

California Children's Services Program Analysis

Final Report

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## EXECUTIVE SUMMARY

The California Children's Services (CCS) Program is a joint State/county program providing medical case management and authorization of services for California children with special health care needs who meet specific medical, residential and financial eligibility requirements. These services are provided to children enrolled in Medi-Cal and Healthy Families but may also be provided to children who are uninsured or who have private insurance when their health-related expenditures exceed a designated level of family income (CCS-only clients). In this manner, the CCS program plays a crucial role in ensuring access to essential health care services for a large number of children with serious, chronic diseases in California.

However, growing concerns for the overall cost of the CCS program and perceived opportunities for greater efficiency and improved services have generated increased interest in exploring alternative delivery and payment options for the program. Under CCS program rules, covered services are confined only to those required to treat the child's CCS eligible condition which can create complex administrative barriers to highly coordinated care. In addition, CCS services are "carved out" from traditional managed care plans which can also lead to inefficiencies and obstacles to comprehensive service delivery.

Under California's new section 1115 waiver for hospital financing and uninsured care, the Department of Health Care Services has an opportunity to create innovative models and pilot programs to test new approaches to caring for children enrolled in the CCS program. This effort underscored the need for a stronger analytic foundation for considering different reform options. Among the most critical issues is the underlying distribution of utilized services and associated costs among CCS enrollees, particularly the relative concentration of costs among the most severely ill children.

The purpose of this project was to provide the California Department of Health Care Services (DHCS) and stakeholders of the California Children's Services (CCS) program – including consumer groups representing children with special health care needs, health care providers, county CCS programs, and managed care plans – with analytic insight to inform deliberations regarding CCS reform and guidance for pilot efforts to improve care and reduce costs for children receiving care through CCS program.

### **Methods**

The analysis for this project was separated into two components: (a) analysis of claims data for CCS-enrolled children and (b) analysis of the CPQCC data for neonates.

#### *A. Analysis of claims data for CCS-enrolled children*

##### Data

We received from the California Department of Health Care Services (DHCS) of patient-level data pertaining to all paid CCS authorized claims, non-CCS authorized claims, and managed care encounters for fiscal years 2007 to 2009 (7/1/2006 to 6/30/2009). Claims data were abstracted from the Management Information System / Decision Support System (MIS/DSS). The datasets included demographic information, geographic information, diagnoses, procedures and reimbursement information for each claim for every eligible child. The claims

dataset included all paid claims for a child and could include claims from different sources such as EDS, Department of Developmental Services, Delta Dental, CHDP etc. Since it was not possible to identify which claims were specific to the CCS eligible condition we included all claims in our analysis of utilization and only fee-for-service claims in our analysis of expenditures.

We also received separate data that included the CCS eligible diagnosis, eligibility start and end dates each child which were abstracted from the CMS Net system. The CMS Net system is a statewide eligibility, case management, and service authorization application integrated with the Medi-Cal Eligibility Data System (MEDS) and the California Medicaid Management Information system (CA MMIS).

### Analysis

An analytic team comprising of physicians and data analysts analyzed the CCS claims datasets. Decisions regarding the analysis were discussed by team members at regular meetings.

Since the claims dataset did not specify the CCS eligible conditions we linked the claims data to the data on eligibility to conduct analysis on the basis of the presumed CCS eligible condition. Eligibility diagnosis was the primary diagnosis listed on the registration form at the time the data were abstracted from CMS Net.

We performed frequency calculations on all variables and conducted validation checks of the data. During this process, we identified data issues that were discussed and resolved with DHCS. Other issues, for example, missing discharge dates and provider specialty are being investigated by DHCS and will be addressed in the next phase of the report.

We examined the prevalence of the CCS eligible conditions for all children across all three years of data by specialty group and examined utilization and expenditure patterns based on specialty group (see definition below) and by age at first visit for children with claims in fiscal year 2009.

We constructed density plots using a similar method to construct a Lorenz curve to show the distribution of total expenditures per child among CCS-enrolled children. Analyses were conducted using Statistical Analysis Software (SAS).

### Definitions

**Eligible diagnosis:** we defined medical condition of the child based on the CCS eligible diagnosis and not the diagnosis reported in the claims data. We used the primary diagnosis code (ICD 9 code) to define the medical condition; where the primary diagnosis code was missing, we used the secondary diagnosis code. We grouped ICD9 codes by specialty group: two physicians reviewed and reclassified the ICD 9 codes into specialty of care groups; V-codes were reclassified into specialty groups. We used these specialty groups for further analyses of utilization and expenditures.

**Utilization measures:** we calculated the following utilization measures for CCS eligible children who had a claim in fiscal year 2009. We summarized the measure by specialty group:

(i) **Hospitalizations:** we calculated the total number of hospitalizations that occurred in FY 2009. A new admission date that was at least two days after the previous discharge date was considered a new hospitalization; a transfer to another hospital was considered part of the same hospitalization

- (ii) Total bed days: we calculated the total number of bed days for a child that was in the hospital in FY 2009 and that was discharged by the end of FY 2009. If a child had multiple hospitalizations, we summed the bed days for each hospitalization to calculate the total bed days. Children with total bed days greater than 365 reflect hospitalizations where children were admitted prior to FY 2009 but were still hospitalized and discharged in FY 2009.
- (iii) Emergency department (ED) use: we used the procedure code variable to identify claims for emergency department visits. An emergency department visit could have occurred on the same day as an admission or as a visit that did not result in an admission.
- (iv) Outpatient, physician/provider, dental, EPSDT: we defined each new service date on the claim form as a new visit for each of these measures. An outpatient claim typically represented a procedure where as a provider claim represented the involvement of a provider (e.g. a radiologist that was reading a radiology film, nurse, physician etc.)
- (iv) Outpatient prescriptions: we defined a new outpatient prescription as any new drug or device, new service date or new claim number that was not part of an inpatient hospitalization. This captured any refills or any new prescriptions. Injections or drugs that were provided during an outpatient visit were included in the outpatient analyses and not as a prescription.
- (v) Readmissions: we defined a readmission as any admission to the hospital subsequent to a discharge in fiscal year 2009 for a prior hospitalization. Transfers to another hospital were not considered a readmission. Time to readmission was calculated as the days between the discharge date of a hospitalization and the admission date of a subsequent hospitalization within fiscal year 2009.

Expenditures: we summed the Medi-Cal reimbursement amount for all fee-for-service claims (inpatient, outpatient, provider, outpatient prescription, ED use) by child and by specialty group for FY 2009. Fee-for-service claims were defined based on the following criteria provided by DCCHS:

Program code (identifies the fiscal intermediary processing the claim) = 09 (EDS) and source code (identifies the source of the payment for the claim)=19 (Medi-Cal), 24 (Healthy Families) or 26 (CCS only).

- (i) Inpatient expenditures: any services that were provided during an inpatient stay were included in the calculation of the inpatient expenditure (with the exception of the use of the emergency department on the same day as an admission).
- (ii) Emergency department use: the expenditure for ED use only captures the Medi-Cal reimbursement amount for the claim representing the use of the ED. Other procedures or services provided during the ED visit, were captured either as inpatient expenditures (for ED visits resulting in an admission) or outpatient/provider expenditures (for ED visits not resulting in an admission)

### Inclusion/exclusion

We restricted our analyses to claims within the CCS eligibility period. We excluded the following: 1) claims where a child's claim was filed under the mother's eligibility (1.5%); 2) children where a child resided in a long-term care or sub-acute care facility (3%); 3) children with an unknown eligible diagnosis (1%); 4) claims with a missing discharge data for the inpatient admission (1%). When analyzing data for the most expensive children, we excluded children that resided in a carved-in county (4%).

For our analysis on expenditures, we only included fee-for-service claims. The vast majority of the data, even from the Medi-Cal managed care plans, is required to be submitted to DHCS; however, there is no verification of the accuracy of the data. Expenditure data from other claim types are either not available or are unreliable since there is no requirement for these data to be submitted.

### *B. Analysis of CPQCC data for neonates*

To facilitate Quality Improvement, the California Perinatal Quality Improvement Collaborative (CPQCC) collects clinical data prospectively using an expanded version of the Vermont Oxford Dataset. Membership is offered to all California neonatal intensive care hospitals. In the study period 2009, we estimate that greater than 90% of California's high acuity neonates were cared for in the 131 member neonatal intensive care units (NICUs). CPQCC conducts yearly data abstractor trainings. Each record has extensive range and logic checks at the time of data collection and prior to data closeout and records with excessive missing data are audited. During 2009 CPQCC collected data on 14171 high acuity infants admitted at  $\leq 28$  days of life. High acuity was defined as all infants with a birth weight less than 1500 grams as well as all infants greater than 1500 grams who met at least one of the following criteria; death while in hospital, acute neonatal transport, surgery requiring general anesthesia, endotracheal ventilation for  $> 4$  hours, and/or early onset sepsis. Because an infant at a CPQCC NICU who requires a higher level of care may be transferred to another CPQCC NICU, the hospitalization records of each infant are linked to create a patient level dataset that includes information on the status of the infant from the time of first admission to death, discharge to home, or transfer from the NICU to another setting for feeding and growing. We conducted analysis of the CCS eligibility status of neonatal admissions to CPQCC in 2009.

This analysis was based on the patient level dataset for 2009. The CPQCC data forms were reviewed by DHCS and the following items identified the CCS eligible infants. The population born with a CCS eligible condition was defined by using:

- Data from item 49, Presence of Congenital Anomalies
- Data from item 39, Presence of a PDA

The population with CCS eligible conditions acquired during the stay in the NICU was identified using:

- Data from items 40 (NEC), 41(GI perforation), 42 (ROP), 45 (IVH), 46 (CPVL) 47 (seizures) and 48 (HIE) and evidence of chronic lung disease (oxygen at 36 weeks adjusted gestational age, OR discharged on oxygen at 34 or 35 wks adjusted gestational age)
- And as surrogates –the following surgery codes in Appendix E of the CPQCC database manual.
  - o Head & Neck – S109
  - o Thorax – S213
  - o Abdominal and GI – S304, 307-11, 316- 317, 321 -324, 327, and 333
  - o Central Nervous System – S901-903

We characterized the percentage of NICU infants who had a CCS eligible condition, for any condition and for each condition. This analysis was performed for all NICU infants and for infants stratified by gestational age and for infants stratified by birth weight. Figures were



created showing gestational age (GA) and birth weight distributions for NICU infants born with a CCS eligible condition, infants who acquired a condition, and infants without an eligible condition.

We also examined the percentage and type of CCS condition by the NICUs level of care. CPQCC members include both California Children's Services (CCS) designated and non-CCS designated NICUs. CCS designates level of care on a voluntary basis. In general, intermediate NICUs do not provide prolonged mechanical ventilation, community NICUs provide full ventilation but not complex surgery, and regional NICUs provide a full range of services including complex surgery and ECMO.

## **Limitations**

Because of delays in acquiring the full dataset for children residing in Los Angeles county, the findings presented in this interim report use only partial data for Los Angeles county. We are currently working with the State and Los Angeles county to obtain and analyze the complete dataset for Los Angeles.

Utilization data are available for all children in the CCS dataset. However, data on expenditures are limited to fee-for-service expenditures only which results in the exclusion of expenditures for managed care encounters. The expenditure analyses include all services for children who were only enrolled in Medi-Cal, which account for the vast majority of children in the CCS program. For children in managed care, Healthy Families or CCS only, this expenditure analysis is restricted to services associated with the CCS condition. For the five counties that "carve in" CCS services within their managed care plan, expenditure analyses could not be conducted; however, utilization data are available and presented in this report.

## **Results**

### *A. Analysis of claims data for CCS-enrolled children*

The main results of our analyses were:

- The majority of CCS-enrolled children were  $\geq 1$  year of age. In fiscal year 2009, 16% of children were age  $< 1$  year and 84% of children were age  $\geq 1$  year. Utilization and expenditure patterns differed considerably between these two groups of children.
- A large proportion of the children appeared to be highly vulnerable with serious medical conditions. Most of the children had either Medi-Cal or Healthy Families eligibility; among children age  $< 1$  year the leading eligible diagnoses were cardiac and NICU-related conditions; for older children it was neurology and ENT. Thirty-six percent of infants had at least one hospitalization in the year. Nine percent had two or more hospitalizations; 16% had subsequent hospitalizations occurring within one week. 48% and 55% of readmissions among children age  $< 1$  year and age  $\geq 1$  year respectively, occurred within 30 days of discharge. During the year, 6% of children age  $< 1$  year and 17% of children age  $\geq 1$  year had four or more readmissions within 30 days of a discharge (a detailed review of these discharges does not suggest a coding error). For children age  $< 1$  year, most of the readmissions within 30 days were for a different diagnoses compared to the reason for the previous hospitalization. For older children, most of the readmissions were for the same diagnoses.
- In fiscal year 2009, there was disproportionate use of service type by children based on age; children less than one year were a small proportion of the patient population (16%)

but accounted for the highest inpatient utilization (36%). Among older children, outpatient services and prescriptions accounted for the highest percentage of utilization.

- Among children less than one year of age, inpatient bed days accounted for the highest percentage of utilization among all four leading conditions; the length of stay per hospitalized child varied substantially by condition.
- Among all children, inpatient services accounted for 60% of total expenditures, followed by outpatient prescriptions at 17%.
- Total expenditures were highest among children < 1 year of age with inpatient expenditures accounting for most of the cost; children < 1 year of age accounted for 39% of all inpatient expenditures.
- When examined by condition, 7 conditions accounted for 77% to 80% of expenditures and about 60% of children. There was substantial variation in total expenditures and per child expenditures by condition.
- Among children age  $\geq 1$ , although inpatient utilization was lower than outpatient utilization, inpatient expenditures accounted for a large proportion of total expenditures.
- When we examined expenditures by child, we found that most of the children had fairly low expenditures in the year; however, a small percentage of children had high expenditures. Ten percent of children accounted for approximately 75 percent of total expenditures.
- Among children age < 1, expenditures among the most expensive children were accounted for mostly by inpatient expenditures; however, there was considerable variation by county in the inpatient expenditures per child. While in some counties the high inpatient expenditures per child could be explained by longer bed-days per hospitalization, in other counties this was not the case. Children in the top 1% of the most expensive children were admitted and readmitted more frequently and within a shorter time frame than children in the top 10% of expensive children.
- Among children age  $\geq 1$  year, the contribution of expenditure types varied by county. In some counties, high total expenditures per child were accounted for primarily by inpatient expenditures, while in other counties a mix of inpatient, pharmacy and outpatient expenditures contributed toward total expenditures. In counties where inpatient expenditures accounted for a large percent of total expenditures and where inpatient expenditures per child were high (e.g. Santa Clara), long bed-days only partially explained these high costs. Admissions, readmissions and time to readmission showed similar patterns to those among children age < 1 year; children in the top 1% had higher admissions and readmissions and more children were readmitted within a shorter time compared with children in the top 10% groups.

#### *B. Analysis of CPQCC data for neonates*

Our main results of the CPQCC data analysis were:

- 53% of NICU admissions had CCS eligible conditions. 45% were born with a PDA and or a congenital anomaly.
- 16% of NICU admissions had a condition at birth and an acquired condition.
- Another 8% acquired a CCS eligible condition during their admission.
- ROP and IVH were the most prevalent acquired conditions and were seen with highest frequency in the very immature infants. Surgical conditions were seen in both premature and term infants.

## **Summary**

These analyses suggest that children enrolled in the CCS program are highly heterogeneous in both the nature and severity of their medical conditions. This, in turn, suggests that great care should be exercised in implementing any one single delivery or financing structure. In addition, the findings of this report underscore the inherent vulnerability of a significant portion of children enrolled in the CCS program and that any revisions to the current program should be carefully monitored to ensure that the desired improvements are actually being realized.

However, the findings of this report also suggest that many opportunities may exist for improved care delivery and cost reduction. The geographic variation in utilization patterns as well as the intense concentration of utilized services among a relatively small portion of the enrollees could provide essential guidance for major changes to program functioning and financing.

## **BACKGROUND**

The California Children's Services (CCS) Program is a joint State/county program providing medical case management and authorization of services for California children with special health care needs who meet specific medical, residential and financial eligibility requirements. These services are provided to children enrolled in Medi-Cal and Healthy Families but may also be provided to children who are uninsured or who have private insurance when their health-related expenditures exceed a designated level of family income (CCS-only clients). In this manner, the CCS program plays a crucial role in ensuring access to essential health care services for a large number of children with serious, chronic diseases in California.

However, growing concerns for the overall cost of the CCS program and perceived opportunities for greater efficiency and improved services have generated increased interest in exploring alternative delivery and payment options for the program. Under CCS program rules, covered services are confined only to those required to treat the child's CCS eligible condition which can create complex administrative barriers to highly coordinated care. In addition, CCS services are "carved out" from traditional managed care plans which can also lead to inefficiencies and obstacles to comprehensive service delivery.

Under California's new section 1115 waiver for hospital financing and uninsured care, the Department of Health Care Services has an opportunity to create innovative models and pilot programs to test new approaches to caring for children enrolled in the CCS program. This effort underscored the need for a stronger analytic foundation for considering different reform options. Among the most critical issues is the underlying distribution of utilized services and associated costs among CCS enrollees, particularly the relative concentration of costs among the most severely ill children.

## **PURPOSE**

The purpose of this project was to provide the California Department of Health Care Services (DHCS) and stakeholders of the California Children's Services (CCS) program – including consumer groups representing children with special health care needs, health care providers, county CCS programs, and managed care plans – with analytic insight to inform deliberations regarding CCS reform and guidance for pilot efforts to improve care and reduce costs for children receiving care through CCS program.

## **METHODS**

The analysis for this project was separated into two components: (a) analysis of claims data for CCS-enrolled children and (b) analysis of the CPQCC data for neonates.

### **A. Analysis of claims data for CCS-enrolled children**

#### Data

In mid-September 2010, we received from the California Department of Health Care Services (DHCS) three datasets of patient-level data pertaining to all CCS authorized claims, non-CCS authorized claims, and managed care encounters for each fiscal year 2007 (7/1/2006 to

6/30/2007), 2008 (7/1/2007 to 6/30/2008) and 2009 (7/1/2008 to 6/30/2009). The datasets included demographic information, geographic information, diagnoses, procedures and reimbursement information for each claim for every eligible child. Each dataset had, on average, 16 million observations.

The datasets were created in the following manner: DHCS identified a list of CCS-eligible children for the three fiscal years using the eligibility table in the Management Information System / Decision Support System (MIS/DSS). MIS/DSS is a data repository updated from the operational systems used throughout the Department of Health Care Services and the State. The data is loaded into regions such as Eligibility, Paid and Denied Claims, Pharmacy, Health Insurance Plans, and Provider information to be accessed by MIS/DSS users for reporting purposes. All paid claims data were abstracted from MIS/DSS for this list of CCS-eligible children.

The claims dataset included all paid claims for a child and could include claims from different sources such as EDS, Department of Developmental Services, Delta Dental, CHDP etc. Since it was not possible to identify which claims were specific to the CCS eligible condition (there is no variable that allows this determination; the TAR variable does not provide sufficient information to identify such claims) we included all claims in our analysis of utilization and only fee-for-service claims in our analysis of expenditures.

We also received separate datasets that included the CCS eligible diagnosis, eligibility start and end dates each child. Eligibility start and end dates were abstracted from MIS/DSS. CCS eligible diagnosis was abstracted from the CMS Net system. The CMS Net system is a statewide eligibility, case management, and service authorization application integrated with the Medi-Cal Eligibility Data System (MEDS) and the California Medicaid Management Information system (CA MMIS) that currently serves approximately 180,000 clients of the California Children's Services (CCS) Program. There are more than 1200 users of CMS Net including 58 statewide county CCS programs, 3 CCS Regional Offices. CMS Net ensures DHCS compliance with California Health and Safety Code Section 123822, providing centralized billing and payment for county authorized CCS provider claims.

### Analysis

An analytic team comprising of physicians and data analysts analyzed the CCS claims datasets. Decisions regarding the analysis were discussed by team members at regular meetings.

Since the claims dataset did not specify the CCS eligible conditions we linked the claims data to the data on eligibility to conduct analysis on the basis of the presumed CCS eligible condition. Eligibility diagnosis was the primary diagnosis listed on the registration form at the time the data were abstracted from CMSNet.

We performed frequency calculations on all variables and conducted validation checks of the data. During this process, we identified data issues that were discussed and resolved with DHCS. Other issues, for example, missing discharge dates and provider specialty are being investigated by DHCS and will be addressed in the next phase of the report.

We examined the prevalence of the CCS eligible conditions for all children across all three years of data by specialty group for children less than one year of age and by children  $\geq$  one year of age at entry into the CCS program. We examined utilization and expenditure patterns based on specialty group (see definition below) and by age at visit for children with claims in fiscal year 2009.

We constructed density plots to show the distribution of total expenditures per child using a similar method used to construct a Lorenz curve. Analyses were conducted using Statistical Analysis Software (SAS).

### Definitions

**Eligible diagnosis:** we defined medical condition of the child based on the CCS eligible diagnosis and not the diagnosis reported in the claims data. We used the primary diagnosis code (ICD 9 code) to define the medical condition; where the primary diagnosis code was missing, we used the secondary diagnosis code. We grouped ICD9 codes by specialty group: two physicians reviewed and reclassified the ICD 9 codes into specialty of care groups; V-codes were reclassified into specialty groups. We used these specialty groups for further analyses of utilization and expenditures.

**Age at visit:** for analysis on utilization and expenditures, we calculated the age at first visit during fiscal year 2009 and grouped children according to those who were less than one year at first visit and those who were greater or equal to one year.

**Race/ethnicity:** we utilized the classification system provided to us by DHCS. For children with multiple values for race/ethnicity we defined a new category of “mixed” race.

**County:** for children that reported more than one county of residence (n=6334), we selected the first county of residence. We grouped counties as carved-in (Napa, Yolo, Solano, Santa Barbara, San Mateo) or carved-out (remaining counties).

**Hospitalizations:** a transfer to another hospital was considered part of the same hospitalization

**Utilization measures:** we calculated the following utilization measures for CCS eligible children who had a claim in fiscal year 2009. We summarized the measure by specialty group:

(i) **Hospitalizations:** we calculated the total number of hospitalizations that occurred in FY 2009. A new admission date that was at least two days after the previous discharge date was considered a new hospitalization.

(ii) **Total bed days:** we calculated the total number of bed days for a child that was in the hospital in FY 2009 and that was discharged by the end of FY 2009. If a child had multiple hospitalizations, we summed the bed days for each hospitalization to calculate the total bed days. Children with total bed days greater than 365 reflect hospitalizations where children were admitted prior to FY 2009 but were still hospitalized and discharged in FY 2009.

(iii) **Emergency department (ED) use:** we used the procedure code variable to identify claims for emergency department visits. An emergency department visit could have occurred on the same day as an admission or as a visit that did not result in an admission.

(iv) **Outpatient, physician/provider, dental, EPSDT:** we defined each new service date on the claim form as a new visit for each of these measures. An outpatient claim typically represented a procedure where as a provider claim represented the involvement of a provider (e.g. a radiologist that was reading a radiology film, nurse, physician etc.)

(iv) **Outpatient prescriptions:** we defined a new outpatient prescription as any new drug or device, new service date or new claim number that was not part of an inpatient hospitalization.

This captured any refills or any new prescriptions. Injections or drugs that were provided during an outpatient visit were included in the outpatient analyses and not as a prescription.

(v) Readmissions: we defined a readmission as any admission to the hospital subsequent to a discharge in fiscal year 2009 for a prior hospitalization. Transfers to another hospital were not considered a readmission. Time to readmission was calculated as the days between the discharge date of a hospitalization and the admission date of a subsequent hospitalization within fiscal year 2009.

Expenditures: we summed the Medi-Cal reimbursement amount for all fee-for-service claims (inpatient, outpatient, provider, outpatient prescription, ED use) by child and by specialty group for FY 2009. Fee-for-service claims were defined based on the following criteria provided by DCHS:

Program code (identifies the fiscal intermediary processing the claim) = 09 (EDS) and source code (identifies the source of the payment for the claim)=19 (Medi-Cal), 24 (Healthy Families) or 26 (CCS only).

(i) Inpatient expenditures: any services that were provided during an inpatient stay were included in the calculation of the inpatient expenditure (with the exception of the use of the emergency department on the same day as an admission).

(ii) Emergency department use: the expenditure for ED use only captures the Medi-Cal reimbursement amount for the claim representing the use of the ED. Other procedures or services provided during the ED visit, were captured either as inpatient expenditures (for ED visits resulting in an admission) or outpatient/provider expenditures (for ED visits not resulting in an admission)

### Inclusion/exclusion

We restricted our analyses to claims within the CCS eligibility period. We excluded the following: 1) claims where a child's claim was filed under the mother's eligibility (1.5%); 2) children where a child resided in a long-term care or sub-acute care facility (3%); 3) children with an unknown eligible diagnosis (1%); 4) claims with a missing discharge data for the inpatient admission (1%). When analyzing data for the most expensive children, we excluded children that resided in a carved-in county (4%).

For our analysis on expenditures, we only included fee-for-service claims. The vast majority of the data, even from the Medi-Cal managed care plans, is required to be submitted; however, there is no verification of the accuracy of the data. Expenditure data from other claim types are either not available or are unreliable since there is no requirement for these data to be submitted.

## **B. Analysis of CPQCC data for neonates**

To facilitate Quality Improvement, the California Perinatal Quality Improvement Collaborative (CPQCC) collects clinical data prospectively using an expanded version of the Vermont Oxford Dataset. Membership is offered to all California neonatal intensive care hospitals. In the study period 2009, we estimate that greater than 90% of California's high acuity neonates were cared for in the 131 member neonatal intensive care units (NICUs). CPQCC conducts yearly data abstractor trainings. Each record has extensive range and logic checks at the time of data collection and prior to data closeout and records with excessive missing data are audited. During 2009 CPQCC collected data on 14171 high acuity infants admitted at <= 28

days of life. High acuity was defined as all infants with a birth weight less than 1500 grams as well as all infants greater than 1500 grams who met at least one of the following criteria; death while in hospital, acute neonatal transport, surgery requiring general anesthesia, endotracheal ventilation for > 4 hours, and/or early onset sepsis. Because an infant at a CPQCC NICU who requires a higher level of care may be transferred to another CPQCC NICU, the hospitalization records of each infant are linked to create a patient level dataset that includes information on the status of the infant from the time of first admission to death, discharge to home, or transfer from the NICU to another setting for feeding and growing. We conducted analysis of the CCS eligibility status of neonatal admissions to CPQCC in 2009.

This analysis was based on the patient level dataset for 2009. The CPQCC data forms were reviewed by DHCS and the following items identified the CCS eligible infants.

The population born with a CCS eligible condition was defined by using:

- Data from item 49, Presence of Congenital Anomalies
- Data from item 39, Presence of a PDA

The population with CCS eligible conditions acquired during the stay in the NICU was identified using:

- Data from items 40 (NEC), 41(GI perforation), 42 (ROP), 45 (IVH), 46 (CPVL) 47 (seizures) and 48 (HIE) and evidence of chronic lung disease (oxygen at 36 weeks adjusted gestational age, OR discharged on oxygen at 34 or 35 wks adjusted gestational age)
- And as surrogates –the following surgery codes in Appendix E of the CPQCC database manual.
  - o Head & Neck – S109
  - o Thorax – S213
  - o Abdominal and GI – S304, 307-11, 316- 317, 321 -324, 327, and 333
  - o Central Nervous System – S901-903

We characterized the percentage of NICU infants who had a CCS eligible condition, for any condition and for each condition. This analysis was performed for all NICU infants and for infants stratified by gestational age and for infants stratified by birth weight. Figures were created showing gestational age (GA) and birth weight distributions for NICU infants born with a CCS eligible condition, infants who acquired a condition, and infants without an eligible condition.

We also examined the percentage and type of CCS condition by the NICUs level of care. CPQCC members include both California Children’s Services (CCS) designated and non-CCS designated NICUs. CCS designates level of care on a voluntary basis. In general, intermediate NICUs do not provide prolonged mechanical ventilation, community NICUs provide full ventilation but not complex surgery, and regional NICUs provide a full range of services including complex surgery and ECMO.



## RESULTS

### A. Analysis of CCS claims data for CCS-enrolled children

*Who are the CCS-enrolled children?*

Table 1. Demographic characteristics of CCS enrolled children by age group, fiscal year (FY) 2009 (n=158,074)

	Age < 1		Age >= 1	
	N	%	N	%
<b>Age group</b>				
< 1	25024	100.0	-	-
1 to 4	-	-	36959	27.78
5 to 9	-	-	31000	23.3
10 to 14	-	-	31927	24
15 to 18	-	-	26152	19.66
19 to 21	-	-	7012	5.27
<b>Gender</b>				
Female	10235	40.9	53588	40.28
Male	11974	47.9	62709	47.13
Unknown	2815	11.3	16753	12.59
<b>Race/Ethnicity</b>				
White	1117	4.46	19074	14.34
Black	626	2.5	9108	6.85
Hispanic	5957	23.81	67767	50.93
American Indian	24	0.1	376	0.28
Asian/PI	393	1.57	6213	4.67
Other	194	0.78	1442	1.08
Mixed	1143	4.57	13012	9.78
Unknown	15570	62.22	16058	12.07
<b>Residence county</b>				
Carved-in	1042	4.2	4802	3.6
Carved-out	24000	95.8	128248	96.4
<b>Eligibility</b>				
Medi-Cal	23534	94.05	108077	81.23
Healthy Families	446	1.78	9708	7.3
CCS-only	295	1.18	2384	1.79
Mixed	749	2.99	12881	9.68

\*Mixed eligibility refers to children who moved from Medi-Cal, Healthy Families and CCS-only eligibility during the year.

Of the 158,074 children included in our analyses, 16% were less than one year of age at their first visit and about 48% were male. Most of the children lived in a carved-out county. Among children age < 1 year, 24% were Hispanic (62% had an unknown race) and 94% had Medi-Cal eligibility. Among children age >= 1, 51% were Hispanic and 81% had Medi-Cal eligibility. (Table 1).

The leading eligible diagnoses for children less than one year of age were for cardiac conditions, NICU-related conditions, and ENT (Table 2a). For older children the leading eligible diagnoses were neurology disorders, ENT and cardiac conditions (Table 2b).

Table 2a. Eligible diagnosis among children age < 1 year

Eligible diagnosis	N	%
Cardiology/Cardiothoracic Surgery	4873	19.47
NICU	4481	17.91
ENT	2417	9.66
Other	2174	8.69
General Pediatrics/ Behavior & Development	2077	8.3
Orthopedics	1410	5.63
Neurology/Neurosurgery	1395	5.57
Urology	1264	5.05
Ophthalmology	862	3.44
External/Injury	606	2.42
Gastroenterology	590	2.36
Endocrine	584	2.33
Hematology/Oncology	466	1.86
Surgery	355	1.42
Genetic	339	1.35
Speech/Visual/Hearing Loss	277	1.11
Infectious diseases	252	1.01
Pulmonary	240	0.96
Dermatology	187	0.75
Rheumatology	83	0.33
Nephrology	55	0.22
Obstetrics-Gynecology	26	0.1
Dental	11	0.04

Table 2b. Eligible diagnosis among children age >= 1 year

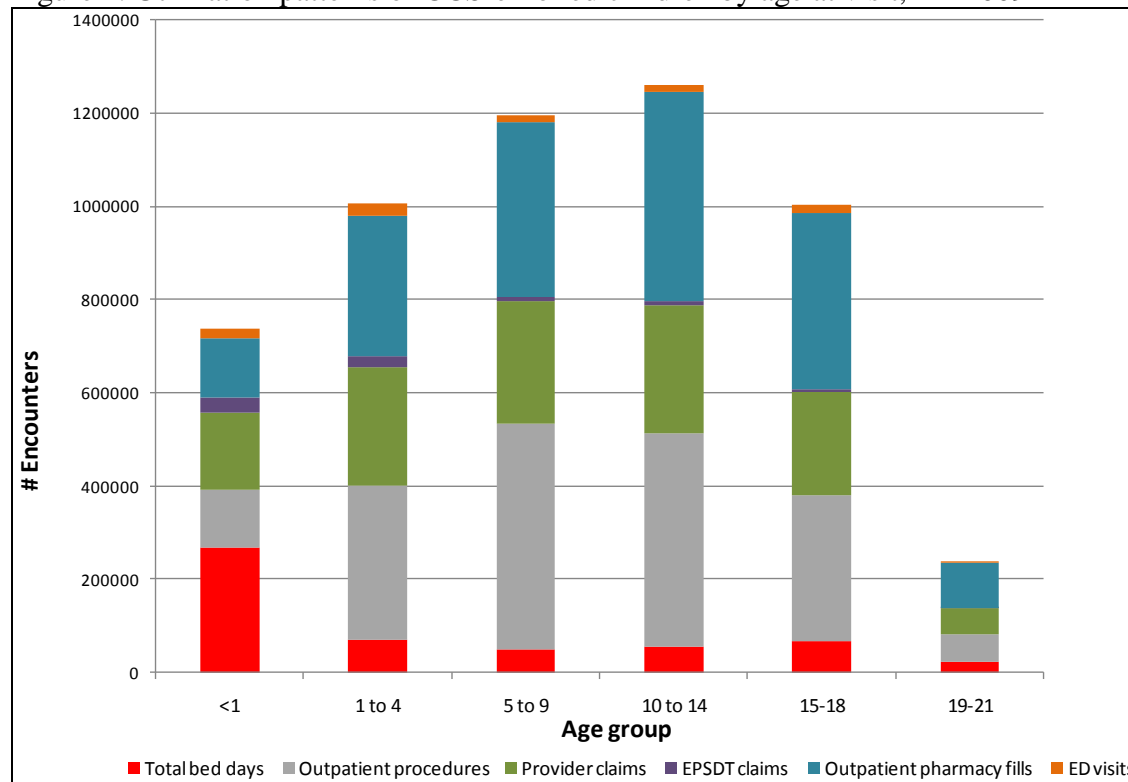
Eligible diagnosis	N	%
Neurology/Neurosurgery	23538	17.7
ENT	18333	13.8
Cardiology/Cardiothoracic Surgery	16234	12.2
External/Injury	13287	9.99
Endocrine	11778	8.85
Hematology/Oncology	8814	6.62
Orthopedics	8571	6.44
Ophthalmology	7054	5.3
Urology	4680	3.52
Gastroenterology	3496	2.63
Other	2709	2.04
Rheumatology	2142	1.61
NICU	2051	1.54
Nephrology	1898	1.43
Infectious diseases	1446	1.09
Pulmonary	1444	1.09
Genetic	1222	0.92
General Pediatrics/ Behavior & Development	1154	0.87
Dental	1088	0.82
Dermatology	976	0.73
Speech/Visual/Hearing Loss	557	0.42
Surgery	417	0.31
Obstetrics-Gynecology	126	0.09
Psychiatry	35	0.03

*What services do the CCS-enrolled children utilize?*

Our following results describe the utilization and expenditure patterns of the CCS-enrolled children for fiscal year 2009.

Figure 1 shows the utilization pattern of CCS-enrolled children in fiscal year 2009 by age at visit. Children less than one year of age had the largest number of total bed days which accounted for 36% of total utilization as compared to 6% among older children. Outpatient procedures and provider visits accounted for 40% of utilization among children less than one year and 58% among older children. Outpatient pharmacy fills accounted for 17% of utilization among children less than one year and 34% among older children.

Figure 1. Utilization patterns of CCS-enrolled children by age at visit, FY 2009



Note: Age is based on age at visit for the first visit in fiscal year 2009

EPSDT=Early Periodic Screening, Diagnosis, and Treatment Program; ED=emergency department

Tables 3a and 3b show the utilization of services by children for each specialty group and by age of visit in fiscal year 2009. Most of the children were  $\geq$  one year of age and the most prevalent eligible conditions differed by age group.

In fiscal year 2009, there were 25,024 children less than one year of age and 36% of these children had at least one hospitalization for any eligible condition. On average, for most conditions, of those who were hospitalized, the average number of hospitalizations was one (Table 3a); children with gastroenterology, hematology/oncology and nephrology disorders had an average of two hospitalization per year. The average bed-days per child varied by condition, from a minimum of 7.6 days for injury to a maximum of 53 days for nephrology (Table 3a). The number of outpatient procedures, provider visits and outpatient prescriptions per child also varied dramatically by condition.

There were 133,050 children greater than or equal to one year (older children) in the CCS program in fiscal year 2009 (Table 3b). Of these children, 17% had at least one hospitalization and for most conditions, there was one hospitalization per child; there were two or more hospitalizations per child among children with rheumatology, and genetic conditions and nearly three hospitalizations per child for children with hematology/oncology condition. The average length of stay varied by condition from a minimum of 3.4 days per child for dental conditions to a maximum of 25.7 days per child for hematology/oncology. There was also substantial variation in the use of outpatient procedures, provider visits and outpatient prescriptions per child across the eligible conditions.

Table 3a. Utilization among CCS enrolled children age < 1 year by eligible diagnosis, FY 2009 (n=25024)

Eligible diagnosis	Hospitalizations					Emergency department visits		Outpatient claims		Provider claims		Outpatient pharmacy		EPSDT claims	
	N children †	N	Per child#	Total bed days	Bed days per child#	N	Per child#	N	Per child#	N	Per child#	N	Fills per child#	N	Per child#
All conditions	25024	8933	1.4	267310	29.9	20948	1.9	124527	7.1	164534	7.9	126432	10.3	33654	2.3
Cardiology/Cardiothoracic Surgery	4873	1388	1.6	37803	27.2	4293	1.9	23295	6.5	34753	7.9	26233	10.5	6946	2.3
NICU	4481	2019	1.2	74897	37.1	2676	1.8	15604	6.4	23959	7.7	17786	9.6	5293	2.4
ENT	2417	726	1.5	13316	18.3	1945	1.9	14286	7.3	16111	7.7	10257	8.7	3621	2.3
Other	2174	833	1.2	22817	27.4	1145	1.6	5665	5.5	8936	5.8	6085	7.5	2088	1.9
General Pediatrics/ Behavior & Development	2077	772	1.2	30443	39.4	1504	1.7	10221	7.0	13047	7.8	8857	8.0	3086	2.4
Orthopedics	1410	255	1.3	2682	10.5	975	1.9	8068	6.6	9902	7.5	3847	6.1	2065	2.3
Neurology/Neurosurgery	1395	708	1.7	21430	30.3	2053	2.1	13734	12.0	14189	11.6	12799	16.0	1953	2.4
Urology	1264	368	1.4	5089	13.8	1297	2.0	6342	6.0	8133	7.0	6223	9.0	1861	2.3
Ophthalmology	862	296	1.4	15359	51.9	761	1.9	4670	7.5	7240	9.3	4015	8.3	1221	2.3
External/Injury	606	316	1.1	2398	7.6	625	1.4	2240	5.3	2494	5.2	1665	6.9	667	2.1
Gastroenterology	590	336	2.1	14476	43.1	867	2.1	3899	8.9	5982	11.6	8390	23.0	794	2.2
Endocrine	584	125	1.6	2845	22.8	533	2.0	3258	7.3	4277	8.3	4484	12.3	952	2.4
Hematology/Oncology	466	224	2.2	5106	22.8	640	1.9	3287	8.8	3869	9.2	3325	12.7	595	2.3
Surgery	355	187	1.5	8458	45.2	413	1.9	1740	7.2	2375	8.4	2574	13.3	488	2.3
Genetic	339	87	1.9	1699	19.5	286	1.8	2117	7.7	2325	7.9	2664	12.9	524	2.5
Speech/Visual/Hearing Loss	277	21	1.0	435	20.7	130	1.7	552	3.3	755	3.6	654	5.5	266	1.8
Infectious diseases	252	79	1.4	2285	28.9	217	1.6	1350	6.5	1349	6.5	1293	10.3	341	2.4
Pulmonary	240	94	1.6	3099	33.0	248	1.8	1863	9.3	2125	10.1	2997	19.2	363	2.4
Dermatology	187	40	1.3	554	13.9	177	1.8	998	6.3	1372	7.9	750	7.8	300	2.5
Rheumatology	83	12	1.3	107	8.9	40	1.7	640	9.1	268	4.4	192	6.0	99	1.9
Nephrology	55	31	1.9	1642	53.0	87	2.1	423	9.8	744	16.2	1130	47.1	66	2.1
Obstetrics-Gynecology	26	9	1.6	223	24.8	18	1.6	78	4.6	109	5.0	42	3.2	39	2.8
Dental	11	7	2.3	147	21.0	18	2.3	197	17.9	220	20.0	170	17.0	26	2.9

†Number of children with condition

#Calculated based on the number of children with the measure within the condition (e.g. hospitalizations per child for neonatology refers to the total number of hospitalizations for neonatology divided by the number of children with a neonatology condition who had at least one hospitalization)

Table 3b. Utilization among CCS enrolled children age >= 1 year by eligibility diagnosis, FY 2009 (n=133,050)

Eligible diagnosis	Hospitalizations					Emergency department visits		Outpatient claims		Provider claims		Outpatient pharmacy		EPSDT claims	
	N children †	N	Per child #	Total bed days	Bed days per child#	N	Per child#	N	Per child#	N	Per child#	N	Fills per child#	N	Per child#
All conditions	133050	22294	1.6	262884	11.8	77170	1.6	1643650	15.4	1074239	9.2	1599786	23.6	43706	1.3
Neurology/Neurosurgery	23538	4175	1.5	50249	12.0	15824	1.8	675277	31.2	389542	18.1	552348	35.8	7129	1.3
ENT	18333	1124	1.2	6472	5.8	6519	1.6	221829	15.1	106411	6.7	88166	12.0	6636	1.3
Cardiology/Cardiothoracic Surgery	16234	1680	1.4	15779	9.4	7906	1.6	115796	10.0	91925	6.1	113358	16.1	6816	1.4
External/Injury	13287	4374	1.1	36068	8.2	8998	1.3	71802	7.5	50941	4.8	39423	9.6	2852	1.3
Endocrine	11778	1756	1.4	11433	6.5	6801	1.7	107752	11.1	71185	6.9	268228	29.8	2994	1.3
Hematology/Oncology	8814	2560	2.9	65897	25.7	7820	1.8	97114	12.8	90969	11.3	113582	22.0	2092	1.3
Orthopedics	8571	1225	1.2	7507	6.1	3580	1.6	69306	10.0	50917	6.5	36863	11.3	2979	1.3
Ophthalmology	7054	266	1.1	1646	6.2	2586	1.5	49321	9.9	39516	6.0	32474	10.8	2606	1.3
Urology	4680	644	1.3	3857	6.0	2659	1.7	28371	7.5	23117	5.4	21113	10.5	2057	1.4
Gastroenterology	3496	1229	1.6	15500	12.6	3444	1.8	32263	12.2	26149	8.8	66688	32.2	974	1.3
Other	2709	498	1.5	8260	16.6	1650	1.7	31355	15.0	21611	9.5	27193	23.8	971	1.4
Rheumatology	2142	369	2.0	4969	13.5	1329	1.8	19099	10.3	16654	8.6	35422	25.1	492	1.3
NICU	2051	196	1.5	2233	11.4	1421	1.7	19023	12.0	13370	7.9	21295	21.4	1531	1.5
Nephrology	1898	616	1.9	8891	14.4	1521	1.7	25091	15.1	23111	13.6	47871	35.7	457	1.2
Infectious diseases	1446	341	1.5	6721	19.7	957	1.6	18593	15.2	12094	9.7	30994	33.0	395	1.3
Pulmonary	1444	569	1.7	10497	18.4	1378	1.8	14224	12.5	15103	12.4	50234	46.3	501	1.4
Genetic	1222	189	2.0	2371	12.5	818	1.9	22230	20.5	13797	12.6	26294	31.0	462	1.4
General Pediatrics/ Behavior & Development	1154	82	1.3	696	8.5	678	1.6	4815	6.2	3970	4.3	4155	8.4	818	1.6
Dental	1088	80	1.1	275	3.4	167	1.4	2883	7.7	1810	4.3	1375	6.5	156	1.3
Dermatology	976	140	1.7	1475	10.5	500	1.6	7840	9.5	6454	7.5	11283	22.8	369	1.3
Speech/Visual/Hearing Loss	557	10	1.1	57	5.7	152	1.6	3721	8.1	1274	3.5	1373	6.0	180	1.2
Surgery	417	130	1.5	1807	13.9	383	1.8	4389	13.9	3651	10.6	9431	45.6	201	1.5
Obstetrics-Gynecology	126	29	1.2	174	6.0	55	1.5	867	10.4	509	4.8	555	10.7	32	1.3
Psychiatry	35	12	1.0	50	4.2	24	1.1	689	26.5	159	6.1	68	6.8	6	1.2

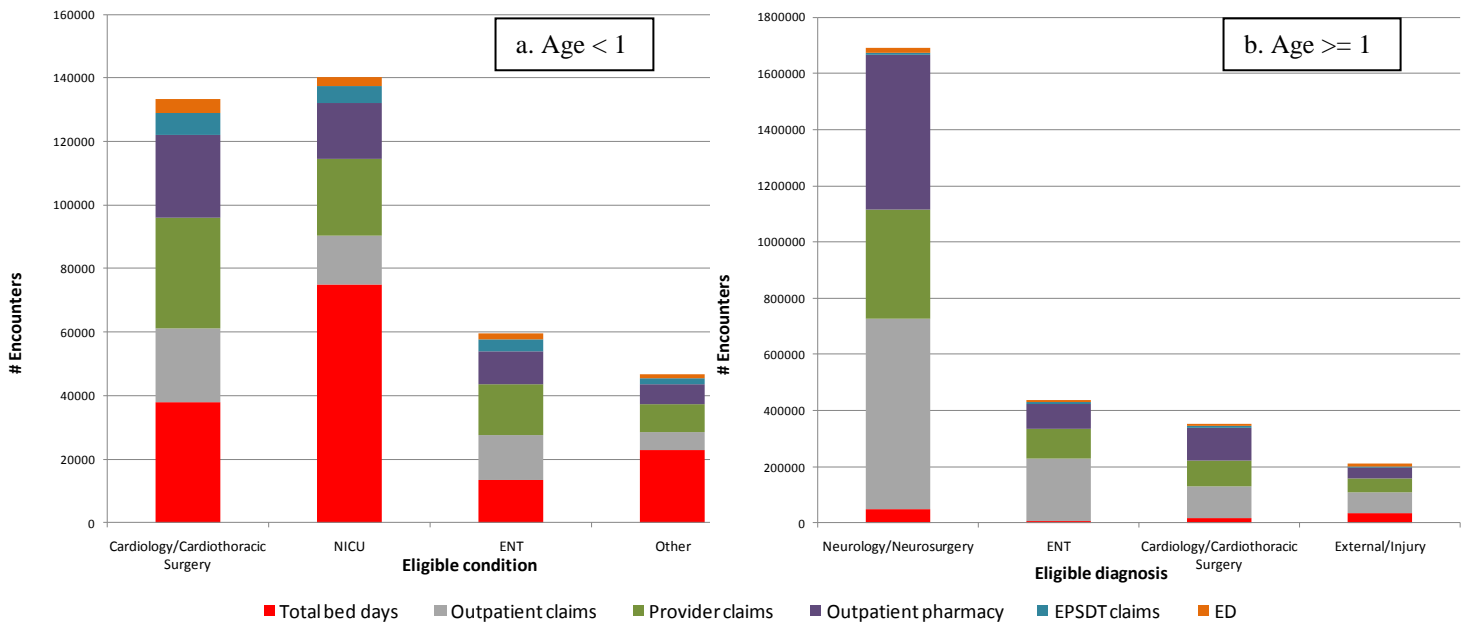
†Number of children with condition

#Calculated based on the number of children with the measure within the condition (e.g. hospitalizations per child for neurology refers to the total number of hospitalizations for neurology divided by the number of children with a neurology condition who had at least one hospitalization)

Utilization of services showed similar patterns when examined by the most prevalent eligible diagnoses. Among children age < 1 year, total utilization was highest among children with a NICU-related condition, followed by cardiac conditions, ENT and other (Table 3a; Figure 2a). Inpatient bed days accounted for the highest percentage of utilization in NICU, cardiac and other conditions, followed by outpatient services and outpatient pharmacy fills. For children with ENT eligible diagnosis, outpatient services accounted for the highest percentage of utilization followed by total bed-days and outpatient pharmacy fills (Table 3a; Figure 2a).

Among older children, utilization was highest among children with a neurological disorder followed by ENT, cardiac conditions and injury. Outpatient services and pharmacy fills accounted for most of the utilization among all four conditions (Table 3b; Figure 2b).

Figure 2. Utilization among children for select conditions, FY 2009



### Initial and subsequent hospitalizations

Among children age < 1 year, 4,114 (36%) had at least one hospitalization; nine percent had two or more hospitalizations (Figure 3a). Among children with one hospitalization, most had lengths of stay of two or three days.

There were a total of 12,461 hospitalizations; 3,528 (28%) of these hospitalizations were readmissions. The mean number of days between admissions was 57 (range: 1 to 349). Among children with more than one admission, most had one subsequent hospitalization (readmission) (Figure 3b, Table 4a). Readmissions occurred within one week for 16% of children, with most occurring within 2 or 3 days. Most readmissions occurred after 7 weeks (Figure 3c).

1,053 (26%) children had readmissions within 30 days of discharge from a prior hospitalization for a total of 1,681 (48%) readmissions within 30 days. Table 4a shows the eligible diagnosis and Table 4b shows the county of residence for children with a readmission within 30 days of a prior discharge. Children with cardiology, neurology and NICU-related eligible diagnoses had the highest number of readmissions within 30 days (Table 4a). Children from Los Angeles, San Diego and Fresno counties had the highest number of readmissions

within 30 days (Table 4b). Most children had a single readmission within 30 days; 6% of children had 4 or more readmissions within 30 days (detailed review of these readmissions does not suggest a coding error)

Figure 3. Initial, subsequent hospitalizations and time to subsequent hospitalizations among CCS enrolled children, FY 2009

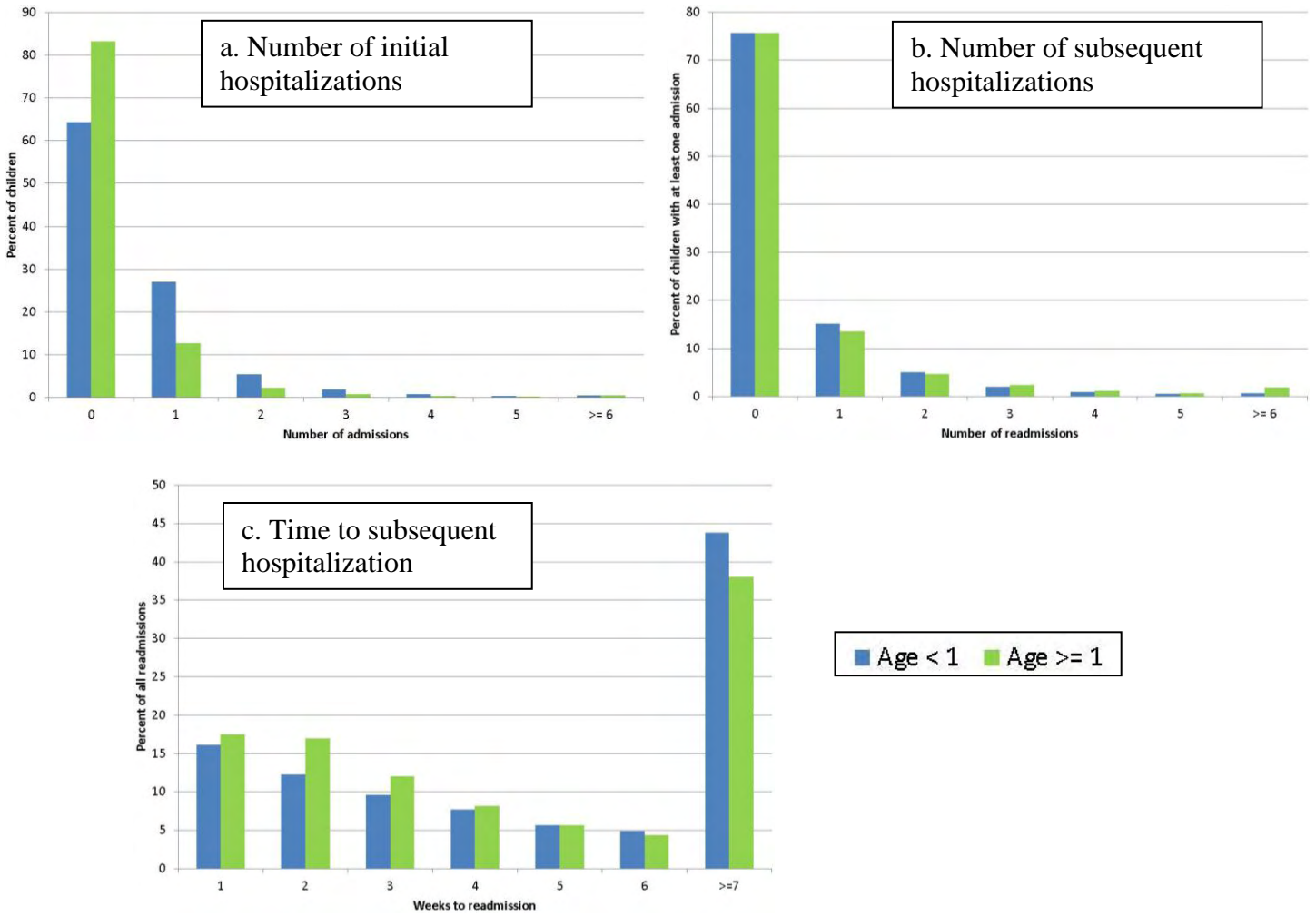




Table 4a. CCS eligible diagnoses among children age < 1 year who were readmitted within 30 days of a prior hospitalization

Eligible diagnosis	Number of readmissions within 30 days of a prior hospitalization				
	1	2	3	>=4	Total
Total	756	170	61	66	1053
Cardiology/Cardiothoracic surgery	187 (73.3)	36 (14.1)	18 (7.1)	14 (5.5)	255
Neurology/Neurosurgery	103 (72.5)	26 (18.3)	10 (7)	< 10	142
NICU-related	102 (80.3)	15 (11.8)	< 10	< 10	127
Gastroenterology	51 (58.6)	16 (18.4)	< 10	14 (16.1)	87
ENT	48 (67.6)	17 (23.9)	< 10	< 10	71
Other	49 (81.7)	10 (16.7)	< 10	< 10	60
Hematology/Oncology	26 (51)	< 10	< 10	14 (27.5)	51
Urology	36 (72)	< 10	< 10	< 10	50
General pediatrics/behavior & development	42 (85.7)	< 10	< 10	< 10	49
Surgery	24 (77.4)	< 10	< 10	< 10	31
Ophthalmology	21 (70)	< 10	< 10	< 10	30
Endocrinology	12 (66.7)	< 10	< 10	< 10	18
Genetic	6 (35.3)	10 (58.8)	< 10	< 10	17
Orthopedics	11 (68.8)	< 10	< 10	< 10	16
Pulmonary	11 (84.6)	< 10	< 10	< 10	13
Infectious diseases	10 (90.9)	< 10	< 10	< 10	11
External/Injury	8 (88.9)	< 10	< 10	< 10	< 10
Nephrology	3 (42.9)	< 10	< 10	< 10	< 10
Dermatology	4 (100)	< 10	< 10	< 10	< 10
Dental	1 (50)	< 10	< 10	< 10	< 10
Obstetrics-Gynecology	1 (50)	< 10	< 10	< 10	< 10
Rheumatology	0 (0)	< 10	< 10	< 10	< 10

Table 4b. County of residence for children age < 1 year who were readmitted within 30 days of a prior hospitalization

County of residence	Number of readmissions within 30 days of a prior hospitalization				
	1	2	3	>=4	Total
Total	756	170	61	66	1053
Los Angeles	179 (74.6)	33 (13.8)	< 10	19 (7.9)	240
San Diego	69 (75)	12 (13)	< 10	< 10	92
Fresno	59 (76.6)	13 (16.9)	< 10	< 10	77
San Bernardino	53 (68.8)	15 (19.5)	< 10	< 10	77
Riverside	47 (64.4)	16 (21.9)	< 10	< 10	73
Orange	53 (74.6)	< 10	< 10	< 10	71
Kern	23 (65.7)	< 10	< 10	< 10	35

County of residence	Number of readmissions within 30 days of a prior hospitalization				
	1	2	3	>=4	Total
Santa Clara	25 (71.4)	< 10	< 10	< 10	35
Sacramento	25 (73.5)	< 10	< 10	< 10	34
San Joaquin	22 (68.8)	< 10	< 10	< 10	32
Alameda	25 (80.6)	< 10	< 10	< 10	31
Tulare	17 (58.6)	< 10	< 10	< 10	29
Monterey	18 (72)	< 10	< 10	< 10	25
Ventura	18 (85.7)	< 10	< 10	< 10	21
Contra Costa	16 (84.2)	< 10	< 10	< 10	19
Stanislaus	< 10	< 10	< 10	< 10	18
San Francisco	< 10	< 10	< 10	< 10	13
San Mateo	< 10	< 10	< 10	< 10	12
Sonoma	< 10	< 10	< 10	< 10	12
Imperial	< 10	< 10	< 10	< 10	10
Santa Cruz	< 10	< 10	< 10	< 10	10
Santa Barbara	< 10	< 10	< 10	< 10	< 10
Madera	< 10	< 10	< 10	< 10	< 10
Kings	< 10	< 10	< 10	< 10	< 10
Shasta	< 10	< 10	< 10	< 10	< 10
Butte	< 10	< 10	< 10	< 10	< 10
El Dorado	< 10	< 10	< 10	< 10	< 10
Merced	< 10	< 10	< 10	< 10	< 10
San Luis Obispo	< 10	< 10	< 10	< 10	< 10
Marin	< 10	< 10	< 10	< 10	< 10
Solano	< 10	< 10	< 10	< 10	< 10
Sutter	< 10	< 10	< 10	< 10	< 10
Yuba	< 10	< 10	< 10	< 10	< 10
Placer	< 10	< 10	< 10	< 10	< 10
Tuolumne	< 10	< 10	< 10	< 10	< 10
Glenn	< 10	< 10	< 10	< 10	< 10
Lassen	< 10	< 10	< 10	< 10	< 10
Mendocino	< 10	< 10	< 10	< 10	< 10
Tehama	< 10	< 10	< 10	< 10	< 10
Humboldt	< 10	< 10	< 10	< 10	< 10
Modoc	< 10	< 10	< 10	< 10	< 10
Mono	< 10	< 10	< 10	< 10	< 10
Napa	< 10	< 10	< 10	< 10	< 10
Nevada	< 10	< 10	< 10	< 10	< 10

Tables 5a and 5d show the reasons for readmission within 7, 15 and 30 days of a prior admission for children age < 1. Readmissions were most frequent for general pediatrics/behavior and development, other, gastroenterology, cardiology and external/injury diagnoses (Table 5a) Table 5b shows the distribution of whether the reason for readmission was the same or different from the reason for the prior admission for the top ten reasons for admission. For example, for readmissions occurring within 30 days of a prior admission, 40 percent of admissions for general pediatrics/behavior and development had readmissions for the same reason, but 60 percent of admissions for general pediatrics had a different readmission diagnosis. Similarly 37 percent of cardiology admissions readmissions for cardiology, but percent had a different readmission diagnosis (Table 5d). For all admission diagnoses, 33% of readmissions within 30 days were for the same reason as the prior admission.

Table 5a. Reasons for readmission by days to readmission among children age < 1 year

Reason for readmission	Days to readmission			Total
	7	15	30	
	Number (%) of readmissions			
Total	569	1052	1681	3528
General pediatrics/behavior & development	73 (10)	156 (21)	284 (38)	746
Other	87 (26)	156 (40)	231 (60)	386
Gastroenterology	61 (19)	104 (32)	167 (51)	330
Cardiology/ Cardiothoracic surgery	35 (11)	71 (23)	124 (40)	309
External/Injury	68 (25)	114 (42)	169 (63)	269
Neurology/Neurosurgery	33 (15)	62 (28)	96 (44)	218
ENT	11 (6)	18 (10)	35 (20)	173
Pulmonary	21 (12)	47 (27)	67 (39)	173
Hematology/Oncology	32 (19)	68 (41)	126 (76)	166
Infectious diseases	49 (30)	74 (45)	101 (61)	166
Urology	15 (9)	33 (21)	60 (38)	159
Nephrology	30 (20)	51 (34)	78 (51)	152
Surgery	11 (14)	26 (33)	37 (47)	78
NICU-related conditions	26 (36)	39 (54)	56 (78)	72
Orthopedics	< 10	< 10	< 10	45
Genetic	< 10	< 10	10 (38)	26
Endocrinology	< 10	< 10	10 (53)	19
Ophthalmology	< 10	< 10	12 (67)	18
Dermatology	< 10	< 10	< 10	13
Dental	< 10	< 10	< 10	< 10
Obstetrics-Gynecology	< 10	< 10	< 10	< 10
Psychiatry	< 10	< 10	< 10	< 10
Rheumatology	< 10	< 10	< 10	< 10

Table 5b. Reasons for readmission compared with prior admission reason by days to readmission among children age < 1 year

Admission reason	Readmission reason	Days to readmission		
		7	15	30
		<b>Number (%) of readmissions</b>		
All diagnoses	same	178 (31)	348 (33)	561 (33)
	different	391 (69)	704 (67)	1120 (67)
Cardiology/Cardiothoracic surgery	same	19 (31)	38 (34)	61 (37)
	different	42 (69)	74 (66)	105 (63)
External/Injury	same	15 (42)	30 (44)	43 (43)
	different	21 (58)	38 (56)	58 (57)
Gastroenterology	same	19 (37)	34 (37)	53 (35)
	different	32 (63)	58 (63)	98 (65)
General Pediatrics/Behavior & Development	same	22 (35)	49 (35)	93 (40)
	different	40 (65)	90 (65)	139 (60)
Hematology/Oncology	same	22 (56)	49 (63)	86 (70)
	different	17 (44)	29 (37)	38 (31)
Infectious diseases	same	5 (17)	9 (16)	12 (14)
	different	24 (83)	48 (84)	75 (86)
NICU-related	same	7 (22)	9 (17)	12 (12)
	different	25 (78)	44 (83)	85 (88)
Neurology/Neurosurgery	same	16 (39)	31 (44)	50 (45)
	different	25 (61)	40 (56)	60 (55)
Other	same	24 (22)	43 (21)	68 (20)
	different	87 (78)	156 (79)	257 (80)
Urology	same	5 (42)	14 (48)	25 (45)
	different	7 (58)	15 (52)	30 (55)

Among children age  $\geq 1$  year, 10,262 (17%) had at least one hospitalization; four percent had two or more hospitalizations (Figure 3a). Among children with one hospitalization, most had lengths of stay of two or three days.

There were a total of 34,415 hospitalizations; 12,122 (35%) of these hospitalizations were readmissions. The mean number of days between admissions was 53 (range 1 to 359). Among children with more than one admission, most had one subsequent hospitalization (readmission) (Figure 3b, Table 6a). Readmissions occurred within one week for 18% of children, with most occurring within 2 or 3 days. Most readmissions occurred after 7 weeks (Figure 3c).

2,808 (27%) children had readmissions within 30 days of a prior hospitalization for a total of 6,635 (55%) readmissions within 30 days of a prior admission. Table 6a shows the eligible diagnosis and Table 6b shows the county of residence for children with a readmission within 30 days of a prior discharge. Children with hematology/oncology, neurology and gastroenterology eligible diagnoses had the highest number of readmissions within 30 days (Table 6a). Children from Los Angeles, San Bernadino and San Diego counties had the highest number of readmissions within 30 days (Table 6b). Most children had a single readmission within 30 days;

17% had four or more readmissions within 30 days (detailed review of these does not suggest a coding error) (Table 6b).

Table 6a. CCS eligible diagnoses among children age  $\geq 1$  year who were readmitted within 30 days of a prior hospitalization

Eligible diagnosis	Number of readmissions within 30 days of a prior hospitalization				
	1	2	3	$\geq 4$	Total
Total	1719	422	199	468	2808
Hematology/Oncology	377 (41.2)	141 (15.4)	87 (9.5)	310 (33.9)	915
Neurology/Neurosurgery	406 (72.2)	86 (15.3)	32 (5.7)	38 (6.8)	562
Gastroenterology	125 (67.2)	30 (16.1)	14 (7.5)	17 (9.1)	186
Cardiology/Cardiothoracic surgery	131 (72.4)	30 (16.6)	< 10	11 (6.1)	181
External/Injury	143 (86.1)	18 (10.8)	< 10	< 10	166
Endocrinology	93 (64.1)	25 (17.2)	< 10	22 (15.2)	145
Nephrology	82 (62.6)	26 (19.8)	12 (9.2)	11 (8.4)	131
Pulmonary	52 (75.4)	< 10	< 10	< 10	69
Rheumatology	31 (46.3)	< 10	< 10	20 (29.9)	67
ENT	51 (79.7)	< 10	< 10	< 10	64
Urology	41 (73.2)	10 (17.9)	< 10	< 10	56
Infectious diseases	40 (74.1)	< 10	< 10	< 10	54
Orthopedics	42 (80.8)	< 10	< 10	< 10	52
Other	33 (63.5)	< 10	< 10	13 (25)	52
Genetic	19 (70.4)	< 10	< 10	< 10	27
Dermatology	10 (43.5)	< 10	< 10	< 10	23
NICU-related	17 (85)	< 10	< 10	< 10	20
Surgery	< 10	< 10	< 10	< 10	15
Ophthalmology	< 10	< 10	< 10	< 10	10
General pediatrics/behavior & development	< 10	< 10	< 10	< 10	< 10
Obstetrics-gynecology	< 10	< 10	< 10	< 10	< 10
Dental	< 10	< 10	< 10	< 10	< 10
Speech/Visual/Hearing Loss	< 10	< 10	< 10	< 10	< 10

Table 6b. County of residence for children age  $\geq 1$  year who were readmitted within 30 days of a prior hospitalization

County of residence	Number of readmissions within 30 days of a prior hospitalization				
	1	2	3	$\geq 4$	Total
Total	1719	422	199	468	2808
Los Angeles	387 (63.2)	106 (17.3)	38 (6.2)	81 (13.2)	612
San Bernardino	183 (63.8)	42 (14.6)	19 (6.6)	43 (15)	287

County of residence	Number of readmissions within 30 days of a prior hospitalization				
	1	2	3	>= 4	Total
San Diego	148 (58.7)	41 (16.3)	21 (8.3)	42 (16.7)	252
Riverside	135 (61.9)	31 (14.2)	10 (4.6)	42 (19.3)	218
Orange	126 (60.3)	30 (14.4)	16 (7.7)	37 (17.7)	209
Fresno	87 (66.4)	16 (12.2)	< 10	21 (16)	131
Sacramento	75 (57.7)	24 (18.5)	12 (9.2)	19 (14.6)	130
Kern	63 (64.3)	< 10	< 10	23 (23.5)	98
Santa Clara	52 (55.3)	20 (21.3)	5 (5.3)	17 (18.1)	94
Alameda	51 (60.7)	< 10	11 (13.1)	13 (15.5)	84
Ventura	38 (59.4)	< 10	< 10	13 (20.3)	64
San Joaquin	38 (61.3)	10 (16.1)	< 10	< 10	62
Stanislaus	33 (58.9)	< 10	< 10	10 (17.9)	56
Tulare	31 (60.8)	< 10	< 10	11 (21.6)	51
Contra Costa	29 (61.7)	12 (25.5)	< 10	< 10	47
San Francisco	24 (58.5)	< 10	< 10	10 (24.4)	41
Monterey	27 (67.5)	< 10	< 10	< 10	40
Merced	11 (44)	< 10	< 10	< 10	25
San Mateo	19 (76)	< 10	< 10	< 10	25
Imperial	14 (63.6)	< 10	< 10	< 10	22
Santa Cruz	10 (45.5)	< 10	< 10	< 10	22
Sonoma	16 (72.7)	< 10	< 10	< 10	22
Placer	11 (57.9)	< 10	< 10	< 10	19
Santa Barbara	13 (68.4)	< 10	< 10	< 10	19
Butte	< 10	< 10	< 10	< 10	16
Madera	< 10	< 10	< 10	< 10	16
San Luis Obispo	12 (80)	< 10	< 10	< 10	15
Kings	< 10	< 10	< 10	< 10	13
Shasta	< 10	< 10	< 10	< 10	11
Solano	< 10	< 10	< 10	< 10	11
Humboldt	< 10	< 10	< 10	< 10	< 10
Mendocino	< 10	< 10	< 10	< 10	< 10
Sutter	< 10	< 10	< 10	< 10	< 10
Tehama	< 10	< 10	< 10	< 10	< 10
Yuba	< 10	< 10	< 10	< 10	< 10
Marin	< 10	< 10	< 10	< 10	< 10
El Dorado	< 10	< 10	< 10	< 10	< 10
Napa	< 10	< 10	< 10	< 10	< 10
San Benito	< 10	< 10	< 10	< 10	< 10

County of residence	Number of readmissions within 30 days of a prior hospitalization				
	1	2	3	>= 4	Total
Del Norte	< 10	< 10	< 10	< 10	< 10
Lake	< 10	< 10	< 10	< 10	< 10
Nevada	< 10	< 10	< 10	< 10	< 10
Tuolumne	< 10	< 10	< 10	< 10	< 10
Yolo	< 10	< 10	< 10	< 10	< 10
Calaveras	< 10	< 10	< 10	< 10	< 10
Colusa	< 10	< 10	< 10	< 10	< 10
Glenn	< 10	< 10	< 10	< 10	< 10
Inyo	< 10	< 10	< 10	< 10	< 10
Amador	< 10	< 10	< 10	< 10	< 10
Lassen	< 10	< 10	< 10	< 10	< 10
Plumas	< 10	< 10	< 10	< 10	< 10
Siskiyou	< 10	< 10	< 10	< 10	< 10

Tables 7a and 7b show the reasons for readmission within 7, 15 and 30 days of discharge for a prior admission for children age  $\geq 1$ . Readmissions were most frequent for hematology/oncology, external/injury, general pediatrics/behavior and development, other, and neurology diagnoses (Table 7a). Table 7b shows the distribution of whether the reason for readmission was the same or different from the reason for the prior admission for the top ten reasons for admission. For example, for readmissions occurring within 30 days of a prior admission, 81 percent of hematology/oncology admissions had readmissions for the same reason and only 29 percent had a different readmission diagnosis. For external/injury, which was the next most frequent reason for admission, 45 percent of readmissions were for the same reason and 55 percent were for a different reason (Table 7b). For all admission diagnoses, 60% of readmissions within 30 days were for the same reason as the prior admission.

Table 7a. Reasons for readmission by days to readmission among children age  $\geq 1$  year

Reason for readmission	Days to readmission			Total
	7	15	30	
	Number (%) of readmissions			
Total	2188	4141	6635	12122
Hematology/Oncology	817 (23)	1713 (48)	2743 (77)	3542
External/Injury	220 (19)	407 (34)	623 (52)	1190
General pediatrics/behavior & development	106 (11)	212 (22)	355 (36)	984
Other	173 (19)	301 (33)	476 (52)	908
Neurology/Neurosurgery	104 (14)	186 (25)	308 (42)	737
Gastroenterology	125 (17)	211 (29)	331 (45)	730
Infectious diseases	120 (22)	203 (37)	295 (53)	555
Pulmonary	46 (9)	79 (15)	151 (29)	518

Reason for readmission	Days to readmission			Total
	7	15	30	
	Number (%) of readmissions			
Endocrinology	43 (9)	100 (21)	172 (36)	476
Nephrology	85 (22)	128 (32)	189 (48)	396
Urology	38 (11)	78 (23)	130 (38)	344
Rheumatology	46 (15)	72 (24)	198 (65)	304
Orthopedics	11 (5)	30 (12)	59 (24)	246
Cardiology/Cardiothoracic surgery	38 (16)	69 (29)	108 (45)	242
Psychiatry	46 (20)	84 (36)	129 (56)	231
ENT	20 (10)	44 (22)	71 (36)	199
Genetic	88 (52)	121 (72)	132 (79)	168
Surgery	35 (21)	50 (30)	76 (46)	165
Obstetrics-Gynecology	10 (14)	21 (28)	38 (51)	74
Dermatology	< 10	15 (26)	25 (44)	57
Ophthalmology	< 10	11 (31)	18 (51)	35
Dental	< 10	< 10	< 10	16
NICU-related conditions	< 10	< 10	< 10	< 10

Table 7b. Reasons for readmission compared with prior admission reason by days to readmission among children age  $\geq 1$  year

Admission reason	Readmission reason	Days to readmission		
		7	15	30
All diagnoses	same	1228 (56)	2394 (58)	3964 (60)
	different	960 (44)	1747 (42)	2671 (40)
Endocrinology	same	37 (77)	77 (76)	138 (78)
	different	11 (23)	24 (24)	39 (22)
External/Injury	same	88 (41)	161 (43)	258 (45)
	different	126 (59)	213 (57)	314 (55)
Gastroenterology	same	51 (43)	88 (43)	136 (42)
	different	68 (57)	117 (57)	186 (58)
General pediatrics/behavior & development	same	27 (32)	52 (30)	98 (31)
	different	57 (68)	123 (71)	223 (69)
Hematology/Oncology	same	661 (73)	1408 (78)	2310 (81)
	different	239 (27)	404 (22)	551 (19)
Infectious diseases	same	23 (28)	41 (26)	62 (25)
	different	58 (72)	116 (74)	185 (75)
Nephrology	same	31 (42)	46 (36)	68 (35)
	different	42 (58)	82 (64)	129 (66)



Admission reason	Readmission reason	Days to readmission		
		7	15	30
Neurology/Neurosurgery	same	54 (51)	96 (51)	164 (54)
	different	51 (49)	93 (49)	142 (46)
Other	same	33 (25)	54 (21)	90 (22)
	different	97 (77)	208 (79)	317 (78)
Rheumatology	same	25 (56)	41 (53)	152 (71)
	different	20 (44)	37 (47)	61 (29)

*What is the cost of the services used by CCS-enrolled children?*

Tables 8a to d show the total and per child expenditures for children by specialty group or ICD9 group and age at visit for hospitalizations, use of the emergency department, outpatient procedures, provider visits and outpatient prescriptions. These expenditures reflect the Medi-Cal reimbursement rate among fee-for-service claims only. Note that expenditures for the carved-in counties are likely under-represented. Among children age < 1 year, nephrology, gastroenterology and surgery had the highest total expenditures per child; among children age >= 1 year, hematology/oncology, pulmonary, and infectious disease eligible diagnoses had the highest total expenditures per child. Similar to what was observed for utilization, there was substantial variation by condition for total expenditures and per child expenditures between conditions.

Figure 4 shows the distribution of total expenditure by type of service among all fee-for-service claims for all CCS-enrolled children. Inpatient services contributed to 60% of total expenditures, followed by outpatient procedures and pharmacy. Cost of emergency department reflects only the cost for the use of the ED and likely underestimates the cost of the total ED visit (it excludes any procedures that might have occurred at the visit; these are accounted for either in the inpatient expenditures or outpatient procedures). Total expenditures were highest among children less than one year of age with inpatient expenditures accounting for most of the cost (87% of total expenditures) (Figure 5a). Children less than one year of age accounted for 39% of all inpatient expenditures (Figure 5b).

Table 8a. Fee-for-service expenditures among CCS enrolled children age < 1 year by eligible diagnosis, FY 2009

Eligible diagnosis	N Children †	Total expenditures		Hospitalizations		Emergency department visit		Outpatient procedures		Provider visits		Outpatient prescriptions	
		Total \$	Per child#	Total \$	Per child#	Total \$	Per child #	Total \$	Per child#	Total \$	Per child #	Total \$	Per child#
All conditions	25024	487,555,000	19,483	426,225,063	50,929	1,289,744	193	24,722,692	1,518	18,444,678	1,085	16,872,823	1,886
Nephrology	55	3,254,197	59,167	3,041,501	98,113	4,880	139	61,522	1,465	52,713	1,318	93,580	4,679
Gastroenterology	590	27,312,095	46,292	24,834,289	76,886	53,547	178	809,151	1,974	731,606	1,655	883,502	2,945
Surgery	355	15,622,299	44,006	14,680,382	80,661	30,555	197	380,633	1,746	266,959	1,192	263,771	1,807
Neurology/Neurosurgery	1395	45,213,288	32,411	38,443,181	57,037	175,774	253	3,085,831	2,863	1,843,220	1,795	1,665,282	2,598
Dental	11	347,730	31,612	217,167	31,024	1,022	255	100,597	9,145	21,227	2,123	7,716	857
Ophthalmology	862	24,247,501	28,129	21,925,334	80,905	29,884	153	870,556	1,527	806,441	1,264	615,285	1,773
Pulmonary	240	6,532,784	27,220	4,846,445	55,073	21,750	236	506,945	2,640	233,762	1,257	923,882	7,107
NICU	4481	116,819,158	26,070	106,773,720	56,049	186,514	213	3,755,343	1,681	2,822,686	1,128	3,280,895	2,142
Hematology/Oncology	466	12,108,468	25,984	10,643,543	50,443	30,480	132	658,704	1,856	355,324	1,004	420,419	1,974
Obstetrics-Gynecology	26	598,618	23,024	572,073	63,564	323	54	16,692	1,043	7,349	490	2,181	242
General Pediatrics/ Behavior & Development	2077	46,668,160	22,469	42,460,508	62,168	105,499	234	1,418,821	1,118	1,168,942	961	1,514,389	1,944
Cardiology/Cardiothoracic Surgery	4873	85,717,004	17,590	70,598,443	54,390	207,401	157	5,693,683	1,720	4,813,693	1,253	4,403,784	2,477
Other	2174	36,957,418	17,000	33,526,012	42,927	68,227	155	1,412,536	1,519	1,083,679	898	866,964	1,421
Infectious diseases	252	4,258,549	16,899	3,869,938	56,086	19,965	250	236,474	1,292	66,164	427	66,006	695
ENT	2417	27,980,962	11,577	22,571,454	32,807	97,982	178	2,825,243	1,503	1,705,761	1,000	780,521	960
Genetic	339	3,458,136	10,201	2,683,361	33,542	18,246	177	323,596	1,274	175,155	682	257,778	1,516
Endocrine	584	5,587,464	9,568	4,631,872	39,253	28,222	175	378,138	886	260,902	593	288,330	1,019
Urology	1264	10,330,688	8,173	8,617,366	24,834	73,598	222	763,875	768	648,297	703	227,551	573
External/Injury	606	4,671,455	7,709	4,093,577	13,645	83,199	257	259,627	683	192,625	554	42,428	307
Dermatology	187	1,202,042	6,428	927,693	24,413	5,569	118	111,168	756	124,204	839	33,407	548
Orthopedics	1410	7,622,502	5,406	5,496,540	23,390	35,595	151	913,558	783	990,694	864	186,114	502
Rheumatology	83	314,150	3,785	210,959	19,178	921	61	74,202	1,091	21,828	574	6,240	250
Speech/Visual/Hearing Loss	277	730,334	2,637	559,705	27,985	10,590	258	65,796	424	51,446	357	42,796	535

†Number of children with condition

#Calculated based on the number of children with the measure within the condition (e.g. hospitalization expenditures per child for cardiology refers to the total cost of all inpatient stays divided by the number of children with a cardiology condition who had at least one hospitalization)

Table 8b. Fee-for-service expenditures among CCS enrolled children age >= 1 year by eligible diagnosis, FY 2009

Eligible diagnosis	N Children †	Total expenditures		Hospitalization		Emergency department visit		Outpatient procedures		Provider visits		Outpatient prescriptions	
		Total \$	Per child#	Total \$	Per child#	Total \$	Per child#	Total \$	Per child #	Total \$	Per child#	Total \$	Per child#
All conditions	133050	1,331,915,045	10,011	659,531,598	31,357	11,892,129	406	267,001,852	2,681	126,925,067	1,327	266,564,400	5,301
Hematology/Oncology	8814	304,150,442	34,508	178,455,600	72,337	880,033	283	26,143,699	3,571	12,535,553	1,748	86,135,557	20,421
Pulmonary	1444	43,368,559	30,034	25,402,122	46,354	190,678	317	2,444,181	2,282	1,924,593	1,913	13,406,985	14,370
Infectious diseases	1446	38,040,073	26,307	18,750,598	56,820	94,753	235	3,974,083	3,486	1,179,405	1,163	14,041,233	17,061
Genetic	1222	23,633,317	19,340	5,445,038	30,938	67,603	242	8,326,153	8,139	1,400,085	1,527	8,394,438	11,643
Nephrology	1898	36,490,749	19,226	20,524,198	34,553	266,550	404	6,229,474	3,884	1,978,073	1,317	7,492,455	6,291
Surgery	417	6,935,958	16,633	3,943,132	32,058	57,651	367	1,260,645	4,423	550,039	2,149	1,124,491	7,255
Gastroenterology	3496	55,166,888	15,780	38,183,615	32,719	506,952	375	6,172,648	2,538	2,218,455	971	8,085,218	4,936
Neurology/Neurosurgery	23538	345,722,580	14,688	114,197,067	28,830	1,707,585	264	118,724,374	5,767	55,909,161	3,033	55,184,392	4,177
Other	2709	32,930,781	12,156	15,290,623	33,168	241,684	430	10,623,676	5,536	4,043,846	2,370	2,730,953	3,483
Rheumatology	2142	23,216,745	10,839	11,904,205	34,605	189,740	388	4,372,173	2,449	1,413,052	840	5,337,575	4,485
External/Injury	13287	110,680,533	8,330	89,469,317	21,156	4,803,206	954	8,809,032	1,025	5,405,481	708	2,193,497	1,014
Dermatology	976	6,623,195	6,786	2,916,792	22,967	37,792	229	1,408,431	1,822	802,990	1,108	1,457,190	4,212
NICU	2051	13,581,907	6,622	4,071,502	23,950	125,603	291	5,744,520	3,943	1,251,036	1,222	2,389,247	3,282
Endocrine	11778	72,597,087	6,164	23,827,932	14,538	1,105,224	456	8,996,935	978	4,916,812	557	33,750,184	4,302
Psychiatry	35	190,755	5,450	101,323	10,132	36,595	2,815	45,083	1,878	6,370	398	1,383	230
Cardiology/ Cardiothoracic Surgery	16234	84,864,213	5,228	46,735,873	30,191	519,822	214	15,855,960	1,486	9,215,052	728	12,537,506	2,763
Orthopedics	8571	42,573,095	4,967	27,685,885	23,908	275,335	270	7,325,345	1,134	4,806,656	767	2,479,874	1,356
Obstetrics-Gynecology	126	560,125	4,445	397,931	14,212	6,745	241	70,153	961	55,337	758	29,957	881
Urology	4680	15,845,305	3,386	10,070,994	16,983	187,120	266	2,551,771	723	1,856,847	581	1,178,573	1,062
ENT	18333	56,653,651	3,090	15,981,695	15,886	343,402	176	22,967,694	1,670	11,190,656	870	6,170,204	1,349
General Pediatrics/ Behavior & Development	1154	2,335,606	2,024	1,303,849	21,375	34,061	200	593,856	872	164,089	329	239,751	948
Ophthalmology	7054	13,389,297	1,898	3,313,195	15,702	171,809	246	3,979,273	886	3,930,531	727	1,994,489	1,148
Dental	1088	1,946,076	1,789	1,451,535	19,354	30,734	394	170,072	580	121,830	417	171,905	1,364
Speech/Visual/Hearing Loss	557	418,109	751	107,576	15,368	11,451	201	212,623	499	49,116	230	37,344	277

†Number of children with condition; number of children with all conditions is greater than number of children in FY2009 because children may have more than one condition

#Calculated based on the number of children with the measure within the condition (e.g. hospitalization expenditures per child for hematology/oncology refers to the total cost of all inpatient stays divided by the number of children with a hematology/oncology condition who had at least one hospitalization)

Figure 4. Total expenditures among CCS-enrolled children for fee-for-service claims, FY 2009

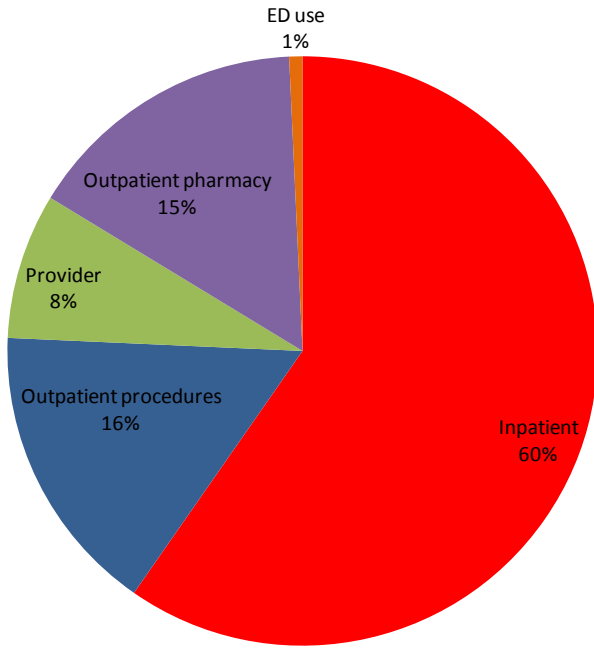


Figure 5a. Total expenditures by age group, FY 2009

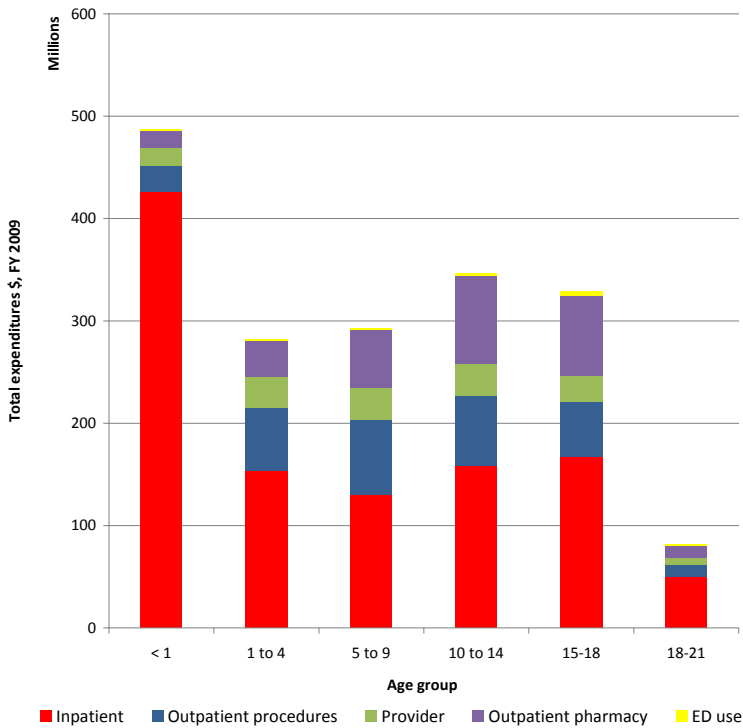
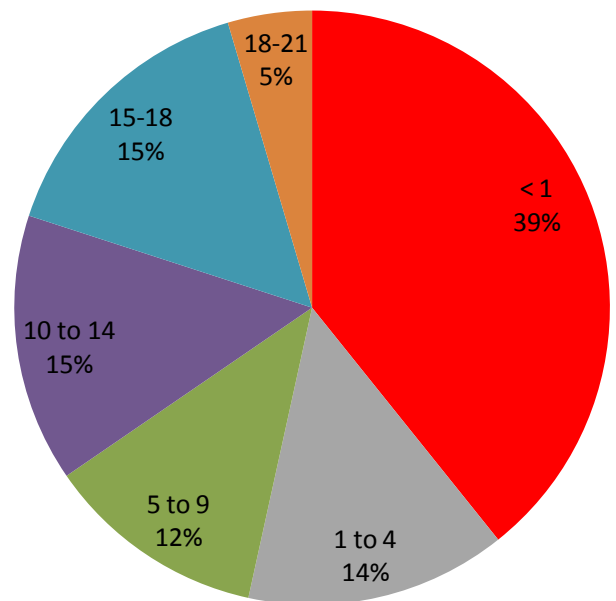


Figure 5b. Inpatient expenditures by age group, FY 2009



Among children age < 1, NICU, cardiology, general pediatrics/behavior and development, neurology, other conditions, ENT and gastroenterology were the leading eligible diagnoses and accounted for 80% of total expenditures and 72% of all children (Figure 6a). Among older children, neurology, hematology/oncology, injury, cardiology, endocrine, ENT and gastroenterology accounted for 77% of total expenditures which represented 72% of older children (Figure 6b); of note, 18% of children had a neurology diagnosis and accounted for 26% of total expenditures; similarly 7% of children had a hematology/oncology eligible diagnosis and accounted for 23% of total expenditures (Figure 6b).

Figure 6a. Percent of total expenditures and percent of all children less than one year of age for eligible conditions with largest expenditures, FY 2009

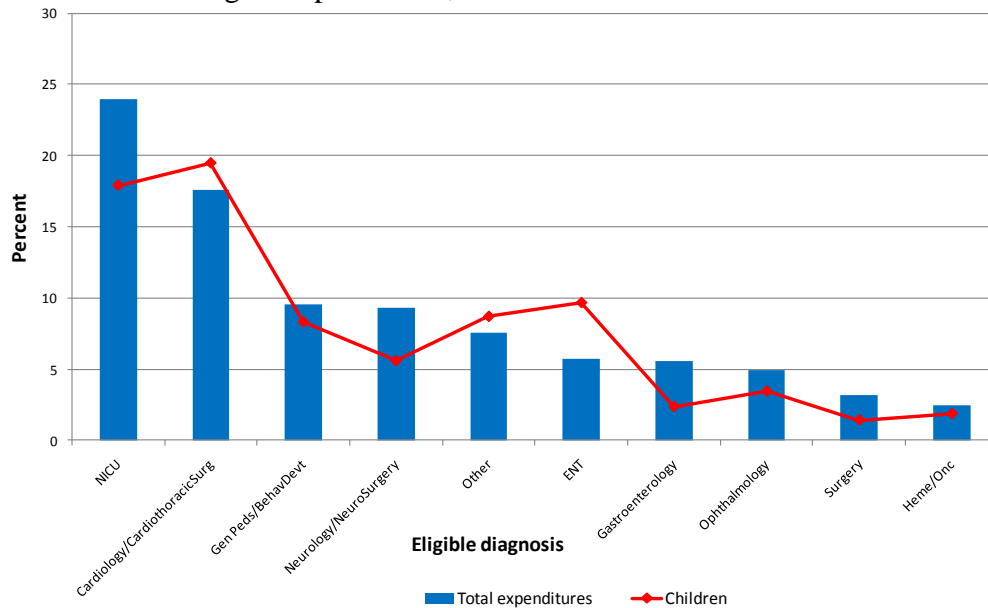


Figure 6b. Percent of total expenditures and children age >= 1 year for eligible conditions with largest expenditures, FY 2009

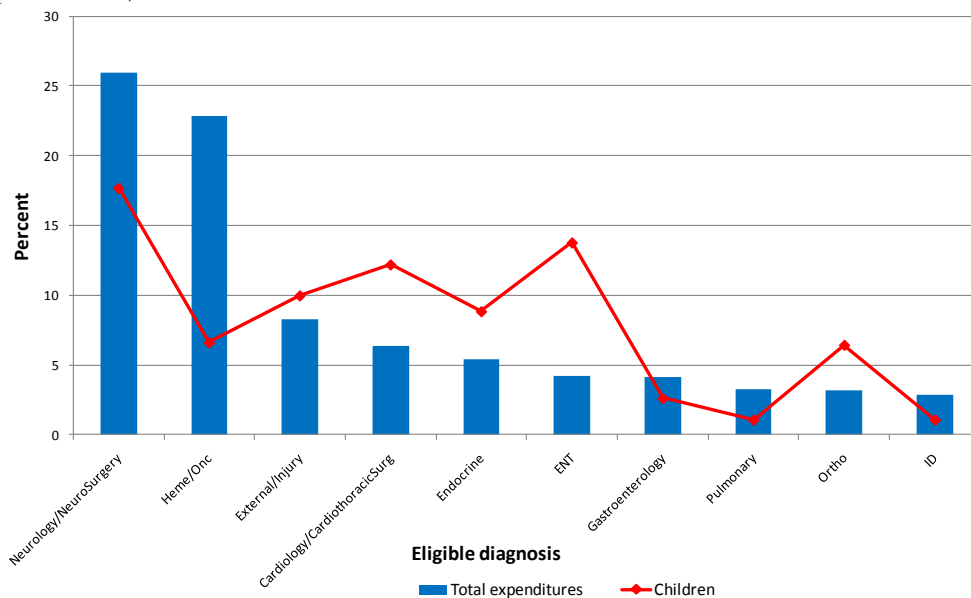


Figure 7a. Expenditures among children < 1 year of age for select eligible conditions, FY 2009

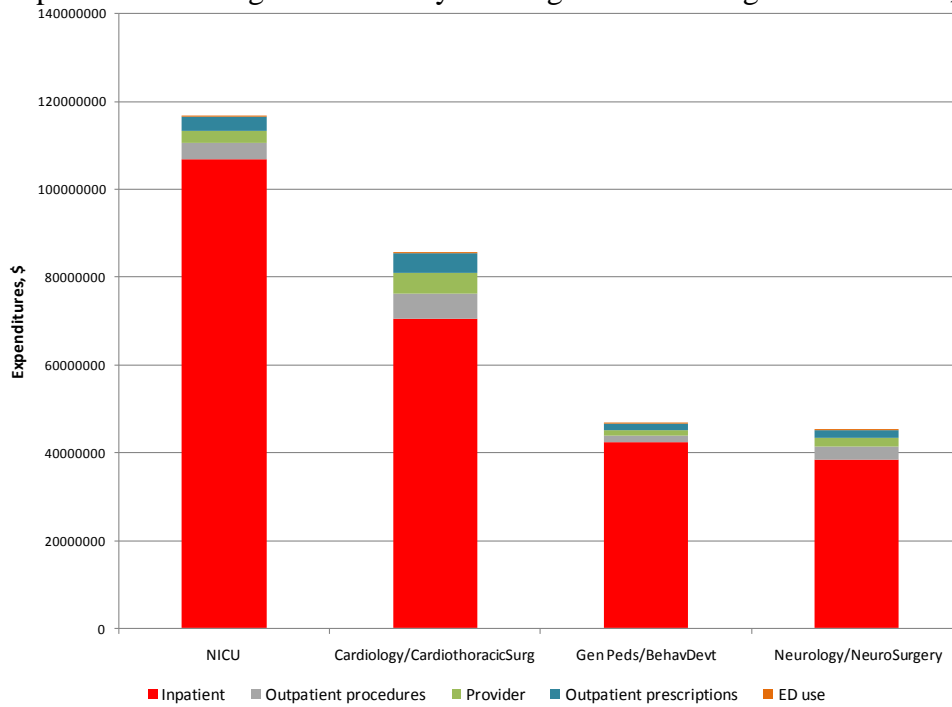
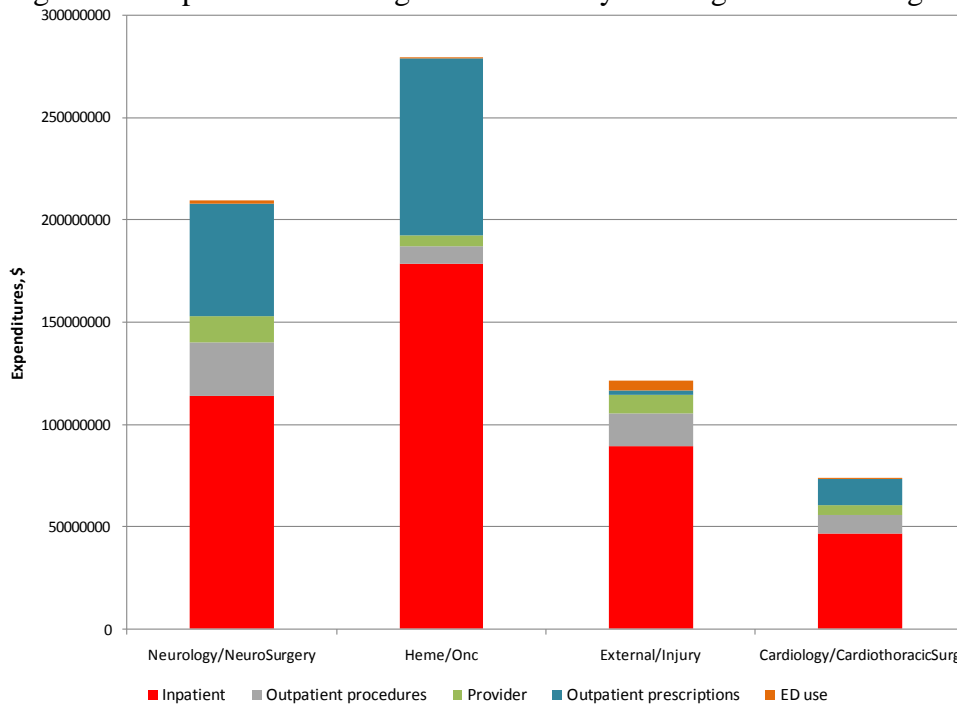


Figure 7b. Expenditures among children >= 1 year of age for select eligible conditions, FY 2009

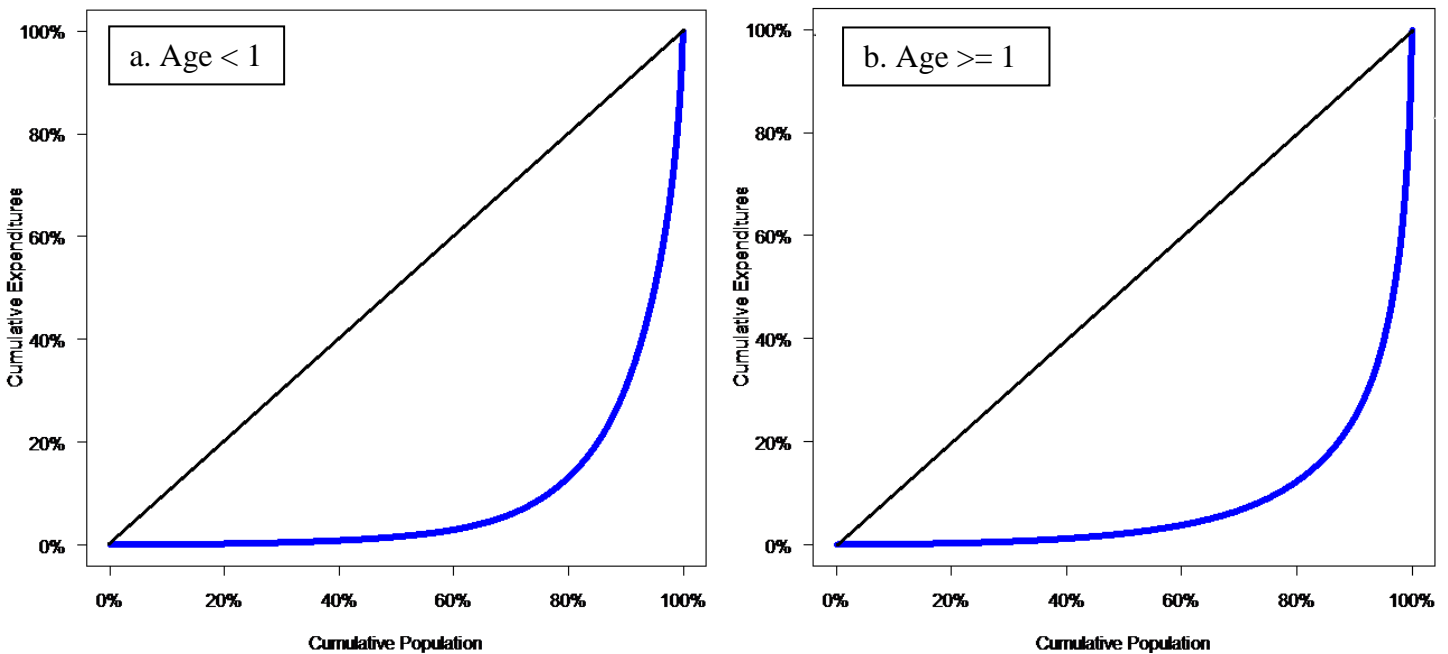


Figures 7a and 7b shows the distribution of the expenditures by type of service for the four most prevalent eligible conditions among children less than one year of age and older children, respectively. Similar to what was seen for expenditures among all children, inpatient

expenditures accounted for most of the expenditures for all four of the leading eligible conditions.

Figures 8a and 8b show the distribution of total expenditures per child among children age < 1 and those age  $\geq 1$ , respectively. The cumulative population is on the x-axis and the cumulative total expenditures are on the y-axis. For both groups of children, a similar pattern of expenditures per child is seen. Most of the children have low expenditures with a small group of children accounting for a majority of the expenditures. Among children age < 1 year, 10% of the children accounted for 69% of total expenditures and among children age  $\geq 1$  year, 10% of the children accounted for 75%.

Figure 8. Distribution of total expenditures per child, FY 2009



### Geographic variation

Table 9 shows the number of children, percent of fee-for-service claims and percent of fee-for-service expenditures in each county. For both age groups, Los Angeles and San Diego had the largest number of CCS-enrolled children in FY 2009 and accounted for the largest percent of all claims and all fee-for-service expenditures. The first 12 counties listed on the table accounted for 75% of all children, claims and fee-for-service expenditures (Table 9).

Table 9. Percentage of total utilization\* and fee-for-service expenditures<sup>†</sup> by county, FY 2009

	Age < 1				Age >= 1			
	N children	% of children	% of utilization	% of FFS expenditures	N children	% of children	% of utilization	% of FFS expenditures
Los Angeles	4551	18.2	21.5	22.9	24795	18.6	22.6	21.6
San Diego	2305	9.2	8.1	7.8	13630	10.2	9.4	9.5
Orange	1403	5.6	5.9	4.7	9979	7.5	7.9	8.2
San Bernardino	1693	6.8	6.8	8.0	9632	7.2	7.2	8.2
Riverside	1636	6.5	6.1	6.5	8549	6.4	7.0	8.2
Fresno	1458	5.8	5.6	5.1	7318	5.5	4.5	4.2
Kern	1075	4.3	3.6	3.9	5347	4.0	3.5	3.4
Santa Clara	932	3.7	3.6	3.8	5092	3.8	3.1	3.6
Sacramento	879	3.5	3.5	3.2	4726	3.6	3.7	3.8
Alameda	885	3.5	3.6	3.4	4495	3.4	2.5	2.4
Tulare	771	3.1	3.1	3.9	3413	2.6	2.5	2.5
San Joaquin	873	3.5	3.2	3.1	3377	2.5	2.1	2.0
Stanislaus	536	2.1	2.3	2.0	2876	2.2	1.8	1.7
Contra Costa	589	2.4	2.3	2.1	2740	2.1	2.0	2.0
Ventura	574	2.3	2.4	2.3	2625	2.0	2.1	2.0
Monterey	603	2.4	2.0	1.8	2344	1.8	1.5	1.8
Merced	287	1.1	1.3	1.1	1805	1.4	1.2	1.0
San Francisco	260	1.0	1.0	0.6	1790	1.3	1.2	1.4
Santa Barbara	328	1.3	1.0	0.3	1596	1.2	0.9	0.5
San Mateo	346	1.4	1.3	0.3	1488	1.1	1.0	0.4
Santa Cruz	421	1.7	1.2	1.3	1437	1.1	0.9	0.9
Imperial	230	0.9	1.2	1.1	1352	1.0	1.0	0.7
Sonoma	252	1.0	1.1	1.4	1279	1.0	1.0	1.7
San Luis Obispo	179	0.7	0.6	0.5	894	0.7	0.6	0.6
Solano	167	0.7	0.4	0.5	826	0.6	0.5	0.3
Madera	161	0.6	1.0	0.7	804	0.6	0.7	0.7
Butte	124	0.5	0.5	0.4	773	0.6	0.8	0.7
Humboldt	147	0.6	0.4	0.3	739	0.6	0.6	0.6
Shasta	134	0.5	0.6	1.2	729	0.5	0.7	0.6
Kings	138	0.6	0.7	0.8	683	0.5	0.7	0.5
Placer	128	0.5	0.5	0.4	624	0.5	0.7	0.6
Yolo	114	0.5	0.2	0.0	555	0.4	0.3	0.1
Mendocino	93	0.4	0.3	0.3	528	0.4	0.4	0.4
Sutter	69	0.3	0.4	1.2	419	0.3	0.3	0.3



Table 9. Percentage of total utilization\* and fee-for-service expenditures<sup>†</sup> by county, FY 2009  
(continued)

County	Age < 1				Age >= 1			
	N children	% of children	% of utilization	% of FFS expenditures	N children	% of children	% of utilization	% of FFS expenditures
El Dorado	69	0.3	0.3	0.3	391	0.3	0.4	0.2
Marin	77	0.3	0.3	0.3	387	0.3	0.3	0.3
Napa	87	0.3	0.1	0.1	337	0.3	0.2	0.1
Yuba	59	0.2	0.3	0.4	310	0.2	0.2	0.3
Lake	46	0.2	0.2	0.2	297	0.2	0.2	0.3
Tehama	52	0.2	0.3	0.3	290	0.2	0.3	0.4
Nevada	26	0.1	0.1	0.1	252	0.2	0.2	0.2
San Benito	44	0.2	0.2	0.2	210	0.2	0.1	0.2
Siskiyou	38	0.2	0.1	0.1	176	0.1	0.1	0.1
Tuolumne	25	0.1	0.1	0.2	161	0.1	0.1	0.2
Glenn	25	0.1	0.2	0.1	140	0.1	0.1	0.1
Del Norte	15	0.1	0.0	0.1	131	0.1	0.1	0.1
Calaveras	18	0.1	0.1	0.2	120	0.1	0.1	0.1
Colusa	24	0.1	0.1	0.1	105	0.1	0.1	0.1
Inyo	15	0.1	0.0	0.0	84	0.1	0.1	0.1
Amador	< 10	0.0	0.0	0.0	78	0.1	0.1	0.1
Lassen	15	0.1	0.1	0.1	78	0.1	0.1	0.1
Mono	15	0.1	0.0	0.0	56	0.0	0.0	0.0
Mariposa	< 10	0.0	0.0	0.0	51	0.0	0.0	0.0
Trinity	< 10	0.0	0.0	0.0	49	0.0	0.0	0.1
Modoc	< 10	0.0	0.0	0.1	40	0.0	0.0	0.1
Plumas	< 10	0.0	0.0	0.0	36	0.0	0.0	0.0
Sierra					< 10	0.0	0.0	0.0
Alpine					< 10	0.0	0.0	0.0

FFS=fee-for-service

\*Total utilization is the sum of bed days, outpatient procedures, outpatient prescriptions, emergency department, provider, EPSDT and dental visit

†Total FFS expenditures is the sum of FFS expenditures for inpatient services, outpatient procedures and prescriptions, emergency department and provider visits

Tables 10a and 10b show the variation in total expenditures, distribution of expenditures and expenditure types per child by county for children age < 1 and children age >= 1, respectively. There was considerable variation in the total per child expenditures as well as different expenditure types between counties. For example, among children age < 1, Los Angeles had the largest number of children and largest total expenditures, however, the per child expenditures were much lower than for other counties. For most of the counties, inpatient expenditures

accounted for more than 80% of total expenditures, but there was considerable variation in the inpatient expenditures per child by county (Table 10a).

Among children age  $\geq 1$ , there was even more variation between counties for the per child expenditures, as well as the distribution of the types of expenditures. For example, in Los Angeles the total expenditures per child were \$11,598 as compared to San Diego where total expenditures per child were \$9,300. Inpatient expenditures accounted for 39% of total expenditures in Los Angeles, but 51% in San Diego. Inpatient expenditures per child in Los Angeles were lower than San Diego but outpatient and pharmacy expenditures per child were higher (Table 10b).

Table 10a. Variation in FFS expenditures and distribution of expenditures per child by county among children age < 1, FY 2009

County	N Children	Total expenditures†			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
All counties	25024	487,555,000	100	19,483	87.4	3.8	5.1	3.5	50,929	1,085	1,518	1,886
Los Angeles	4551	111,559,491	22.9	24,513	87.1	3.2	5.4	4.1	56,847	1,076	2,046	2,360
San Diego	2305	38,228,780	7.8	16,585	90.0	2.6	3.5	3.5	44,929	602	795	1,957
San Bernardino	1693	39,214,975	8.0	23,163	88.7	3.6	4.5	3.0	49,457	1,202	1,943	2,034
Riverside	1636	31,598,581	6.5	19,315	86.2	4.9	5.1	3.6	44,724	1,272	1,829	1,771
Fresno	1458	25,100,228	5.1	17,216	86.4	4.8	3.6	4.9	47,880	1,154	890	2,267
Orange	1403	23,006,310	4.7	16,398	87.1	4.6	6.7	1.5	50,446	1,040	2,203	1,674
Kern	1075	19,227,161	3.9	17,886	89.2	4.7	2.7	3.2	58,313	1,190	728	1,885
Santa Clara	932	18,392,333	3.8	19,734	87.0	3.0	8.9	1.1	68,640	1,223	2,359	757
Alameda	885	16,584,894	3.4	18,740	87.1	4.4	7.0	1.3	54,938	1,262	1,814	641
Sacramento	879	15,814,557	3.2	17,992	86.6	6.1	3.9	3.3	45,225	1,472	1,347	1,821
San Joaquin	873	15,243,961	3.1	17,462	89.3	3.7	5.1	1.8	32,807	1,102	1,604	1,074
Tulare	771	19,221,192	3.9	24,930	91.4	2.4	4.5	1.4	61,829	1,115	1,392	1,015
Monterey	603	8,685,616	1.8	14,404	88.5	3.7	5.5	1.9	40,257	828	1,065	2,453
Contra Costa	589	10,131,170	2.1	17,201	82.6	5.9	10.7	0.8	52,299	1,469	2,346	368
Ventura	574	11,390,755	2.3	19,845	86.3	4.4	6.0	2.9	41,309	1,298	1,561	872
Stanislaus	536	9,617,469	2.0	17,943	84.6	4.9	4.2	6.1	49,903	1,156	988	2,715
Santa Cruz	421	6,455,498	1.3	15,334	89.9	4.8	3.9	0.5	43,974	1,093	1,129	1,199
San Mateo	346	1,398,779	0.3	4,043	82.6	3.5	13.2	0.7	41,248	768	1,104	244
Santa Barbara	328	1,452,940	0.3	4,430	91.8	1.6	6.1	0.3	66,687	505	725	239
Merced	287	5,245,537	1.1	18,277	79.9	5.0	6.1	8.5	45,075	1,087	1,481	2,296
San Francisco	260	3,149,465	0.6	12,113	86.5	3.3	8.3	1.7	31,297	694	1,323	771
Sonoma	252	6,677,067	1.4	26,496	86.2	2.9	3.2	7.2	67,713	1,057	1,105	3,180
Imperial	230	5,564,268	1.1	24,192	90.8	2.4	2.3	3.6	57,421	681	672	1,232
San Luis Obispo	179	2,387,979	0.5	13,341	83.9	4.9	3.9	7.1	40,082	1,029	761	6,302
Solano	167	2,645,093	0.5	15,839	97.4	1.0	1.0	0.1	99,085	788	336	124
Madera	161	3,394,472	0.7	21,084	81.8	4.3	3.2	10.2	42,085	1,044	873	2,765
Humboldt	147	1,413,169	0.3	9,613	75.4	3.4	17.0	2.8	28,024	534	1,982	531
Kings	138	3,853,710	0.8	27,925	86.2	2.9	5.7	4.9	54,449	1,078	2,023	1,931

County	N Children	Total expenditures†			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
Shasta	134	5,950,321	1.2	44,405	92.5	2.2	2.3	2.3	107,979	1,285	1,299	1,803
Placer	128	1,764,621	0.4	13,786	77.1	9.5	2.9	9.0	41,209	1,584	661	2,247
Butte	124	1,812,461	0.4	14,617	74.8	4.0	6.0	13.8	28,857	818	1,185	3,534
Yolo	114	131,845	0.0	1,157	82.3	6.0	11.0	0.2	21,703	314	346	51
Mendocino	93	1,639,746	0.3	17,632	79.2	3.4	6.8	9.5	43,301	1,054	1,245	2,599
Napa	87	526,027	0.1	6,046	96.4	1.8	1.7	0.1	63,416	940	418	75
Marin	77	1,370,240	0.3	17,795	73.2	3.7	14.2	7.9	52,820	815	2,906	2,117
El Dorado	69	1,416,361	0.3	20,527	82.6	4.6	2.5	10.0	43,314	1,256	797	3,834
Sutter	69	5,717,730	1.2	82,866	95.2	1.3	1.0	2.3	155,501	1,288	1,070	2,907
Yuba	59	1,938,246	0.4	32,852	85.1	2.9	2.6	9.1	66,004	1,092	1,076	4,530
Tehama	52	1,329,653	0.3	25,570	84.1	2.7	4.9	7.0	50,800	818	1,484	2,462
Lake	46	1,018,716	0.2	22,146	85.3	3.9	4.1	6.4	51,107	1,244	1,196	2,828
San Benito	44	800,688	0.2	18,197	81.8	5.1	10.0	2.3	65,528	1,173	2,347	536
Siskiyou	38	332,850	0.1	8,759	73.4	4.8	8.8	11.5	30,521	556	834	1,591
Nevada	26	257,257	0.1	9,895	73.1	7.2	10.2	8.1	47,025	741	1,756	1,497
Glenn	25	696,952	0.1	27,878	81.4	3.7	3.4	11.1	47,288	1,173	1,089	4,078
Tuolumne	25	820,905	0.2	32,836	89.9	4.0	4.7	1.2	92,224	1,410	1,624	637
Colusa	24	723,524	0.1	30,147	86.9	2.8	1.6	8.4	69,895	1,145	711	6,110
Calaveras	18	753,566	0.2	41,865	93.3	2.7	3.0	1.0	78,138	1,341	1,589	714
Del Norte	15	271,874	0.1	18,125	93.0	0.8	3.8	0.6	50,581	208	802	154
Inyo	15	136,562	0.0	9,104	61.2	3.3	10.3	24.5	20,909	380	1,169	3,711
Lassen	15	615,743	0.1	41,050	83.0	3.8	6.4	5.7	73,027	1,790	3,299	3,209
Mono	15	134,159	0.0	8,944	57.8	7.0	12.0	16.5	15,517	784	1,616	2,465
Amador	< 10	75,859	0.0	8,429	84.0	2.7	4.3	8.3	21,232	338	543	1,050
Modoc	< 10	294,039	0.1	36,755	89.4	4.0	4.0	2.5	87,656	1,456	1,981	1,216
Trinity	< 10	217,856	0.0	27,232	81.8	4.7	3.9	6.8	35,626	2,050	1,063	2,969
Mariposa	< 10	54,994	0.0	10,999	94.9	0.5	4.5	0.1	26,100	63	495	34
Plumas	< 10	96,754	0.0	32,251	95.8	0.7	3.2	0.2	92,724	327	1,549	91

Table 10b. Variation in FFS expenditures and distribution of expenditures per child by county among children age >= 1, FY 2009

County	N Children	Total expenditures†			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
All counties	133050	1,331,915,045	100	10,011	49.5	9.5	20.0	20.0	31,357	1,327	2,681	5,301
Modoc	40	807,298	0.1	20,182	78.3	5.2	6.2	5.1	126,380	1,174	1,525	1,326
Sonoma	1279	22,784,278	1.7	17,814	39.6	7.6	10.8	40.1	46,992	1,762	2,492	13,286
Tehama	290	4,936,354	0.4	17,022	49.3	5.1	11.6	30.2	55,303	1,015	2,162	7,072
Trinity	49	809,839	0.1	16,527	68.9	8.4	8.7	5.1	46,513	1,706	1,858	1,204
Lassen	78	1,114,794	0.1	14,292	44.0	6.8	7.9	39.4	40,842	1,220	1,369	8,610
San Benito	210	2,787,471	0.2	13,274	48.4	7.9	13.2	29.3	48,152	1,315	2,265	6,059
Riverside	8549	108,663,180	8.2	12,711	47.4	8.9	22.9	20.2	33,014	1,524	4,273	6,264
Tuolumne	161	2,025,631	0.2	12,582	41.7	10.3	22.1	24.8	36,746	1,626	3,359	4,880
Placer	624	7,728,613	0.6	12,386	44.5	16.2	19.0	19.5	37,770	2,321	3,337	3,662
Amador	78	964,134	0.1	12,361	39.0	6.9	38.5	15.1	53,724	1,091	5,898	3,098
Colusa	105	1,296,134	0.1	12,344	64.2	5.8	13.3	14.3	69,306	806	1,980	3,640
Butte	773	9,292,809	0.7	12,022	47.4	18.5	13.0	18.4	26,204	2,591	1,812	2,941
Madera	804	9,566,548	0.7	11,899	52.4	9.5	11.7	25.4	40,081	1,281	1,606	3,891
Lake	297	3,488,647	0.3	11,746	52.0	14.3	14.8	16.3	42,182	2,245	1,990	2,981
Los Angeles	24795	287,569,846	21.6	11,598	39.0	9.2	27.9	23.6	26,967	1,388	4,212	6,685
Shasta	729	8,287,220	0.6	11,368	40.0	11.8	27.0	17.4	25,712	1,559	3,645	2,822
Plumas	36	408,197	0.0	11,339	59.4	16.7	13.4	9.0	30,322	2,627	1,821	2,150
San Bernardino	9632	109,082,995	8.2	11,325	52.0	9.6	19.1	18.5	30,628	1,465	3,281	5,111
Yuba	310	3,430,193	0.3	11,065	49.2	7.4	11.4	29.9	33,736	967	1,545	5,159
Orange	9979	109,058,333	8.2	10,929	51.4	8.5	21.9	17.6	38,606	1,223	3,526	7,332
Mendocino	528	5,700,194	0.4	10,796	60.7	6.7	14.5	15.7	45,561	990	1,735	2,591
Humboldt	739	7,940,327	0.6	10,745	55.3	14.2	12.1	15.4	36,869	2,053	1,513	2,728
Sacramento	4726	50,559,434	3.8	10,698	47.2	10.8	17.7	23.3	29,252	1,548	2,850	6,812
Marin	387	4,110,702	0.3	10,622	50.3	10.3	24.5	13.7	31,325	1,496	3,301	2,588
Kings	683	7,131,358	0.5	10,441	49.8	9.0	21.7	18.1	34,499	1,202	2,512	2,764
Nevada	252	2,604,756	0.2	10,336	34.4	29.3	12.7	21.9	23,596	3,539	1,698	3,477
Glenn	140	1,446,693	0.1	10,334	46.1	16.0	12.9	24.0	28,978	1,973	1,714	4,634
San Francisco	1790	18,448,775	1.4	10,307	57.3	7.4	20.3	14.6	36,459	1,290	2,646	5,651
Monterey	2344	23,523,305	1.8	10,036	66.8	8.8	12.3	10.3	41,934	1,240	1,562	4,470

County	N Children	Total expenditures†			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
Ventura	2625	26,159,252	2.0	9,965	55.6	9.7	20.1	14.1	33,728	1,328	2,307	2,304
Del Norte	131	1,305,452	0.1	9,965	60.5	9.5	13.5	14.7	39,463	1,198	1,541	2,282
Contra Costa	2740	27,041,092	2.0	9,869	47.8	9.0	24.4	17.7	31,386	1,369	3,021	5,545
Calaveras	120	1,180,114	0.1	9,834	46.0	8.8	18.0	23.6	45,260	1,019	2,209	3,318
Tulare	3413	33,295,075	2.5	9,755	54.4	7.0	14.0	23.3	35,122	945	1,556	6,797
Sutter	419	4,075,644	0.3	9,727	41.1	9.9	17.8	30.0	31,052	1,123	2,329	4,416
Mono	56	532,098	0.0	9,502	45.1	5.9	18.8	29.9	26,641	710	2,131	6,119
Inyo	84	797,425	0.1	9,493	69.2	6.2	13.7	9.8	39,425	729	1,419	1,663
Santa Clara	5092	47,654,674	3.6	9,359	59.6	9.0	18.7	12.2	42,364	1,688	2,301	4,228
San Diego	13630	126,757,566	9.5	9,300	51.6	9.6	17.6	20.1	29,119	1,172	1,993	5,515
Kern	5347	45,006,741	3.4	8,417	55.6	10.4	13.8	19.1	32,018	1,184	1,528	4,485
Santa Cruz	1437	12,058,003	0.9	8,391	58.7	9.9	13.4	15.4	42,366	1,085	1,748	5,847
El Dorado	391	3,276,657	0.2	8,380	36.2	13.4	22.8	25.8	21,545	1,355	2,270	3,266
San Luis Obispo	894	7,385,356	0.6	8,261	51.7	9.2	21.0	16.5	34,679	1,067	2,326	4,392
Mariposa	51	419,208	0.0	8,220	56.5	6.8	10.1	26.1	26,308	658	966	3,312
Stanislaus	2876	22,371,014	1.7	7,779	54.8	13.1	13.1	17.8	28,401	1,360	1,323	3,715
Alpine	< 10	23,225	0.0	7,742	0.0	14.2	36.9	48.5		1,101	4,288	3,751
San Joaquin	3377	25,972,649	2.0	7,691	53.3	12.1	13.8	20.5	27,945	1,350	1,501	4,555
Fresno	7318	56,174,602	4.2	7,676	55.5	10.1	13.9	19.7	24,756	1,097	1,401	5,001
Merced	1805	13,324,132	1.0	7,382	52.8	12.2	14.3	19.4	24,856	1,070	1,254	2,170
Alameda	4495	32,041,065	2.4	7,128	55.8	9.9	16.6	16.3	24,410	1,123	1,597	3,576
Siskiyou	176	1,208,399	0.1	6,866	39.5	13.5	19.9	24.5	19,111	1,165	1,611	2,506
Imperial	1352	9,143,761	0.7	6,763	57.2	11.4	13.1	16.2	28,745	922	1,011	1,518
Sierra	< 10	57,926	0.0	6,436	70.3	3.4	5.8	19.3	20,354	279	671	1,862
Napa	337	1,610,139	0.1	4,778	76.4	4.6	8.4	10.2	55,898	773	732	3,359
Santa Barbara	1596	6,757,383	0.5	4,234	72.8	4.8	12.6	8.5	70,233	751	907	2,474
Solano	826	3,334,224	0.3	4,037	68.9	4.4	12.6	12.2	52,213	741	1,061	4,422
San Mateo	1488	5,833,513	0.4	3,920	64.8	4.2	22.0	8.6	52,540	650	1,691	4,111
Yolo	555	1,550,597	0.1	2,794	47.4	10.3	17.2	22.2	26,276	882	1,046	4,099

FFS=fee-for-service; †Total FFS expenditures is the sum of FFS expenditures for inpatient services, outpatient procedures and prescriptions, emergency department and provider visits

Since inpatient expenditures accounted for such a large percent of expenditure, we examined inpatient utilization by county to determine geographic variation. Tables 11a and 11b show the hospitalizations, bed-days and utilization per child among children age < 1 and children age >= 1, respectively. For children age < 1, while inpatient expenditures accounted for most of the total expenditures, there was considerable variation in the inpatient expenditures per child as well as the hospitalizations and bed-days per child between counties (Table 11a). For example, in Santa Clara which was one of the counties with a large number of CCS children, inpatient expenditures per child were high; 27.5% of children were hospitalized with an average of 33.7 bed-days per child and 23.1 bed-days per hospitalization. In comparison, in Sacramento which had a comparable number of CCS children, inpatient expenditures per child were about \$23,000 lower than Santa Clara, 36.3% of children were hospitalized with 30.7 bed-days per child and 21.7 bed-days per hospitalization (Table 11a).

Among children age >= 1 year, there was variation in the contribution of inpatient expenditures to total expenditures by county. For example, in Sonoma which had a large number of CCS enrolled children, inpatient expenditures per child were lower than other counties and only accounted for 39.6 of total expenditures. In comparison, in Santa Cruz which had a comparable number of CCS children and slightly lower inpatient expenditures per child, inpatient expenditures accounted for 58.7% of total expenditures; children who were hospitalized had lower bed-days per child and lower bed-days per hospitalization compared to Sonoma (Table 11b).

Table 11a. Variation in inpatient utilization by county among children age < 1 year, FY 2009

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
All counties	25024	19,483	87.4	426,225,063	50,929	1,594	8933	35.7	12760	267310	1.4	29.9	20.9
Sutter	69	82,866	95.2	5,442,529	155,501	5,852	35	50.7	50	930	1.4	26.6	18.6
Shasta	134	44,405	92.5	5,506,923	107,979	3,635	51	38.1	82	1515	1.6	29.7	18.5
Calaveras	18	41,865	93.3	703,243	78,138	1,932	< 10	50.0	11	364	1.2	40.4	33.1
Lassen	15	41,050	83.0	511,188	73,027	1,521	< 10	46.7	26	336	3.7	48.0	12.9
Modoc	< 10	36,755	89.4	262,968	87,656	1,865	< 10	37.5	6	141	2.0	47.0	23.5
Yuba	59	32,852	85.1	1,650,108	66,004	1,696	25	42.4	35	973	1.4	38.9	27.8
Tuolumne	25	32,836	89.9	737,791	92,224	1,936	< 10	32.0	13	381	1.6	47.6	29.3
Plumas	< 10	32,251	95.8	92,724	92,724	1,496	< 10	33.3	1	62	1.0	62.0	62.0
Colusa	24	30,147	86.9	629,059	69,895	1,221	< 10	37.5	10	515	1.1	57.2	51.5
Kings	138	27,925	86.2	3,321,406	54,449	1,953	61	44.2	91	1701	1.5	27.9	18.7
Glenn	25	27,878	81.4	567,453	47,288	1,401	12	48.0	19	405	1.6	33.8	21.3
Trinity	< 10	27,232	81.8	178,132	35,626	2,001	< 10	62.5	6	89	1.2	17.8	14.8
Sonoma	252	26,496	86.2	5,755,582	67,713	2,351	85	33.7	124	2448	1.5	28.8	19.7
Tehama	52	25,570	84.1	1,117,609	50,800	2,617	22	42.3	29	427	1.3	19.4	14.7
Tulare	771	24,930	91.4	17,559,512	61,829	2,236	294	38.1	416	7853	1.4	26.7	18.9
Los Angeles	4551	24,513	87.1	97,150,712	56,847	1,471	1784	39.2	2620	66062	1.5	37.0	25.2
Imperial	230	24,192	90.8	5,053,051	57,421	1,940	88	38.3	123	2605	1.4	29.6	21.2
San Bernardino	1693	23,163	88.7	34,768,105	49,457	1,418	722	42.6	1016	24520	1.4	34.0	24.1
Lake	46	22,146	85.3	868,825	51,107	1,671	17	37.0	17	520	1.0	30.6	30.6
Madera	161	21,084	81.8	2,777,615	42,085	1,627	66	41.0	98	1707	1.5	25.9	17.4
El Dorado	69	20,527	82.6	1,169,470	43,314	1,576	27	39.1	46	742	1.7	27.5	16.1
Ventura	574	19,845	86.3	9,831,427	41,309	1,671	238	41.5	301	5884	1.3	24.7	19.5
Santa Clara	932	19,734	87.0	15,993,110	68,640	1,853	256	27.5	374	8632	1.5	33.7	23.1
Riverside	1636	19,315	86.2	27,236,900	44,724	1,411	637	38.9	917	19305	1.4	30.3	21.1
Alameda	885	18,740	87.1	14,448,752	54,938	1,571	276	31.2	389	9198	1.4	33.3	23.6



County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
Merced	287	18,277	79.9	4,192,019	45,075	1,605	94	32.8	126	2612	1.3	27.8	20.7
San Benito	44	18,197	81.8	655,281	65,528	1,815	10	22.7	14	361	1.4	36.1	25.8
Del Norte	15	18,125	93.0	252,903	50,581	2,090	< 10	33.3	7	121	1.4	24.2	17.3
Sacramento	879	17,992	86.6	13,703,150	45,225	1,400	319	36.3	454	9787	1.4	30.7	21.6
Stanislaus	536	17,943	84.6	8,134,113	49,903	1,562	174	32.5	271	5209	1.6	29.9	19.2
Kern	1075	17,886	89.2	17,144,106	58,313	1,823	314	29.2	451	9403	1.4	29.9	20.8
Marin	77	17,795	73.2	1,003,588	52,820	1,941	19	24.7	35	517	1.8	27.2	14.8
Mendocino	93	17,632	79.2	1,299,038	43,301	2,017	30	32.3	43	644	1.4	21.5	15.0
San Joaquin	873	17,462	89.3	13,614,850	32,807	1,362	445	51.0	575	9998	1.3	22.5	17.4
Fresno	1458	17,216	86.4	21,689,542	47,880	1,766	475	32.6	689	12281	1.5	25.9	17.8
Contra Costa	589	17,201	82.6	8,367,837	52,299	1,601	170	28.9	239	5226	1.4	30.7	21.9
San Diego	2305	16,585	90.0	34,415,435	44,929	1,727	782	33.9	1096	19926	1.4	25.5	18.2
Orange	1403	16,398	87.1	20,027,172	50,446	1,610	444	31.6	695	12441	1.6	28.0	17.9
Solano	167	15,839	97.4	2,576,218	99,085	2,859	30	18.0	38	901	1.3	30.0	23.7
Santa Cruz	421	15,334	89.9	5,804,615	43,974	1,777	149	35.4	205	3266	1.4	21.9	15.9
Butte	124	14,617	74.8	1,356,294	28,857	1,519	47	37.9	62	893	1.3	19.0	14.4
Monterey	603	14,404	88.5	7,689,041	40,257	1,566	220	36.5	328	4911	1.5	22.3	15.0
Placer	128	13,786	77.1	1,359,907	41,209	1,719	34	26.6	45	791	1.3	23.3	17.6
San Luis Obispo	179	13,341	83.9	2,004,099	40,082	1,427	53	29.6	76	1404	1.4	26.5	18.5
San Francisco	260	12,113	86.5	2,722,828	31,297	1,039	92	35.4	137	2620	1.5	28.5	19.1
Mariposa	< 10	10,999	94.9	52,200	26,100	2,175	< 10	40.0	2	24	1.0	12.0	12.0
Nevada	26	9,895	73.1	188,101	47,025	7,235	< 10	15.4	7	26	1.8	6.5	3.7
Humboldt	147	9,613	75.4	1,064,923	28,024	1,358	38	25.9	41	784	1.1	20.6	19.1
Inyo	15	9,104	61.2	83,637	20,909	1,212	< 10	26.7	4	69	1.0	17.3	17.3
Mono	15	8,944	57.8	77,583	15,517	1,521	< 10	33.3	6	51	1.2	10.2	8.5
Siskiyou	38	8,759	73.4	244,171	30,521	1,272	< 10	23.7	12	192	1.3	21.3	16.0
Amador	< 10	8,429	84.0	63,696	21,232	2,275	< 10	33.3	4	28	1.3	9.3	7.0
Napa	87	6,046	96.4	507,325	63,416	1,697	12	13.8	13	299	1.1	24.9	23.0

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
Santa Barbara	328	4,430	91.8	1,333,741	66,687	558	93	28.4	107	2391	1.2	25.7	22.3
San Mateo	346	4,043	82.6	1,154,940	41,248	417	110	31.8	149	2769	1.4	25.2	18.6
Yolo	114	1,157	82.3	108,517	21,703	2,170	< 10	7.9	9	50	1.0	5.6	5.6

Table 11b. Variation in inpatient utilization by county among children age >= 1 year, FY 2009

County	N children	Expenditures					Hospitalizations					Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days				
All counties	133050	10,011	49.5	659,531,598	31,357	2,509	22294	16.8	34650	262884	1.6	11.8	7.6	
Modoc	40	20,182	78.3	631,901	126,380	7,706	< 10	12.5	8	82	1.6	16.4	10.3	
Sonoma	1279	17,814	39.6	9,022,527	46,992	3,770	197	15.4	276	2393	1.4	12.1	8.7	
Tehama	290	17,022	49.3	2,433,315	55,303	4,160	44	15.2	93	585	2.1	13.3	6.3	
Trinity	49	16,527	68.9	558,157	46,513	9,967	12	24.5	12	56	1.0	4.7	4.7	
Lassen	78	14,292	44.0	490,109	40,842	4,456	12	15.4	26	110	2.2	9.2	4.2	
San Benito	210	13,274	48.4	1,348,262	48,152	2,757	28	13.3	54	489	1.9	17.5	9.1	
Riverside	8549	12,711	47.4	51,535,323	33,014	2,422	1627	19.0	2581	21275	1.6	13.1	8.2	
Tuolumne	161	12,582	41.7	845,150	36,746	3,877	23	14.3	30	218	1.3	9.5	7.3	
Placer	624	12,386	44.5	3,437,106	37,770	3,185	91	14.6	153	1079	1.7	11.9	7.1	
Amador	78	12,361	39.0	376,065	53,724	6,838	< 10	9.0	8	55	1.1	7.9	6.9	
Colusa	105	12,344	64.2	831,669	69,306	3,494	12	11.4	16	238	1.3	19.8	14.9	
Butte	773	12,022	47.4	4,402,251	26,204	3,458	169	21.9	232	1273	1.4	7.5	5.5	
Madera	804	11,899	52.4	5,010,152	40,081	3,106	126	15.7	211	1613	1.7	12.8	7.6	
Lake	297	11,746	52.0	1,813,846	42,182	5,722	44	14.8	59	317	1.3	7.2	5.4	
Los Angeles	24795	11,598	39.0	112,292,528	26,967	1,949	4408	17.8	7106	57614	1.6	13.1	8.1	
Shasta	729	11,368	40.0	3,316,867	25,712	3,060	131	18.0	188	1084	1.4	8.3	5.8	
Plumas	36	11,339	59.4	242,577	30,322	5,054	< 10	22.2	11	48	1.4	6.0	4.4	
San Bernardino	9632	11,325	52.0	56,692,057	30,628	2,562	1923	20.0	3098	22125	1.6	11.5	7.1	
Yuba	310	11,065	49.2	1,686,797	33,736	2,640	51	16.5	90	639	1.8	12.5	7.1	
Orange	9979	10,929	51.4	56,017,469	38,606	2,802	1546	15.5	2449	19995	1.6	12.9	8.2	
Mendocino	528	10,796	60.7	3,462,649	45,561	3,692	76	14.4	125	938	1.6	12.3	7.5	
Humboldt	739	10,745	55.3	4,387,393	36,869	3,294	119	16.1	161	1332	1.4	11.2	8.3	
Sacramento	4726	10,698	47.2	23,869,549	29,252	2,081	875	18.5	1418	11472	1.6	13.1	8.1	
Marin	387	10,622	50.3	2,067,446	31,325	3,406	66	17.1	99	607	1.5	9.2	6.1	
Kings	683	10,441	49.8	3,553,363	34,499	2,439	103	15.1	201	1457	2.0	14.1	7.2	

County	N children	Expenditures					Inpatient expenditure per bed day	Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	N children		% children	Total admissions	Total bed days				
Nevada	252	10,336	34.4	896,631	23,596	3,950	38	15.1	48	227	1.3	6.0	4.7	
Glenn	140	10,334	46.1	666,486	28,978	3,744	23	16.4	27	178	1.2	7.7	6.6	
San Francisco	1790	10,307	57.3	10,573,186	36,459	1,594	305	17.0	523	6635	1.7	21.8	12.7	
Monterey	2344	10,036	66.8	15,725,319	41,934	3,884	404	17.2	571	4049	1.4	10.0	7.1	
Ventura	2625	9,965	55.6	14,536,886	33,728	3,079	435	16.6	717	4722	1.6	10.9	6.6	
Del Norte	131	9,965	60.5	789,254	39,463	2,428	20	15.3	36	325	1.8	16.3	9.0	
Contra Costa	2740	9,869	47.8	12,930,859	31,386	2,781	446	16.3	638	4650	1.4	10.4	7.3	
Calaveras	120	9,834	46.0	543,119	45,260	3,504	12	10.0	31	155	2.6	12.9	5.0	
Tulare	3413	9,755	54.4	18,122,876	35,122	2,537	538	15.8	804	7144	1.5	13.3	8.9	
Sutter	419	9,727	41.1	1,676,783	31,052	2,809	54	12.9	79	597	1.5	11.1	7.6	
Mono	56	9,502	45.1	239,766	26,641	4,064	< 10	16.1	11	59	1.2	6.6	5.4	
Inyo	84	9,493	69.2	551,944	39,425	2,253	14	16.7	24	245	1.7	17.5	10.2	
Santa Clara	5092	9,359	59.6	28,384,035	42,364	2,878	729	14.3	1153	9864	1.6	13.5	8.6	
San Diego	13630	9,300	51.6	65,344,124	29,119	3,021	2301	16.9	3401	21630	1.5	9.4	6.4	
Kern	5347	8,417	55.6	25,005,877	32,018	2,670	812	15.2	1258	9367	1.5	11.5	7.4	
Santa Cruz	1437	8,391	58.7	7,075,148	42,366	4,118	180	12.5	276	1718	1.5	9.5	6.2	
El Dorado	391	8,380	36.2	1,184,952	21,545	2,610	55	14.1	75	454	1.4	8.3	6.1	
San Luis Obispo	894	8,261	51.7	3,814,725	34,679	2,955	117	13.1	184	1291	1.6	11.0	7.0	
Mariposa	51	8,220	56.5	236,776	26,308	3,588	< 10	17.6	9	66	1.0	7.3	7.3	
Stanislaus	2876	7,779	54.8	12,269,214	28,401	2,419	449	15.6	702	5072	1.6	11.3	7.2	
Alpine	< 10	7,742	0.0	0			0	0.0	0	0				
San Joaquin	3377	7,691	53.3	13,832,787	27,945	2,370	537	15.9	814	5836	1.5	10.9	7.2	
Fresno	7318	7,676	55.5	31,167,540	24,756	2,336	1299	17.8	1857	13342	1.4	10.3	7.2	
Merced	1805	7,382	52.8	7,034,185	24,856	2,509	285	15.8	449	2804	1.6	9.8	6.2	
Alameda	4495	7,128	55.8	17,892,608	24,410	2,524	779	17.3	1134	7088	1.5	9.1	6.3	
Siskiyou	176	6,866	39.5	477,769	19,111	2,794	25	14.2	30	171	1.2	6.8	5.7	
Imperial	1352	6,763	57.2	5,231,502	28,745	2,756	182	13.5	303	1898	1.7	10.4	6.3	
Sierra	< 10	6,436	70.3	40,708	20,354	8,142	< 10	22.2	2	5	1.0	2.5	2.5	

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
Napa	337	4,778	76.4	1,229,749	55,898	4,606	33	9.8	49	267	1.5	8.1	5.4
Santa Barbara	1596	4,234	72.8	4,916,294	70,233	1,834	187	11.7	260	2680	1.4	14.3	10.3
Solano	826	4,037	68.9	2,297,364	52,213	2,755	67	8.1	113	834	1.7	12.4	7.4
San Mateo	1488	3,920	64.8	3,782,862	52,540	1,727	213	14.3	325	2190	1.5	10.3	6.7
Yolo	555	2,794	47.4	735,740	26,276	3,241	32	5.8	42	227	1.3	7.1	5.4

Most expensive children in the CCS program

Table 12 shows the pattern of expenditures for three groups of expensive children: those in the top 10%, those in the top 5% and those in the top 1%. Children in the top 1% were more expensive than those in the top 10%; among children age < 1 year, the median expenditure was \$108,801 in the top 10% as compared with \$368,793 in the top 1%. Similarly, among children >= 1 year, the median expenditure in the top 10% of children was \$48,638 as compared with \$246,702 in the top 1%.

Table 12. Distribution of total expenditure among most expensive children

	Age < 1			Age >= 1		
	Top 10%	Top 5%	Top 1%	Top 10%	Top 5%	Top 1%
Number of children	2229	1115	223	11710	5855	1171
Percent of total expenditures accounted for	69%	50%	20%	75%	60%	30%
Median	\$108,801	\$168,258	\$368,793	\$48,638	\$88,108	\$246,702
Mean	\$149,616	\$217,389	\$433,717	\$84,600	\$136,868	\$338,054
Range	\$61,081- \$3,440,040	\$108,801- \$3,440,040	\$273,620- \$3,440,040	\$22,012- \$7,001,752	\$48,639- \$7,001,752	\$173,902- \$7,001,752

NOTE: Columns represent the different groups of children with the most total expenditures. For example, top 10 percent represents the children who were in the top 10 percent of most expensive children.

Tables 13a and 13b show the demographic characteristics of two groups of expensive children age < 1 and age >=1, respectively. Among children age < 1 year, most of the children were Hispanic, had Medi-Cal eligibility and NICU-related and cardiac conditions were the most eligible diagnoses for all three groups. The third leading eligible diagnoses for children in the top 1% was neurology as opposed to general pediatrics for children in the top 10% group (Table 13a). Among children age >= 1 year, 50% were greater than 10 years old, most were Hispanic and had Medi-Cal eligibility for both groups. The leading eligible diagnoses for both groups were neurology, hematology/oncology and injury (Table 13b).

Table 13a. Demographic characteristics of most expensive children age &lt; 1, FY 2009

Characteristic	Top 10%		Top 1%	
	N	%	N	%
	N=2229		N=223	
Gender				
F	893	40.06	76	34.08
M	967	43.38	101	45.29
Unknown	369	16.55	46	20.63
Race/Ethnicity				
White	46	2.06	< 10	
Black	41	1.84	< 10	
Hispanic	275	12.34	32	14.35
Asian/PI	17	0.76	< 10	
Other	14	0.63	< 10	
Mixed	37	1.66	< 10	
Unknown	1799	80.71	174	78.03
Eligibility				
Medi-Cal	2060	92.42	174	78.03
Healthy Families	77	3.45	24	10.76
CCS only	6	0.27	24	10.76
Mixed	86	3.86	< 10	
Eligible diagnosis				
NICU-related	575	25.8	46	20.63
Cardiology/Cardiothoracic Surgery	371	16.64	40	17.94
General Pediatrics/ Behavior & Development	253	11.35	18	8.07
Neurology/Neurosurgery	192	8.61	24	10.76
Other	167	7.49	14	6.28
Ophthalmology	121	5.43	< 10	
Gastroenterology	119	5.34	21	9.42
ENT	118	5.29	14	6.28
Surgery	76	3.41	10	4.48
Urology	40	1.79	< 10	
Hematology/Oncology	39	1.75	13	5.83
Pulmonary	32	1.44	< 10	
Endocrine	29	1.3	< 10	
Orthopedics	25	1.12	< 10	
Genetic	15	0.67		
Infectious diseases	15	0.67	< 10	
External/Injury	14	0.63		
Nephrology	12	0.54	< 10	
Dermatology	< 10			
Dental	< 10			

Characteristic	Top 10%		Top 1%	
	N	%	N	%
	N=2229		N=223	
Obstetrics-Gynecology	< 10			
Speech/Visual/Hearing Loss	< 10			
Rheumatology	< 10			

Table 13b. Demographic characteristics of most expensive children age >= 1, FY 2009

Characteristics	Top 10%		Top 1%	
	N	%	N	%
	N=11710		N=1171	
Age group				
1 to 4	2612	22.31	225	19.21
5 to 9	2469	21.08	255	21.78
10 to 14	3072	26.23	317	27.07
15 to 18	2801	23.92	305	26.05
19 to 21	756	6.46	69	5.89
Gender				
F	4009	34.24	334	28.52
M	5186	44.29	540	46.11
Unknown	2515	21.48	297	25.36
Race/Ethnicity				
White	2089	17.84	163	13.92
Black	840	7.17	69	5.89
Hispanic	5257	44.89	578	49.36
American Indian	33	0.28	< 10	
Asian/PI	493	4.21	43	3.67
Other	86	0.73	< 10	0.77
Mixed	1125	9.61	91	7.77
Unknown	1787	15.26	217	18.53
Eligibility				
Medi-Cal	8985	76.73	785	67.04
Healthy Families	967	8.26	99	8.45
CCS only	174	1.49	25	2.13
Mixed	1584	13.53	262	22.37
Eligible diagnosis				
Neurology/Neurosurgery	3474	29.67	271	23.14
Hematology/Oncology	1954	16.69	405	34.59
External/Injury	1009	8.62	76	6.49
Cardiology/Cardiothoracic Surgery	791	6.75	56	4.78
Endocrine	601	5.13	16	1.37

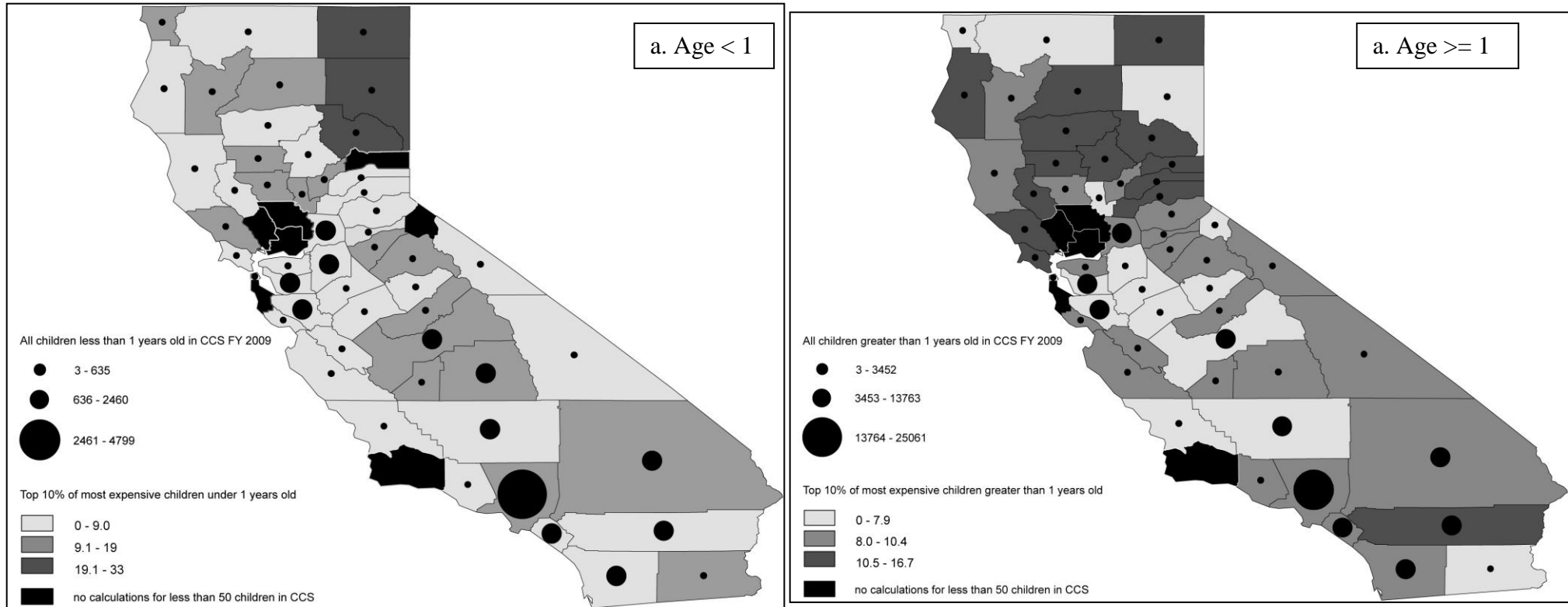


Characteristics	Top 10%		Top 1%	
	N	%	N	%
	N=11710		N=1171	
Gastroenterology	553	4.72	55	4.7
Pulmonary	481	4.11	40	3.42
ENT	470	4.01	27	2.31
Nephrology	396	3.38	25	2.13
Orthopedics	359	3.07	28	2.39
Infectious diseases	349	2.98	37	3.16
Other	281	2.4	48	4.1
Rheumatology	249	2.13	15	1.28
Genetic	184	1.57	36	3.07
Urology	153	1.31	< 10	
NICU	131	1.12	14	1.2
Surgery	76	0.65	< 10	
Ophthalmology	71	0.61	< 10	
Dermatology	67	0.57	< 10	
Dental	26	0.22		
General Pediatrics/ Behavior & Development	24	0.2	< 10	
Obstetrics-Gynecology	< 10		0	
Psychiatry	< 10		0	
Speech/Visual/Hearing Loss	< 10		0	

Figures 9a-b map the number of children in the CCS program and the percent of children that were included in the top 10% most expensive group of children for each county. The circles represent the size of the county in terms of the number of CCS enrolled children; the larger the circle, the more CCS children. The grey colors represent the percent of children who were included in the top 10%; the darker the grey, the larger percent included in the top 10%.

For both age groups, there was a disproportionate contribution by county to the group of most expensive children. For example, among children age < 1 (Figure 9a), in three counties that had between 50 to 300 CCS enrolled children, between 19% and 33% were included in the top 10% of children. Among children age >= 1, most of the counties had between 50 to 3,452 children and there was variation in terms of the proportion of children that were included in the most expensive group. Most of the counties that contributed more than 10% of their CCS population were in the northern part of the state (Figure 9b).

Figure 9. Proportion of children included in the top 10% of most expensive children by county, FY 2009



For each county, the circles represent the total number of children enrolled in the CCS program for that county; increasing circle sizes show increasing number of CCS enrolled children. The grey shading represents the percent of children in the top 10% percent of most expensive children for that county; the darker the grey, the larger the percent of children included in the top 10%. For both age groups, there was a disproportionate contribution by county to the group of most expensive children. For example, among children age < 1 (Figure 9a), in three counties that had between 50 to 300 CCS enrolled children, between 19% and 33% were included in the top 10% of children. Among children age >= 1, most of the counties had between 50 to 3,452 children and there was variation in terms of the proportion of children that were included in the most expensive group. Most of the counties that contributed more than 10% of their CCS population were in the northern part of the state (Figure 9b).

We examined total expenditure and inpatient utilization patterns, by county, for two of the groups of children in the most expensive groups: those in the top 10% and those in the top 1%. Tables 14a-b show the total expenditures, per child expenditures and distribution of expenditures for the top 10% and top 1% of children by county among children age < 1. Tables 15a-b show the variation in inpatient expenditure and utilization by county for each of these groups. Among children age < 1 year, for most counties, over 90% of the total expenditures were accounted for by inpatient expenditures with almost all children being hospitalized at least once in both groups (Tables 14a-b). In counties with at least 50 children in the top 10%, Santa Clara, Orange and San Diego had the highest total expenditures per child but Santa Clara, Orange and Tulare had the highest inpatient expenditures per child. Among children in the top 1%, San Diego had one of the highest total and inpatient expenditures per child, unlike what was seen for San Diego among children age  $\geq 1$  (Tables 14b and 15b). Despite having the largest number of children age < 1 in both groups, Los Angeles still had relatively lower expenditures per child compared to other counties (Tables 14a-b, 15a-b).

Table 14a. Variation in FFS expenditures and distribution of expenditures per child by county among children age < 1 in the top 10% of most expensive children, FY 2009

County	N children	Total expenditures			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
All counties*	2229	333,493,182	100.0	149,616	94.6	1.1	2.3	1.8	142,365	2,358	4,789	4,487
Sutter	10	5,086,206	1.5	508,621	98.7	0.5	0.1	0.7	501,966	2,297	928	5,057
Shasta	21	5,220,434	1.6	248,592	97.7	0.6	0.6	0.7	242,932	2,254	2,208	3,981
San Benito	< 10	599,966	0.2	199,989	97.4	0.4	1.8	0.2	194,759	1,177	3,641	903
Santa Clara	74	13,715,385	4.1	185,343	95.8	1.0	2.4	0.8	177,517	2,639	5,584	2,573
Tehama	< 10	918,070	0.3	183,614	95.8	0.6	0.6	2.6	175,837	1,307	1,163	4,707
Colusa	< 10	533,721	0.2	177,907	98.1	0.0	0.3	1.7	174,456	125	668	8,893
Sonoma	29	5,097,170	1.5	175,764	95.9	0.8	0.8	2.4	168,532	1,621	1,754	5,758
Nevada	< 10	172,223	0.1	172,223	99.9	0.1	0.0	0.0	172,107	116		
Orange	96	16,181,468	4.9	168,557	94.5	1.1	3.1	1.2	161,015	2,445	7,871	4,688
San Diego	156	25,546,556	7.7	163,760	96.0	0.7	1.3	1.9	157,168	1,443	3,059	5,226
Calaveras	< 10	654,283	0.2	163,571	96.9	1.4	0.6	1.1	158,470	2,334	979	1,788
Alameda	71	11,566,596	3.5	162,910	96.4	0.8	2.1	0.6	156,990	2,057	4,960	1,664
Tulare	87	14,169,340	4.2	162,866	97.1	0.5	1.7	0.7	158,067	1,400	3,614	1,846
San Luis Obispo	< 10	1,435,451	0.4	159,495	96.4	0.7	1.1	1.5	153,713	1,340	2,294	4,345
Kings	18	2,828,395	0.8	157,133	96.7	0.4	1.3	1.5	151,954	969	2,455	2,821
Placer	6	933,185	0.3	155,531	95.9	1.7	0.5	1.9	149,087	3,091	980	4,513
Kern	93	14,446,048	4.3	155,334	96.2	1.4	0.5	1.8	149,468	3,473	1,106	4,527
Siskiyou	< 10	151,928	0.0	151,928	92.2	0.1	1.9	5.4	140,140	209	2,925	8,154
Contra Costa	42	6,230,843	1.9	148,353	95.9	1.5	2.3	0.3	142,247	3,133	4,675	594
Tuolumne	< 10	737,363	0.2	147,473	97.9	0.6	1.1	0.3	144,354	871	1,564	616
Merced	22	3,220,248	1.0	146,375	92.7	1.1	2.8	3.4	135,654	1,813	4,942	6,159
Fresno	118	17,229,773	5.2	146,015	95.3	1.1	0.9	2.6	139,168	1,992	1,601	5,215
Monterey	38	5,546,478	1.7	145,960	95.8	1.2	1.6	1.0	139,796	2,147	2,666	3,041
Los Angeles	557	80,429,435	24.1	144,398	93.8	1.0	2.9	2.3	137,148	1,944	6,072	5,468
Lake	< 10	568,740	0.2	142,185	95.1	0.2	0.8	3.9	135,203	587	1,454	7,405
Imperial	27	3,828,986	1.1	141,814	96.1	0.5	0.7	2.5	136,226	939	1,250	4,755
San Bernardino	197	27,779,834	8.3	141,014	92.2	1.6	3.8	2.2	130,716	3,404	8,053	5,342

County	N children	Total expenditures			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
Riverside	149	20,925,396	6.3	140,439	91.2	2.5	4.1	2.1	129,865	4,482	8,231	4,611
Glenn	< 10	558,129	0.2	139,532	93.4	2.1	1.0	3.4	130,277	3,824	1,877	6,383
Santa Cruz	31	4,262,319	1.3	137,494	94.6	2.0	1.4	0.7	130,107	3,754	2,402	3,031
Marin	< 10	802,972	0.2	133,829	82.5	1.0	10.9	5.5	110,468	1,289	14,538	7,311
Stanislaus	50	6,605,643	2.0	132,113	95.4	1.3	1.0	2.2	126,058	2,217	1,792	4,491
Sacramento	80	10,454,417	3.1	130,680	92.9	2.1	3.2	1.7	124,498	3,997	6,873	3,818
San Joaquin	68	8,471,658	2.5	124,583	96.2	0.8	2.0	1.0	119,901	1,559	4,312	2,865
Yuba	12	1,448,296	0.4	120,691	94.0	0.8	1.0	4.1	113,451	1,090	1,373	5,947
San Francisco	15	1,805,752	0.5	120,383	96.7	0.8	1.2	1.3	116,358	1,267	1,599	2,076
Ventura	59	7,067,877	2.1	119,795	94.8	0.9	2.5	1.6	113,606	1,384	3,737	2,579
Modoc	< 10	235,979	0.1	117,990	93.4	1.2	3.4	1.9	110,203	1,461	3,966	2,257
Mendocino	< 10	941,466	0.3	117,683	95.3	0.6	1.2	2.8	112,134	960	1,606	3,732
Madera	19	2,228,179	0.7	117,273	92.9	0.9	1.1	4.9	108,918	1,213	1,591	6,823
El Dorado	< 10	778,433	0.2	111,205	90.0	2.3	0.7	6.8	100,059	2,947	744	8,802
Lassen	< 10	502,020	0.2	100,404	85.5	3.0	6.0	5.5	85,831	2,997	5,982	5,519
Humboldt	< 10	401,121	0.1	100,280	97.5	0.4	1.1	0.3	97,761	582	1,463	416
Del Norte	< 10	199,895	0.1	99,948	97.7	0.2	1.7	0.3	97,640	466	1,665	322
Trinity	< 10	95,760	0.0	95,760	97.8	0.5	0.7	1.0	93,651	434	716	959
Plumas	< 10	92,724	0.0	92,724	100.0	0.0	0.0	0.0	92,724			
Butte	< 10	787,018	0.2	87,446	91.2	1.7	1.4	5.0	79,768	2,682	2,177	7,805

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)

Table 14b. Variation in FFS expenditures and distribution of expenditures per child by county among children age < 1 in the top 1% of most expensive children, FY 2009

County	N children	Total expenditures			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
All counties*	223	96,718,834	100.0	433,717	97.2	0.6	1.5	0.7	421,445	3,446	8,991	5,049
Sutter	< 10	4,491,532	4.6	1,122,883	99.3	0.3	0.1	0.3	1,115,152	3,298	988	7,285
San Luis Obispo	< 10	655,554	0.7	655,554	97.4	0.2	1.5	0.9	638,748	1,326	9,639	5,818
Shasta	< 10	3,480,471	3.6	580,079	99.3	0.2	0.1	0.2	575,948	2,418	923	5,497
San Diego	16	8,894,671	9.2	555,917	98.5	0.2	0.7	0.6	547,667	1,131	5,425	4,501
Santa Cruz	< 10	1,480,254	1.5	493,418	97.8	1.0	0.6	0.0	482,669	7,601	4,096	110
Alameda	< 10	3,877,822	4.0	484,728	99.9	0.0	0.0	0.0	484,464	717	296	191
Sonoma	< 10	2,264,283	2.3	452,857	99.0	0.3	0.3	0.4	448,193	1,166	1,843	2,421
Kern	12	5,226,161	5.4	435,513	97.6	0.9	0.2	1.3	425,028	5,273	1,320	8,212
Santa Clara	14	6,000,368	6.2	428,598	98.2	1.0	0.6	0.3	420,772	5,224	4,426	2,313
San Bernardino	16	6,673,750	6.9	417,109	89.4	1.3	7.8	1.4	372,930	6,924	43,195	7,674
Tehama	< 10	416,455	0.4	416,455	96.0	0.2	0.7	2.9	399,845	1,025	2,992	12,158
Orange	13	5,412,156	5.6	416,320	98.0	0.5	0.9	0.5	408,149	2,558	5,659	3,703
Merced	< 10	832,189	0.9	416,094	98.5	0.6	0.9	0.0	409,823	2,325	7,840	54
Los Angeles	54	22,263,219	23.0	412,282	96.5	0.6	1.9	0.9	397,869	3,426	11,165	5,337
Sacramento	< 10	1,642,070	1.7	410,517	99.7	0.2	0.1	0.1	409,261	924	518	560
Contra Costa	< 10	2,453,091	2.5	408,849	98.9	0.1	0.8	0.1	404,442	1,108	10,417	694
Imperial	< 10	1,203,521	1.2	401,174	98.3	0.4	0.2	1.0	394,472	1,490	969	4,093
Tulare	12	4,811,018	5.0	400,918	97.5	0.4	1.7	0.3	390,957	2,119	7,351	1,857
San Joaquin	< 10	1,093,175	1.1	364,392	99.0	0.9	0.0	0.1	360,634	4,681	82	799
Riverside	12	4,293,653	4.4	357,804	95.1	0.8	2.0	2.0	340,447	3,664	9,394	10,965
Monterey	< 10	1,413,161	1.5	353,290	98.7	0.6	0.5	0.1	348,679	2,153	1,859	632
Stanislaus	< 10	1,368,824	1.4	342,206	95.5	1.6	1.9	1.0	326,875	7,445	8,536	4,450
Fresno	11	3,760,251	3.9	341,841	97.0	1.0	0.5	1.6	331,492	4,533	2,138	7,345
San Francisco	< 10	334,968	0.3	334,968	99.9	0.0	0.0	0.0	334,744		74	
San Benito	< 10	327,608	0.3	327,608	99.9	0.1	0.0	0.0	327,229	344	35	
Placer	< 10	311,871	0.3	311,871	97.4	0.8	0.6	1.2	303,683	2,577	1,808	3,686
Colusa	< 10	303,247	0.3	303,247	100.0	0.0	0.0	0.0	303,247			
Kings	< 10	604,314	0.6	302,157	97.1	0.6	1.9	0.4	293,329	1,747	5,792	1,288
Ventura	< 10	281,769	0.3	281,769	99.8	0.0	0.1	0.0	281,276	41	191	
Madera	< 10	273,786	0.3	273,786	97.3	0.2	0.1	2.3	266,452	584	364	6,386
Lake	< 10	273,620	0.3	273,620	100.0	0.0	0.0	0.0	273,620			

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)

Table 15a. Variation in inpatient utilization by county among children age < 1 year in top 10% of most expensive children, FY 2009

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
All counties*	2229	149,616	94.6	315,480,364	142,365	1,920	2216	99.4	4397	164355	2.0	74.2	37.4
Sutter	10	508,621	98.7	5,019,658	501,966	7,819	10	100.0	21	642	2.1	64.2	30.6
Shasta	21	248,592	97.7	5,101,574	242,932	4,101	21	100.0	40	1244	1.9	59.2	31.1
San Benito	< 10	199,989	97.4	584,278	194,759	2,718	< 10	100.0	5	215	1.7	71.7	43.0
Santa Clara	74	185,343	95.8	13,136,222	177,517	1,959	74	100.0	144	6707	1.9	90.6	46.6
Tehama	< 10	183,614	95.8	879,183	175,837	3,369	< 10	100.0	8	261	1.6	52.2	32.6
Colusa	< 10	177,907	98.1	523,368	174,456	1,434	< 10	100.0	3	365	1.0	121.7	121.7
Sonoma	29	175,764	95.9	4,887,415	168,532	2,605	29	100.0	60	1876	2.1	64.7	31.3
Nevada	< 10	172,223	99.9	172,107	172,107	9,562	< 10	100.0	4	18	4.0	18.0	4.5
Orange	96	168,557	94.5	15,296,425	161,015	2,294	95	99.0	254	6667	2.7	70.2	26.2
San Diego	156	163,760	96.0	24,518,238	157,168	2,109	156	100.0	329	11626	2.1	74.5	35.3
Calaveras	< 10	163,571	96.9	633,882	158,470	1,944	< 10	100.0	5	326	1.3	81.5	65.2
Alameda	71	162,910	96.4	11,146,270	156,990	1,682	71	100.0	135	6625	1.9	93.3	49.1
Tulare	87	162,866	97.1	13,751,806	158,067	2,419	87	100.0	164	5686	1.9	65.4	34.7
San Luis Obispo	< 10	159,495	96.4	1,383,415	153,713	2,497	< 10	100.0	27	554	3.0	61.6	20.5
Kings	18	157,133	96.7	2,735,175	151,954	2,093	18	100.0	43	1307	2.4	72.6	30.4
Placer	< 10	155,531	95.9	894,524	149,087	2,520	< 10	100.0	10	355	1.7	59.2	35.5
Kern	93	155,334	96.2	13,900,541	149,468	2,312	93	100.0	172	6013	1.8	64.7	35.0
Siskiyou	< 10	151,928	92.2	140,140	140,140	1,774	< 10	100.0	1	79	1.0	79.0	79.0
Contra Costa	42	148,353	95.9	5,974,382	142,247	2,170	42	100.0	71	2753	1.7	65.5	38.8
Tuolumne	< 10	147,473	97.9	721,772	144,354	2,080	< 10	100.0	10	347	2.0	69.4	34.7
Merced	22	146,375	92.7	2,984,395	135,654	1,962	22	100.0	34	1521	1.5	69.1	44.7
Fresno	118	146,015	95.3	16,421,850	139,168	1,892	118	100.0	247	8680	2.1	73.6	35.1
Monterey	38	145,960	95.8	5,312,232	139,796	2,322	38	100.0	95	2288	2.5	60.2	24.1
Los Angeles	557	144,398	93.8	75,431,141	137,148	1,702	550	98.7	1038	44330	1.9	80.6	42.7
Lake	< 10	142,185	95.1	540,814	135,203	1,644	< 10	100.0	4	329	1.0	82.3	82.3

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
Imperial	27	141,814	96.1	3,678,108	136,226	2,080	27	100.0	50	1768	1.9	65.5	35.4
San Bernardino	197	141,014	92.2	25,620,332	130,716	1,679	196	99.5	360	15257	1.8	77.8	42.4
Riverside	149	140,439	91.2	19,090,219	129,865	1,699	147	98.7	309	11236	2.1	76.4	36.4
Glenn	< 10	139,532	93.4	521,109	130,277	1,468	< 10	100.0	8	355	2.0	88.8	44.4
Santa Cruz	31	137,494	94.6	4,033,330	130,107	2,217	31	100.0	71	1819	2.3	58.7	25.6
Marin	< 10	133,829	82.5	662,810	110,468	1,996	< 10	100.0	14	332	2.3	55.3	23.7
Stanislaus	50	132,113	95.4	6,302,907	126,058	1,683	50	100.0	108	3745	2.2	74.9	34.7
Sacramento	80	130,680	92.9	9,710,873	124,498	1,685	78	97.5	142	5764	1.8	73.9	40.6
San Joaquin	68	124,583	96.2	8,153,268	119,901	1,637	68	100.0	132	4981	1.9	73.3	37.7
Yuba	12	120,691	94.0	1,361,408	113,451	1,886	12	100.0	19	722	1.6	60.2	38.0
San Francisco	15	120,383	96.7	1,745,369	116,358	1,567	15	100.0	37	1114	2.5	74.3	30.1
Ventura	59	119,795	94.8	6,702,725	113,606	1,939	59	100.0	92	3456	1.6	58.6	37.6
Modoc	< 10	117,990	93.4	220,406	110,203	2,099	< 10	100.0	5	105	2.5	52.5	21.0
Mendocino	< 10	117,683	95.3	897,072	112,134	2,126	< 10	100.0	14	422	1.8	52.8	30.1
Madera	19	117,273	92.9	2,069,438	108,918	2,043	19	100.0	40	1013	2.1	53.3	25.3
El Dorado	< 10	111,205	90.0	700,413	100,059	2,382	< 10	100.0	22	294	3.1	42.0	13.4
Lassen	< 10	100,404	85.5	429,156	85,831	1,380	< 10	100.0	22	311	4.4	62.2	14.1
Humboldt	< 10	100,280	97.5	391,044	97,761	1,827	< 10	100.0	5	214	1.3	53.5	42.8
Del Norte	< 10	99,948	97.7	195,280	97,640	1,933	< 10	100.0	3	101	1.5	50.5	33.7
Trinity	< 10	95,760	97.8	93,651	93,651	1,801	< 10	100.0	1	52	1.0	52.0	52.0
Plumas	< 10	92,724	100.0	92,724	92,724	1,496	< 10	100.0	1	62	1.0	62.0	62.0
Butte	< 10	87,446	91.2	717,916	79,768	1,718	< 10	100.0	18	418	2.0	46.4	23.2

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)



Table 15b. Variation in inpatient utilization by county among children age < 1 year in top 1% of most expensive children, FY 2009

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
All counties*	223	433,717	97.2	93,982,169	421,445	2,835	223	100.0	631	33149	2.8	148.7	52.5
Sutter	< 10	1,122,883	99.3	4,460,606	1,115,152	12,056	< 10	100.0	12	370	3.0	92.5	30.8
San Luis Obispo	< 10	655,554	97.4	638,748	638,748	5,236	< 10	100.0	11	122	11.0	122.0	11.1
Shasta	< 10	580,079	99.3	3,455,689	575,948	8,838	< 10	100.0	10	391	1.7	65.2	39.1
San Diego	16	555,917	98.5	8,762,666	547,667	4,937	16	100.0	35	1775	2.2	110.9	50.7
Santa Cruz	< 10	493,418	97.8	1,448,007	482,669	2,217	< 10	100.0	14	653	4.7	217.7	46.6
Alameda	< 10	484,728	99.9	3,875,710	484,464	2,701	< 10	100.0	12	1435	1.5	179.4	119.6
Sonoma	< 10	452,857	99.0	2,240,963	448,193	3,857	< 10	100.0	8	581	1.6	116.2	72.6
Kern	12	435,513	97.6	5,100,332	425,028	3,579	12	100.0	35	1425	2.9	118.8	40.7
Santa Clara	14	428,598	98.2	5,890,814	420,772	2,457	14	100.0	31	2398	2.2	171.3	77.4
San Bernardino	16	417,109	89.4	5,966,884	372,930	2,667	16	100.0	40	2237	2.5	139.8	55.9
Tehama	< 10	416,455	96.0	399,845	399,845	5,880	< 10	100.0	2	68	2.0	68.0	34.0
Orange	13	416,320	98.0	5,305,933	408,149	3,977	13	100.0	39	1334	3.0	102.6	34.2
Merced	< 10	416,094	98.5	819,645	409,823	27,322	< 10	100.0	2	30	1.0	15.0	15.0
Los Angeles	54	412,282	96.5	21,484,913	397,869	2,118	54	100.0	172	10142	3.2	187.8	59.0
Sacramento	< 10	410,517	99.7	1,637,045	409,261	2,075	< 10	100.0	11	789	2.8	197.3	71.7
Contra Costa	< 10	408,849	98.9	2,426,651	404,442	2,767	< 10	100.0	9	877	1.5	146.2	97.4
Imperial	< 10	401,174	98.3	1,183,415	394,472	3,334	< 10	100.0	6	355	2.0	118.3	59.2
Tulare	12	400,918	97.5	4,691,487	390,957	2,543	12	100.0	47	1845	3.9	153.8	39.3
San Joaquin	< 10	364,392	99.0	1,081,903	360,634	1,935	< 10	100.0	6	559	2.0	186.3	93.2
Riverside	12	357,804	95.1	4,085,368	340,447	2,422	12	100.0	47	1687	3.9	140.6	35.9
Monterey	< 10	353,290	98.7	1,394,716	348,679	2,617	< 10	100.0	11	533	2.8	133.3	48.5
Stanislaus	< 10	342,206	95.5	1,307,501	326,875	1,993	< 10	100.0	14	656	3.5	164.0	46.9
Fresno	11	341,841	97.0	3,646,416	331,492	2,186	11	100.0	30	1668	2.7	151.6	55.6
San Francisco	< 10	334,968	99.9	334,744	334,744	1,431	< 10	100.0	2	234	2.0	234.0	117.0
San Benito	< 10	327,608	99.9	327,229	327,229	32,723	< 10	100.0	2	10	2.0	10.0	5.0
Placer	< 10	311,871	97.4	303,683	303,683	1,998	< 10	100.0	3	152	3.0	152.0	50.7

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
Colusa	< 10	303,247	100.0	303,247	303,247	1,330	< 10	100.0	1	228	1.0	228.0	228.0
Kings	< 10	302,157	97.1	586,659	293,329	2,205	< 10	100.0	15	266	7.5	133.0	17.7
Ventura	< 10	281,769	99.8	281,276	281,276	4,850	< 10	100.0	2	58	2.0	58.0	29.0
Madera	< 10	273,786	97.3	266,452	266,452	2,358	< 10	100.0	1	113	1.0	113.0	113.0
Lake	< 10	273,620	100.0	273,620	273,620	1,732	< 10	100.0	1	158	1.0	158.0	158.0

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)

Tables 16a-b show the total expenditures, per child expenditures and distribution of expenditures for the groups of children in the top 10% and top 1% of most expensive children, by county among children age  $\geq 1$ . Tables 17a-b show the variation in inpatient expenditure and utilization by county for each of these groups. There was considerable variation by county for the number of children who were in the most expensive groups, as well as variation in the total per child expenditures and the distribution of inpatient expenditures. Among counties with at least 100 children in the top 10%, Sonoma, Santa Clara, San Francisco and Monterey had the highest total per child expenditures. The percent of inpatient expenditures accounting for total expenditures varied in these counties from 43% to 78% with outpatient pharmacy and outpatient procedures accounting for the remainder of the total expenditures; Santa Clara also had high inpatient expenditures per child. (Table 16a). At least 70% of the children were hospitalized with two hospitalizations per child on average and about 10 bed days per hospitalization in these four counties (Table 16a). Although Los Angeles and San Diego had the largest number of children and accounted for 30% of total expenditures, per child expenditures in these two counties was lower than several other counties; they also had lower inpatient expenditures per child as compared to other counties (Table 16a) although the percentage of children hospitalized and bed days per hospitalization were similar to counties with higher per child expenditures (Table 17a).

The variation in expenditure patterns by county was seen for both groups of children. Sonoma, Santa Clara and Monterey continued to have the highest expenditures per child in both groups (Tables 16a-b). Among children in the top 1%, outpatient pharmacy expenditures accounted for 61% of total expenditures in Sonoma, higher than any other county (Table 17b). For Santa Clara and Monterey, inpatient expenditures accounted for most of the total expenditures among these children, with over 90% being hospitalized with 16 and 28 bed days per hospitalization, respectively (Table 17b). Los Angeles had one of the lowest inpatient expenditures per child (Table 16b), despite 70% of children in this group being hospitalized at least once, with an average of four hospitalization per child and 17 bed days per hospitalization (Table 17b).

Table 16a. Variation in FFS expenditures and distribution of expenditures per child by county among children age >= 1 in the top 10% of most expensive children, FY 2009

County	N children	Total expenditures			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
All counties*	11710	990,670,996	100.0	84,600	56.9	5.5	18.3	18.4	68,382	5,276	17,443	20,777
Lassen	< 10	890,232	0.1	148,372	49.4	3.4	2.5	43.1	109,852	6,024	4,489	95,921
Modoc	< 10	718,024	0.1	143,605	88.0	2.6	2.7	1.1	126,380	3,734	3,809	1,631
Sonoma	142	19,409,678	2.0	136,688	42.7	4.4	7.9	43.0	83,749	6,923	12,703	78,816
Trinity	< 10	605,305	0.1	121,061	81.3	1.0	5.5	1.1	123,069	2,031	16,513	3,262
Tehama	35	4,110,291	0.4	117,437	56.8	2.1	7.6	29.4	80,472	2,940	9,517	46,479
Colusa	< 10	1,031,531	0.1	114,615	76.3	2.5	10.2	8.3	98,385	2,895	11,664	12,234
Santa Clara	344	36,021,891	3.6	104,715	70.9	4.2	13.1	11.3	101,732	5,465	15,173	17,692
San Benito	22	2,239,905	0.2	101,814	56.1	3.9	9.0	30.0	73,939	4,380	11,187	42,068
San Francisco	142	14,064,989	1.4	99,049	66.6	4.1	15.7	13.1	88,360	5,018	17,976	18,110
Madera	75	7,282,411	0.7	97,099	62.1	6.1	8.2	22.9	88,729	6,164	8,170	24,172
Monterey	191	18,430,571	1.9	96,495	78.1	5.2	6.6	8.4	87,199	6,167	7,485	13,745
Orange	921	87,835,258	8.9	95,369	58.4	3.9	20.9	16.0	80,586	4,480	22,930	22,314
Riverside	952	85,954,781	8.7	90,289	52.8	5.6	23.3	18.0	71,681	5,669	24,182	21,442
Sutter	31	2,775,908	0.3	89,545	49.6	4.2	17.0	28.0	72,427	3,930	16,294	26,841
San Bernardino	966	84,219,592	8.5	87,184	58.8	5.7	19.5	15.3	70,303	5,616	19,418	17,271
Amador	< 10	693,461	0.1	86,683	48.2	2.9	41.0	7.9	111,340	2,496	40,632	9,103
Mendocino	47	4,069,274	0.4	86,580	75.0	2.9	8.4	11.2	92,495	2,740	7,813	12,269
Del Norte	10	864,407	0.1	86,441	77.6	4.0	6.3	10.0	83,806	3,830	6,072	9,603
Sacramento	456	39,384,367	4.0	86,369	52.8	7.0	16.8	22.3	65,570	7,048	16,757	25,795
San Joaquin	231	19,590,307	2.0	84,807	67.1	6.5	11.2	14.9	74,696	6,195	11,203	17,181
Los Angeles	2566	216,592,991	21.9	84,409	44.0	5.0	28.2	22.6	58,209	4,592	25,372	23,313
Yuba	30	2,527,151	0.3	84,238	58.3	3.2	5.8	30.2	73,641	2,971	5,649	34,710
Tuolumne	17	1,423,414	0.1	83,730	50.2	4.6	22.0	22.4	65,014	4,393	19,589	21,300
Kings	58	4,761,909	0.5	82,102	66.2	6.9	9.3	16.3	80,873	5,988	7,918	14,076
Tulare	309	25,090,337	2.5	81,199	63.9	3.6	8.9	22.4	68,761	3,379	7,990	24,799
Contra Costa	247	19,975,872	2.0	80,874	55.9	4.8	21.4	17.0	66,041	4,735	20,260	20,902
San Diego	1193	95,920,782	9.7	80,403	58.7	5.8	15.3	19.2	64,922	5,206	13,819	22,082
Kern	411	32,877,601	3.3	79,994	65.8	6.1	9.8	17.3	72,599	5,276	8,752	17,620

County	N children	Total expenditures			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
Santa Cruz	120	9,516,672	1.0	79,306	69.2	4.9	9.2	13.4	71,598	5,117	9,151	18,015
Mariposa	< 10	236,436	0.0	78,812	82.4	2.3	1.5	13.8	97,436	5,331	3,520	32,541
Ventura	243	18,766,550	1.9	77,229	68.7	5.2	15.5	10.3	74,048	4,362	13,169	10,163
Stanislaus	202	15,268,873	1.5	75,588	67.4	8.5	9.4	13.7	65,522	7,149	8,191	13,715
San Luis Obispo	67	5,052,485	0.5	75,410	66.3	3.8	15.0	12.9	83,732	3,289	13,289	13,265
Placer	78	5,874,536	0.6	75,315	54.2	12.4	19.3	13.4	63,648	9,984	16,470	12,104
Fresno	532	39,481,488	4.0	74,213	64.8	6.8	9.9	17.7	60,446	5,697	8,295	17,935
Lake	35	2,586,014	0.3	73,886	61.9	12.1	8.8	14.4	72,744	9,469	6,895	12,021
Inyo	< 10	589,306	0.1	73,663	85.4	3.6	5.1	5.2	71,924	2,639	3,767	5,108
Calaveras	11	793,054	0.1	72,096	62.6	2.8	17.3	12.5	70,926	2,033	13,691	11,032
Alameda	313	21,333,486	2.2	68,158	67.6	4.1	13.3	13.4	59,803	3,740	11,801	15,806
Imperial	86	5,762,138	0.6	67,002	75.6	5.8	6.3	11.1	61,321	4,650	4,982	9,843
Mono	< 10	396,716	0.0	66,119	52.1	2.9	12.1	32.6	41,360	1,935	8,022	25,856
Humboldt	90	5,932,183	0.6	65,913	66.7	13.2	6.0	11.3	54,987	10,265	4,589	10,773
Merced	130	8,374,914	0.8	64,422	68.8	6.8	8.8	14.7	58,169	4,739	6,281	12,679
Shasta	92	5,905,690	0.6	64,192	49.7	5.7	28.0	12.1	46,600	4,106	20,429	9,049
Nevada	28	1,686,577	0.2	60,235	39.1	30.3	10.2	19.4	47,095	19,642	7,165	13,660
Butte	110	6,590,490	0.7	59,914	57.1	16.8	8.8	14.2	44,820	10,823	5,834	10,161
Glenn	18	1,073,794	0.1	59,655	53.7	14.1	10.4	21.0	52,413	9,447	6,542	18,751
Marin	52	3,079,184	0.3	59,215	60.5	4.7	22.8	10.8	53,258	3,361	15,579	9,509
El Dorado	36	1,990,397	0.2	55,289	47.5	8.5	20.1	22.1	52,545	5,278	11,757	13,325
Plumas	< 10	310,349	0.0	51,725	72.6	15.3	1.3	9.7	37,556	11,874	1,335	14,976
Siskiyou	14	670,424	0.1	47,887	58.5	3.8	18.0	16.9	32,677	1,937	9,300	10,326
Sierra	< 10	37,000	0.0	37,000	98.0	0.0	0.0	0.0	36,265			

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)

Table 16b. Variation in FFS expenditures and distribution of expenditures per child by county among children age >= 1 in the top 1% of most expensive children, FY 2009

County	N children	Total expenditures			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
All counties*	1171	395,861,313	100.0	338,054	64.0	2.7	12.8	20.1	265,373	10,144	47,968	82,627
Sonoma	11	11,565,372	2.9	1,051,397	37.5	0.3	0.4	60.8	433,486	3,778	7,370	1,003,994
Monterey	20	8,727,308	2.2	436,365	85.0	6.1	1.9	6.1	412,190	37,788	11,074	53,612
Santa Clara	43	18,742,688	4.7	435,876	84.2	0.7	4.5	10.4	426,530	3,564	20,742	58,990
Tehama	< 10	2,093,549	0.5	418,710	50.6	0.9	1.0	47.5	352,924	4,731	4,357	198,682
San Benito	< 10	1,249,543	0.3	416,514	49.3	0.1	4.5	46.1	308,018	290	18,588	192,180
Alameda	14	5,814,520	1.5	415,323	80.7	0.7	0.9	16.4	391,220	3,231	4,830	95,530
Sutter	< 10	1,200,972	0.3	400,324	55.3	0.3	1.9	42.5	221,310	1,306	7,523	170,054
San Joaquin	20	7,832,342	2.0	391,617	87.9	2.0	3.5	6.2	362,502	9,009	16,944	34,582
Tulare	26	9,997,688	2.5	384,526	69.7	0.6	1.7	27.3	331,603	2,706	7,537	130,187
Riverside	100	35,810,704	9.0	358,107	60.1	4.0	17.4	18.3	259,251	14,586	64,098	72,015
San Bernardino	96	34,358,743	8.7	357,904	70.2	3.3	13.7	12.5	290,415	12,692	54,219	54,879
San Francisco	18	6,412,400	1.6	356,244	73.8	3.8	13.1	9.1	337,836	18,745	59,829	44,768
Sacramento	47	16,576,810	4.2	352,698	52.8	2.3	14.5	29.4	250,194	9,476	61,581	135,601
Madera	12	4,214,299	1.1	351,192	74.1	6.1	3.9	14.9	312,394	23,339	15,088	69,843
Lassen	< 10	700,780	0.2	350,390	54.1	0.8	0.3	44.8	378,998	2,770	930	156,988
Orange	112	38,668,648	9.8	345,256	68.5	1.8	11.9	17.3	294,256	7,211	47,479	76,944
Stanislaus	15	5,135,424	1.3	342,362	86.9	5.2	3.1	4.5	297,570	19,074	11,216	21,117
San Diego	108	36,789,528	9.3	340,644	65.4	1.9	9.6	22.8	264,258	7,164	34,741	88,205
Contra Costa	24	8,046,771	2.0	335,282	56.4	0.9	17.4	24.7	252,058	2,985	66,825	153,030
San Luis Obispo	< 10	1,606,090	0.4	321,218	94.6	0.9	1.4	0.9	303,817	3,500	5,519	3,512
Kern	45	14,363,553	3.6	319,190	78.2	1.6	4.0	16.0	274,133	5,023	12,680	53,611
Ventura	23	7,150,468	1.8	310,890	87.9	1.0	9.1	1.8	299,243	3,711	34,290	7,530
Imperial	< 10	1,826,395	0.5	304,399	92.7	0.9	3.3	3.0	282,298	4,215	14,952	13,707
Fresno	43	12,894,482	3.3	299,872	75.9	3.9	6.2	13.6	271,808	13,284	20,565	53,223
Del Norte	< 10	292,504	0.1	292,504	96.5	0.1	1.1	0.3	282,263	399	3,113	997
Colusa	< 10	583,653	0.1	291,826	98.1	1.0	0.0	0.4	286,389	2,861	90	1,042
Los Angeles	290	83,932,745	21.2	289,423	42.6	3.4	26.0	27.9	174,462	10,465	80,319	89,100

County	N children	Total expenditures			% distribution of expenditures				Per child expenditures			
		Total, \$	%	Per Child	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy	Inpatient	Provider	Outpatient procedures	Outpatient pharmacy
Shasta	< 10	572,072	0.1	286,036	83.8	0.8	1.4	4.6	239,565	4,433	8,119	26,405
Kings	< 10	1,683,620	0.4	280,603	91.7	2.5	2.6	3.0	257,415	6,907	7,230	8,329
Yuba	< 10	839,780	0.2	279,927	56.6	0.1	0.0	39.8	237,651	514	79	333,914
Mendocino	< 10	2,231,833	0.6	278,979	89.2	1.0	2.9	3.6	248,879	3,277	8,000	13,281
Santa Cruz	< 10	2,510,697	0.6	278,966	77.3	2.0	4.4	14.6	215,767	6,208	12,314	45,930
Modoc	< 10	533,338	0.1	266,669	90.2	1.5	1.1	0.1	240,478	3,901	2,893	356
Trinity	< 10	511,673	0.1	255,836	86.8	0.0	0.0	0.0	222,135	51	0	0
Calaveras	< 10	249,417	0.1	249,417	81.2	0.8	1.7	2.2	202,453	1,925	4,157	5,388
Humboldt	< 10	1,742,078	0.4	248,868	78.3	7.9	1.3	12.0	194,795	22,857	4,398	69,522
Placer	< 10	1,720,109	0.4	245,730	77.9	6.6	10.8	3.7	223,353	16,137	31,000	12,566
Merced	< 10	2,129,049	0.5	236,561	88.4	2.8	2.7	6.1	209,097	8,370	8,120	18,585
Lake	< 10	918,351	0.2	229,588	78.7	18.7	0.2	0.0	180,722	85,852	915	87
Marin	< 10	911,675	0.2	227,919	62.1	1.3	30.3	6.2	188,824	2,924	68,967	28,324
Butte	< 10	896,864	0.2	224,216	68.6	25.2	4.8	1.1	205,015	56,571	14,308	3,162
Inyo	< 10	212,471	0.1	212,471	87.5	1.3	1.9	8.2	185,825	2,657	4,024	17,426
Glenn	< 10	208,046	0.1	208,046	98.7	0.0	0.0	0.0	205,371	0	0	0
Nevada	< 10	207,573	0.1	207,573	99.6	0.0	0.0	0.4	206,769	11	63	730
Amador	< 10	410,487	0.1	205,244	49.3	0.6	50.0	0.0	202,462	1,305	205,106	156
Tuolumne	< 10	392,846	0.1	196,423	67.0	7.0	11.0	14.6	131,563	13,848	21,670	28,654
El Dorado	< 10	391,355	0.1	195,678	89.1	9.2	0.9	0.9	174,277	17,960	1,733	1,682

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)

Table 17a. Variation in inpatient utilization by county among children age >= 1 year in top 10% of most expensive children, FY 2009

County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
All counties*	11710	84,600	56.9	564,149,392	68,382	2,967	8267	70.6	18528	190119	2.2	23.0	10.3
Lassen	< 10	148,372	49.4	439,407	109,852	7,087	< 10	66.7	18	62	4.5	15.5	3.4
Modoc	< 10	143,605	88.0	631,901	126,380	7,706	< 10	100.0	8	82	1.6	16.4	10.3
Sonoma	142	136,688	42.7	8,291,116	83,749	4,405	99	69.7	169	1882	1.7	19.0	11.1
Trinity	< 10	121,061	81.3	492,275	123,069	14,065	< 10	80.0	4	35	1.0	8.8	8.8
Tehama	35	117,437	56.8	2,333,689	80,472	4,322	29	82.9	76	540	2.6	18.6	7.1
Colusa	< 10	114,615	76.3	787,080	98,385	3,610	< 10	88.9	12	218	1.5	27.3	18.2
Santa Clara	344	104,715	70.9	25,534,809	101,732	4,121	251	73.0	618	6196	2.5	24.7	10.0
San Benito	22	101,814	56.1	1,256,962	73,939	2,787	17	77.3	42	451	2.5	26.5	10.7
San Francisco	142	99,049	66.6	9,366,183	88,360	2,336	106	74.6	297	4009	2.8	37.8	13.5
Madera	75	97,099	62.1	4,525,184	88,729	3,362	51	68.0	133	1346	2.6	26.4	10.1
Monterey	191	96,495	78.1	14,387,808	87,199	4,640	165	86.4	300	3101	1.8	18.8	10.3
Orange	921	95,369	58.4	51,333,210	80,586	3,224	644	69.9	1439	15923	2.2	24.7	11.1
Riverside	952	90,289	52.8	45,373,792	71,681	3,054	636	66.8	1427	14858	2.2	23.4	10.4
Sutter	31	89,545	49.6	1,376,114	72,427	3,612	19	61.3	40	381	2.1	20.1	9.5
San Bernardino	966	87,184	58.8	49,493,466	70,303	3,030	706	73.1	1656	16336	2.3	23.1	9.9
Amador	< 10	86,683	48.2	334,020	111,340	9,543	< 10	37.5	4	35	1.3	11.7	8.8
Mendocino	47	86,580	75.0	3,052,339	92,495	4,228	33	70.2	82	722	2.5	21.9	8.8
Del Norte	10	86,441	77.6	670,446	83,806	2,502	< 10	80.0	24	268	3.0	33.5	11.2
Sacramento	456	86,369	52.8	20,785,797	65,570	2,441	319	70.0	762	8517	2.4	26.7	11.2
San Joaquin	231	84,807	67.1	13,146,521	74,696	3,154	177	76.6	400	4168	2.3	23.5	10.4
Los Angeles	2566	84,409	44.0	95,346,243	58,209	2,199	1639	63.9	3918	43354	2.4	26.5	11.1
Yuba	30	84,238	58.3	1,472,827	73,641	2,934	20	66.7	55	502	2.8	25.1	9.1
Tuolumne	17	83,730	50.2	715,154	65,014	4,498	11	64.7	17	159	1.5	14.5	9.4
Kings	58	82,102	66.2	3,154,040	80,873	2,620	39	67.2	135	1204	3.5	30.9	8.9
Tulare	309	81,199	63.9	16,021,214	68,761	2,736	233	75.4	474	5856	2.0	25.1	12.4
Contra Costa	247	80,874	55.9	11,160,859	66,041	3,290	169	68.4	310	3392	1.8	20.1	10.9



County	N children	Expenditures					Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	Inpatient expenditure per bed day	N children	% children	Total admissions	Total bed days			
San Diego	1193	80,403	58.7	56,287,675	64,922	3,419	867	72.7	1815	16464	2.1	19.0	9.1
Kern	411	79,994	65.8	21,634,414	72,599	3,062	299	72.7	688	7066	2.3	23.6	10.3
Santa Cruz	120	79,306	69.2	6,587,023	71,598	4,692	92	76.7	185	1404	2.0	15.3	7.6
Mariposa	< 10	78,812	82.4	194,871	97,436	7,217	< 10	66.7	2	27	1.0	13.5	13.5
Ventura	243	77,229	68.7	12,884,326	74,048	3,659	174	71.6	408	3521	2.3	20.2	8.6
Stanislaus	202	75,588	67.4	10,286,975	65,522	2,742	157	77.7	365	3752	2.3	23.9	10.3
San Luis Obispo	67	75,410	66.3	3,349,291	83,732	4,140	40	59.7	97	809	2.4	20.2	8.3
Placer	78	75,315	54.2	3,182,380	63,648	3,467	50	64.1	107	918	2.1	18.4	8.6
Fresno	532	74,213	64.8	25,568,585	60,446	2,597	423	79.5	883	9845	2.1	23.3	11.1
Lake	35	73,886	61.9	1,600,358	72,744	7,209	22	62.9	32	222	1.5	10.1	6.9
Inyo	< 10	73,663	85.4	503,467	71,924	2,218	< 10	87.5	17	227	2.4	32.4	13.4
Calaveras	11	72,096	62.6	496,479	70,926	3,879	< 10	63.6	26	128	3.7	18.3	4.9
Alameda	313	68,158	67.6	14,412,453	59,803	3,071	241	77.0	525	4693	2.2	19.5	8.9
Imperial	86	67,002	75.6	4,353,810	61,321	2,881	71	82.6	186	1511	2.6	21.3	8.1
Mono	< 10	66,119	52.1	206,802	41,360	4,700	< 10	83.3	7	44	1.4	8.8	6.3
Humboldt	90	65,913	66.7	3,959,084	54,987	4,870	72	80.0	112	813	1.6	11.3	7.3
Merced	130	64,422	68.8	5,758,765	58,169	2,732	99	76.2	243	2108	2.5	21.3	8.7
Shasta	92	64,192	49.7	2,935,828	46,600	3,661	63	68.5	111	802	1.8	12.7	7.2
Nevada	28	60,235	39.1	659,326	47,095	4,366	14	50.0	23	151	1.6	10.8	6.6
Butte	110	59,914	57.1	3,764,918	44,820	4,211	84	76.4	137	894	1.6	10.6	6.5
Glenn	18	59,655	53.7	576,539	52,413	4,303	11	61.1	15	134	1.4	12.2	8.9
Marin	52	59,215	60.5	1,864,022	53,258	3,684	35	67.3	66	506	1.9	14.5	7.7
El Dorado	36	55,289	47.5	945,818	52,545	2,937	18	50.0	33	322	1.8	17.9	9.8
Plumas	< 10	51,725	72.6	225,334	37,556	5,778	< 10	100.0	8	39	1.3	6.5	4.9
Siskiyou	14	47,887	58.5	392,129	32,677	3,295	12	85.7	16	119	1.3	9.9	7.4
Sierra	< 10	37,000	98.0	36,265	36,265	12,088	< 10	100.0	1	3	1.0	3.0	3.0

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)

Table 17b. Variation in inpatient utilization by county among children age >= 1 year in top 1% of most expensive children, FY 2009

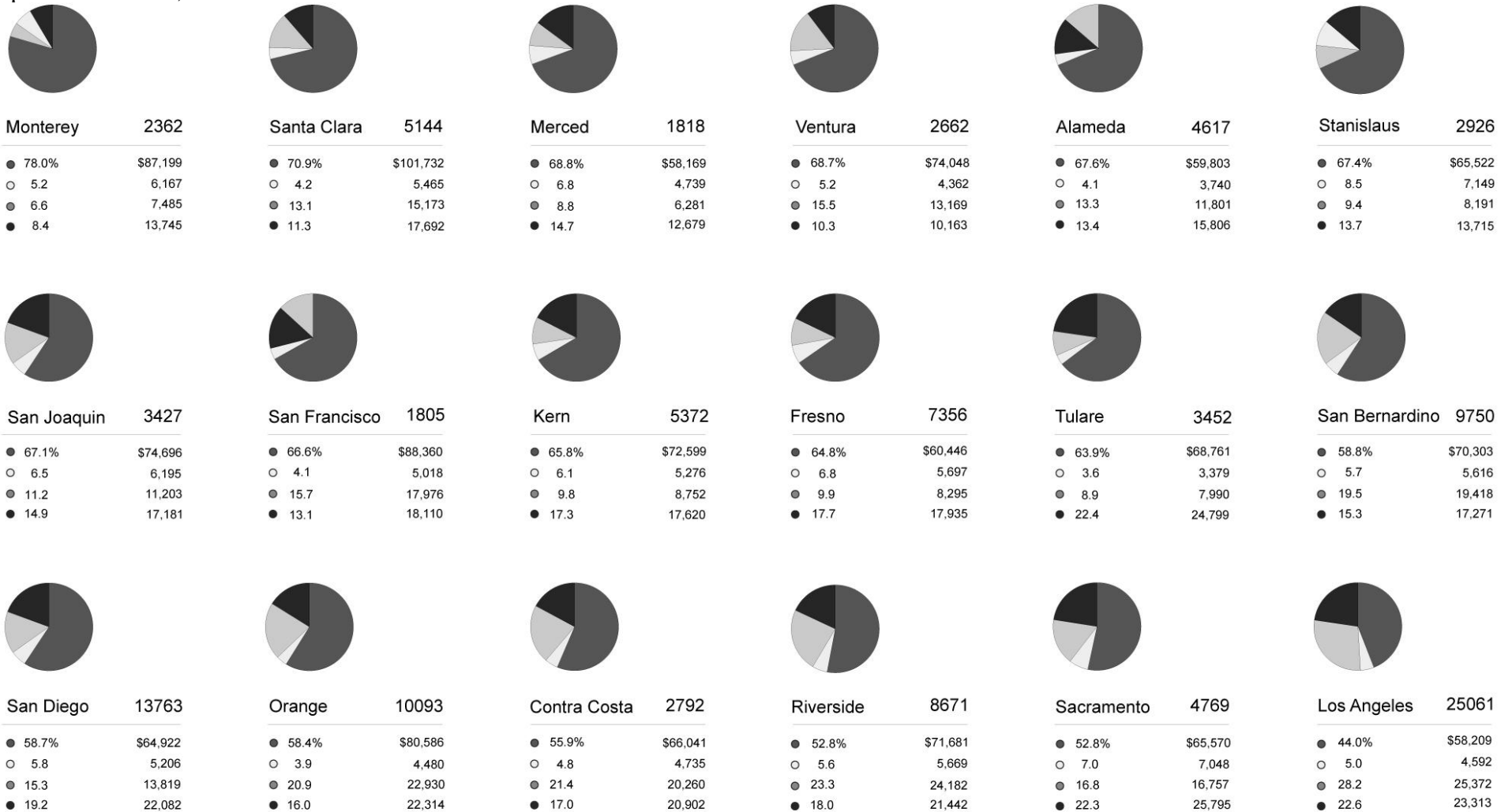
County	N children	Expenditures					Inpatient expenditure per bed day	Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	N children		% children	Total admissions	Total bed days				
All counties*	1171	338,054	64.0	253,166,230	265,373	3,824	954	81.5	4165	66196	4.4	69.4	15.9	
Sonoma	11	1,051,397	37.5	4,334,860	433,486	5,118	10	90.9	27	847	2.7	84.7	31.4	
Monterey	20	436,365	85.0	7,419,419	412,190	5,685	18	90.0	47	1305	2.6	72.5	27.8	
Santa Clara	43	435,876	84.2	15,781,593	426,530	5,361	37	86.0	185	2944	5.0	79.6	15.9	
Tehama	< 10	418,710	50.6	1,058,771	352,924	5,216	< 10	60.0	28	203	9.3	67.7	7.3	
San Benito	< 10	416,514	49.3	616,035	308,018	2,067	< 10	66.7	7	298	3.5	149.0	42.6	
Alameda	14	415,323	80.7	4,694,635	391,220	3,989	12	85.7	54	1177	4.5	98.1	21.8	
Sutter	< 10	400,324	55.3	663,929	221,310	9,095	< 10	100.0	7	73	2.3	24.3	10.4	
San Joaquin	20	391,617	87.9	6,887,543	362,502	5,394	19	95.0	82	1277	4.3	67.2	15.6	
Tulare	26	384,526	69.7	6,963,653	331,603	3,770	21	80.8	95	1847	4.5	88.0	19.4	
Riverside	100	358,107	60.1	21,517,865	259,251	4,139	83	83.0	325	5199	3.9	62.6	16.0	
San Bernardino	96	357,904	70.2	24,104,430	290,415	4,651	83	86.5	355	5183	4.3	62.4	14.6	
San Francisco	18	356,244	73.8	4,729,702	337,836	2,728	14	77.8	102	1734	7.3	123.9	17.0	
Sacramento	47	352,698	52.8	8,756,799	250,194	3,962	35	74.5	128	2210	3.7	63.1	17.3	
Madera	12	351,192	74.1	3,123,944	312,394	4,495	10	83.3	46	695	4.6	69.5	15.1	
Lassen	< 10	350,390	54.1	378,998	378,998	7,018	< 10	50.0	15	54	15.0	54.0	3.6	
Orange	112	345,256	68.5	26,483,005	294,256	3,934	90	80.4	407	6731	4.5	74.8	16.5	
Stanislaus	15	342,362	86.9	4,463,551	297,570	3,324	15	100.0	88	1343	5.9	89.5	15.3	
San Diego	108	340,644	65.4	24,047,508	264,258	4,149	91	84.3	427	5796	4.7	63.7	13.6	
Contra Costa	24	335,282	56.4	4,537,047	252,058	5,086	18	75.0	47	892	2.6	49.6	19.0	
San Luis Obispo	< 10	321,218	94.6	1,519,083	303,817	4,932	< 10	100.0	41	308	8.2	61.6	7.5	
Kern	45	319,190	78.2	11,239,451	274,133	3,744	41	91.1	215	3002	5.2	73.2	14.0	
Ventura	23	310,890	87.9	6,284,104	299,243	5,164	21	91.3	92	1217	4.4	58.0	13.2	
Imperial	< 10	304,399	92.7	1,693,788	282,298	2,750	< 10	100.0	49	616	8.2	102.7	12.6	
Fresno	43	299,872	75.9	9,785,091	271,808	3,185	36	83.7	149	3072	4.1	85.3	20.6	

County	N children	Expenditures					Inpatient expenditure per bed day	Hospitalizations				Hospitalizations per child	Bed days per child	Bed days per hospitalization
		Total expenditure per child	% inpatient expenditure of total expenditure	Inpatient expenditure	Inpatient expenditure per hospitalized child	N children		% children	Total admissions	Total bed days				
Del Norte	< 10	292,504	96.5	282,263	282,263	1,974	< 10	100.0	10	143	10.0	143.0	14.3	
Colusa	< 10	291,826	98.1	572,778	286,389	3,292	< 10	100.0	3	174	1.5	87.0	58.0	
Los Angeles	290	289,423	42.6	35,764,794	174,462	2,512	205	70.7	828	14238	4.0	69.5	17.2	
Shasta	< 10	286,036	83.8	479,129	239,565	4,240	< 10	100.0	5	113	2.5	56.5	22.6	
Kings	< 10	280,603	91.7	1,544,489	257,415	2,898	< 10	100.0	57	533	9.5	88.8	9.4	
Yuba	< 10	279,927	56.6	475,301	237,651	12,187	< 10	66.7	2	39	1.0	19.5	19.5	
Mendocino	< 10	278,979	89.2	1,991,029	248,879	4,546	< 10	100.0	37	438	4.6	54.8	11.8	
Santa Cruz	< 10	278,966	77.3	1,941,900	215,767	3,437	< 10	100.0	40	565	4.4	62.8	14.1	
Modoc	< 10	266,669	90.2	480,956	240,478	25,313	< 10	100.0	2	19	1.0	9.5	9.5	
Trinity	< 10	255,836	86.8	444,269	222,135	14,809	< 10	100.0	2	30	1.0	15.0	15.0	
Calaveras	< 10	249,417	81.2	202,453	202,453	4,601	< 10	100.0	14	44	14.0	44.0	3.1	
Humboldt	< 10	248,868	78.3	1,363,563	194,795	7,618	< 10	100.0	19	179	2.7	25.6	9.4	
Placer	< 10	245,730	77.9	1,340,118	223,353	5,096	< 10	85.7	17	263	2.8	43.8	15.5	
Merced	< 10	236,561	88.4	1,881,874	209,097	2,318	< 10	100.0	71	812	7.9	90.2	11.4	
Lake	< 10	229,588	78.7	722,888	180,722	20,654	< 10	100.0	4	35	1.0	8.8	8.8	
Marin	< 10	227,919	62.1	566,471	188,824	3,237	< 10	75.0	17	175	5.7	58.3	10.3	
Butte	< 10	224,216	68.6	615,045	205,015	14,644	< 10	75.0	4	42	1.3	14.0	10.5	
Inyo	< 10	212,471	87.5	185,825	185,825	2,693	< 10	100.0	4	69	4.0	69.0	17.3	
Glenn	< 10	208,046	98.7	205,371	205,371	4,776	< 10	100.0	1	43	1.0	43.0	43.0	
Nevada	< 10	207,573	99.6	206,769	206,769	34,461	< 10	100.0	1	6	1.0	6.0	6.0	
Amador	< 10	205,244	49.3	202,462	202,462	40,492	< 10	50.0	1	5	1.0	5.0	5.0	
Tuolumne	< 10	196,423	67.0	263,125	131,563	6,119	< 10	100.0	4	43	2.0	21.5	10.8	
El Dorado	< 10	195,678	89.1	348,554	174,277	2,112	< 10	100.0	4	165	2.0	82.5	41.3	

\*Excludes carved-in counties (Napa, San Mateo, Santa Barbara, Solano, Yolo)

Figure 10 shows the variation in the distribution of expenditure types, by county, among children  $\geq 1$  year in the top 10% group. Each circle represents a county and the number next to the county name shows the number of children included in the top 10%. Each section of the pie chart represents the percent distribution toward total expenditure for the different expenditure types; the \$ value shows the expenditure per child for that specific expenditure type. For example, the dark grey sections show the percent of inpatient expenditures that account for the total expenditure; the black sections show the percent of outpatient pharmacy expenditures that account for total expenditure. There is considerable variation by county in terms of the proportions of different expenditure types contributing to the total. Among counties with large number of children in the top 10%, inpatient expenditures accounted for 44% to 67% of total expenditures with outpatient pharmacy expenditures accounting for 14% to 23% of total expenditures. In counties with very few children, inpatient expenditures accounted for most of the total expenditures. As county size increased, total expenditures were accounted for by a varying mix of inpatient, outpatient and pharmacy expenditures. This was in contrast to children age  $< 1$ , where inpatient expenditures accounted for more than 90% of total expenditures, irrespective of county size.

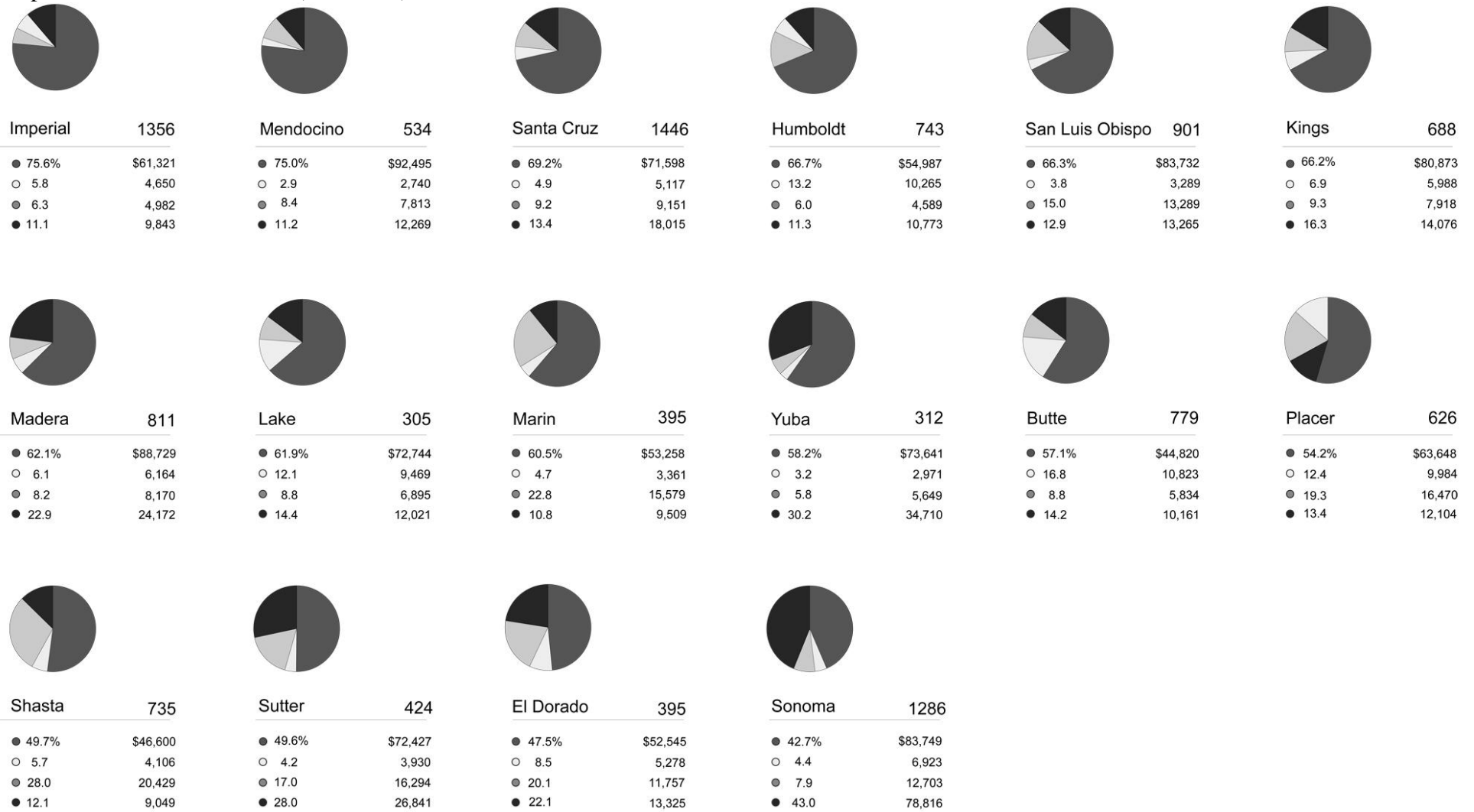
Figure 10. Distribution of total expenditure by expenditure type and per child expenditures by county among children age >=1 in the top 10% most expensive children, FY 2009



decreasing % inpatient expenditure →

County	N Children
% Distribution of expenditures	Per child expenditure \$ USD
● Inpatient	Inpatient
○ Provider	Provider
● Outpatient procedures	Outpatient procedures
● Outpatient pharmacy	Outpatient pharmacy

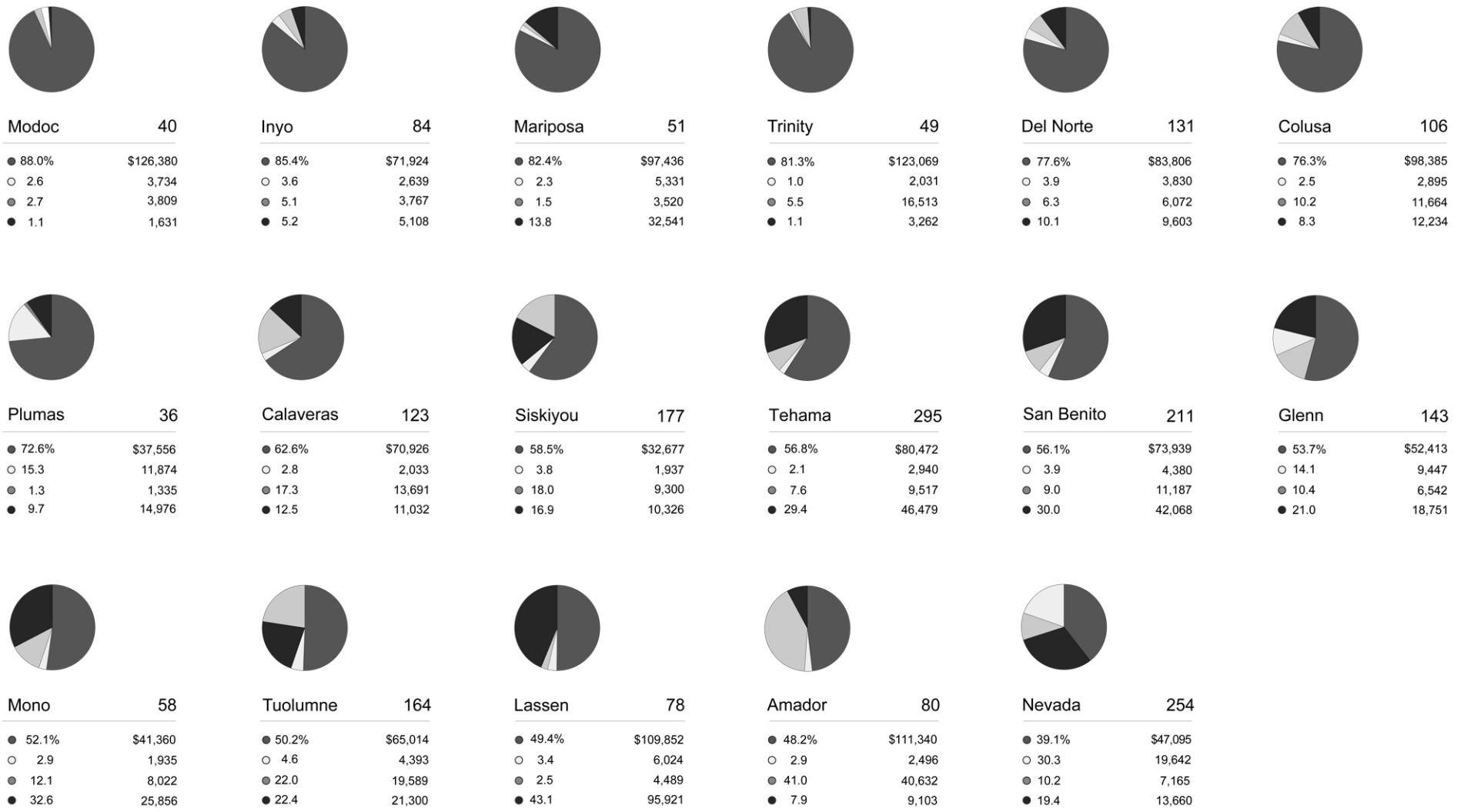
Figure 10. Distribution of total expenditure by expenditure type and per child expenditures by county among children age >=1 in the top 10% most expensive children, FY 2009 (continued)



decreasing % inpatient expenditure →

County	N Children
% Distribution of expenditures	Per child expenditure \$ USD
● Inpatient	Inpatient
○ Provider	Provider
● Outpatient procedures	Outpatient procedures
● Outpatient pharmacy	Outpatient pharmacy

Figure 10. Distribution of total expenditure by expenditure type and per child expenditures by county among children age >=1 in the top 10% most expensive children, FY 2009 (continued)



decreasing % inpatient expenditure →

County	N Children
% Distribution of expenditures	Per child expenditure \$ USD
● Inpatient	Inpatient
○ Provider	Provider
● Outpatient procedures	Outpatient procedures
● Outpatient pharmacy	Outpatient pharmacy

*Initial and subsequent hospital admissions*

Figure 11a shows the total number of hospital admissions for children age < 1 year in the top 10% and 1% groups. Less than one percent of children did not have any hospitalizations. Approximately 43% of children had more than one admission in the top 10% group as compared to 63% in the top 1% group. 14% of children in the top 1% had 6 or more admissions as compared to 5% in the top 10% group. Figure 11b shows the number of readmissions among children age < 1 year who had at least one hospitalization. For both groups, 55% of children were only admitted once. 7% of children in the top 1% compared with 2% of children in the top 10% had seven or more subsequent hospital admissions. Figure 11c shows the time to readmission among all children who had readmissions. Among children in the top 1%, 25% were readmitted within one week and 22% within two weeks, as compared to 20% within one week and 14% within two weeks in the top 10%.

Figure 11. Initial, subsequent hospitalizations and time to subsequent hospitalizations among children age < 1, FY 2009

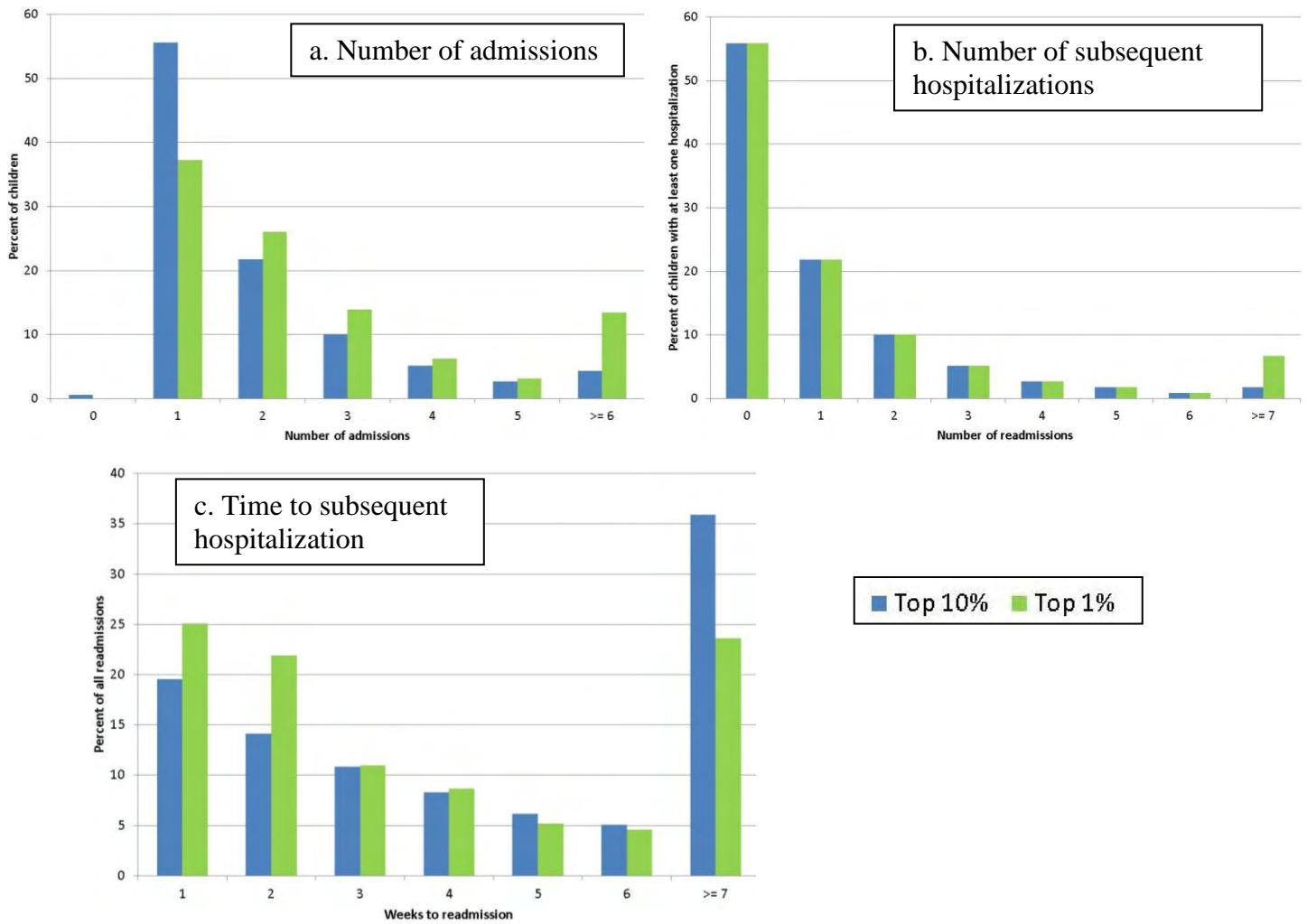
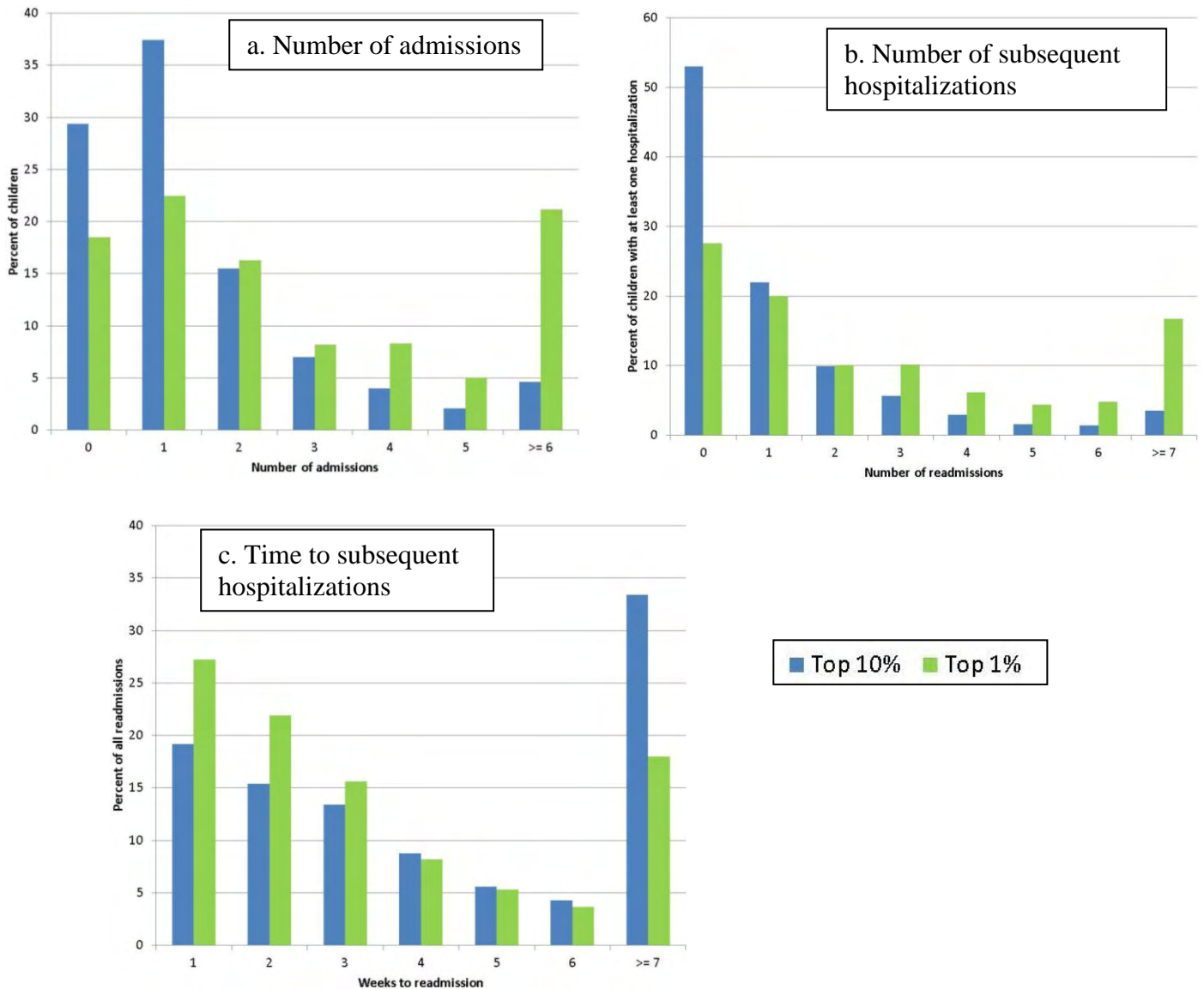




Figure 12a shows the number of hospital admissions among children age  $\geq 1$  year for the two groups of expensive children. 29% of top 10% and 19% of the top 1% of children had no hospital admissions; 33% of top 10% and 59% of the top 1% of children had more than one hospital admission. Figure 12b shows the number of readmissions among children with at least one hospitalization; children in the top 1% had higher number of readmissions compared with children in the top 10%. Figure 12c shows the time to readmission and shows a similar pattern to that observed among children age  $< 1$  year.

Figure 12. Initial, subsequent hospitalizations and time to subsequent hospitalizations among children age  $\geq 1$ , FY 2009



## **B. Analysis of CPQCC data for neonates**

In 2009, CPQCC cared for 14,171 infants who required neonatal intensive care in the first 28 days of life. 14,146 of these infants had a gestational age recorded. Overall 53.4 percent of infants admitted to the CPQCC NICUs with a recorded gestational age had one or more CCS eligible conditions (Table 18). It is important to note that eligible conditions at birth and eligible conditions that emerge during the NICU stay are not mutually exclusive. 45.2% of infants admitted to the NICU were born with a CCS eligible condition and 24.9% developed a CCS eligible condition during their NICU admission. Table 18 also lists the percentage of infants with specific eligible condition by gestational age. 32 percent of the infants with CCS eligible conditions were born at term (greater than or equal to 37 weeks of gestation). PDA was the most common condition at birth with highest incidence in those preterm infants less than 30 weeks GA. Congenital anomalies at birth were seen in 24.9% of the cohort and had their highest incidence in term born admissions. IVH (11.4%) and ROP (10.4%) were the most prevalent acquired conditions and were increasingly seen at the lower gestational ages. Abdominal surgery (8.4% of admissions) and CNS surgery (1.2% of admissions) had bimodal distributions with respect to gestational age.

Table 19 shows the percentage of CCS eligible conditions among CPQCC admissions by birth weight. Overall 53.3% of these infants had CCS eligible conditions. 67 percent of all VLBWs (<1500 grams) admitted to CPQCC intensive care units had CCS eligible conditions. Eligible conditions were present in 41% of LBWs (1499-2500) and 49% of NBW (>2499). The pattern of specific conditions is similar to those reported above for gestational age.

Table 20 compares the prevalence of CCS eligible conditions by location of care. The higher the level of care, the greater the percentage of infants cared for who were born with a CCS eligible condition. 55.3 percent of infants cared for at regional centers versus 27.7 percent of infants cared for at intermediate centers were born with an eligible condition, a 2 fold difference. There was a 0.7 fold difference between regional and community NICUs. For acquired eligibility, regional NICUs had the highest percent of its admissions who were CCS eligible. This was 4 times greater than intermediate admissions with acquired eligible conditions (31.9% versus 7.9%) and 1.5 times higher than infants cared for in community NICUs (31.9% versus 21%).

Table 18. CCS eligible conditions by gestational age for CPQCC infants born in 2009

Gestational Age (Wks Completed)	Born w/ Eligible Condition	PDA	Anomaly	Acquired Eligible Condition	NEC	GI Perforation	ROP	Peri IVH	Cystic PVL	HIE	CLD	Craniotomy	Lung Transplant	Abdominal/ GI Surgery	CNS Surgery	No CCS Condition	Any CCS Condition	Total Infants
<i>Ns</i>																		
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
21	2	2	1	1	-	-	-	1	-	-	-	-	-	-	-	2	2	4
22	18	16	3	20	1	1	12	17	3	-	11	-	-	1	2	7	21	28
23	145	141	19	161	20	24	87	120	18	-	62	-	-	26	6	40	173	213
24	283	270	48	306	46	38	206	191	21	-	149	-	-	52	11	28	335	363
25	358	343	56	381	50	38	280	171	24	-	192	-	-	58	7	26	435	461
26	360	348	73	387	54	25	258	167	27	-	197	-	-	43	14	47	462	509
27	370	344	74	365	46	13	206	159	17	-	153	-	-	31	11	95	475	570
28	375	352	63	352	52	12	166	132	8	-	148	-	-	27	6	155	497	652
29	370	324	102	301	32	10	102	132	18	-	101	-	-	31	9	295	500	795
30	304	248	94	249	29	7	84	110	14	-	87	-	-	30	4	403	422	825
31	247	196	108	203	18	7	40	99	9	-	66	-	-	33	2	463	355	818
32	224	142	132	177	15	6	16	81	5	-	59	-	-	43	6	485	316	801
33	229	143	145	145	17	7	12	42	4	-	69	-	-	45	6	552	279	831
34	269	146	194	207	13	4	2	35	2	-	123	-	-	71	6	645	338	983
35	294	158	238	373	6	5	5	25	8	1	309	-	-	93	7	423	471	894
36	356	156	292	427	11	6	-	15	5	25	328	-	-	115	7	291	563	854
37	432	207	364	197	5	6	1	28	6	19	-	-	-	134	21	397	458	855
38	610	277	534	212	8	5	1	25	5	37	-	-	-	134	24	530	648	1,178
39	617	285	533	215	4	3	-	24	8	66	-	-	-	119	17	560	677	1,237
40	393	197	334	159	7	3	-	25	1	59	-	-	-	80	6	473	454	927
41	124	66	100	57	1	-	-	12	-	29	-	-	-	19	2	163	157	320
42	11	3	9	3	-	-	-	-	-	3	-	-	-	-	-	10	14	24
43	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
Total	6,393	4,365	3,518	4,898	435	220	1,478	1,611	203	239	2,054	-	-	1,185	174	6,092	8,054	14,146
<i>Percentages</i>																		
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	100.0
21	50.0	50.0	25.0	25.0	-	-	-	25.0	-	-	-	-	-	-	-	50.0	50.0	100.0
22	64.3	57.1	10.7	71.4	3.6	3.6	42.9	60.7	10.7	-	39.3	-	-	3.6	7.1	25.0	75.0	100.0
23	68.1	66.2	8.9	75.6	9.4	11.3	40.8	56.3	8.5	-	29.1	-	-	12.2	2.8	18.8	81.2	100.0
24	78.0	74.4	13.2	84.3	12.7	10.5	56.7	52.6	5.8	-	41.0	-	-	14.3	3.0	7.7	92.3	100.0
25	77.7	74.4	12.1	82.6	10.8	8.2	60.7	37.1	5.2	-	41.6	-	-	12.6	1.5	5.6	94.4	100.0
26	70.7	68.4	14.3	76.0	10.6	4.9	50.7	32.8	5.3	-	38.7	-	-	8.4	2.8	9.2	90.8	100.0
27	64.9	60.4	13.0	64.0	8.1	2.3	36.1	27.9	3.0	-	26.8	-	-	5.4	1.9	16.7	83.3	100.0
28	57.5	54.0	9.7	54.0	8.0	1.8	25.5	20.2	1.2	-	22.7	-	-	4.1	0.9	23.8	76.2	100.0
29	46.5	40.8	12.8	37.9	4.0	1.3	12.8	16.6	2.3	-	12.7	-	-	3.9	1.1	37.1	62.9	100.0
30	36.8	30.1	11.4	30.2	3.5	0.8	10.2	13.3	1.7	-	10.5	-	-	3.6	0.5	48.8	51.2	100.0
31	30.2	24.0	13.2	24.8	2.2	0.9	4.9	12.1	1.1	-	8.1	-	-	4.0	0.2	56.6	43.4	100.0
32	28.0	17.7	16.5	22.1	1.9	0.7	2.0	10.1	0.6	-	7.4	-	-	5.4	0.7	60.5	39.5	100.0
33	27.6	17.2	17.4	17.4	2.0	0.8	1.4	5.1	0.5	-	8.3	-	-	5.4	0.7	66.4	33.6	100.0
34	27.4	14.9	19.7	21.1	1.3	0.4	0.2	3.6	0.2	-	12.5	-	-	7.2	0.6	65.6	34.4	100.0
35	32.9	17.7	26.6	41.7	0.7	0.6	0.6	2.8	0.9	0.1	34.6	-	-	10.4	0.8	47.3	52.7	100.0
36	41.7	18.3	34.2	50.0	1.3	0.7	-	1.8	0.6	2.9	38.4	-	-	13.5	0.8	34.1	65.9	100.0
37	50.5	24.2	42.6	23.0	0.6	0.7	0.1	3.3	0.7	2.2	-	-	-	15.7	2.5	46.4	53.6	100.0
38	51.8	23.5	45.3	18.0	0.7	0.4	0.1	2.1	0.4	3.1	-	-	-	11.4	2.0	45.0	55.0	100.0
39	49.9	23.0	43.1	17.4	0.3	0.2	-	1.9	0.6	5.3	-	-	-	9.6	1.4	45.3	54.7	100.0
40	42.4	21.3	36.0	17.2	0.8	0.3	-	2.7	0.1	6.4	-	-	-	8.6	0.6	51.0	49.0	100.0
41	38.8	20.6	31.3	17.8	0.3	-	-	3.8	-	9.1	-	-	-	5.9	0.6	50.9	49.1	100.0
42	45.8	12.5	37.5	12.5	-	-	-	-	-	12.5	-	-	-	-	-	41.7	58.3	100.0
43	66.7	33.3	66.7	-	-	-	-	-	-	-	-	-	-	-	-	33.3	66.7	100.0
Total	45.2	30.9	24.9	34.6	3.1	1.6	10.4	11.4	1.4	1.7	14.5	-	-	8.4	1.2	43.1	56.9	100.0

Note: The table is infant based rather than stay-based.

Table 19. CCS eligible conditions by birth weight for CPQCC infants born in 2009

Birth Weight (Grams)	Born w/ Eligible Condition	PDA	Anomaly	Acquired Eligible Condition	NEC	GI Perforation	ROP	Peri IVH	Cystic PVL	HIE	CLD	Craniotomy	Lung Transplant	Abdominal/ GI Surgery	CNS Surgery	No CCS Condition	Any CCS Condition	Total Infants
<i>Ns</i>																		
250-499	50	48	13	58	6	2	39	32	3	-	34	-	-	9	2	17	66	83
500-749	618	582	114	689	90	75	461	372	48	-	350	-	-	101	20	102	762	864
750-999	822	773	170	846	119	61	528	355	50	-	417	-	-	111	20	152	1,046	1,198
1000-1249	664	597	152	642	75	24	286	284	32	-	228	-	-	56	15	446	904	1,350
1250-1499	526	430	176	426	53	13	116	200	11	-	141	-	-	45	10	911	737	1,648
1500-1749	353	266	168	246	29	7	32	101	14	-	90	-	-	56	9	436	460	896
1750-1999	258	174	163	186	13	2	8	54	14	1	81	-	-	58	5	501	327	828
2000-2249	327	177	240	208	7	5	2	43	3	7	97	-	-	89	6	543	385	928
2250-2499	339	174	274	275	11	5	1	34	2	7	155	-	-	104	12	469	438	907
2500-2749	386	170	329	313	7	7	2	23	7	14	178	-	-	124	9	403	515	918
2750-2999	420	188	368	314	12	7	1	31	6	34	142	-	-	120	18	410	537	947
3000-3249	457	197	391	232	4	3	1	26	5	51	79	-	-	90	12	439	548	987
3250-3499	400	195	337	184	4	4	-	19	1	45	26	-	-	86	13	464	465	929
3500-3749	327	153	279	118	2	-	-	13	1	33	16	-	-	64	3	368	368	736
3750-3999	185	91	153	68	-	1	-	13	2	22	7	-	-	30	4	199	210	409
4000-4249	124	69	97	46	3	3	1	5	1	14	8	-	-	21	7	120	137	257
4250-4499	55	28	43	17	-	-	-	1	-	2	2	-	-	10	3	78	59	137
4500-4749	29	22	14	6	-	-	-	1	1	3	1	-	-	1	1	31	32	63
4750-4999	25	13	18	11	-	1	-	1	1	1	1	-	-	5	3	17	27	44
5000-5249	13	7	12	7	-	-	-	1	-	2	1	-	-	3	1	7	15	22
5250-5499	9	7	5	4	-	-	-	1	1	2	-	-	-	1	1	1	9	10
5500-5749	3	2	1	2	-	-	-	1	-	1	-	-	-	1	-	3	4	7
5750-5999	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
6000-6249	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
6250-6499	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Total	6,393	4,365	3,518	4,898	435	220	1,478	1,611	203	239	2,054	-	-	1,185	174	6,117	8,054	14,171
<i>Percentages</i>																		
250-499	60.2	57.8	15.7	69.9	7.2	2.4	47.0	38.6	3.6	-	41.0	-	-	10.8	2.4	20.5	79.5	100.0
500-749	71.5	67.4	13.2	79.7	10.4	8.7	53.4	43.1	5.6	-	40.5	-	-	11.7	2.3	11.8	88.2	100.0
750-999	68.6	64.5	14.2	70.6	9.9	5.1	44.1	29.6	4.2	-	34.8	-	-	9.3	1.7	12.7	87.3	100.0
1000-1249	49.2	44.2	11.3	47.6	5.6	1.8	21.2	21.0	2.4	-	16.9	-	-	4.1	1.1	33.0	67.0	100.0
1250-1499	31.9	26.1	10.7	25.8	3.2	0.8	7.0	12.1	0.7	-	8.6	-	-	2.7	0.6	55.3	44.7	100.0
1500-1749	39.4	29.7	18.8	27.5	3.2	0.8	3.6	11.3	1.6	-	10.0	-	-	6.3	1.0	48.7	51.3	100.0
1750-1999	31.2	21.0	19.7	22.5	1.6	0.2	1.0	6.5	1.7	0.1	9.8	-	-	7.0	0.6	60.5	39.5	100.0
2000-2249	35.2	19.1	25.9	22.4	0.8	0.5	0.2	4.6	0.3	0.8	10.5	-	-	9.6	0.6	58.5	41.5	100.0
2250-2499	37.4	19.2	30.2	30.3	1.2	0.6	0.1	3.7	0.2	0.8	17.1	-	-	11.5	1.3	51.7	48.3	100.0
2500-2749	42.0	18.5	35.8	34.1	0.8	0.8	0.2	2.5	0.8	1.5	19.4	-	-	13.5	1.0	43.9	56.1	100.0
2750-2999	44.4	19.9	38.9	33.2	1.3	0.7	0.1	3.3	0.6	3.6	15.0	-	-	12.7	1.9	43.3	56.7	100.0
3000-3249	46.3	20.0	39.6	23.5	0.4	0.3	0.1	2.6	0.5	5.2	8.0	-	-	9.1	1.2	44.5	55.5	100.0
3250-3499	43.1	21.0	36.3	19.8	0.4	0.4	-	2.0	0.1	4.8	2.8	-	-	9.3	1.4	49.9	50.1	100.0
3500-3749	44.4	20.8	37.9	16.0	0.3	-	-	1.8	0.1	4.5	2.2	-	-	8.7	0.4	50.0	50.0	100.0
3750-3999	45.2	22.2	37.4	16.6	-	0.2	-	3.2	0.5	5.4	1.7	-	-	7.3	1.0	48.7	51.3	100.0
4000-4249	48.2	26.8	37.7	17.9	1.2	1.2	0.4	1.9	0.4	5.4	3.1	-	-	8.2	2.7	46.7	53.3	100.0
4250-4499	40.1	20.4	31.4	12.4	-	-	-	0.7	-	1.5	1.5	-	-	7.3	2.2	56.9	43.1	100.0
4500-4749	46.0	34.9	22.2	9.5	-	-	-	1.6	1.6	4.8	1.6	-	-	1.6	1.6	49.2	50.8	100.0
4750-4999	56.8	29.5	40.9	25.0	-	2.3	-	2.3	2.3	2.3	2.3	-	-	11.4	6.8	38.6	61.4	100.0
5000-5249	59.1	31.8	54.5	31.8	-	-	-	4.5	-	9.1	4.5	-	-	13.6	4.5	31.8	68.2	100.0
5250-5499	90.0	70.0	50.0	40.0	-	-	-	10.0	10.0	20.0	-	-	-	10.0	10.0	10.0	90.0	100.0
5500-5749	42.9	28.6	14.3	28.6	-	-	-	14.3	-	14.3	-	-	-	14.3	-	42.9	57.1	100.0
5750-5999	100.0	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	100.0
6000-6249	100.0	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	100.0
6250-6499	100.0	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	100.0
Total	45.1	30.8	24.8	34.6	3.1	1.6	10.4	11.4	1.4	1.7	14.5	-	-	8.4	1.2	43.2	56.8	100.0

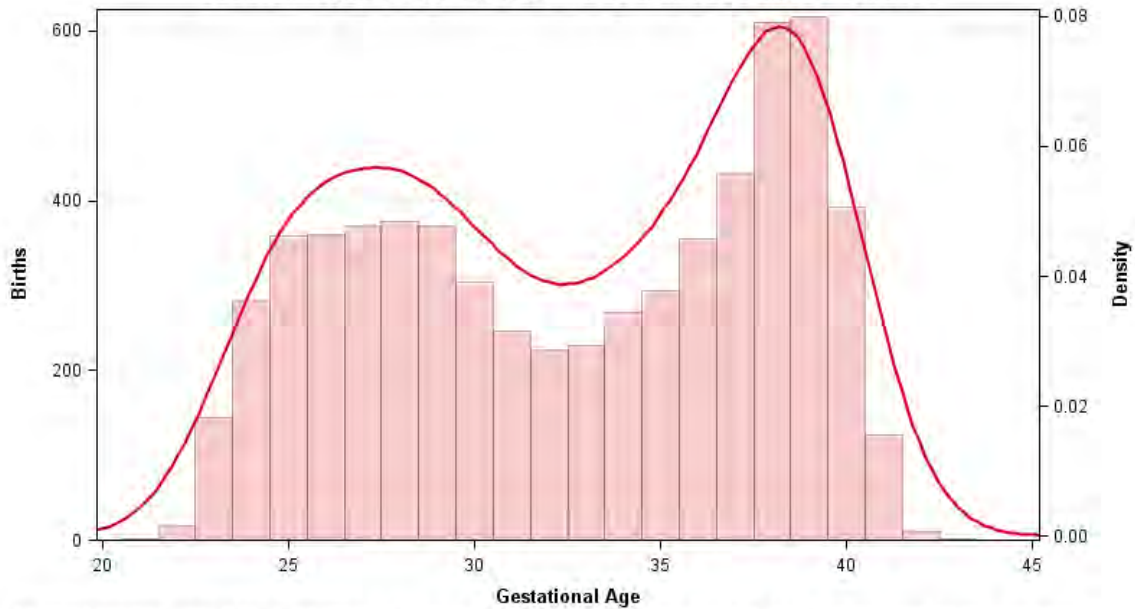
Note: The table is infant based rather than stay-based.

Table 20. CCS eligible conditions by center level

CCS Level	Born w/ Eligible Condition	PDA	Anomaly	Acquired Eligible Condition	NEC	GI Perforation	ROP	Peri IVH	Cystic PVL	HIE	CLD	Cranioto my	Lung Transplant	Abdominal/ GI Surgery	CNS Surgery	No CCS Condition	Any CCS Condition	Total Infants
<i>Ns</i>																		
Community	3,148	2,097	1,510	2,237	181	91	808	802	73	86	1,039	-	-	170	13	3,871	4,103	7,974
Intermediate	270	172	136	184	12	1	35	19	5	7	115	-	-	4	-	593	380	973
Regional	3,961	2,418	2,623	2,729	244	113	612	716	131	197	1,048	-	-	987	151	2,435	4,723	7,158
Non-CCS	250	189	110	189	11	4	55	48	-	5	91	-	-	17	2	400	345	745
Total	7,629	4,876	4,379	5,339	448	209	1,510	1,585	209	295	2,293	-	-	1,178	166	7,299	9,551	16,850
CCS Level	Born w/ Eligible Condition	PDA	Anomaly	Acquired Eligible Condition	NEC	GI Perforation	ROP	Peri IVH	Cystic PVL	HIE	HIE	Cranioto my	Lung Transplant	Abdominal/ GI Surgery	CNS Surgery	No CCS Condition	Any CCS Condition	Total Infants
<i>Percentages</i>																		
Community	39.5	26.3	18.9	28.1	2.3	1.1	10.1	10.1	0.9	1.1	13.0	-	-	2.1	0.2	48.5	51.5	100.0
Intermediate	27.7	17.7	14.0	18.9	1.2	0.1	3.6	2.0	0.5	0.7	11.8	-	-	0.4	-	60.9	39.1	100.0
Regional	55.3	33.8	36.6	38.1	3.4	1.6	8.5	10.0	1.8	2.8	14.6	-	-	13.8	2.1	34.0	66.0	100.0
Non-CCS	33.6	25.4	14.8	25.4	1.5	0.5	7.4	6.4	-	0.7	12.2	-	-	2.3	0.3	53.7	46.3	100.0
Total	45.3	28.9	26.0	31.7	2.7	1.2	9.0	9.4	1.2	1.8	13.6	-	-	7.0	1.0	43.3	56.7	100.0

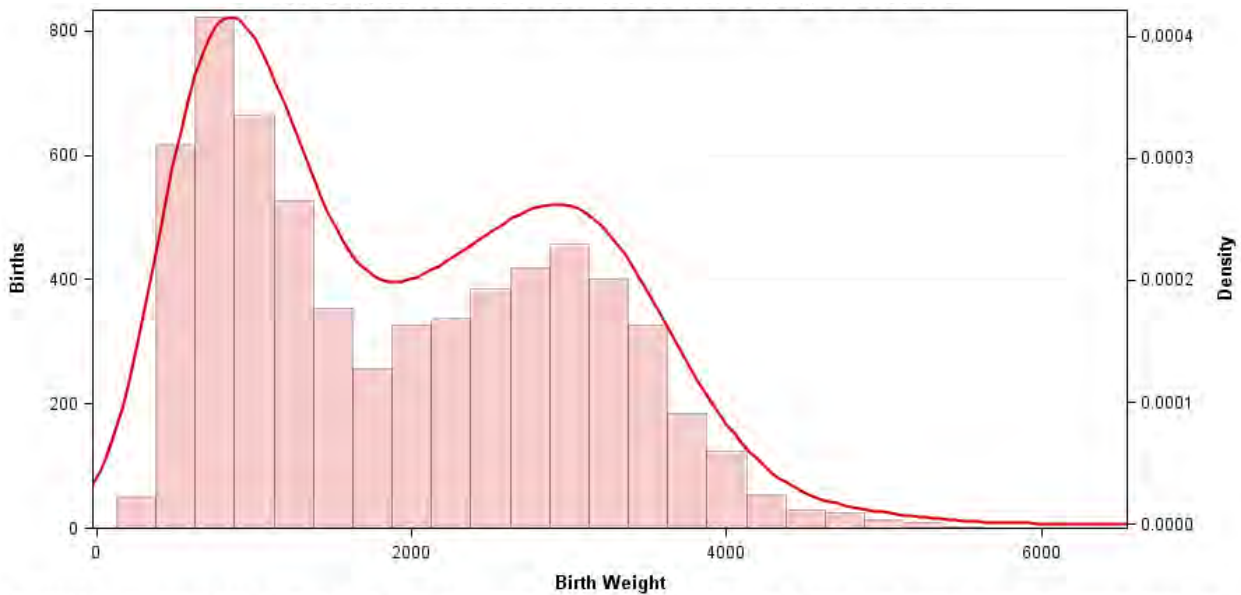
Figures 13a and 13b show the distribution of infants born with an eligible condition by birth weight and by gestational age. While both are bimodal the peak incidence is at the higher GA but at the lower birth weight.

Figure 13a. Gestational age distribution for infants born with a CCS eligible condition



The chart is based on all CPQCC infants admitted to a participating NICU following birth in 2009. Delivery room deaths and infants previously home are not included.

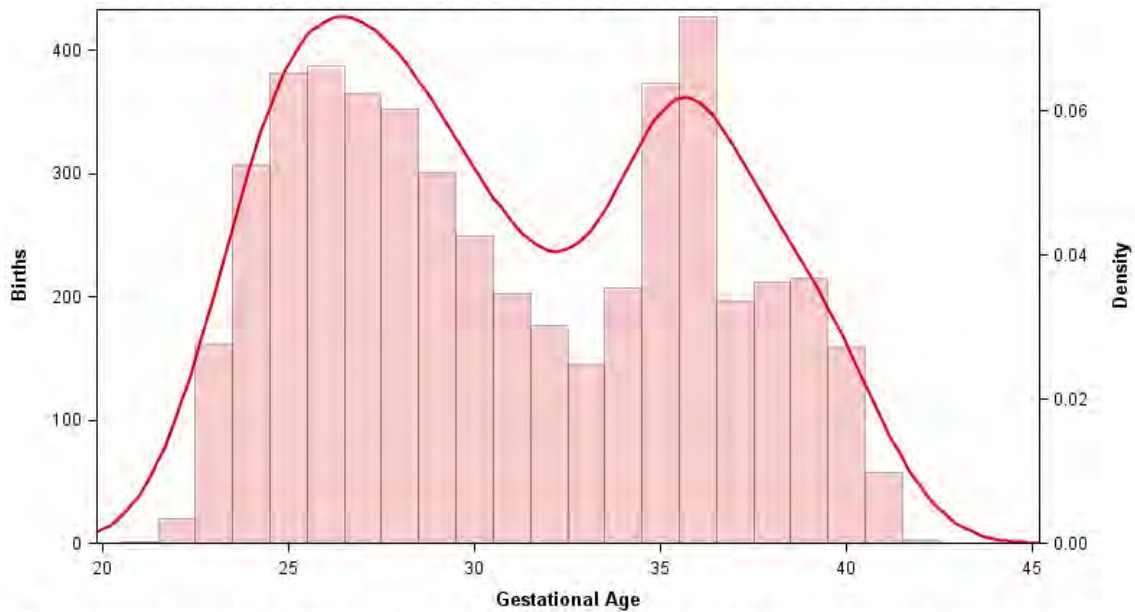
Figure 13b. Birth weight distribution for infants born with a CCS eligible condition



The chart is based on all CPQCC infants admitted to a participating NICU following birth in 2009. Delivery room deaths and infants previously home are not included.

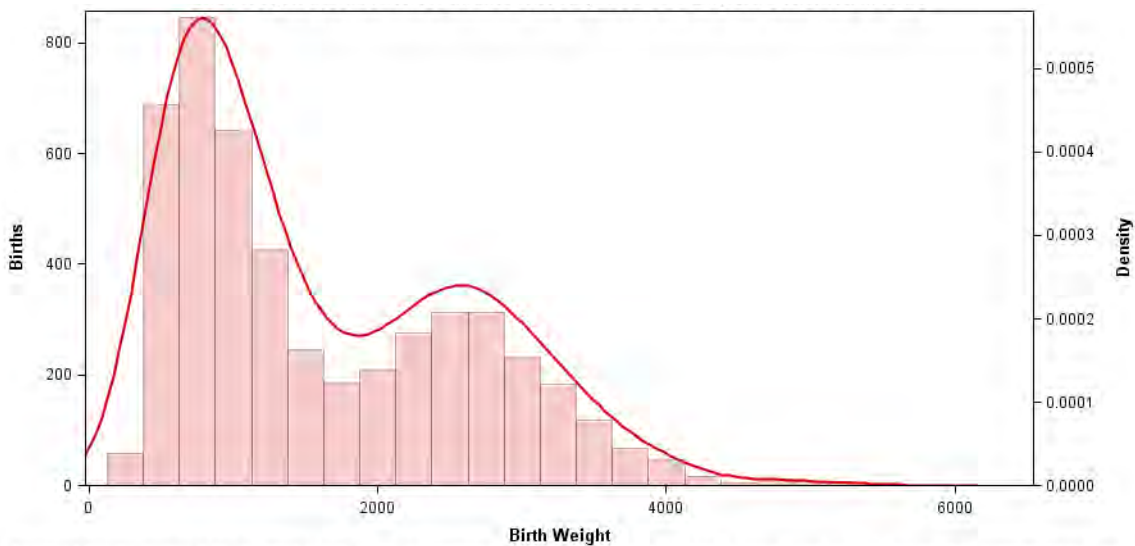
Figures 14a and 14b show the distribution of acquired conditions by GA and birth weight. Note that both are bimodal with the more prominent peak seen in the immature infants. In contrast the distributions of admissions without CCS conditions (Figures 15a and 15b) approximate a normal distribution.

Figure 14a. Gestational age distribution for infants who acquired a CCS eligible condition in NICU



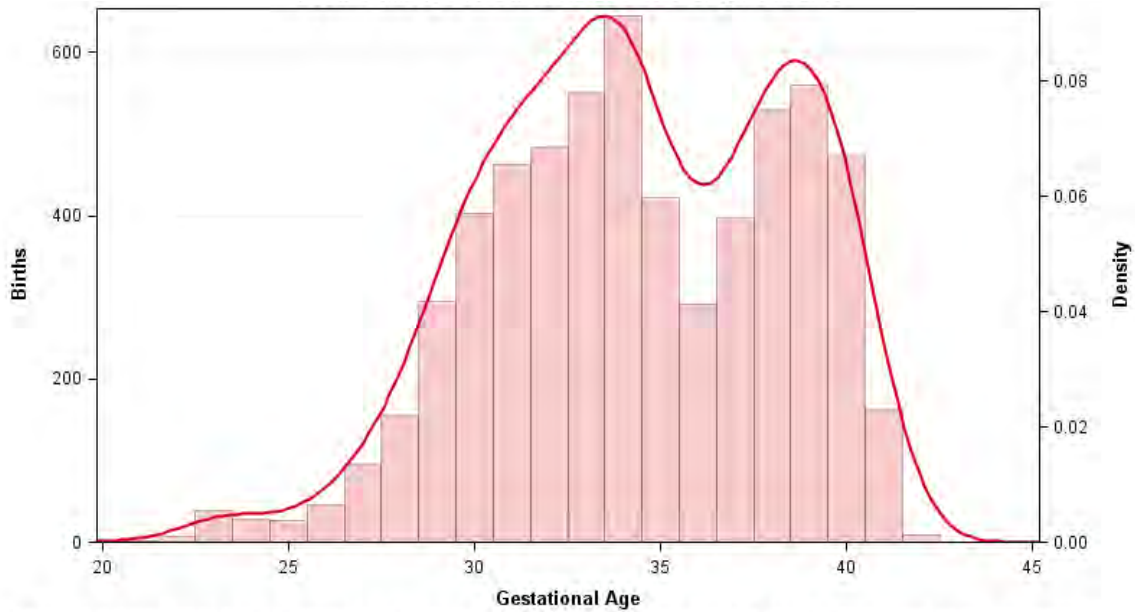
The chart is based on all CPQCC infants admitted to a participating NICU following birth in 2009. Delivery room deaths and infants previously home are not included.

Figure 14b. Birth weight distribution for infants who acquired a CCS eligible condition in NICU



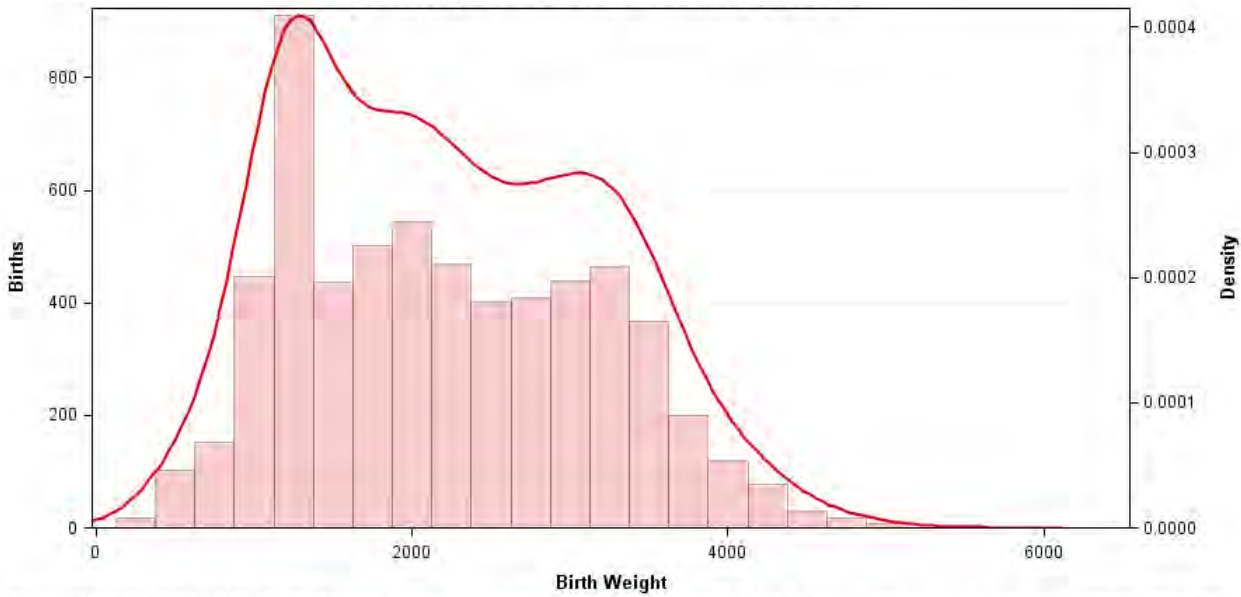
The chart is based on all CPQCC infants admitted to a participating NICU following birth in 2009. Delivery room deaths and infants previously home are not included.

Figure 15a. Gestational age distribution for infants without a CCS eligible condition



The chart is based on all CPQCC infants admitted to a participating NICU following birth in 2009. Delivery room deaths and infants previously home are not included.

Figure 15b. Birth weight distribution for infants without a CCS eligible condition



The chart is based on all CPQCC infants admitted to a participating NICU following birth in 2009. Delivery room deaths and infants previously home are not included.



## LIMITATIONS

Because of delays in acquiring the full dataset for children residing in Los Angeles County, the findings presented in this interim report use only partial data for Los Angeles County. We are currently working with the State and Los Angeles County to obtain and analyze the complete dataset for Los Angeles.

Utilization data are available for all children in the CCS dataset. However, data on expenditures are limited to fee-for-service expenditures only which results in the exclusion of expenditures for managed care encounters. The expenditure analyses include all services for children who were only enrolled in Medi-Cal, which account for the vast majority of children in the CCS program. For children in managed care, Healthy Families or CCS only, this expenditure analysis is restricted to services associated with the CCS condition. For the five counties that “carve in” CCS services within their managed care plan, expenditure analyses could not be conducted; however, utilization data are available and presented in this report.

## SUMMARY

### A. Analysis of claims data for CCS-enrolled children

The main results of our analyses were:

- The majority of CCS-enrolled children were  $\geq 1$  year of age. In fiscal year 2009, 16% of children were age  $< 1$  year and 84% of children were age  $\geq 1$  year. Utilization and expenditure patterns differed considerably between these two groups of children.
- A large proportion of the children appeared to be highly vulnerable with serious medical conditions. Most of the children had either Medi-Cal or Healthy Families eligibility; among children age  $< 1$  one year the leading eligible diagnoses were cardiac and NICU-related conditions; for older children it was neurology and ENT. Thirty-six percent of infants had at least one hospitalization in the year. Nine percent had two or more hospitalizations; 16% had subsequent hospitalizations occurring within one week. 48% and 55% of readmissions among children age  $< 1$  year and age  $\geq 1$  year respectively, occurred within 30 days of discharge. During the year, 6% of children age  $< 1$  year and 17% of children age  $\geq 1$  year had four or more readmissions within 30 days of a discharge (a detailed review of these discharges does not suggest a coding error). For children age  $< 1$  year, most of the readmissions within 30 days were for a different diagnoses compared to the reason for the previous hospitalization. For older children, most of the readmissions were for the same diagnoses.
- In fiscal year 2009, there was disproportionate use of service type by children based on age; children less than one year were a small proportion of the patient population (16%) but accounted for the highest inpatient utilization (36%). Among older children, outpatient services and prescriptions accounted for the highest percentage of utilization.
- Among children less than one year of age, inpatient bed days accounted for the highest percentage of utilization among all four leading conditions; the length of stay per hospitalized child varied substantially by condition.
- Among all children, inpatient services accounted for 60% of total expenditures, followed by outpatient prescriptions at 17%.

- Total expenditures were highest among children < 1 year of age with inpatient expenditures accounting for most of the cost; children < 1 year of age accounted for 39% of all inpatient expenditures.
- When examined by condition, 7 conditions accounted for 77% to 80% of expenditures and about 60% of children. There was substantial variation in total expenditures and per child expenditures by condition.
- Among children age  $\geq 1$ , although inpatient utilization was lower than outpatient utilization, inpatient expenditures accounted for a large proportion of total expenditures.
- When we examined expenditures by child, we found that most of the children had fairly low expenditures in the year; however, a small percentage of children had high expenditures. Ten percent of children accounted for approximately 75 percent of total expenditures.
- Among children age < 1, expenditures among the most expensive children were accounted for mostly by inpatient expenditures; however, there was considerable variation by county in the inpatient expenditures per child. While in some counties the high inpatient expenditures per child could be explained by longer bed-days per hospitalization, in other counties this was not the case. Children in the top 1% of the most expensive children were admitted and readmitted more frequently and within a shorter time frame than children in the top 10% of expensive children.
- Among children age  $\geq 1$  year, the contribution of expenditure types varied by county. In some counties, high total expenditures per child were accounted for primarily by inpatient expenditures, while in other counties a mix of inpatient, pharmacy and outpatient expenditures contributed toward total expenditures. In counties where inpatient expenditures accounted for a large percent of total expenditures and where inpatient expenditures per child were high (e.g. Santa Clara), long bed-days only partially explained these high costs. Admissions, readmissions and time to readmission showed similar patterns to those among children age < 1 year; children in the top 1% had higher admissions and readmissions and more children were readmitted within a shorter time compared with children in the top 10% groups.

## **B. Analysis of CPQCC data for neonates**

Our main results of the CPQCC data analysis were:

- 53% of NICU admissions had CCS eligible conditions. 45% were born with a PDA and or a congenital anomaly.
- 16% of NICU admissions had a condition at birth and an acquired condition.
- Another 8% acquired a CCS eligible condition during their admission.
- ROP and IVH were the most prevalent acquired conditions and were seen with highest frequency in the very immature infants. Surgical conditions were seen in both premature and term infants.

## **C. Summary**

These analyses suggest that children enrolled in the CCS program are highly heterogeneous in both the nature and severity of their medical conditions. This, in turn, suggests that great care should be exercised in implementing any one single delivery or financing structure. In addition, the findings of this report underscore the inherent vulnerability of a significant portion of

children enrolled in the CCS program and that any revisions to the current program should be carefully monitored to ensure that the desired improvements are actually being realized.

However, the findings of this report also suggest that many opportunities may exist for improved care delivery and cost reduction. The geographic variation in utilization patterns as well as the intense concentration of utilized services among a relatively small portion of the enrollees could provide essential guidance for major changes to program functioning and financing.