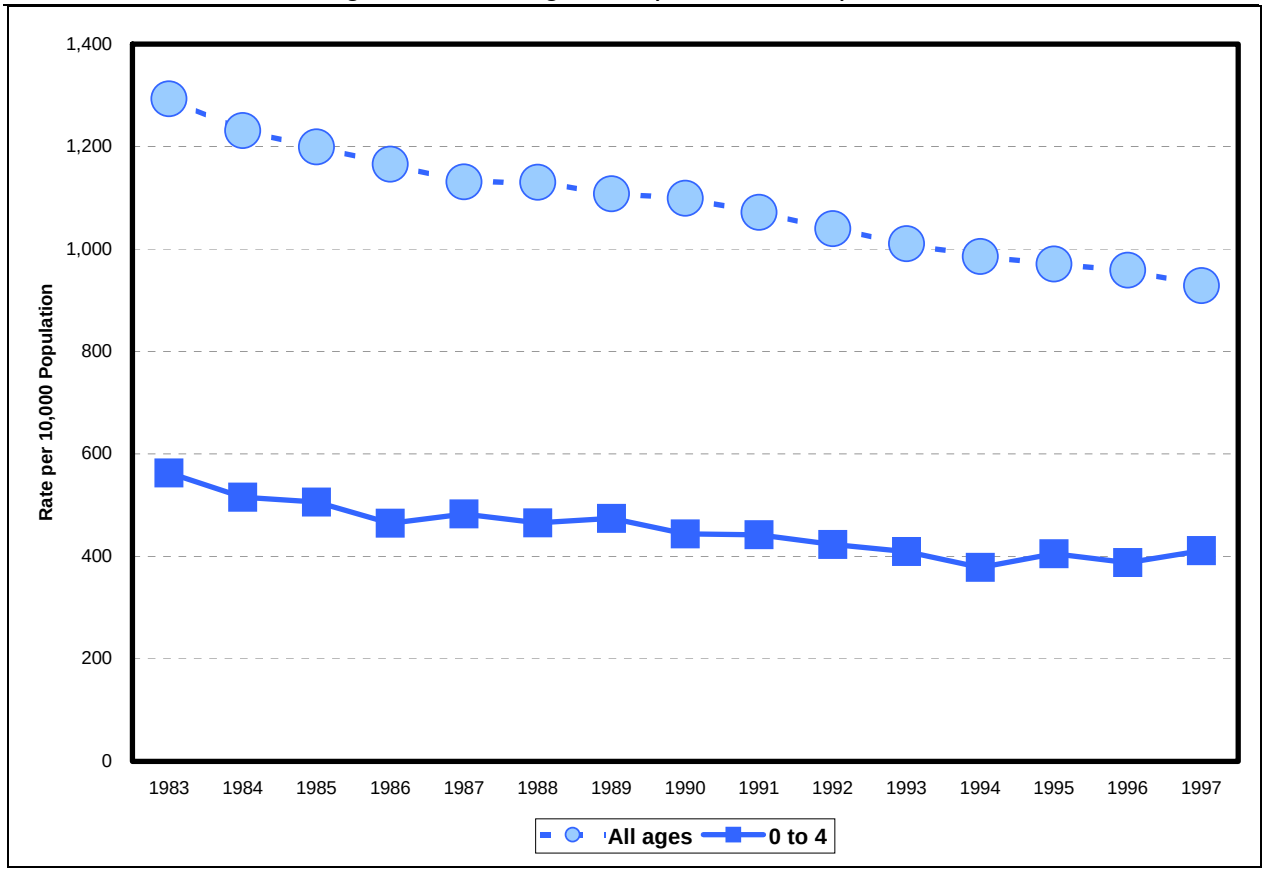


Figure 4 shows the change expressed as a percent of the 1983 rates. In every year, the percent change was greater for study group children than for the total population. The percent change for children plateaued between 1986 and 1989, and rose beginning in 1994 relative to 1983. Due to the increase since 1994, by 1997 the decline relative to 1983 was similar for the study group and the total population -- about 37%.

Figure 4: Change in Discharge Rate per 10,000 Population as Percent of 1983 Values

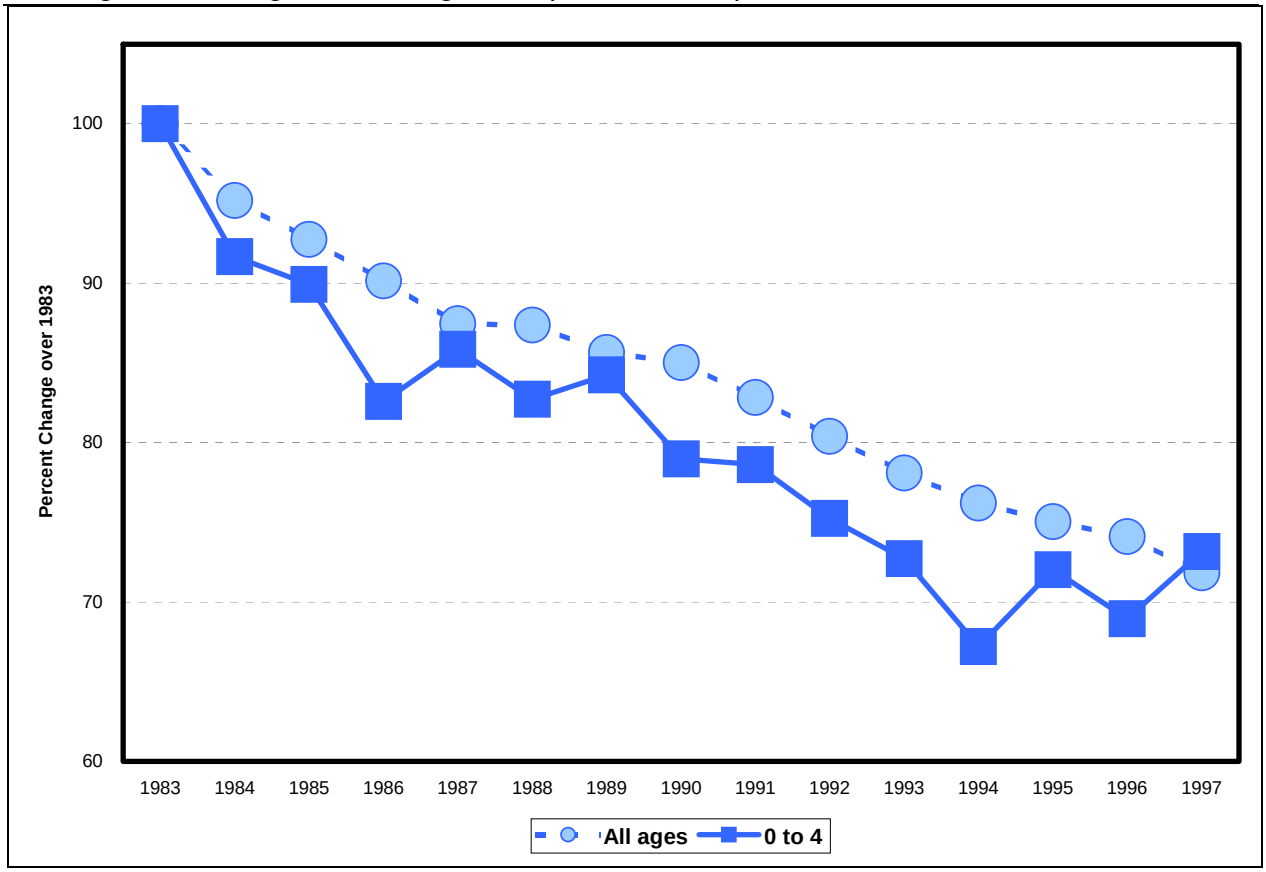
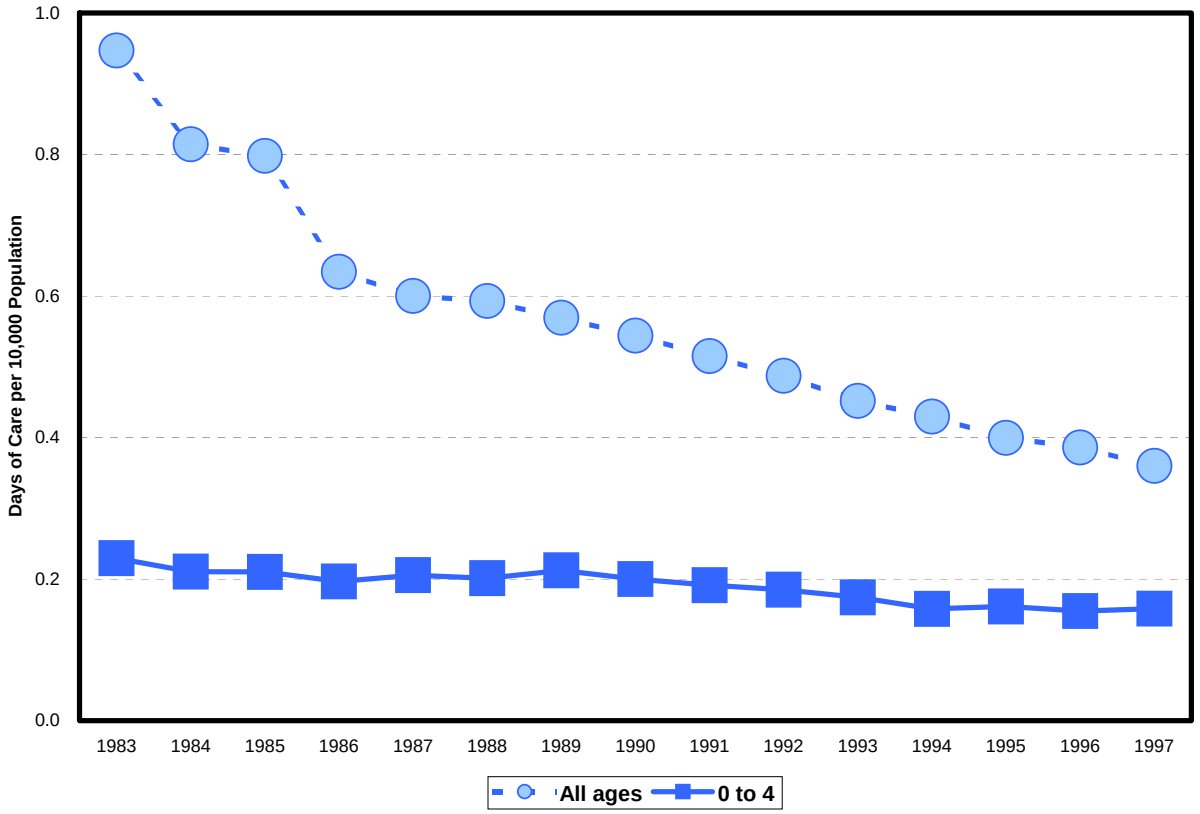


Figure 5 shows the change in annual days of care per 10,000 population, comparing all ages to children ages 0 to 4. The annual total days of care declined very steeply from 0.95 per 10,000 population through 1987, then a slower decline began. By 1997, the total population had 0.36 days of care annually per 10,000 population. For the study group, on the other hand, days of care per 10,000 population declined from 0.22 days annually to 0.16 days. For the total population, this was a relative 62% decline over 1983; for the child population, this was a relative 31% decline. Thus, annual days per 10,000 for the total population declined two times more than that for the study population.

Figure 5: Change in Annual Days of Care per 10,000 Population



CHANGES IN RACE/ETHNIC ADMISSION RATES

Figure 6 shows the discharge rate per 10,000 for the four major race/ethnic groups of children age 0 to 4. The overall rate declined between 1983 and 1997 for all groups except Hispanic, which remained relatively stable. Throughout the period, the discharge rate was highest for Black children and lowest for Asian. White children experienced the greatest decrease. Since 1994, the rate increased for all groups except Asian children.

Figure 6: Discharge Rate per 10,000 Population Age 0 to 4 by Race/Ethnicity

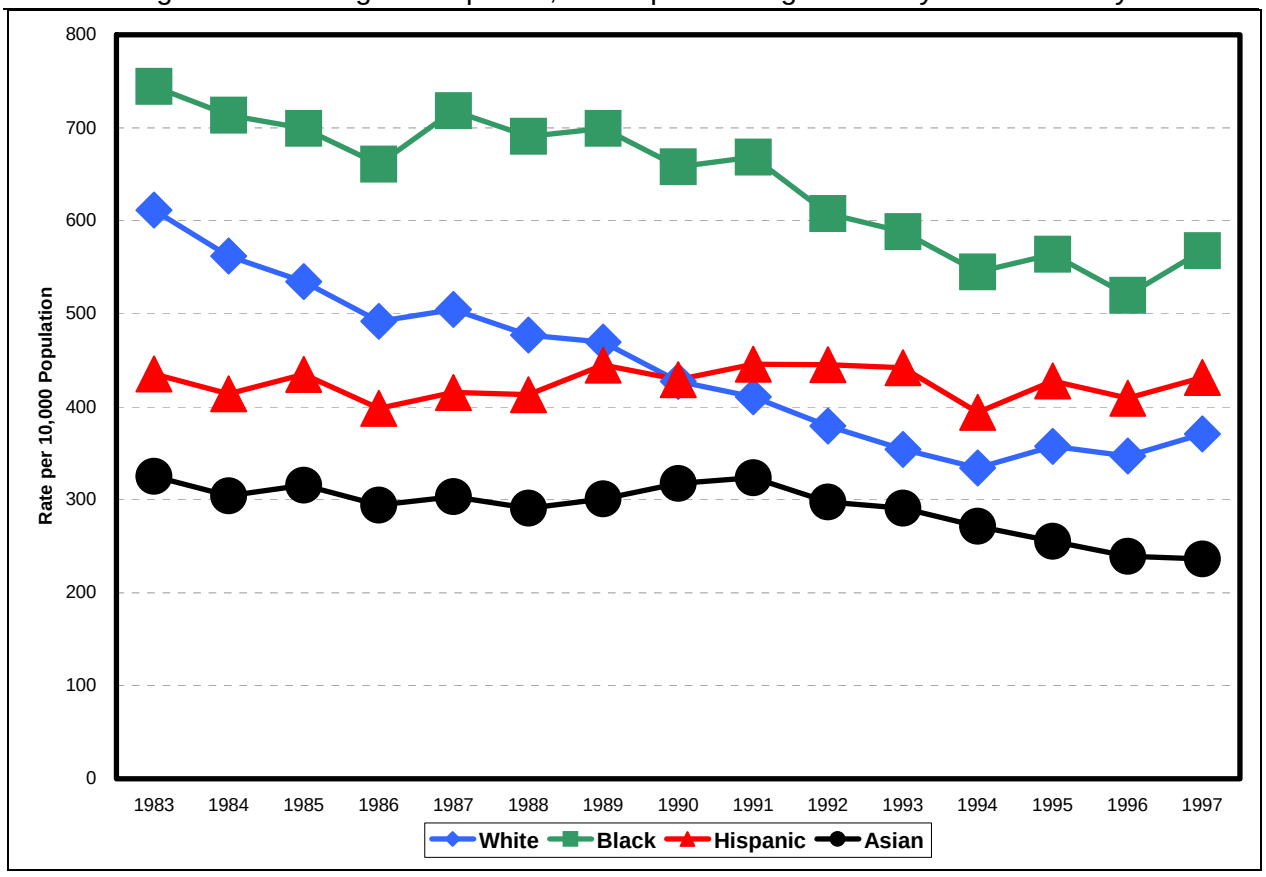
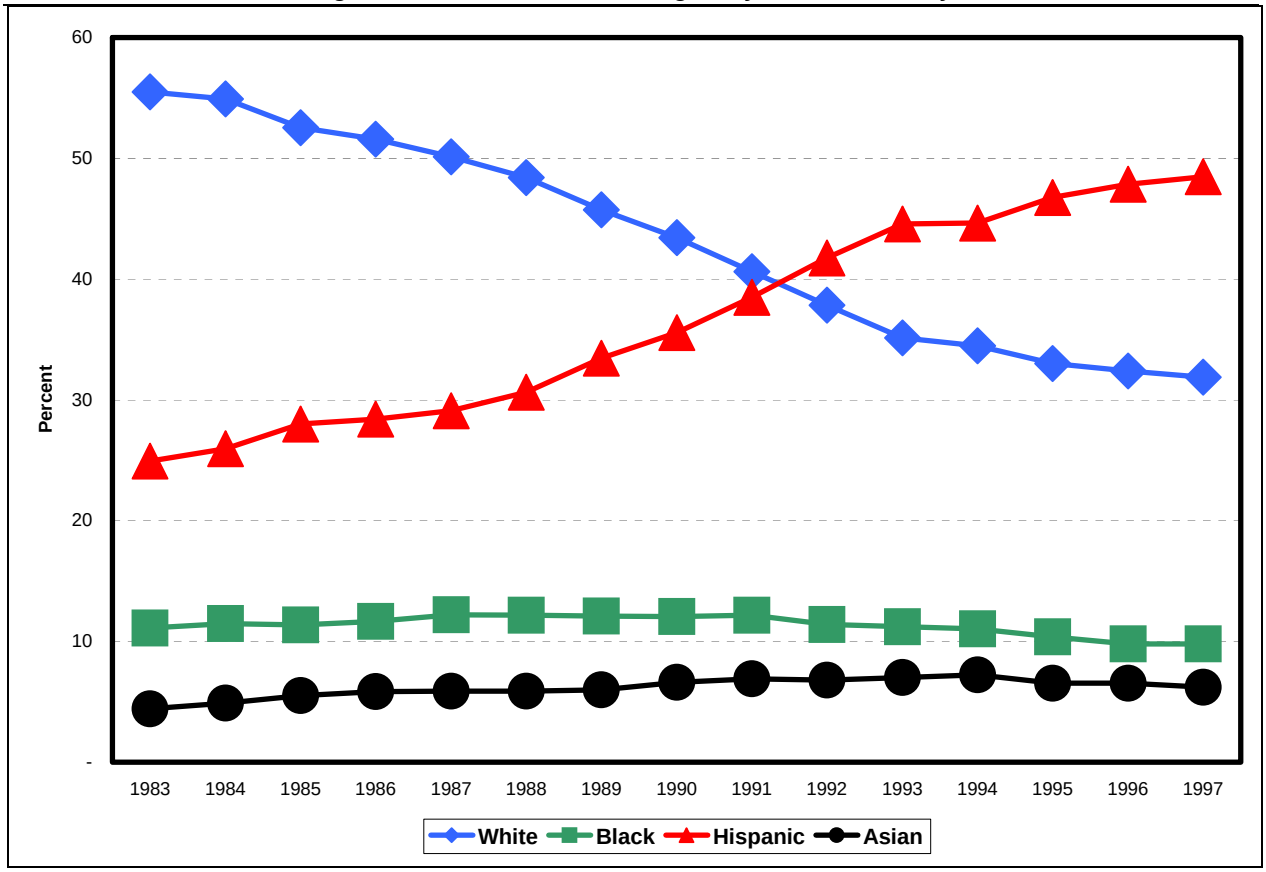


Figure 7 shows from the hospital viewpoint the percent changes in race/ethnic composition of discharged children during the study period. In 1983, White children were 55% of discharges; in 1997, 32%. The trend was reversed for Hispanic children: 25% in 1983 and 48% in 1997. Black children were 11% of discharges in 1983 and 10% in 1997. Asian children were 4% in 1983 and 6% in 1997.

Figure 7. Percent of Discharges by Race/Ethnicity

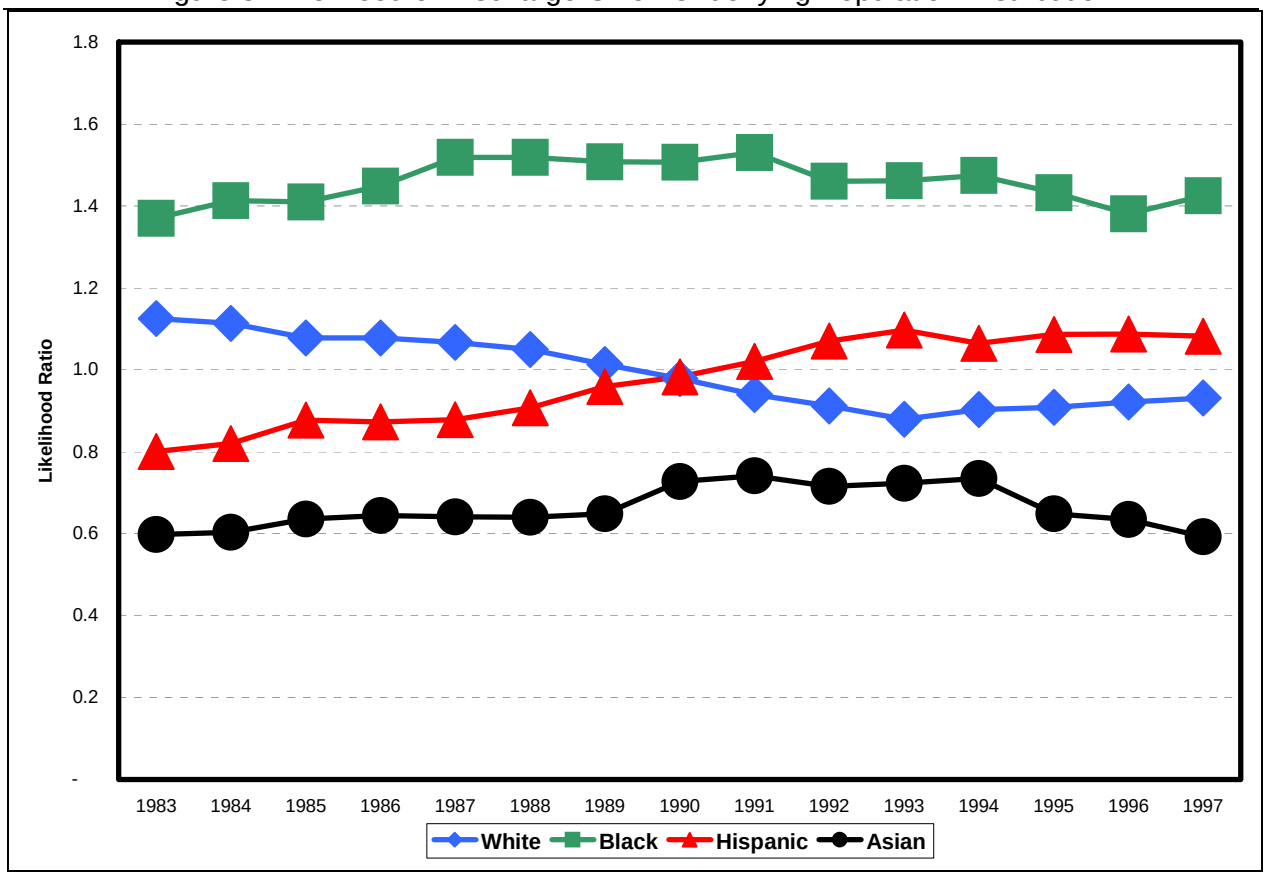


In terms of other demographic characteristics for the study group, about 59% were boys, with minor variation from year to year. Children younger than one year accounted for 39% of discharges in 1983 and 46% in 1997. This represents an absolute 7% increase and a relative 15% increase in this age group. Children age 1 to 2 accounted for 38% of discharges in 1983 and 36% in 1997. Discharges of children age 3-4 declined from 23% to 19% between 1983 and 1997. This represents an absolute 4% decline and a relative 17% decline.

Figure 8 summarizes shifts in the likelihood children would be admitted, comparing the race/ethnic composition of hospitalized children to the underlying race/ethnic population. The value 1.0 reflects a 1 to 1 relationship between percent of admissions and percent of population, or population parity. Values above or below 1.0 reflect racial disparities. For example, in 1983, Black children were about 8.5% of the population and about 11.6% of hospital discharges, for a discharge likelihood of 1.37, or 37% above population parity.

The likelihood of White children being admitted given their underlying population distribution dropped from 1.12 in 1983, bottomed out in 1993 at 0.88, and rose steadily to 0.93 by 1997. The likelihood of Black children being admitted increased overall from 1.37 in 1983 to 1.43 in 1997, with a plateau of about 1.51 between 1987 and 1991. Hispanic children, who had a decreased likelihood of admission in 1983 given their population (0.80), reached parity in 1990, plateaued at about 1.08 in 1993, where they remained through 1997. In 1983, Asian children were under-admitted given their population, and except for a slight plateau between 1990 and 1994, their discharge likelihood was relatively unchanged by 1997 compared with 1983.

Figure 8: Likelihood of Discharge Given Underlying Population Distribution



CHANGES IN THE POPULATION-BASED CLINICAL PROFILE

Figure 9 shows population discharge rates for study group children by clinical condition: ambulatory care sensitive diagnoses (ACS), medical (MED), surgical (SUR), and injury (INJ). Over the 15-year period rates declined steadily for surgical and injury cases. By 1997, these conditions were 49% and 53% below 1983 rates. However, ACS and other medical cases behaved differently.

Specifically, the ACS rate decreased steadily from 186 in 1983 to a low of 137 in 1994 and after that rose to 148. Although the 1997 ACS rate was 20% below the 1983 rate, that reflected an 8% increase above the 1994 rate. Rates for other medical conditions fluctuated annually between 150 and 125 per 10,000-child population, hitting a low of 122 in 1994. After 1994 this rate rose 19% and by 1997 was only 3% below 1983.

Figure 9: Discharge Rate per 10,000 Population by Clinical Condition

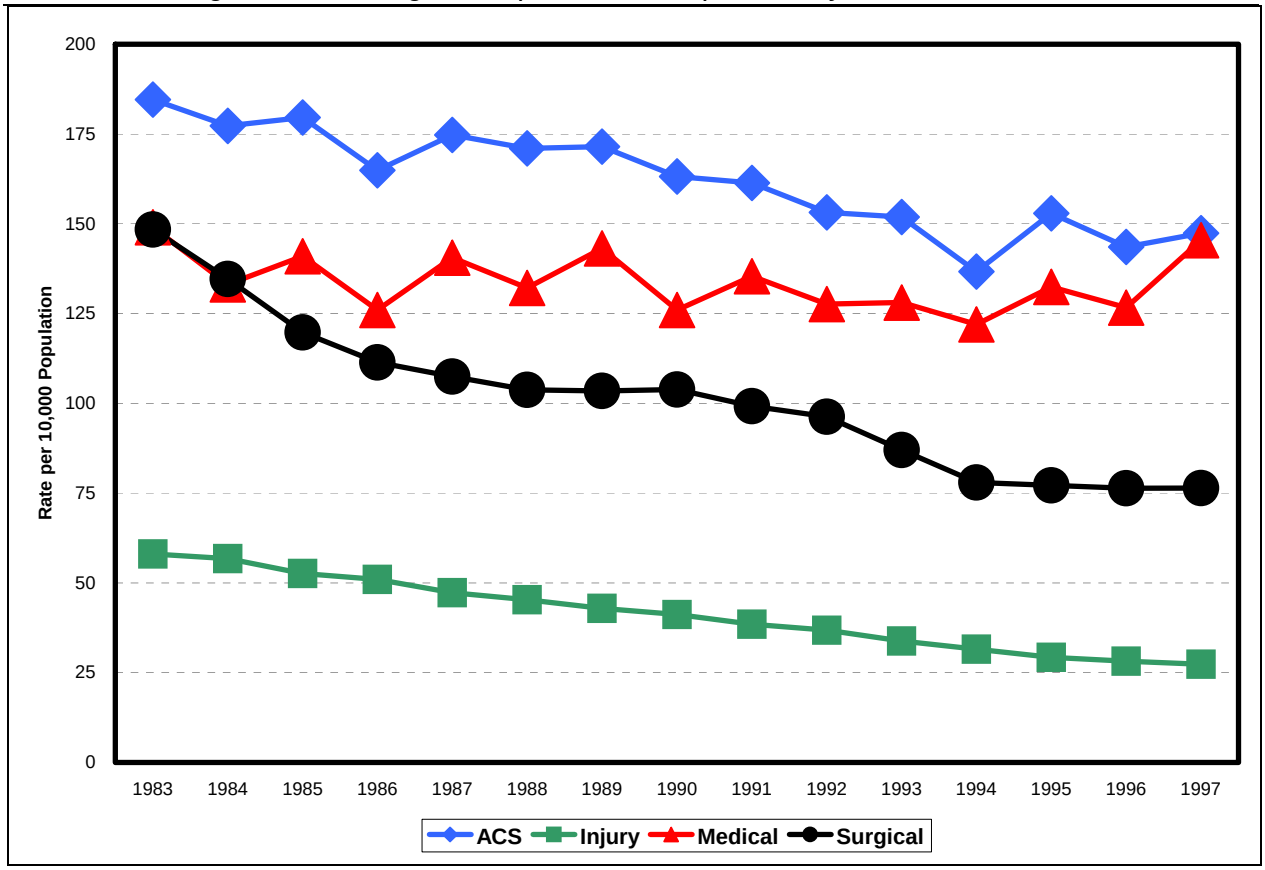


Table 1 shows condition-specific discharge rates per 10,000 children age 0 to 4 by race/ethnic group for 1983 and 1997 and the percent change in the rate. Changes in hospitalization rates were not distributed equally among race/ethnic groups.

For example, the ACS rate decreased 33% for White children but only 2% for Hispanic children. In both 1983 and 1997, Black children had the highest ACS rate and Asian children the lowest. Despite a 16% decline for Black children, their 1997 ACS rate ranged from about 50% to more than 250% higher than the other groups.

Discharges for injuries decreased significantly across the race/ethnic groups. In 1983 and 1997, Black children had the highest injury discharge rate and Asian children the lowest. In 1997, Asian children had an injury discharge rate 2 to 3 times lower than the other race/ethic groups.

The population discharge rate for other medical conditions decreased overall only 3%. The failure to drop lower was driven solely by the large increase (31%) in the Hispanic rate. In both 1983 and 1997, Black children had the highest discharge rate for other medical conditions and Asian children the lowest.

Surgical discharge rates decreased significantly across all race/ethnic groups between 1983 and 1997. In 1983, White children had the highest surgery rate and Asian children the lowest. In 1997, Black children had the highest rate and Asian children the lowest. In 1997, the surgery rate for Asian children was about 2 times lower than for the other race/ethnic groups.

Table 1. Race/Ethnic Discharge Rates per 10,000 Population by Clinical Condition, 1983 and 1997

Condition	Race/Ethnicity	1983	1997	% Change
ACS	Total	186	148	(20)
	White	191	127	(33)
	Black	282	238	(16)
	Hispanic	167	163	(2)
	Asian	124	91	(27)
Injury	Total	58	27	(53)
	White	65	28	(57)
	Black	87	43	(51)
	Hispanic	48	28	(42)
	Asian	26	13	(49)
Medical	Total	150	146	(3)
	White	167	137	(18)
	Black	203	193	(5)
	Hispanic	122	160	31
	Asian	96	87	(9)
Surgical	Total	149	77	(49)
	White	189	79	(58)
	Black	172	94	(46)
	Hispanic	97	80	(18)
	Asian	79	45	(43)

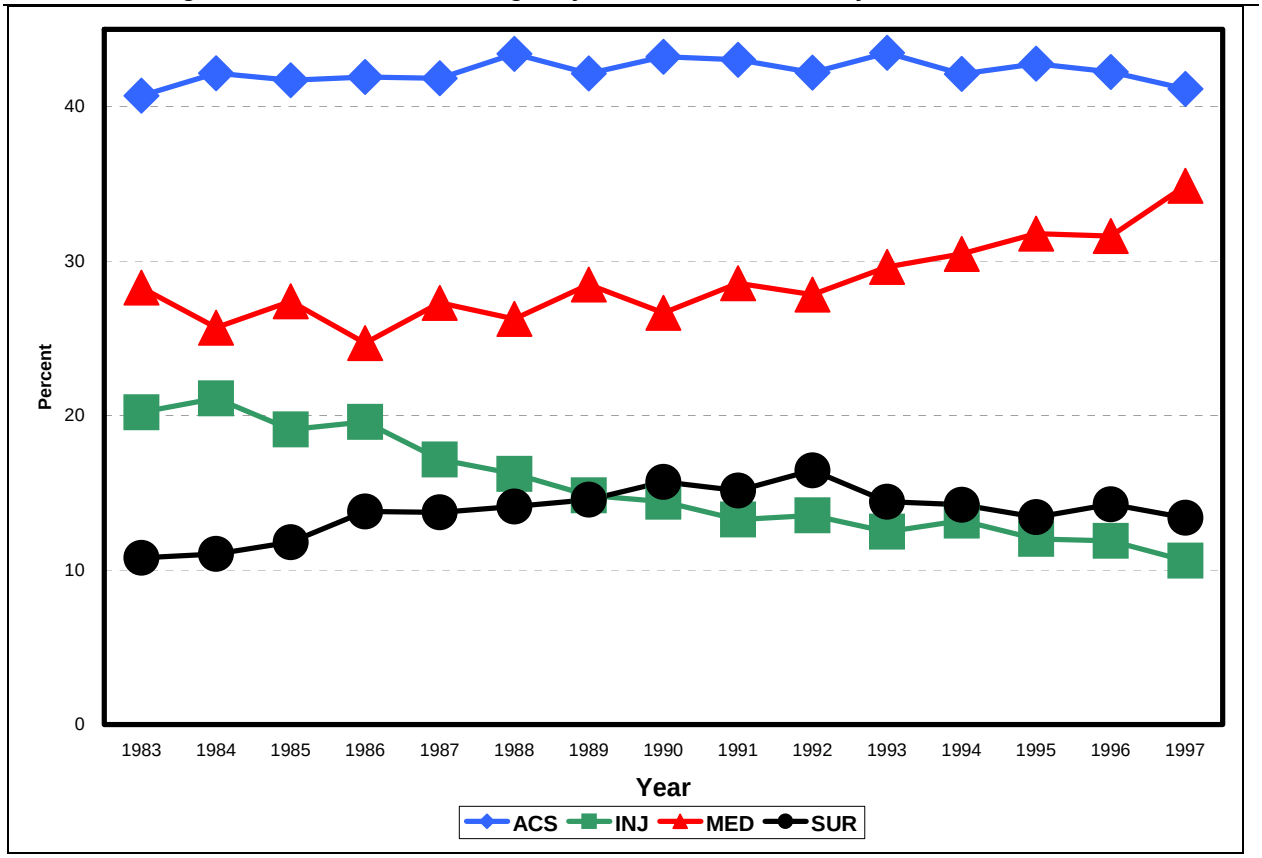
CHANGES IN EMERGENCY ROOM ADMISSION RATES

Population-based ER admission rates were fairly steady throughout this period, typically varying within a narrow range around 170 per 10,000. The population rate was 172 in 1983, hit an atypical low of 149 in 1994, and rose steadily to 177 by 1997.

From the hospital viewpoint ER admissions increased steadily as a percent of all admissions from 30.6% in 1983 to 43.0% in 1997, with a sharp hike beginning 1994.

Figure 10 shows the percent of ER admissions by clinical condition. The percent of ACS cases remained relatively steady and highest of all conditions throughout the study period, ranging from 41% to 43% of all ER admissions annually. Medical conditions increased from 28% to 35% of ER admissions. Surgical cases peaked in 1992 at 16% of ER admissions and declined to 13% by 1997. Injuries as a percent of ER admissions declined steadily throughout the period.

Figure 10: Percent of Emergency Room Admissions by Clinical Condition



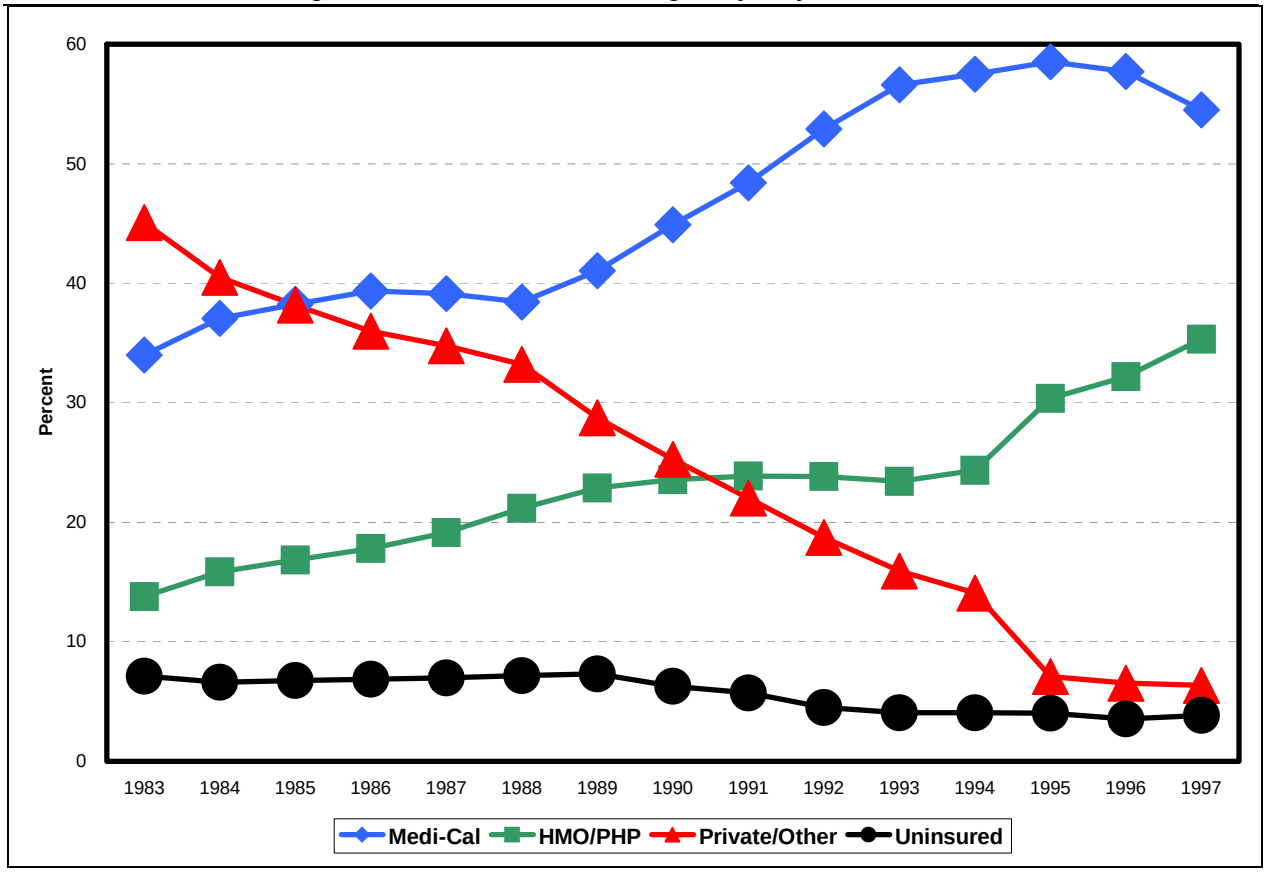
PAYING FOR CARE

CHANGES IN PAYMENT SOURCE

Figure 11 shows changes in anticipated payment source between 1983 and 1997. In 1983, the Private Sector paid for 59% of discharges; by 1997, 41%. Within the Private Sector, HMO/PHPs increased from 14% to 35% of discharges and other private payors declined from 45% to 6%. By 1997, there was an absolute 18% drop, and a relative 42% overall drop in the percent of hospitalized children with Private Sector coverage.

In 1983, the Public Sector paid for 41% of discharged children. By 1997, the percent of children uninsured at discharge declined from 7% to 4%, but Medi-Cal paid for 59% of discharges.

Figure 11. Percent of Discharges by Payment Source



During this period, race/ethnic differences in anticipated payment source changed for admitted children. Table 2 shows the percent of admissions in 1983 and 1997 by Private and Public Sector. In 1983, the Private Sector paid for 68% of White, 53% of Asian, 48% of Black, and 44% of Hispanic admissions. By 1997, every group except Asian children received less Private Sector care. Asian children were close to achieving parity with White children because Asian Private Sector admissions increased 4% while White decreased 5%. Private Sector admissions decreased from their earlier lows for Black and Hispanic children respectively 16% and 17%.

Table 2. Changes in Race Ethnicity Percent by Payor, 1983 and 1997

Pay Source	Race/Ethnicity	1983 %	1997 %	% Change
Private Sector (HMO/PHP/ Private/Other)	White	68	63	(5)
	Black	48	32	(16)
	Hispanic	44	27	(17)
	Asian	53	58	4
Public Sector Medi-Cal	White	26	33	8
	Black	48	65	17
	Hispanic	45	68	23
	Asian	43	39	(3)
Uninsured	White	6	3	(3)
	Black	4	3	(1)
	Hispanic	11	5	(7)
	Asian	4	3	(1)

By 1997, 3% of each race/ethnic group except Hispanic (5%) remained uninsured at discharge. Although a small gap remained for uninsured Hispanic children, they experienced the largest absolute decrease.

MEDI-CAL PARTICIPATION

During the 15-year period, Medi-Cal participation increased for every group except Asian children. There is a one-to-one correspondence between decreases in the percents of Private Sector and uninsured discharges and increases in the percents of Medi-Cal discharges. For example, Medi-Cal coverage of White children increased 8%, which exactly matches the 5% and 3% decrease in Private Sector and uninsured. For Asian children, the 1% decrease uninsured and 3% decrease in Medi-Cal exactly equals the 4% Private Sector increase.

Historic population-based information regarding Medi-Cal coverage at the state and county level are not available. However, Census Population Survey (CPS) data were available from the California Department of Finance, which prepared a 1997 estimate of the number of children with Medi-Cal coverage by age. This provides a denominator with which to estimate the risk of hospital admission for Medicaid insured children in this year. Medi-Cal paid for 43% of deliveries in California in 1997,[47] and children age 0 to 4 have the highest Medi-Cal eligibility.

Table 3 shows the 1997 number and percent of estimated population, hospital discharges, and rate of discharges per 10,000 population for all California children age 0 to 4, children who are not Medi-Cal insured, and children who are Medi-Cal insured.

Table 3. Medi-Cal Status and Hospital Admission Risk, 1997

Insurance Status	Population		Discharges		Discharge Rate
	Number	Percent	Number	Percent	
Total	2,795,429	100	115,034	100	412
Not Medi-Cal	1,945,059	70	52,361	46	269
Medi-Cal	850,370	30	62,673	54	737

According to CPS data, 30% of the population age 0 to 4 were estimated to be Medi-Cal recipients. The PDDS showed that 54% of the study group hospital admissions had Medi-Cal as the payor at discharge. The estimated hospital discharge rate per 10,000 population for Medi-Cal children is almost three times higher than the discharge rate for other children.

While information was not available to know if this rate is higher or lower than in 1983, in 1997 children with Medi-Cal coverage are at greatly increased risk of hospital admission relative to other children.

MEDI-CAL MANAGED CARE PLAN COUNTIES

To examine whether the profile of counties that had adopted MCMC plans differed in fundamental ways, we compared admission rates among counties based on MCMC model type with non-MCMC counties. Table 4 identifies counties adopting the Two-Plan Model and the County Organized Health System (COHS) Model as of December 1997.[48]

Table 4. Medi-Cal Managed Care Plan Counties as of December 1997

Plan Type	County	Year Started
County-Organized Health System (COHS)	Santa Barbara	83
	San Mateo	87
	Solano	94
	Santa Cruz	96
Two Plan Model	Orange	95
	Alameda	96
	Fresno	96
	Kern	96
	Riverside	96
	San Bernardino	96
	San Joaquin	96
	Stanislaus	96
	Contra Costa	97
	San Francisco	97
	Santa Clara	97

Table 5 summarizes population and selected hospital characteristics in 1983 and 1997 by plan type. In this table, Public Sector is defined as Medi-Cal and uninsured, and Private Sector is the remainder.

Table 5. Populations and Hospitalization in Medi-Cal Managed Care Counties, 1983 and 1997

Variable Name	Variable	Label	COHS Counties 1983	COHS Counties 1997	Two-Plan Counties 1983	Two-Plan Counties 1997	Other Counties 1983	Other Counties 1997
	Population	Total	101,579	130,738	752,866	1,093,440	1,180,008	1,571,251
	Age 0 to 4	White	60,511	56,699	424,624	429,671	566,474	515,864
		Black	6,859	7,305	56,596	76,126	107,612	115,093
		Hispanic	24,049	48,678	203,969	442,643	427,369	801,597
		Asian	10,160	18,056	67,677	145,000	78,553	138,697
	Population	White	60	43	56	39	48	33
	Percent	Black	7	6	8	7	9	7
		Hispanic	24	37	27	40	36	51
		Asian	10	14	9	13	7	9
	Discharges	Total	4,953	3,998	45,430	46,257	64,068	64,773
		Private Sector	3,439	2,192	29,180	20,579	34,763	25,147
POP04		Public Sector	1,514	1,806	16,250	25,678	29,305	39,626
		% Public Sector	31	45	36	56	46	61
LOSSUM	Days of Care	Total	17,819	14,361	184,551	175,841	264,721	252,140
		Private Sector	11,956	7,625	111,611	71,634	133,750	88,780
		Public Sector	5,863	6,736	72,940	104,207	130,971	163,360
		% Public Sector	33	47	40	59	49	65
	Average	Total	3.60	3.59	4.06	3.80	4.13	3.89
	Length	Private Sector	3.48	3.48	3.82	3.48	3.85	3.53
	of Stay	Public Sector	3.87	3.73	4.49	4.06	4.47	4.12
		Difference	(0.40)	(0.25)	(0.66)	(0.58)	(0.62)	(0.59)
INTERCEP	Charges	Total	34	61	334	582	476	861
	Millions ($97)	Private Sector	23	34	216	261	252	316
		Public Sector	11	27	118	321	224	545
		% Public Sector	32	44	35	55	47	63
	Average	Total	1,908	4,248	1,810	3,310	1,798	3,415
	Charge	Private Sector	1,924	4,459	1,935	3,644	1,884	3,559
	Per Day	Public Sector	1,876	4,008	1,618	3,080	1,710	3,336
		Difference	48	451	318	563	174	223
	Average	Total	6,865	15,258	7,352	12,582	7,430	13,293
	Charge	Private Sector	6,688	15,511	7,402	12,683	7,249	12,566
	Per Discharge	Public Sector	7,266	14,950	7,262	12,501	7,644	13,754
		Difference	(578)	561	141	182	(395)	(1,187)

Between 1983 and 1997, all plan type counties experienced significant increases in total population and in numbers of children of color age 0 to 4, with Hispanic children almost doubling in number. COHS and Two-Plan counties had been most impacted by changing demographics. Unlike the Other counties, these counties had a majority White population in 1983.

Every plan type experienced significant shifts in numbers of discharges from Private to Public Sector. In both 1983 and 1987, Other Counties had the highest percent of Public Sector discharges. The greatest absolute increase in percent Public Sector charges occurred in Two-Plan counties, which increased from 36% to 56%.

Total days of care dropped across plan types, and dropped most for COHS counties. The largest shift from Private to Public Sector days of care occurred in Two-Plan counties. Public Sector days increased from 40% in 1983 to 59% in 1997.

Average length of stay (LOS) for children with Public Sector coverage was longer in 1983 and 1997. COHS counties had the smallest gap in LOS between Public and Private sector hospitalizations.

Total charges in 1997 constant dollars increased substantially across plan types between 1983 and 1997, with COHS counties having the largest increase relative to 1983 ($61/$34 million, or 79%). Since 1983, Private Sector charges increased relatively 21% to 48% with COHS counties having the largest relative increase. Public Sector charges increased 143% to 172% across plan types, with Two-Plan counties having the largest relative increase. In 1983, 35% of Two-Plan county hospital total charges were for Public Sector Children; in 1997, 55%.

Average Private Sector hospital charges per day increased 88% to 132% across plan types. Although these children had shorter stays, their average charges per day were higher than the Public Sector regardless of plan type, and the increase ranged from 90% to 114%. A similar pattern is observed for average charge per discharge.

COHS counties had used MCMC for more years than Two-Plan counties (most of which had been in place only one or two years). Yet COHS counties had the shortest LOS and highest charges per day in 1983 and 1997, and LOS had not changed. With the lowest average charge per discharge in 1983, COHS counties had the highest average charge per discharge in 1997. Charges per discharge had more than doubled in COHS counties, much higher than other county groups.

DISCUSSION AND RECOMMENDATIONS

Hospital costs account for the major portion of health care costs for children. The intent of expanded insurance coverage for children and the transition of children in both employer based insurance and Medi-Cal to managed care models was in part to prevent serious illness and subsequent costly hospitalizations. Results of these policies should be seen in changes in the hospitalized population. Thus, in order to explore the effectiveness of these strategies, it is critical to monitor who is being admitted, why they are being admitted, and how these have changed over time.

Over the 15 years of this study, the demography of the hospitalized population changed to mirror changing California demographics. Hispanic children increased from 25% to 48% of the young hospital population. During that same period, the proportion of White children declined from 55% to about 30% of discharges. Discharges for Black and Asian children were relatively stable as a proportion of discharges.

By 1997, there had been a significant reduction in hospital discharges relative to 1983 for both the total population and the study group population, about 37% each. Between 1983 and 1994, the rate of decline for the target population tended to be steeper than the total population. However, in 1994 the rate of admissions for children began to increase and by 1997 the rate of decline for children age 0 to 4 was equal to that of the total population.

Significant differences in patterns of hospitalization remained over the study period among different race/ethnic subgroups. Population-based admission rates for Hispanic children

remained level while that for all other groups decreased. The rate for Blacks decreased but they still had significantly higher rates than all other groups.

More striking were differences in the likelihood of admission (i.e. the difference between the expected rate based on their proportion of the population and their actual rate). The likelihood of admission dropped for White and Asian children to significantly below expected rates. In contrast, both Black and Hispanic children experienced an increasing likelihood of admission. For Hispanic children, the likelihood of admission went from lower than expected in 1983 to higher than expected by 1997. The likelihood of Black children remained the highest of all ethnic groups throughout the study period and the large gap between them and other children remained.

THE IMPACT OF EXPANDING HEALTH INSURANCE ELIGIBILITY

An immediate observation about changes in the nature of health insurance coverage is the massive conversion of traditional private health insurance to private HMO coverage during the study period. Also, there was a marked reduction in the proportion of hospitalized young children who were uninsured, even in the face of a growing population.

Expansion of Medi-Cal eligibility has been associated with a marked shift in who pays for hospital care. In 1983, the Public Sector paid for 41% of discharges. By 1997, the Public Sector paid for 59% of discharges. Over this period the percent of children uninsured at discharge declined from 7% to 4%, the percent of privately insured declined from 45% to 6% and the percent with HMOs increased from 14% to 35%. There was a one-to-one correspondence between the shift from the Private Sector and uninsured into Medi-Cal.

Some of the increase in Public Sector coverage may be due a shift of children of Private Sector employees to the Public Sector for their insurance. These shifts out of the Private Sector insurance market impacted all children, but particularly impacted Black and Hispanic children. Our findings are consistent with those of the 1998 GAO report showing that as private companies eliminated or decreased benefits, the public sector increasingly absorbed the cost.[5]

The expansion of insurance coverage through Medi-Cal, CHDP, and now Healthy Families was based on the premise that children with health insurance coverage would have access to primary care and the possibility of increased continuity of care. Previous research found that better access to primary care increased the use of ambulatory care,[49] enhanced chances of receiving needed health care,[50 51] prevented unnecessary hospitalizations,[52] and improved health status.[53 54] Even the first primary care contact has been shown to reduce the use of specialist care by children with chronic illness[55 56] and ER use for all children,[56] and as a result to decrease health care expenditures.[57] Continuity of care also has been shown to decrease the likelihood of future hospitalization.[58]

Our findings suggest that expanding health insurance eligibility had a limited impact on access to primary care. Instead, the data suggest that many children may not have been seen first in a primary care setting.

Emergency room (ER) admissions are thought to be sensitive to access to outpatient care. Avoidable pediatric hospital emergency room use has been found to vary widely by geographic area, and areas with high rates of visits to primary care physician offices have been found to have lower rates of hospital ER visits.[59] In a heavily penetrated managed care environment, one would expect ER admission rates to decline. Our findings suggest otherwise. Despite the

decline in the population-based discharge rate, the population-based ER admission rates remained level to 1994 then increased by 1997. From the hospital viewpoint, ER admissions increased steadily as a percent of all admissions. Public Sector children were much more likely to enter the hospital through the ER. As would be expected, children remaining uninsured at discharge had the highest ER admission rate.

The ACS admission rate (i.e. preventable hospitalizations) is another widely used indicator of inadequate access to primary care. ACS conditions remained the most frequent cause for admission and remained steady as a percent of emergency room admissions through the study period. In 1983, the ACS population admission rate was higher than for all other causes. The rate decreased to 20% below the 1983 rate in 1994 but then increased through 1997,an 8% increase above the 1994 rate. The rate of ACS admissions for Hispanic children remained essentially the same over time compared to large decreases for the other race/ethnic groups. Despite their overall decline, the ACS rate for Black children remained significantly higher than all other groups and the large gap between Blacks and others remained. Admission rates for other medical conditions rose steadily to the level of ACS conditions.

Medicaid and CHDP expansions targeted low-income children. Census data for California and the nation show that Black and Hispanic children have much higher poverty rates than other groups. Medi-Cal data show that enrollees are primarily children of color.[80] If these children had access to primary care as a consequence of having health insurance, we would have expected a decrease in the likelihood of admission for Black and Hispanic children similar to that observed for White and Asian children. We also would have expected a decrease in ACS and ER admissions. Instead, ACS admissions were high and steady, and ER admissions increased.

And important finding of this study was a marked shift in trends which began in 1994. The favorable trend during the 80's and early 90's of decreasing overall admission rates and decreasing ACS admission rates changed in 1994. This was the same year as the passage of Proposition 187 and Federal welfare reform began in earnest. While Proposition 187 was never implemented, some observers have noted that fear of deportation may have acted as a barrier to the use of public services by the undocumented Hispanic population.[60] In addition, since welfare reform implementation in California and the delinking of Medicaid eligibility from TANF eligibility, Medicaid enrollment for children has dropped significantly.[61]

Findings of this study suggest that expansions have not had the desired effect of increasing access to primary preventive care for Hispanic and Black children. There are several possible issues to examine to understand what has happened:

1. Children may not be getting publicly-funded insurance coverage until they are admitted to the hospital where eligibility workers facilitate enrollment. Further, in those instances where they are enrolled at the hospital, we do not know if the children are linked to primary care providers who will accept their insurance and provide continuity of care after discharge.

2. Children may be getting insurance coverage but barriers such as hours of operation or geographic location may limit access to primary care providers. Such barriers also will vary across large geographic regions, where children in some areas will be better able to access care than children in other areas.

3. Some eligible families may be reluctant to enroll in publicly-funded insurance programs and/or to access care through approved providers.

4. Because of low reimbursement rates, many providers increasingly are unwilling to accept children with Public Sector insurance coverage. Thus there may be a decrease in the pool of available pediatric providers.

This study cannot provide definitive information as to which of these or other factors may be operating. However, the Kaiser Commission recently released a study that explored differences between poor families enrolled in Medicaid with a comparable sample of eligible families who were not enrolled.[62] The study found that those without coverage were more likely to postpone needed care, not seek care, and not fill prescriptions. Those who did not enroll cited a number of barriers: difficulty gathering documentation, length and complexity of the process, inaccessibility of eligibility workers, lack of knowledge of their eligibility status and the way to enroll, not having materials in their own language (50% of Hispanic respondents); and fear of stigmatization by having to go the welfare office. Non-enrolled respondents suggested that more convenient enrollment procedures providing Medicaid enrollment at sites apart from TANF and the provision of bilingual materials and workers would reduce barriers.

Barriers such as no after-hours care, longer office waits, and longer travel times have been shown to mitigate these effects on use of primary care.[63] These barriers particularly affect two-parent families where each parent must work multiple low paying jobs to support their families. A study of pregnant women in California identified the presence of a co-payment, lack of transportation, language and cultural barriers, reluctance of providers to refer for needed specialty care, and stigmatization as barriers to care.[64]

Some studies suggest that language pattern use and residency status may serve as nonfinancial barriers to care for the Hispanic population.[65] [66] In contrast, other studies indicate that access to medical care by Hispanics, like other populations, is determined largely by insurance independent of language, residency status, and other nonfinancial barriers. A 1997 study compared poor Hispanic families whose parents are not citizens with citizen parents. These families had children 12 to 36 months of age and resided in Los Angeles. The study examined the impact of immigration status, parent's language preference and other socioeconomic factors, and Medicaid enrollment. Noncitizen families were found to be less likely to be continuously enrolled in Medicaid than citizen families.[67] Families with insurance and geographically accessible care were more likely to access care regardless of residency status, language preference, and other family related characteristics. Noncitizen families primarily had two working parents (thus not eligible for TANF) without insurance benefits through their jobs.

The failure of admission rates for Hispanic children to decline even before 1994, when Proposition 187 was passed and Welfare reform was initiated, suggest reluctance to enroll in preventive care. Increased ACS admission rates support this theory. However, admissions for all race/ethnic groups declined in 1994, suggesting all groups were impacted by Welfare reform, with Hispanics doubly impacted by Proposition 187.

Another reason for disparities in health insurance and access to care is regional variation in the willingness of employers to insure their employees. A UCLA study found that among low- and moderate income workers, only 26% had job-based insurance coverage in Los Angeles compared with 41% in Oakland, and the percent uninsured in this group was respectively 46% and 33%. No matter where they live, people with moderate and low incomes are much less likely than the more affluent to have job-based coverage.[68]

Recommendations Related to Access to Care

All Families

A single streamlined enrollment process should be developed for all public insurance programs. Enrollment should made accessible through multiple channels such as phone or computer, and eligibility workers familiar with all plans should be located in accessible locations such as shopping areas.

Given new resources available through Healthy Families, an attempt should be made to limit or eliminate co-payments for families in lower income brackets especially for preventive services.

Hispanic and Black Families

Regardless of payment mechanism, targeted outreach is needed to Black and Hispanic families to recruit them early into primary care in order to promote continuity of healthcare for their children. Barriers to care already identified through numerous studies need to be addressed in a comprehensive manner and strategies proven to be effective need to be part of regulations for MCMC. Compliance with these requirements needs to be monitored regularly. Actual numbers of children admitted to hospital will not decline without strong, effective, targeted outreach to these families.

Anti-immigration policies that deny access to preventive health services need to be repealed or avoided.

Outreach and education needs to be directed at low-income Hispanic parents. This is especially an issue for noncitizens -- both documented and undocumented -- to let them know that US-born children are eligible for Medi-Cal and that there will be no danger in accessing this.

Bilingual and culturally appropriate services need to be available at provider sites serving immigrant families. This should include the consideration of developing polices to promote or mandate provider education and quality assurance in this area. Attempts should be made to provide services at times and locations convenient for the target population.

Other Recommendations

Physician reimbursement rates and authorizations for outpatient tests and procedures should be restructured to create more incentive to provide outpatient care.

Monitoring admission trends should continue in order to assess if past patterns change with the implementation of Healthy Families.

Policies such as insurance pools or tax incentives should be developed to encourage employers to provide health benefits to low wage and part-time employees and to provide information to these families about possible eligibility for Medi-Cal and Healthy Families.

Policies that expand publicly-funded insurance to working families and thus allow employers to eliminate dependent benefits should be examined in order to more equitably distribute the burden of costs of in-hospital care between the Public and Private Sectors. Hard working parents with socially valuable yet low paying jobs are being forced to make a draconian choice. Do they choose to risk the health and welfare of their families by going uninsured or by

accepting lower quality insurance? Either decision economically benefits employers and disadvantages children and families.

Another alternative may be to switch to some form of universal healthcare with negotiated capped budgets for providers. Republican Governor Wilson signed legislation to study three alternative methods of achieving universal health care coverage with a high quality, uniform benefit package. Democratic Governor Davis signed two companion bills to fund the study and implement the findings. Clearly a bipartisan environment exists today that may make the provision of universal healthcare possible. In fact, we appear to be more than halfway there. Excluding workers with insurance paid for by the government or by employees themselves, only 43% of working Americans have insurance paid by a private employer, and private employers pay only 21.2% of total health spending.[69]

THE IMPACT OF MEDI-CAL MANAGED CARE MODELS

The question of the role of insurance type (MCMC or other) and hospital admissions was limited by the lack of longitudinal data. However 1997 data showed that Medi-Cal children had population-based admission rates almost three times that of other children. One national longitudinal study identified that Medicaid children have higher utilization levels for illness-related care compared with other low-income children primarily because they had more chronic illnesses. They also received fewer outpatient contacts and received care in different settings.[70] The latter findings could also contribute to higher admission rates for this population.

The transition of the AFDC/TANF population from Medi-Cal FFS to managed care was based on research showing that in most cases patients enrolled in managed care plans had decreased emergency room use, decreased hospitalizations, and decreased use of specialists.[71] [72] [73] While the research did not show consistent cost effects, in California, there was an additional expectation that MCMC would decrease costs of care.

This study attempted to shed some light on the impact of the transition by comparing counties with different MCMC models by 1997. Findings are limited by the fact that the MCMC Two-Plan counties implemented their programs between 1995 and 1997, while some COHS counties had been in operation since the 1980's. However, it is informative to compare COHS counties with Two-Plan counties to get a sense of population trends and hospital utilization in regions electing different models and to provide a baseline for future studies.

We examined changes in hospital admission patterns in MCMC plan counties, comparing Two-Plan counties, COHS counties, and all other counties. The directions of race/ethnic population changes were similar in all counties, with increases in numbers of children of color. In all county types, the percent of the population that was White or Black decreased, and the percent Hispanic and Asian increased.

Despite overall stability in number of discharges, Private Sector children were more likely to be admitted to hospital in 1983, Public Sector children were more likely to be admitted in 1997, and the percent of total discharges covered by the Public Sector increased in all counties regardless of plan type. Two-Plan counties experienced a 20% increase in Public Sector discharges. The increase in Public Sector children as a percent of total discharges likely represents the dual impact of decreasing employer-based insurance coverage for low income working parents and their dependents and state efforts to increase coverage for poor and uninsured children.

The most policy-relevant finding is that total charges in 1997 constant dollars for Public Sector children increased over 140% in all county groupings, with little or no decrease in LOS. This contrasts with Private Sector children where adjusted costs increased only 21% to 48% despite a decrease in the number of admissions and a decrease in LOS.

Despite their shortest LOS, in both 1983 and 1997, COHS counties had the highest charge per day and charge per discharge, overall and for both Public and Private Sector discharges. Increases in charges were lowest in counties not electing MCMC plans. COHS counties had the most years of experience which theoretically should have led to reduced charges per day and discharge, but instead the opposite occurred.

While this increase in total charges may bear little relationship to actual reimbursement, the differences across the various plan types suggests that different forces operated historically to influence those dramatic changes. Trends in hospital costs for Public Sector children suggest that the move toward both expanded coverage and managed care models may not have been effective in containing hospital costs. Examining such issues would require further analysis.

Pertinent to our findings, a recent study found that California MCMC plans are financially stable and "outperforming" both California health plans that do not serve Medi-Cal beneficiaries and other Medicaid and non-Medicaid plans nationwide.[74]

To better understand this, one would need detailed reimbursement information over this period, which is not available so far as we know. However, one study found that reimbursements from Medicaid or its successors should not be assumed to provide unbiased or acceptably accurate measures of the relative or absolute cost of pediatric health care interventions.[75]

After years of consolidations and mergers, hospital systems are in a more powerful position than they were in 1983. In fact, some California hospital systems -- Sutter Health and Catholic Healthcare West -- have become among the largest hospital systems in the nation. These systems also have been flexing their muscles with greater frequency in the last several years, using market dominance to extract contract concessions from HMOs.[76] [77]

The New York Times reported that health insurance premiums for managed care plans are increasing by 10% to 30% across the country, according to employers, insurers and regional business groups familiar with the rates being paid by dozens of companies.[78] Driven largely by escalating hospital and drug costs, the double-digit increase in annual premiums is the third consecutive one for many plans.

Rising premiums suggest that managed care is no longer keeping medical costs down. All sectors of the healthcare industry have been consolidating, increasing profits and top executive salaries, but weakening the ability of employers to bargain on rates.

Many companies facing steep premium increases today actively encouraged employees to join managed care plans in the past, even though some health care experts warned that managed care plans would not control costs in the long run. Our findings suggest that managed plans have increased pediatric hospital charges well above inflation rates. Because of the significant shift of large numbers of children into publicly-funded insurance plans and more recently into MCMC, the public increasingly bears the burden.

Now employers are starting to turn away from HMOs toward insurance that does not entail the high administrative costs of managed care. A number of large companies including Sears

Roebuck, Anderson Consulting, and General Motors have switched to Preferred Provider Organizations which have lower administrative costs and thus can offer lower premiums.

Our findings suggest that publicly funded managed plans have not been particularly effective at constraining pediatric hospital charges. Because of the significant shift of large numbers of children into publicly-funded insurance plans and more recently into MCMC, the public increasingly bears the burden.

Medi-Cal's health plan capitation rates are the lowest of any Medicaid program in the country.[79] This is a real problem in a state with the highest cost of living. Low Medi-Cal reimbursement rate negatively affect the willingness of pediatricians to see poor children in their offices. Policy decisions to severely limit outpatient payments for poor children may cause physicians to avoid providing care until after children are admitted. It also may be the case that physicians serving Medi-Cal children are unable to obtain authorizations for needed outpatient testing and therefore admit them in order to get needed clinical information.

MCMC plans capitate medical groups and hospitals for virtually all services, and capitated plans are much more prevalent in California than elsewhere.[74] Many stakeholders have expressed concern about future willingness to participate. Despite their reluctance, Federal laws place hospitals in a particularly difficult situation, since they may not turn anyone away from an emergency room. Thus, at the last moment, hospitals may be enrolling Medi-Cal eligible children who enter their ER in order at least to obtain the minimum payment.

Our findings also may have implications for the extent of need for the Healthy Families program. California researchers have reported a steadily growing rate of uninsured children, with some estimates ranging as high as 19%.[13 61] It is surprising that the findings of this study show the percent of uninsured discharged children decreased from about 7% to about 4% between 1983 and 1997. These divergent findings suggest that a number of possibilities may be operating.

One possibility may be that the true rate of uninsured children may less than estimated -- perhaps closer to the lower confidence limit of estimates -- than policy makers have presumed. Another possibility may be that many children enter the hospital uninsured, and qualify for Medi-Cal by discharge. A third possibility may be that uninsured children are healthier than other children. Such a situation may reflect an unwillingness of parents to embark on the qualifying process while their children are in good health. A fourth possibility may be that if two children come to the emergency room with the same condition, an uninsured child may be less likely than an insured child to be admitted and more likely to be treated outpatient. That is, care for uninsured children may differ in some fundamentally inequitable way.

Thus enrollment problems reported to date by Healthy Families may be limited as much by complex enrollment procedures as by lack of eligible families, either because estimates of uninsured are too imprecise at different family income levels, or because children actually qualify for Medi-Cal. In any event, either of these possibilities suggest the need to carefully monitor Healthy Families enrollment.

Recommendations

Further research needs to be done to identify factors underlying cost increases in hospital care for children. This should include a more disease specific analysis of trends. Analyses should examine the use of procedures and the rates and types of complications.

A cost analysis needs to be undertaken to examine changes over time in costs for the same services, medications, and procedures to better understand the impact of new drugs and procedures on total charges. Such a study should also explore administrative costs associated with complying with reporting requirements imposed by managed plans.

Monitoring of MCMC counties should be done to closely examine trends in costs and quality of care indicators before making any further decisions to expand these models.

As soon as hospital emergency room data become available, it will be important to study the insurance status of children before they are admitted. This will shed light on the need for Healthy Families versus Medi-Cal and answer questions regarding care for uninsured children.

CONCLUSION

California has been in the forefront of healthcare reform for many years. Major expansions of eligibility for publicly-funded health insurance for children have been implemented since the early 1980's. Results of this study raise considerable doubt as to whether these public policies achieved their desired intent of providing all young children more access and more equitable access to primary care and, as a consequence, decreasing the need for hospital care.

Although overall hospitalization rates decreased, those for Hispanic children did not and rates for poor Black children remained significantly higher than those for other groups. Indicators of access to care, including ER and ACS admission rates, increased after 1994. ER admissions increased throughout the study period as a percent of all admissions. ACS cases as a percent of cases admitted through the ER was stable throughout the period. Thus basic indicators one might use to conclude that access to primary care had improved were incompatible with that expectation.

These findings suggest that the combination of the 1994 passage of Proposition 187 and the implementation of welfare reform in 1996 impacted access to Medi-Cal, and the transition of Medi-Cal FFS to managed care models impacted who received care, how care was delivered, who paid for care, and how much it cost. Before this study, no longitudinal population-based investigations had been undertaken to understand the impact of these events on the health of children or on the public burden.

Further, not all children were impacted equally. Black and Hispanic children continued to have increased likelihood of admission and higher ACS admission rates than other groups. We observed a consistent trend centering around 1994 suggesting that all race/ethnic groups were negatively impacted by welfare reform and that Hispanic children experienced a dual impact from Proposition 187.

Expansions of eligibility for Medi-Cal resulted in a major shift in who pays for hospital care for young children. There was a general shifting out of Private Sector and into Public Sector insurance programs. There was a general trend for charges for care provided to Public Sector children to increase at a much greater rate than charges for care provided to Private Sector children. The increases were greatest in counties with the longest histories of Medi-Cal managed care.

This study suggests the need for a major policy reevaluation of strategies intended to increase access to quality primary care and hospital care for young children in California through the expansion of public insurance programs. Easier access to enrollment and to care providers

clearly is necessary. Ongoing surveillance using emergency room and hospital discharge data should be instituted as part of this effort. In addition further in depth study should be undertaken to shed light on the underlying causes of the findings.

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[34] The official California ZIP range begins at 90001. A number of records had the first three digits indicating the local area and the last two digits showing "00". The value 90000 indicates that the individual is believed to be a resident of Los Angeles County, but the actual ZIP of residence within the county is unknown.

[35] Originally developed by the World Health Organization, the ICD-9-CM is used to classify patient morbidity and mortality.

[36] We identified a number of DRGs that occurred very infrequently over the 15-year study period or that appeared to be questionable for very young children. A pediatrician and a registered nurse practitioner reviewed these. Records with DRGs for conditions rarely or ever affecting young children were considered miscoded and eliminated. Based on this review, 200 cases over the 15-year period were deleted from the study. The deleted DRGs were: 411, 223, 406, 143, 202, 049, 131, 018, 045, 179, 302, 095, 330, 192, 141, 244, 263, 130, 409, 407, 209, 290, 424, 056, 064, 232, 198, 199, 221, 358, 015, 172, 197, 271, 086, 201, 401, 267, 173, 065, 083, 117, 050, 402, 119' '484, 338, 051, 084, 428, 347, 335, 435, 485, 355, 118, 178, 311, 365, 038, 132, 367, 465, 345, 317, 114, 310, 434, 005, 133, 113, 356, 078, 366, 177, 346, 288, 128, 488, 357, 344, 361, 121, 336, 022, 287, 107, 334, 494, 122','195, 437, 258, 337, 262, 438, 123, 364, 006, 261, 260, 433, 196, 354, 274, 285, 115, 257, 363, 353, 289, 493, 307, 362, 106, 495, 306, 476, 491, 140, 436, 471, 275, 349. We also discarded all records where the MDC indicated the record was ungroupable or had mental illness or substance abuse as the MDC (MDC = 0, 19, 20, and 24).

[37] These were premature newborn infants whose age at discharge was greater than 30 days. Premature infant principal diagnoses used to exclude cases: 76402, 76405, 76406, 76493, 76494, 76500, 76501, 76502, 76503, 76504, 76505, 76506, 76508, 76510, 76512, 76513, 76514, 76515, 76516, 76517, 76518, 76519.

[38] In analyses, we excluded children with "other" race. Thus, the number of cases used differs by about 4% from the total numbers of cases actually found in each year.

[39] EpiHosp Manual, Family Health Outcomes Project, 1998.

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[42] The first part of the routine used FHOP principal diagnosis variables, focusing on certain injury types (broken bones, concussion, etc). We also flagged as injuries records in MDCs 21 (Injuries, poisonings and toxic effects of drugs, excluding adverse effects of treatment) and 22 (Burns).

This permits us to know the case was an injury but does not permit us to describe the mechanism or intent. Injury E-Codes did not become part of the PDDS record until July, 1990. Records after that date with any principal external cause of injury (E-code) were flagged unless they indicated late effects of a previous injury or adverse effects of treatment for another condition. Records identified as an injury using any classification method (FHOP, MDC, E-Code) were assigned a primary condition of "Injury".

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[46] Using records with a charge, we created a file containing the original charge and the charge converted to 1997 dollars (CHG97), from the monthly Medical Care Consumer Price Index. (Bureau of Labor Statistics Data, Consumer Price Index-All Urban Consumers, West Size A. Downloaded from http://146.142.4.24/cgi-bin/dsrv.) This was converted to dollars per day, trimmed at the 99th percentile, and converted to logged dollars per day. Within DRG and year, for DRGs with 30 or more cases, we obtained a predicted log charge per day, controlling for the child's age, length of stay, number of diagnoses and number of procedures. If the DRG had fewer than 30 cases a year, we combined years within 5-year rolling averages. The predicted logged dollar per day was converted back into 1997 dollars .

We imputed charges using the predicted value based on the child's age, number of diagnoses and number of procedures, DRG, and year of discharge . Then we converted the dollars back to their original value within each year. We merged records for cases missing a charge back into the master file and converted all charges to 1997 dollars. At the end of the process, we had the original charge, a total charge based on the original or imputed value, the inflated charge, and a variable flagging cases that had been imputed.

We imputed charges on 7% of Medi-Cal cases, 2% on Private/Other, 4% on uninsured, and 39% of HMO/PHP. Average charges on imputed cases were $3,422 less than cases with charges that had not been imputed.

We flagged every record with imputed charges. We examined whether the imputation affected the models in two ways. First, we checked the bivariate correlation of the imputed charges to the CHG97 in each year. The correlation was -.022 in 1983 and -0.016 in 1997. We added the dummy variable as the last variable in the multivariate models, and it was statistically non-significant. As a result, we do not show the results for this variable in presenting our models.

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