The California Child and Youth Injury Hot Spot Project

Report for the Period 1995 to 1997

August 2000

Volume Two: County Guide

A Report By

Family Health Outcomes Project
Department of Family and Community Medicine
University of California, San Francisco

Sponsored by the Family Health Outcomes Project, UCSF,
with funding provided by the
California Department of Health Services,
Maternal and Child Health Branch

The California Child and Youth Injury Hot Spots Project

August, 2000

STUDY CONSULTANTS

Family Health Outcomes Project
Department of Family and Community Medicine
University of California, San Francisco

Geraldine Oliva, MD, MPH, Principal Investigator

Linda Remy, PhD, Co-Investigator and Senior Statistician

Ted Clay, MS, Programmer and Statistician

Victoria Gimeno, MD, MPH, Epidemiologist

Kristie Kooken, Research Assistant

Andy Peri, MA, Geographer

Pamela Weatherford, MA, Editor

Cindie Sedik, Administrative Analyst

Jennifer Gee, Project Administrative Assistant

STATE OF CALIFORNIA

Gray Davis
Governor
State of California

Grantland Johnson
Secretary
Health and Human Services Agency

Diana M. Bontá
Director
California Department of Health Services

Maternal and Child Health Branch
Chief
Gilberto Chavez, MD MPH

Acknowledgements

This report reflects the efforts of the contractors and staff in the California Department of Health Services, Maternal and Child Health Branch (DHS/MCHB). Work was completed under contract 99-85045 with the University of California, San Francisco. Robert Bates, MD MPH, Medical Consultant, Adolescent Health and Injury Control, served as liaison between DHS/MCHB and the research team.

Geraldine Oliva, MD, MPH, led the research team, with day-to-day supervision by Linda Remy, PhD. Dr. Oliva and Dr. Remy shared primary responsibility for writing the *State Guide*. Dr. Remy and Ted Clay, MS shared primary responsibility for writing the *Technical Guide.* Dr Remy and Dr. Oliva shared primary responsibility for writing materials accompanying the *County Guide*.

Drs. Oliva and Remy developed the statistical reporting format. Ted Clay was responsible for most of the data processing and development of SAS programs to link, summarize, and report data. Andy Peri, MA, designed and prepared study maps. Pamela Weatherford, MA, made the statistical tables and publication-ready maps, and edited the reports. Victoria Gimeno, MD MPH, and Kristie Kooken were liaison to the counties and provided technical support as needed. Cindie Sendik and Jennifer Gee provided project support.

Suggested Citations

Oliva G, Remy L, Clay T, Peri A, Weatherford P, Gimeno V, Kooken K. *California Child and Youth Injury Hot Spots Project 1995-1997, Volume One: State Guide*, Sacramento, CA: California Department of Health Services, Maternal and Child Health Branch, August 2000.

Remy L, Oliva G, Clay T. *California Child and Youth Injury Hot Spots Project 1995-1997, Volume Two: County Guide*, Sacramento, CA: California Department of Health Services, Maternal and Child Health Branch, August 2000.

Remy L, Clay T, Oliva G. *California Child and Youth Injury Hot Spots Project 1995-1997, Volume Three: Technical Guide*, Sacramento, CA: California Department of Health Services, Maternal and Child Health Branch, August 2000.

TECHNICAL ADVISORY COMMITTEE

Robert Bates, MD MPH Medical Consultant,
MCHB, Adolescent Health and Injury Control

Gilberto Chavez, MD MPH, Chief,
DHS, Maternal Child Health Branch

Candice Diamond, Section Manager,
Healthcare Information Division, Patient Discharge Data Section
Office of Statewide Health Planning and Development

Jennifer Harper, Research Scientist,
DHS, Injury Surveillance and Epidemiology Section

Katherine Heck,
DHS, Maternal Child Health Branch

David Lawrence,
Center for Childhood Injury Prevention
San Diego State University

Michael Quinn, Research Manager,
DHS, Planning and Data Analysis Section

Don Taylor, MA, Epidemiologist,
DHS, Epidemiology and Evaluation Section

Roger Trent, PhD, Chief,
DHS, Injury Surveillance and Epidemiology Section

Lynn Walton-Haynes, DDS, MPH, Research Scientist,
DHS, Injury Surveillance and Epidemiology Section

Table of Contents

FIGURES

TABLES

Over View

The California Child and Youth Injury Hot Spots Project

In this overview, we describe the Injury Hot Spots Project rational, and objectives. This is followed by a very brief summary of the study methods and a discussion of their limitations.

The primary purpose of the California Child and Youth Injury Hot Spots Project is to identify small area patterns of injury so severe as to result in hospitalization and/or death for children, adolescents, and young adults age 0 to 24. Specifically, hot spots identify California counties and ZIPs whose young residents were at very high risk for serious injury in 1995, 1996, and 1997. The second purpose of the Injury Hot Spots Project is to describe characteristics of the injured and the course of treatment for those who survive to hospital admission.

Project reports will help to better understand injury patterns, target injury prevention activities, and evaluate results of injury prevention efforts. The end of the overview discusses relationships among the three report volumes of the California Child and Youth Injury Hot Spots Project and identifies how to obtain study reports.

Because of underlying complexity and limitations, we recommend that study results be examined and understood in context, using all that is known about injuries in a particular health jurisdiction, other standard injury reports issued by the California Department of Health Services EPIC unit, and other information available to local injury prevention planners and relevant health and social service providers.

The Injury Hot Spots Project Rationale

Injuries are the leading cause of death and disability for children and young adults in California and nationally. Medical, legal and administrative costs for injury hospitalizations of California children under 21 were an estimated $626 million with millions more spent on rehabilitation services and therapies for injured children who survived. Effective injury prevention strategies exist, e.g. car seats, bicycle helmets, ipecac, electric outlet covers, pool fences. County Health Departments and health care providers can use these interventions to decrease rates of death and disability if they can better target their efforts. Geographic information systems can help this effort.

Project Objectives

- To develop a methodology to classify ZIP codes as to the level of risk for injuries by intent for children and youth aged 0-24
- To identify those ZIP codes with the highest injury burden
- To identify factors associated with high injury burden

Methods

Data Sources

Primary data sources were 1995-1997 hospital discharge data from the California Office of Statewide Health Planning and Development (OSHPD) and California Vital Statistics death files. County-level population estimates were obtained from the California Department of Finance. ZIP-level population estimates were obtained from Claritas. Information regarding ZIP changes came from Western Economics Research and the US Postal Service. ZIP-boundary information came from MapInfo.

Record Selection

The target population was California residents age 0 to 24 excluding newborns and conditions originating in the perinatal period. We selected all records with any principal external cause of injury (E-code) following recommended CDC injury categories, in the hospital discharge and Vital Statistics death files.

Record Linkage

Hospital discharge records for individuals were linked to identify people with one or more injuries, to assign the series of hospital admissions related to one injury episode (i.e., admission, transfer, readmission) into an episode of care, or EOC, and to link multiple EOCs for people with more than one injury episode. Hospital and death files were linked to confirm in-hospital deaths and to add cases that died before care could be provided. The resulting file was summarized to the county and ZIP-level.

E-code Discrepancies

The E-Code disagreed on the last EOC for 33% of cases with more than one record. This occurred either when multiple hospital records were linked, when a hospital record and a death record were linked, or in the case of multiple hospital records and a death record. To help readers understand what we encountered, the table below shows a sample case. This case matched exactly on all variables used to make the linkage.

Sample Multiple Injury Case

Admit Date	Admit Source	Injury	Discharge Date	Discharge Disposition
1	ER	Cut/Pierce (sui)	2	Routine
3	ER	Poisoning (int)	6	Other
20	ER	MV Pedestrian	21	LAMA
32	ER	No Injury	34	Routine
54	ER	Poisoning (int)	55	Died

Resolving E-Codes

If the hospital case did not link with the death file, we used the first injury record on the last EOC. In the sample case, we used the last injury (poisoning, intentional) and ignored previous injuries. For hospital cases linking with the death file, we made the following decision: Within 3 days of discharge, we treated both files as describing same injury and used the most specific E-code. More than 3 days after discharge, we used death E-code

unless death E-code showed late effects, adverse effects, or no injury, in which case we used the hospital E-code.

Prioritizing E-Codes

Because of the E-code disagreements, we also had to develop rules to prioritize conflicts for the same injury episode of care. We developed the following hierarchy: Intentional before unintentional, other intentional before self-intentional, and a specific hierarchy within subgroupings from more to less specific.

Problems with ZIP Codes

We identified a number of problems with ZIP codes. These included: ZIPs change over time, ZIPs split into 2 or more, ZIPs consolidate, Post Office Box ZIPs nest in ZIPs with geography, ZIP numbers remain same but boundaries change, ZIP boundaries span county boundaries, ZIPs have no ZIP or nonexistent Zip. These problems had to be resolved in order to calculate rates and develop maps. We made a number of decision rules to handle these various issues.

Identifying Hot Spots

To identify hot spots, we calculated the rate per 100,000 population at the ZIP and county levels for all injury episodes, unintentional injury episodes, and intentional injury episodes. Then we calculated quartiles for number of injury episodes and rate for all ZIPs and counties relative to each other (statewide), and all ZIPs intra-county if the county had 12 or more ZIPs.

Defining Injury Hot Spots

- "Hot" spot: ZIPs and counties (and ZIPs within counties) with both number of injury episodes and rate in the 4th highest quartile.
- "Medium" spot: Rate or number in the 4th quartile and the other in the 3rd quartile
- "Warm" spot: Both rate and number in the 3rd quartile.
- All other ZIPs were considered not to be hot spots.

Study Limitations

In the sample table, notice that one person was hospitalized five times during the three-year study period for three different types of injuries, with poisoning (intentional) occurring two times. Without linkage, we would have counted one person five times for the same ZIP and would have double counted poisoning. This would have incorrectly inflated ZIP-level injury rates. Also notice that the person was discharged to another facility after the second injury, but we were unable to link the other record. A case such as this leads directly to understanding the study limitations.

At each step, we tested the reliability for all linkage decisions we made. Despite the reliability we attained, we may have linked some records -- thereby creating multiple-record sets -- that truly belonged to different people. We think this possible because a large number of injuries seemed to resolve inappropriately to single-record episodes. For example, among single-record injuries, 5,147 came in from another facility, and 4,467 were transferred to

another facility, yet records from these other facilities were not found and linked. Some of these records may be among those incorrectly linked to other people, as discussed above.

We calculated ZIP-level rates using population estimates from a commercial vendor. If the ZIP-level population estimate was smaller than the actual, the rates will be incorrectly inflated. If the ZIP-level population estimate was larger than the actual, the rates will be incorrectly small. We checked with local county officials for a number of ZIP rates that seemed unlikely. When the 2000 census data are released, we may be able to ascertain the magnitude of discrepancies.

On balance, we believe "over-linking" and "under-linking" may cancel each other out. So long as we consider a record in the person-level file to be a "person" in a loose rather than exact sense, we think we have done as good a job as possible in carrying out the linkage task. The number of injuries we summarized to the county and ZIP-levels more likely reflects a "truer" number of injuries than if we had not linked. In that sense, our results may be more conservative, since a given ZIP will have fewer injuries and will be less likely to be identified as a hot spot.

However, because of the linkage method, results of this study will not agree -- at the county or state level -- with standard injury reports issued by the California Department of Health Services.

Results

The Last Injury Episode

- 150,552 California children, adolescents, and young adults age 0 to 24 were severely injured one or more times between 1995 and 1997.
- 11,275 died of their injuries, 61% of all deaths.
- About 4 of 5 deaths occurred before admission.
- The 141,892 young people admitted to hospital spent 674,594 days in care for their last injury.
- Inpatient hospital charges for the last injury was over $1.55 billion.

Injury Episode Trends

- The number of injury cases admitted to hospital or dying before reaching the hospital declined during the 3-year study period.
- The greatest decline was in the number of intentional injuries.
- Transportation-related accidents accounted for 27% of all injury episodes, falls 20%, self-inflicted (Suicide or suicide attempts) 9%, other intentional injuries (assaults) 13%.
- Two-thirds of the injured were male.
- 57% of the injured were over 15 years old.
- Injury episodes declined for those age 20 to 24.
- Injury episodes increased for children age 5 to 9.

- Non-Hispanic Whites were 41% of the injured, Hispanic 39%, African-American 11%, Asian 6%, Other 4%.

Injury Outcomes

- The number of routine dispositions (return home) decreased. The proportion of routine dispositions increased.
- The number and proportion of non-routine dispositions increased.
- The number and proportion of deaths decreased.

Injury Burden for Cases Admitted to Hospital

- Average EOC length of stay decreased from 5.2 to 4.3 days.
- The median injury EOC charge increased from $7,743 to $8,029.
- The average injury EOC charge increased from $13,331 to $14,366.
- Medi-Cal was the most frequently found anticipated payment source: 38% overall.
- Among those with multiple admissions, 82% showed Medi-Cal as the anticipated payor on at least one record.
- Lack of any type of insurance coverage was found in 16% of all injury-related records indicating the patient remained uninsured.

Multiply Admitted

- About 20% of injury victims admitted to hospital were discharged and transferred or readmitted numerous times with no or a very short break before readmission.
- Many such cases had more than one injury record.
- Psychiatric and/or substance abuse diagnoses were present on 44% of multiply-admitted vs 12% on singles.
- Including multiply admitted increased days of care to 907,522 and charges to $3.2 billion for all discharges.
- This is a 35% increase in days and a doubling of charges over the last EOC used for surveillance and mapping.
- Multiply admitted tended to cluster in a few counties.

Injury Hot Spots

- Of 1,563 California ZIPs, 127 were defined as "hot" spots, 213 "medium", and 115 "warm" for total injuries.
- These hotspots represented 29% of all California ZIPs and 53% of the State population age 0 to 24.
- 65% of serious injuries to 0 through age 24 year olds occurred in these ZIPs.

Conclusions

- Injuries cluster in more populated regions.
- Injury hot spots account for a disproportionate share of cases and costs.
- The multiply admitted account for a large percentage of overall costs.
- Linking death and hospital records and unduplicating cases leads to a better understanding of the number of individuals affected by injuries.
- Combining ZIP-level data for both number of injuries and injury rate to generate an injury burden score is more useful than either statistic alone as a method to identify high priority areas for intervention.

The Hot Spot Reports

Volume One: State Guide This volume is intended for all those interested in community safety, such as local health jurisdictions, hospitals, child advocates, and consumers. The State Guide begins with a brief description of the background, methods, and results of a study to identify California injury hotspots between 1995 and 1997. Then maps are presented that display injury patterns at the state- and county-level. An additional non-technical discussion of the study methods and results is presented after the maps. That section includes statistical tables and graphs summarizing state-level injury data.

Small area maps in *Volume One* characterize areas found to be "hot", "medium", and "warm" with respect to all injuries, unintentional injuries, and intentional injuries. All remaining areas are combined into the same category.

Volume Two: County Guide contains results for counties and ZIPs upon which State Guide maps are based. The accompanying text describes the Injury Episode Table, the Injury Episode-of-Care Table, and the Small Area Table (county- or ZIP-level) statistics developed by the California Child and Youth Injury Hot Spots Project, and suggests ways these data might be used.

Volume Three: Technical Guide. This volume is intended for health service researchers, health care providers, and others interested in the computing methods used to identify and flag injury hot spots. It contains a detailed description of the data and methods used to link and categorize injuries, summarize data to the small area, identify injury hot spots, and produce statistical tables and maps. This detailed presentation is intended to allow users and researchers to review and comment on the approaches taken and to encourage future improvements.

How This Differs from Other Injury Reports

This report differs in fundamental ways from other injury reports published by the State of California.

- Multiple hospital discharge records for the same injury episode have been linked and summarized. This allows us to track the course of hospital care.

- Vital Statistics death records have been linked with hospital discharge summaries. Linkage allows for reconciliation between these files for injuries resulting in death.

- Linking and summarizing all records associated with the same injury provides a way to conservatively estimate injury rates in local communities.

- Providing zip code (ZIP) level data for both number of injured children and injury rates can assist local groups interested in public safety to better understand geographic injury patterns, target prevention resources toward communities with the greatest injury burden (i.e., both high rates and high numbers), and evaluate such prevention efforts.

Using This Report

This report summarizes injury data for California's children and youth age 0 to 24 years statewide and for local health jurisdictions (58 counties, with Los Angeles divided into four regions, and three independent cities). The ZIP-level analysis compares each ZIP with all other ZIPs statewide and within each jurisdiction.[2]

The State Guide summarizes methods used to analyze the data, classify ZIPs, and presents overall statewide results. It is important to understand the statewide results in order to evaluate the meaning of regional data. Maps in this volume allow readers to visually compare their region's injury pattern with the statewide injury pattern, and to compare ZIPs within their region to each other.

State summary tables in the *State Guide* can be compared with region summary tables in *Volume Two*: *County Guide*. This enables the reader to compare characteristics of injured children in a particular region of interest to state averages. We hope this will contribute to a better understanding of injuries to California's young people and their course of hospital care.

ZIP-level tables in the *County Guide* compare a community's actual injury rates with injury rates statewide and within the region. This permits the reader to evaluate how well each community within a region safeguards its children.

Finally, for those with technical expertise who are interested in a more detailed description of the methods and analyses, refer to *Volume Three*, *Technical Guide*.

After reviewing these reports, we hope you will join others in your community and use your new knowledge to improve local understanding of injury patterns, and to better protect your community's children, adolescents, and young adults.

---

[2] Intra county or city comparisons were made only for local health jurisdictions with at least 12 ZIPs.

Obtaining Study Reports and Data

To obtain copies of these documents, contact:

California Department of Health Services
Maternal and Child Health Branch
714 P Street, Room 750
Sacramento, CA 95814
(916) 651-1347

The Family Health Outcomes Project can be reached at:
3333 California Street, Suite 365
San Francisco, CA 94109
Phone: 415-476-5283
Fax: 4415-502-0848
Website: http://www.ucsf.edu/fhop/

Chapter 1

The County Injury Episode Table

Overview of Statistical Tables

This volume of the *Child and Youth Injury Hot Spots Report* presents detailed statistical tables summarizing county data and ZIP-level county maps derived from the small area tables. A county worksheet has been prepared to accompany this volume that includes four tables summarizing different aspects of severe injury cases for children, adolescents, and young adults through age 24, for the period 1995 through 1997. The county tables include:

- Injury Episode Table. Overview of injury episodes resulting in death and/or hospital admission.
- Episode-of-Care Table. Overview of the last episode of care (EOC) for injured admitted to hospital.
- Small Area Table. Small area injury information used to identify hot spots.
- Population Table. State and county population estimates for 1995 through 1997. The Population Table has California Department of Finance annual population projections for the state and county by age, and race/ethnicity (http://www.dof.ca.gov/newdr).

The number of cases in the injury episodes table differs from number of cases in the injury EOC table in that the latter describes only those injured who were admitted to hospital.

Volume One, State Guide contains identical state-level tables summarizing injury episodes and episodes of care, and statewide maps using the small area data.

A severe injury is an injury serious enough to result in hospital admission and/or death. Variations in local practice patterns and local emergency response capacity may influence both hospital admissions and deaths, and may influence the statistics reported. Thus, these figures cannot be used to accurately estimate injury incidence or severity.

Further, the primary purpose of this report was to identify injury hot spots. The county tables are byproducts of activities undertaken to accomplish the main purpose. In *Volume Three, Technical Guide*, we describe each methodologic decision made. Given uncertainties inherent in the data, the resulting county tables must be used thoughtfully.

Overview of The Injury Episode Table

For this study, the injury episode is defined as the injury event itself. Because of problems associated with injury coding rules and/or multiple injuries, we made a decision to use the last injury event. Using this definition, we created a person-level

file identifying the last severe injury to a young California resident in the 3-year period 1995 to 1997.

The Injury Episode Table in this volume summarizes county data for each of the three years used in this study. It is the county equivalent of Table 1 in *Volume One, State Guide, Chapter Three*.

In the Injury Episode Table, the first column identifies the variable measured. The second column set presents the number of injury episodes for each year of the study. The third column set shows the rate per 1,000 injury episodes. This rate can also be thought of as a percentage. The fourth column set shows the rate per 100,000 population.

Keep in mind that data in this table are based upon the last injury for cases admitted to a hospital plus injury cases that died before admission. Most hospitals treat relatively minor injuries in the emergency room or on an outpatient basis. The more seriously injured would most likely be admitted.

Because of local differences in admitting practices, the number of injury cases sufficient to result in hospital admission may vary from community to community in such a way as to affect the total number of injuries reported. These differences in local practice patterns may affect the number of injury cases available to this analysis. At present, we have no way to estimate the effect of this variation.

The Variables Measured

Variables in the county-level Injury Episode Table are county population, injuries by intent, demographic characteristics of the injured (sex, age, race) and the outcome, or disposition, for each case. Disposition categories are as follows:

- A "routine" disposition typically means the injured young person was admitted to a hospital and returned home after the last discharge.

- A "non-routine" disposition identifies patients whose last record indicated they were admitted but transferred to another acute hospital, long-term care or rehabilitation facility or, infrequently, were discharged with a plan of providing in-home services. After linkage, no subsequent record was found for them.

- "Died" identifies injury victims who died from their injury, either before they could be admitted to hospital or after they were admitted.

The Number of Cases

This column set shows the number of cases with the characteristic of interest. The column labeled "total" is the sum of the characteristic over the three years. Information on characteristics of the injured was taken from the first injury record in the last injury episode.

Depending on local injury patterns and demographics, many counties have few cases in certain categories.

The population figure is the yearly total population ages 0 to 24 estimated by the California Department of Finance. The number shown for the population total was calculated by summing the yearly estimated population and dividing by three to get an average population. In programs classifying hot spots, rates were based on 1996 estimated population, the middle of the 3-year study period.

The Rate Per 1,000 Episodes

This is calculated by dividing the number of injury episodes with the characteristic by the total number of episodes and multiplying the result by 1,000. The purpose of including this rate is to give readers a sense of the proportion of total injuries accounted for by different race/ethnic and age subgroups and by injury intent as well as type of outcome. We chose the rate per 1,000 in order to magnify differences where percentage changes were very small due to small numbers. For example, if 5 girls were injured in a county with 100 injury episodes, the rate would be 50 per 1,000 injury episodes, or 5%, or 0.05.

The Rate Per 100,000 Population

The annual rate is calculated by dividing the number of cases with the characteristic by the estimated population that year, multiplied by 100,000. For example, if 5 girls were injured in a county with a popuation in a given year of 20,000 young people age 0 to 24, the rate per 100,000 population would be 25.

The rate in the "total" column is obtained by dividing the total number of cases over the three years by the average population age 0 to 24, multiplying by 100,000 and dividing by 3.

These rates are not adjusted for age or race/ethnic distribution. For statewide rates by age and race/ethnicity, see *Volume One, State Guide, Chapter Four*.

Using This Table for Local Monitoring

For simplicity of presentation, we have not calculated confidence intervals for these rates or the standardized ratios and their confidence intervals. However, these can be calculated using FHOP templates (http://www.ucsf.edu/fhop).

With the Injury Episode Table, Population Table, and FHOP templates, counties have the information they need to examine some issues that may be of interest to local health planners.

On the following pages, we use as an example an unidentified hot spot county. We picked this county because its total population age 0 to 24 is above the state median county population, its number of injuries were above the median for all counties, and its rates were above the median for total, unintentional, and intentional injuries.

To mask the county identity, we do not show the Injury Episode Table, or the numeric results from importing this county's data into the templates. After the last example, we summarize the findings and suggest how such a county might proceed given the information available to it at this point.

Example 1: Are Injury Rates Higher:

Most planners are interested in knowing if rates for all injuries or certain types of injuries are higher than state rates. This may suggest a need for broadly-based injury prevention activities targeting, for example, unintentional injuries.

Rates for County X seemed high compared to the state rates. The state total injury rate declined steadily between 1995 and 1997 from 436 to 401 per 100,000 population age 0 to 24. In County X, the total injury rate declined 82 per 100,000 by 1997. However, the major decline was between 1995 and 1996, with little change from 1996 to 1997.

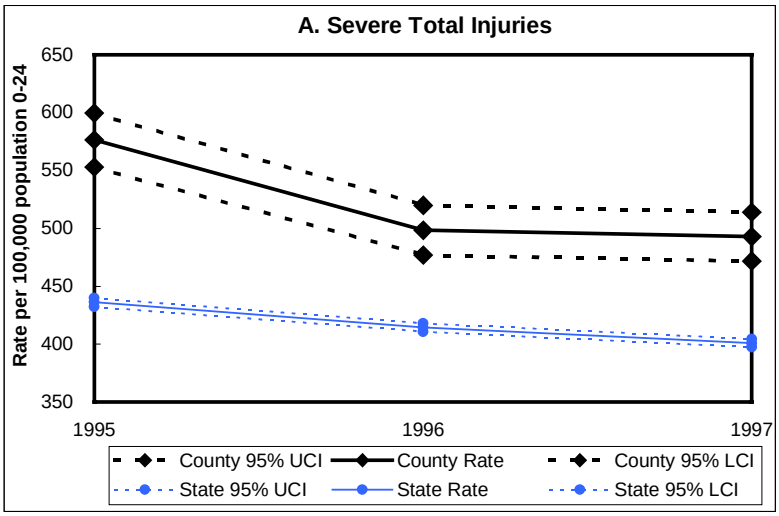
Figure 1 graphs results obtained by importing county data into the hot spots templates. Black lines show the upper confidence interval, rate, and lower confidence interval for the county. Gray lines show the same statistics for the state.

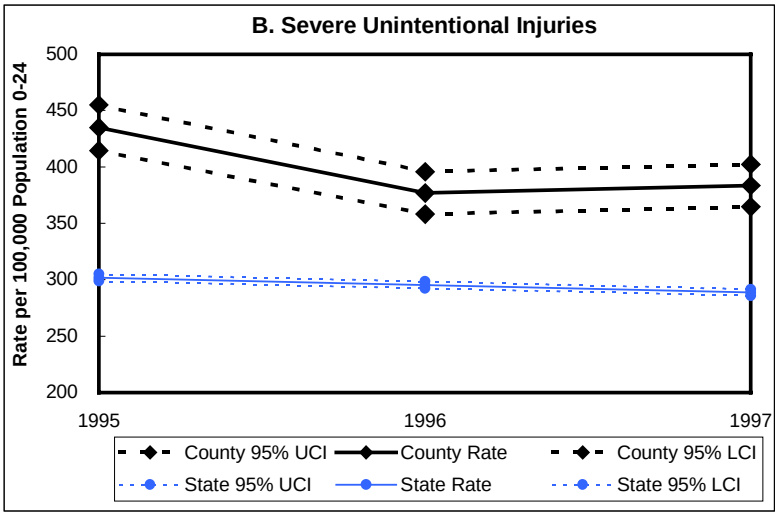
Figure 1.A shows the results for total injuries. The confidence interval is wider for the county than for the state because the numbers of cases and population are a fraction of the entire state. The confidence intervals indicate the county total injury rate is much higher than the state all three years.

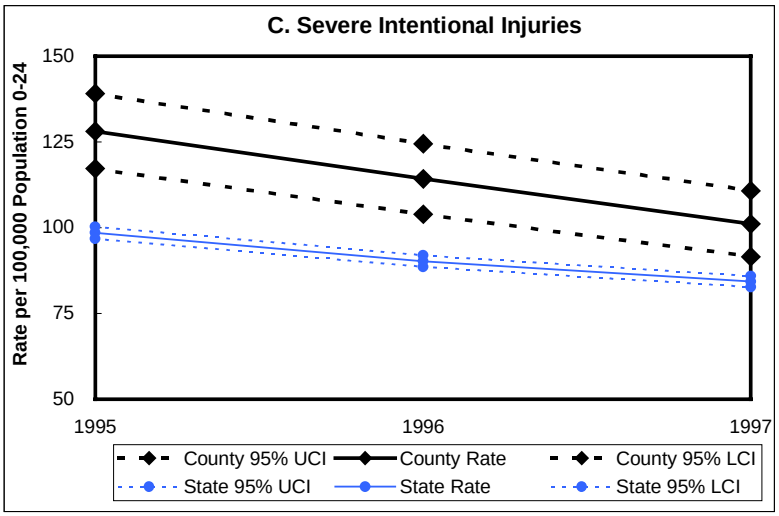
Figure 1.B shows the pattern for severe unintentional injuries. The state rate declined steadily between 1995 and 1997 from 302 to 289 per 100,000 population age 0 to 24. In County X, the rate for severe unintentional injuries declined 58 per 100,000 between 1995 and 1996, and rose slightly in 1997. The unintentional rate for County X is significantly higher than the state all three years.

Figure 1C shows the severe intentional injury rate dropped steadily both statewide (from 99 to 84 per 100,000 population) and in this county between 1995 and 1997. The intentional injury rate for County X is significantly higher than the state all three years.

Figure 1: Severe Injury Rate per 100,000 Population Age 0-24
County and California, 1995-1997







Example 2: Are Certain Age Groups at Greater Injury Risk?

Planners also are interested to know if certain age groups are at greater injury risk. The results may suggest a need to direct injury prevention efforts toward a particular age group, toward parents of children in a certain age group, or toward teachers or healthcare providers serving particular age groups.

We begin our comparison of age group risk by examining the state rate. Figure 2 shows that the state severe injury rate per 100,000 population decreases slightly for each age group: 0 to 4, 319 to 311; 5 to 9, 235 to 219; 10 to 14, 286 to 271; 15 to 19, 650 to 590; 20 to 24, 623 to 587. Notice that the severe injury rate more than doubles at age 15 to 19 and remains high at age 20 to 24. The state severe injury rates for ages 15 to 24 are 2 to 3 times higher than the other age groups.

State confidence intervals do not overlap for ages 0 to 4, 5 to 9, or 10 to 14. No upper confidence interval for these age groups overlaps the total injury lower confidence interval. On the other hand, state confidence intervals do overlap for ages 15 to 19 and 20 to 24 in all three years, and their lower confidence intervals do not overlap the total injury upper confidence interval in any year.

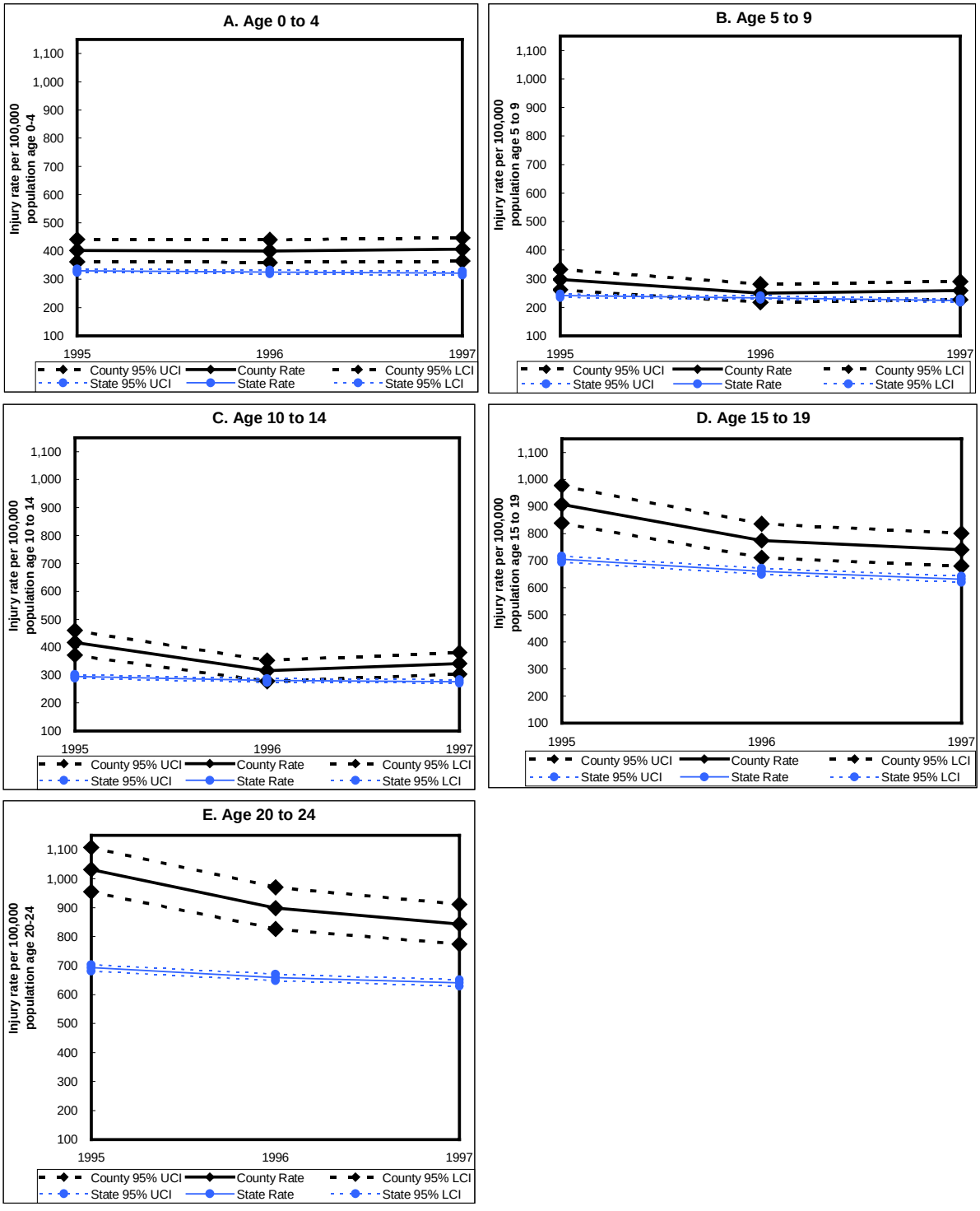
This suggests that state population-based injury rates at younger ages are independent of each other and lower than the state average. On the other hand, rates for adolescents and young adults through age 24 are much higher than the state rate and are not different from each other.

Now we turn attention to County X. In every year and every age category, the County X injury rate was higher than the state rate. The annual rate per 100,000 age group population dropped slightly in 1996 for ages 0 to 4, 5 to 9, and 10 to 14, but dropped steadily between 1995 and 1997 for ages 15 to 19 and 20 to 24.

For age group 5 to 9, the lower confidence interval was within the state upper confidence interval in 1996 and 1997. For age group 10 to 14, the lower confidence interval was within the state upper confidence interval in 1995. Other than these, the county lower confidence interval was outside the state upper confidence intervals in every year. The county confidence intervals for ages 15 to 19 and 20 to 24 overlapped all three years and did not overlap the state age group rate.

In conclusion, all age groups in County X have been at increased risk relative to their peers statewide, risk has been greatest for adolescents and young adults age 15 to 24, and those age 15 to 24 are at similar risk.

Figure 2: Severe Injury Rate per 100,000 Population by Age Group
County and California, 1995-1997



Example 3: Are Certain Race/Ethnic Groups at Greater Injury Risk?

County X is about half White, with Black, Hispanic, and Asian race/ethnic groups about equally forming the balance of the population. If certain race/ethnic groups are at increased risk relative to other groups, injury prevention efforts may be targeted toward that group, or may be increased in communities with large concentrations of the affected race/ethnic group.

Figure 3 shows that the state total severe injury rate per 100,000 race/ethnic group population age 0 to 24 decreases for each group during the study period: White, 413 to 394; Black, 629 to 548; Hispanic, 449 to 400; Asian, 230 to 211. The state severe injury rate is highest for Black children and youth and lowest for Asian children and youth.

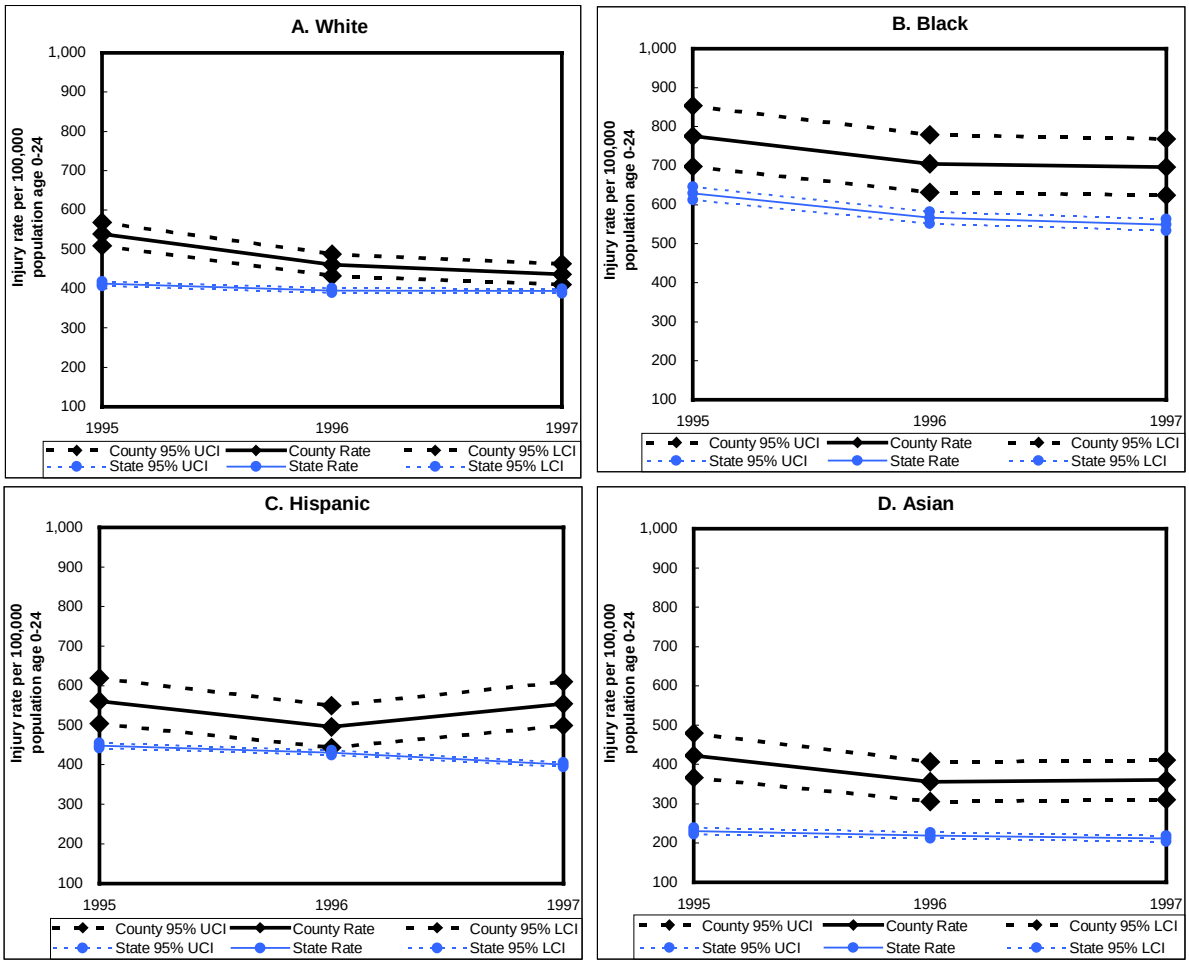
State-level confidence intervals overlap only for White and Hispanic race/ethnic groups in 1997. This suggests that state population-based rates for each race/ethnic group are mainly independent of each other, but that Hispanics may be achieving parity with Whites with respect to injury. Despite their great decrease of 81 injuries per 100,000 population between 1995 and 1997, the state severe injury rate per 100,000 Black population is as much as three times higher than other race/ethnic groups in any given year.

In every year and every race/ethnic category, the County X total severe injury rate was higher than the state rate. The county annual rate per 100,000 race/ethnic group population dropped steadily for Whites and Blacks. For Hispanic and Asian youth, the injury rate was lowest in 1996. County-level confidence intervals overlapped for Whites and Hispanics in 1995 and 1996, but diverged in 1997. No other county-level confidence intervals overlapped. The distance between the county Asian and state Asian rates was greatest of all groups.

Thus all race/ethnic groups in County X have been at increased risk relative to their peers statewide, risk has been even greater for Asians, and Hispanics achieved parity with Whites in two of three study years.

The increased risk based on race/ethnicity probably is due to the generally increased risk for residents of County X. The rate appears higher for each group compared with the state group rate because the overall county rate is higher than the state rate. In this county with its race/ethnic composition, age-related risk probably is more important than race/ethnic risk.

Figure 3: Severe Injury Rate per 100,000 Population by Race/Ethnic Group
County and California, 1995-1997



Example 4: Are Injuries More Severe?

Although there are other measures, injury deaths are a bottom line measure of injury severity. Planners certainly want to know if the local death rate is higher than the state rate. They also want to know if death rates are increasing or decreasing or staying the same? Of those injured, is a higher percent dying? Answers to these questions may suggest a change in the types of severe injuries and/or a local need to improve emergency response capacity.

Figure 4.A shows that the state death rate decreased steadily during the study period from 36 to 27 per 100,000 population age 0 to 24. The County X death rate, which ranged dropped 6 per 100,000 population over three years, was not statistically different from the state rate in any year.

Figure 4.B shows the death rate per 1,000 injuries age 0 to 24. The state rate decreased steadily from 83 to 69 per 1,000 injuries. That is, 8.3% of those injured died in 1995 and 6.9% died in 1997.The County X death rate per 1,000 injuries was much lower than the state rate.

Injury Episode Summary for County X

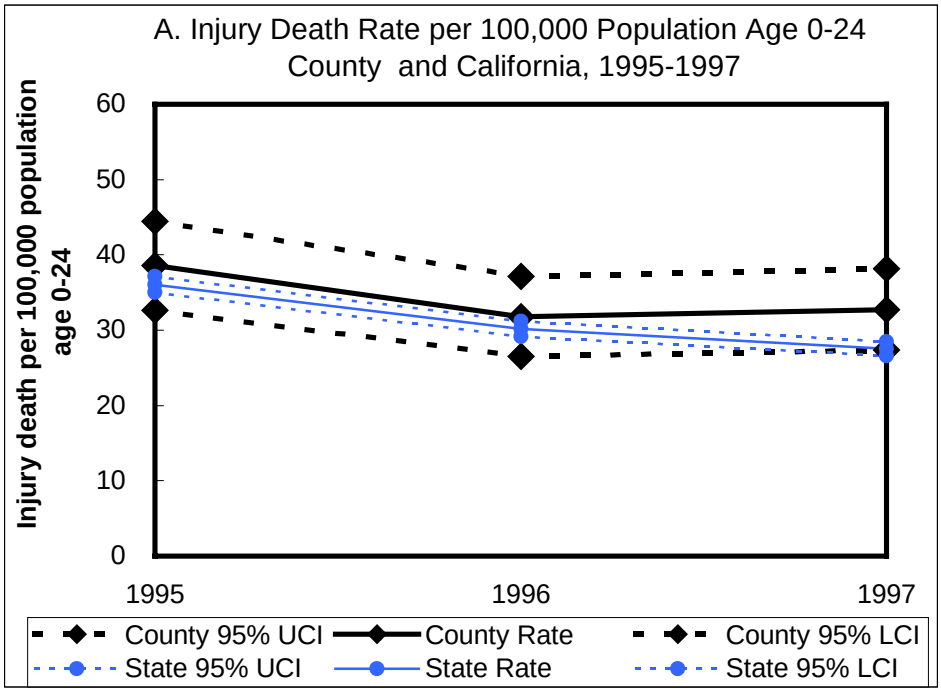
County X is above the state median in population, number of injuries, and injury rate per 100,000 population age 0 to 24. In fact, in all three study years, total, unintentional, and intentional injury rates in County X were much higher than the state. Although injuries are more likely in County X, death rates per 100,000 population and 1,000 episodes indicate injuries are not more deadly. Injuries in this county may be less severe, or injury victims may be more likely to survive because of rapid emergency response or better quality hospital care.

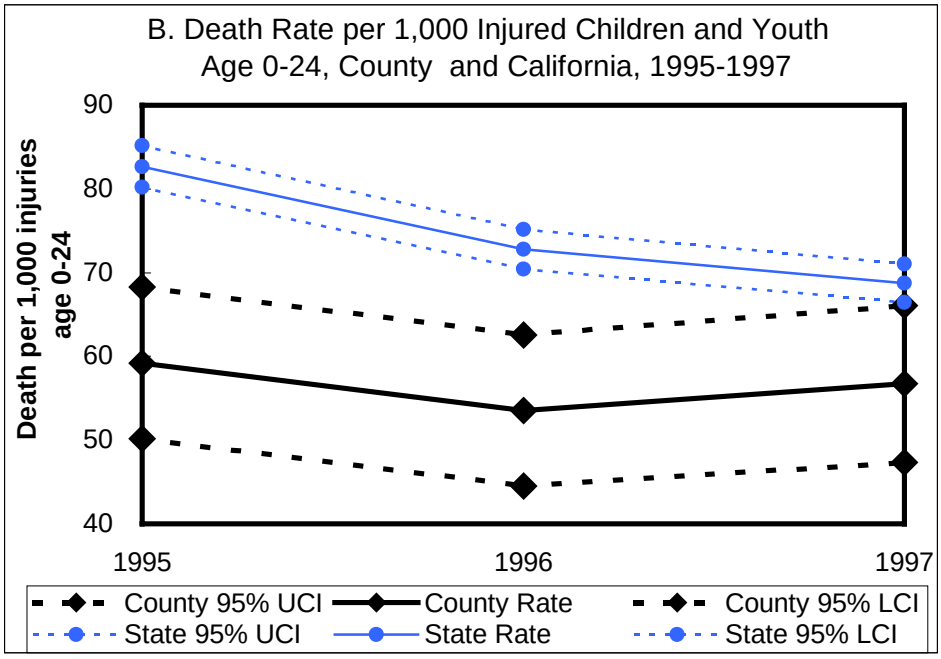
The injury rate in County X generally is higher for all age and race categories than the comparison state rates. Statewide and in County X, the injury rate is much higher beginning at age 15, with little difference between ages 15 to 19 and 20 to 24. In County X, rates in these age groups are higher yet and not significantly different from each other. Race/ethnic rates, while higher in County X overall, are not disproportionately higher than statewide rates for any single race/ethnic group.

We noticed that the County X injury rate for the youngest children age 0 to 4 is proportionately higher than the rate than for 5 to 9 and 10 to 14. This suggests the possibility of cross-generational risk. Most parents of first-born children are between age 15 and 24. This suggests the possibility of targeting young parents to protect themselves and their children.

The extremely high total and unintentional injury rates suggest County X could consider broad injury prevention campaigns to make its community generally safer or a campaign targeting those in the early child bearing years. Before determining the type of campaign, it would be advisable to learn whether the injury pattern is widely dispersed among different mechanisms (which reinforces the idea of a broad campaign) or is disproportionately focused in a small number of mechanisms (i.e., transportation-related, suicide, or assault). Planners probably will examine other injury mortality, hospital, and birth certificate data before making a final decision as to the target population for an injury prevention campaign.

Figure 4: Injury Death Rates Age 0-24,
County and California, 1995-1997





FREQUENTLY ASKED QUESTIONS

Q. The population you reported does not agree with the population figures we use.

A. We are reporting the state and county estimated population for age 0 to 24, not the total all age population. In the Population Table, we report the estimates for sex, age groups, and race/ethnic groups in this age range. We obtained our data from the Department of Finance website (http://www.dof.ca.gov/newdr). If you are sure you are using the correct age range and the figures still do not coincide, please call FHOP at 415-476-5283.

Q. Is the annual number of injuries for my county the same as the number of injuries reported annually by the Injury Surveillance and Epidemiology Section of the California Department of Health Services.

A: No. In general the number of injuries in this report will be smaller than the number of injuries reported annually by the State. This is because the record linkage methodology removed records showing more than one injury for the same person in the 3-year study period. That is, if someone was injured in 1995 and again in 1996 and again in 1997, only the 1997 injury was used. Also, by linking hospital discharge abstracts with the death abstracts, we believe we have better estimated the number of injury-related deaths.

Q. Will the breakout between intentional and unintentional injuries be the same as reported by Injury Surveillance?

A. Again, no, for several reasons. The first reason is related to the answer above. That is, someone multiply injured probably did not have the same type of injury each time, and we used the last injury. Second, many cases admitted to hospital had multiple records for the same injury episode, with conflicting injuries recorded. We used the first injury recorded on the last injury episode. Third, for cases that died, the injury recorded in the discharge abstract disagreed with the injury recorded in the death abstracts about one-third of the time. We had to develop decision rules to handle those disagreements. We strongly urge anyone interested in understanding how we resolved these complex issues to read *Volume Three, Technical Guide, Chapters Two and Three*.

Chapter 2

The County Injury Episode-of-Care Table

This chapter describes the county-level episode-of-care table for injury cases surviving to hospital admission.

The Episode-of-Care Table

The injury episode-of-care (EOC) data in this study were created by summarizing the series of injury-related hospital discharge records for each young person in the 3-year period and then using the last injury EOC for surveillance and mapping. If the injury victim died before hospital admission, no EOC data are available.

The Episode-of-Care Table contains information for the last EOC for injured children and youth admitted to a hospital. Table 7 in *Volume One, State Guide, Chapter Five* is the state-level equivalent.

Numbers would be higher if we reported all injury EOC for the multiply injured. We decided against this as the focus was unduplicated injury counts. We used the last EOC because that would be the last injury for multiply admitted youth who died.

This table has variables summarizing the clinical course of care for young injury victims. The data can provide some insight into local characteristics of care during during hospitalization for injury. It can help one begin to understand certain issues associated with the delivery of hospital care to the injured, and particularly regional variation in services provided.

The columns are identical to those in the Injury Episode Table. County population is restated for ease of comparison.

The Variables Measured

- **Disposition**. The number of routine and non-routine dispositions is the same as the Injury Episode Table. The number of injured who died before they could be admitted can be calculated by subtracting the number who died after admission from the number of all deaths.

- **Types of procedures**. These variables indicate whether the injury victim had no procedure, at least one minor or major diagnostic procedure, and/or at least one minor or major therapeutic procedure. The sum of these can add up to more than the number of injury victims, as patients often have multiple types of procedures.

- **Complications**. These variables indicate whether the injury victim had a complication of care after admission.

- **Payment Source**. This indicates the anticipated payor when the patient was discharged from the first hospital providing care for the last EOC.

  Changes in numbers and rates of Medi-Cal and uninsured patients are important to monitor, since they can be used as proxies for socio-economic status. In particular, high rates or increasing rates of uninsured patients may indicate local problems in establishing eligibility.

- **Admission Source**. This variable tells how the injury victim entered the hospital, using the first injury record in the last EOC. Most injury victims are admitted through the emergency room.

  In a number of cases, admission source shows as transfer from other facility. This is because we were unable to find and link the first record in the EOC.

  If your county is high on transfers from other facilities, it may be helpful to review the data with local hospitals to understand what causes this. Local hospitals may need encouragement to improve the quality and/or completeness of hospital discharge data.

- **Charges**. Each table provides information on total charges, average charges, and the 25%ile, 50%ile, and 75%ile of charges. Total charges provide some information regarding the estimated cost of hospital treatment. The average and percentile charges may be useful to help understand injury severity.

- **Length of Stay**. Length of stay variables include total days in care, average length of stay, and percent of patients discharged for each day of care up to five days.

The Rate Per 1,000 Episodes

This is calculated the same way as for the Injury Episode Table.

The Rate Per 100,000 Population

This is calculated in the same way as for the Injury Episode Table.

In the interests of simplifying the presentation, we have not calculated confidence intervals for these rates. However, local jurisdictions wishing to do so may use the injury template available on the FHOP website (http://www.ucsf.edu/fhop).

Using the Episode-Of-Care Table

This table could be a helpful place to begin a discussion with local healthcare providers. It offers a tool to understand various issues involved in moving a victim from the scene of the injury, into the hospital, through the course of inpatient care, and home again.

Examine the pattern of charges and length of stay over time relative to the pattern of payors, procedures, complications, and disposition. Are charges staying the same or increasing while fewer procedures are undertaken and length of stay is getting shorter? Has there been a change in the pattern of payors? Is the pattern of these indicators similar to the state pattern?

If your area is "behaving" differently from the state, discuss the reasons with your local hospitals. Out of such a discussion, counties may be able to identify ways to improve emergency response and hospital care for injury victims.

Are the injured more likely to have a non-routine disposition? Does a time trend suggest more non-routine dispositions are occurring? This may indicate a need to work with local hospitals and health planners to improve local hospital capacity so more children can be treated locally. Alternatively, perhaps local hospitals need to improve hospital discharge coding.

In the following sections, we continue to follow what happened to County X injury victims age 0 to 24 after they arrived at the hospital.

Example 5. Is the In-Hospital or Out-of-Hospital Death Rate High?

The in-hospital death rate is calculated by dividing the number of cases dying in-hospital by the number of cases admitted to hospital, and multiplying by 1,000. The in-hospital death rate for a county could be higher than the state in-hospital death rate even when the total death rate is not high. Such a situation may suggest several possibilities. One is local emergency response teams are so delayed in getting injury patients to the hospital that severely injured patients have little likelihood of surviving. Another is that injury treatment is delayed once patients arrive because local hospitals do not have physicians or operating rooms ready to provide rapid care. Deciding what is happening locally to cause a high death rate for admitted injury patients will require discussions among relevant public agencies and health providers.

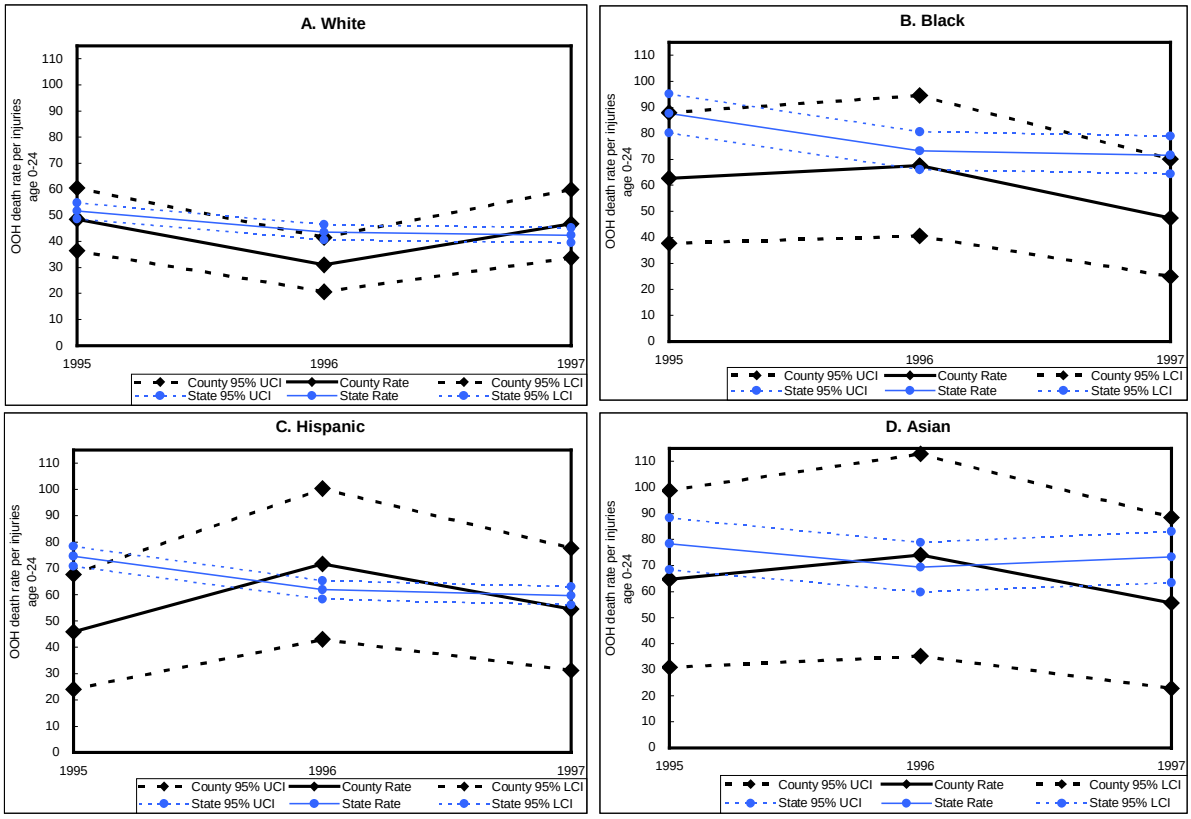
In the case of County X, its in-hospital death rate per 1,000 injuries was not significantly different from the state in-hospital death rate.

By subtracting the total number of injuries admitted to hospital at the state and county level from the total number of injury cases, one also can examine whether certain age or race/ethnic groups are more likely to die out-of-hospital (OOH). Such a possibility would suggest that certain age groups or certain race/ethnic groups experience more severe injuries.

Figure 5 examines race/ethnic variation in OOH death rates per 1,000 injuries at the state level and in County X. At the state level, the OOH death rate per 1,000 injuries for Whites was the lowest of the comparison groups, and its confidence interval did not overlap any other groups. The OOH death rate for Asians and Blacks were highest, and their confidence intervals overlapped. The OOH race/ethnic death rates for County X were not significantly different from the state rates.

The analysis of OOH death rate by age group ranged from 20 to 30 per 1,000 injuries age 0 through 14, 60 per 1,000 injuries age 15 to 19, and ranged from 100 in 1995 to 80 in 1997 for age 20 through 24. The OOH age group death rates for county X were not significantly different from the state rates.

Figure 5: Out-of-Hospital Death Rates per 1,000 Injuries by Race/Ethnicity
County and California, 1995-1997



Example 6. What Medical Procedures are Provided for Hospitalized Injury Victims?

Procedures can provide some measure of injury severity. On balance, the seriously injured have more procedures in general and more major procedures in particular.

However, because of differences in local practice patterns, patients with similar injuries admitted to different hospitals may receive different treatment. This may lead to differences in the availability and type of procedures that are not necessarily related to injury severity.

Figure 6 compares rates per 1,000 injury EOC for four major procedure classifications: Major diagnostic, minor diagnostic, major therapeutic, minor therapeutic.

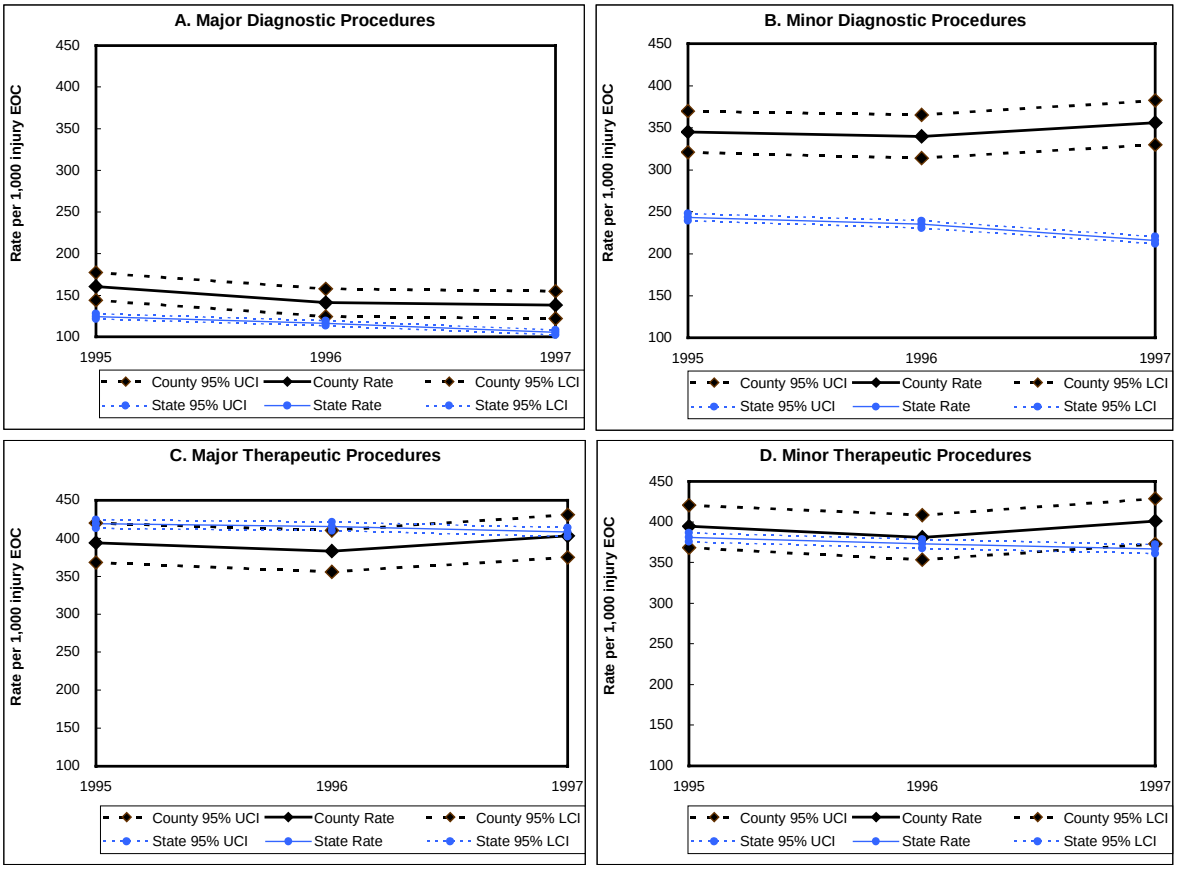
Statewide, physicians ordered major diagnostic procedures at a rate of 121 per 1,000 injury EOC in 1995, dropping to 102 per 1,000 injury EOC by 1997. In County X, physicians ordered major diagnostic procedures at rates ranging from about 160 to about 140 per 1,000 injury EOC, or about 33% more often in 1995 and about 40% more often in 1997. The confidence intervals indicate these differences are statistically significant.

Statewide, physicians ordered minor diagnostic procedures at a rate decreasing from 239 to 212 per 1,000 injury EOC between 1995 and 1997. In County X, physicians ordered minor diagnostic procedures at increasing rates. As a result of these changes, County X ordered about 40% more minor diagnostic procedures than the state average in 1995 and about 60% more by 1997. The confidence intervals indicate these differences are statistically significant.

The rate at which County X physicians ordered minor or major therapeutic procedures was not significantly different from the state rate.

If your county is high or low on the types of procedures offered or if a time trend is indicated, it may be helpful to review the data with local hospitals to understand what causes the differences.

Figure 6: Procedure Rates per 1,000 Injury EOC Age 0 to 24
County and California, 1995-1997



Example 7. What are Outcomes for Hospitalized Injury Victims?

In addition to death rates, other hospital outcomes are available to study for injury patients. These include complications of care, days of care, and charges.

- Complications. Complications of care may identify possible quality of care issues. This is particularly true in the present instance, where most patients were quite healthy before their injury. If your county is high or low on complications or there is a time trend, it may be helpful to review the data with local hospitals to understand what causes the differences. Figure 7.A shows the complication rate per 1,000 injury EOC for the state and County X.

- Days of care. Because of wide variation in practice patterns, two children injured on the same day with similar injuries may be discharged on different days depending on the hospital admitting them. By linking records associated with the same injury EOC, days of care more accurately reflect the personal and social burden of injury-related hospital stays. If your length of stay statistics vary significantly from state averages, you may want to consider meeting with local hospitals to understand reasons for this. Figure 7.B compares the percent of injury cases discharged in 1 day or less.

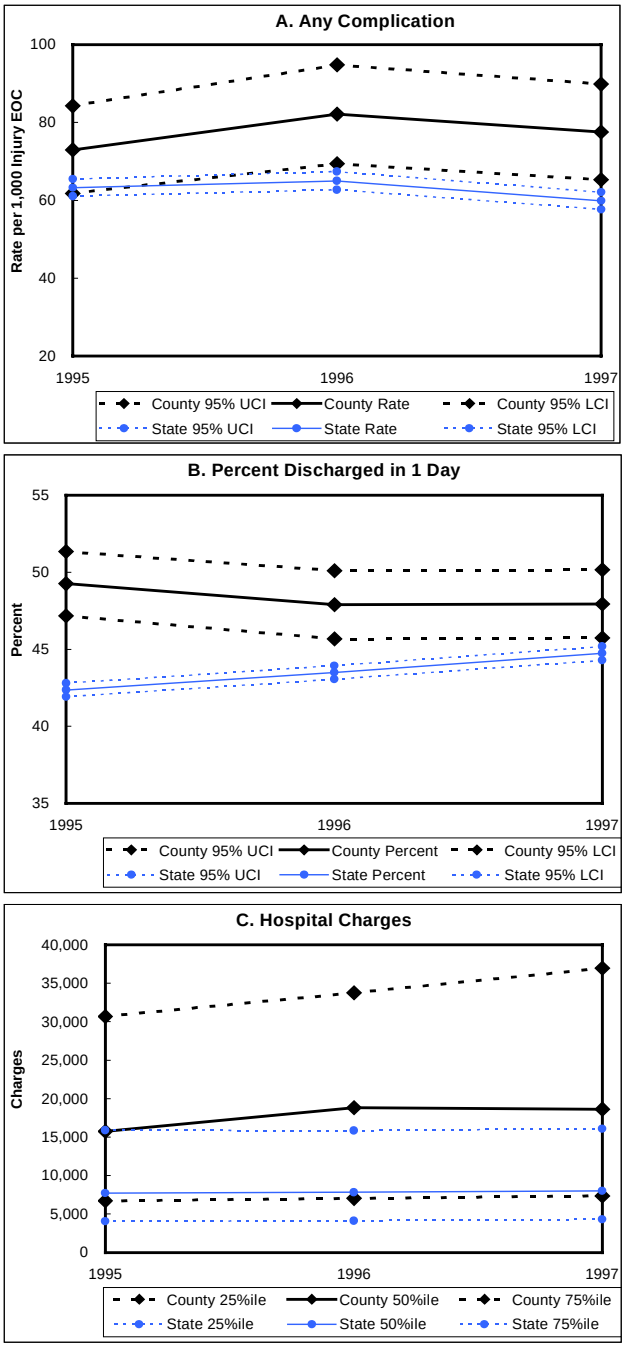
- Total charges. By summing over all records for the last EOC, total charges may more closely reflect the personal and social burden of hospital stays related to injury. Because discounts third party payors negotiate vary markedly from hospital to hospital, these figures are not particularly helpful for assessing true costs or revenue for hospital care of young injured patients. However, a general comparison of charges trends and the other indicators of care may suggest a basis for beginning a discussion with local hospitals as to why the general pattern of care is different in your county. Figure 7.C compares the 25, 50, and 75 percentile for the state and County X.

Notice that each of these outcome measures are higher for County X than they are for the state. About 6% of injury victims statewide have complications; in County X, about 8% of hospitalized injury victims have complications. The confidence intervals indicate the County X complication rate is higher than the state rate in 1996 and 1997.

The percent of injury victims discharged in one day decreased 2% in County X between 1995 and 1997 and increased 2% statewide. Despite the county decrease and the state increase, the confidence intervals indicate the percent of injury victims discharged in one day remains higher than the state average all three years.

The state median charge rose $286 between 1995 and 1997; the median charge in County X rose more than $2,700. In fact, the median charge for County X is higher than the 75%ile charge statewide, and the 75%ile charge for County X is more than two times higher than the 75%ile charge statewide.

Figure 7: Outcomes of Care per 1,000 Injury EOC Age 0 to 24
County and California, 1995-1997

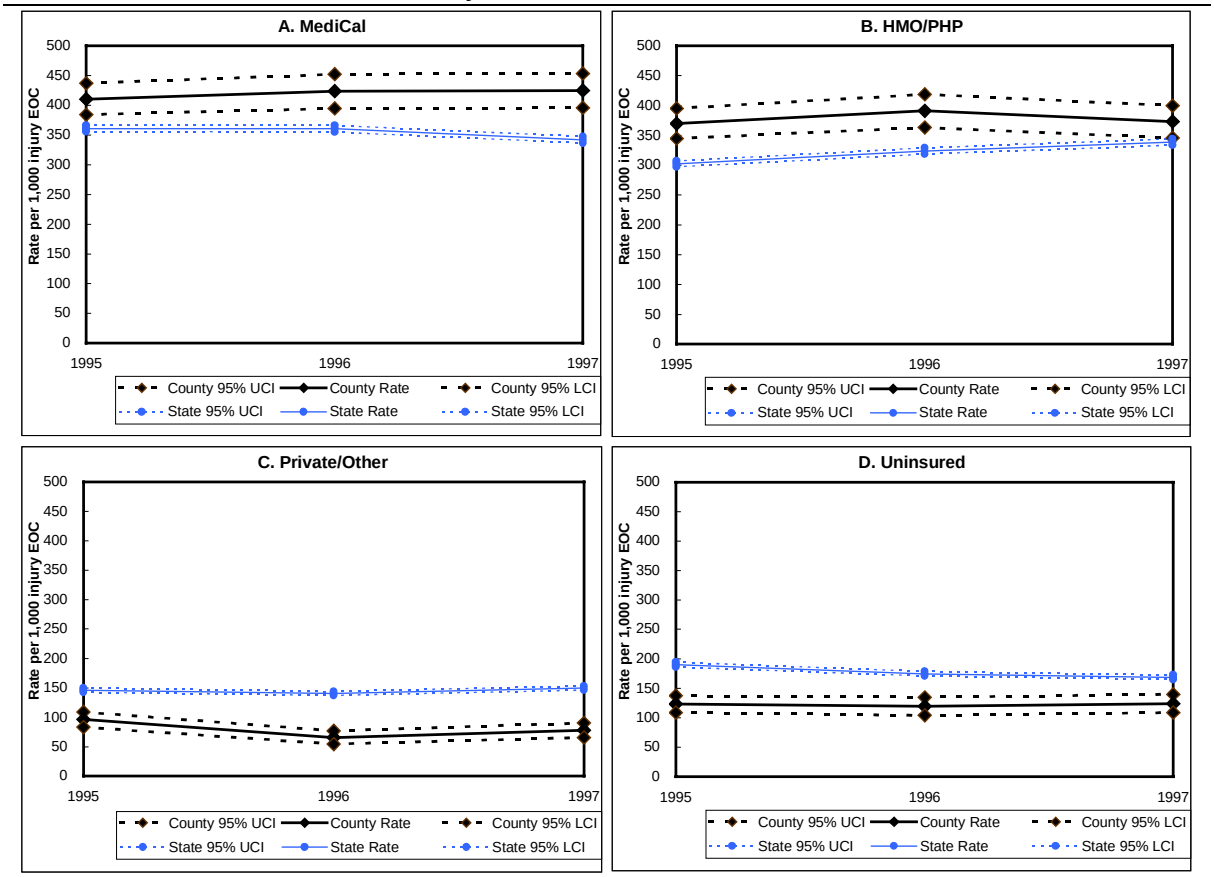


Example 8. Who Pays for Injury Hospitalizations?

Figure 8 shows payors for the last injury EOC. In County X, injuries are more likely than the statewide average to be paid by Medi-Cal and less likely to be uninsured. The explanation may lie in different causes. For example, County X may have more poor people than other counties, or may have been more aggressive than other counties in enrolling its eligible poor population in Medi-Cal, and/or hospitals in County X may have been more aggressive than other hospitals in converting poor uninsured patients into Medi-Cal by the time they are discharged.

Injury patients in County X also are more likely than patients statewide to have managed care (HMO or PHP) coverage than the statewide average, and less likely to have private or other coverage. This suggests County X is more highly penetrated with managed care plans than other counties.

Figure 8: Payor per 1,000 Injury EOC Age 0 to 24
County and California, 1995-1997



Summary of the County X Injury Episode-of-Care Table

The Injury Episode Table indicates that County X has a higher injury rate than the state average for total, unintentional, and intentional injuries. No evidence indicates that County X injuries are more severe on average than injuries in other areas. Indeed, the total death rate per 100,000 population, death rate per 1,000 injury EOC, out-of-hospital death rate per 1,000 injury EOC are not different from state rates, while the percent of injury cases dying is lower than the state. These data suggest that, while County X residents age 0 to 24 seem more likely to be injured, injuries are on average of average or lower severity.

Despite a surface appearance of average injury severity, the County X treatment pattern for admitted injury victims differs from the state pattern. County X physicians order more diagnostic procedures per 1,000 injury EOC. They order therapeutic procedures at a rate similar to the state average, yet the complication rate is higher. County X injury patients also are more likely to be discharged in one day.

In a local healthcare environment with shorter stays, higher rates of diagnostic procedures and complications, and average rates of therapeutic procedures per EOC, the distribution of reported charges is much higher than the state distribution. Injury EOC in County X are more likely to be paid by Medi-Cal and managed care, and less likely to be paid by private or other payors, or to be uninsured.

There is no apparent reason why the County X pattern of hospital care should vary so much from the state pattern. County X was picked because its population, number of injuries, and injury rate was above the state median. A county could have a high injury rate yet still have lower complication rates or average days of care. Or it could have a low or average injury rate yet still have higher death or complication rates.

Something about the environment in County X differs from the environment in other counties. For example, since the death rate per 1,000 total injuries is quite low, emergency room physicians in County X may be more likely to admit less seriously injured than ER physicians in other counties. On the other hand, consider counties with low injury rates but high deaths as a percent of total injury admissions. ER physicians in counties with this pattern may admit only the more obviously severely injured.

In County X, treating physicians may be more likely to order diagnostic procedures for admitted patients. Upon prudently establishing patients are not seriously injured, physicians may then discharge without further inpatient procedures. This cautious practice pattern on the part of both the ER and treating physicians would result in more injuries in County X hospital discharge records and could explain higher injury rates, higher diagnostic rates, and shorter stays in County X.

Counties with physicians who prefer to admit only the severely injured probably would have higher procedure rates and longer stays, because admitted cases would be more serious. Without knowing the proportion of injury patients turned away in emergency rooms, we have no way to know whether a local injury rate truly is high or is being affected by local practice patterns.

In a region with high Medi-Cal and/or managed care penetration, different reimbursement rates may be in place for inpatient versus outpatient care. County X hospitals may code discharge records more aggressively, affecting procedure and complication rates and resulting in higher charge estimates. These scenarios could be causing County X patients to have or to seem like they have a different course of care than injured patients treated in other counties.

These are some examples of why it is important for local injury prevention people to meet with healthcare providers to understand local practice patterns and the local healthcare environment. In a few years, when abstracts are available for outpatient records, injury surveillance will be better able to understand some of these issues, to better estimate injury statistics, and to better understand regional variation in the course of care.

FREQUENTLY ASKED QUESTIONS

Q. Injury prevention people typically have not focused on what happens to injury victims after they are admitted to the hospital. Why is this desirable?

A. Health policy analysts have noted significant variation, among regions and hospitals in the same or different regions, in how care is provided to people with similar medical conditions.

For example, consider two children with the same injury who live in two different counties. In County A, a child might be treated and released from the emergency room. In County B, a child might be admitted to the hospital. If similarly injured children were admitted to two different hospitals, they might receive a completely different course of care with different outcomes. Depending on their source of insurance, they may be in the hospital for different lengths of time and have different access to remedial physical therapy and other rehabilitation services.

We have found regional variation in care to injured children admitted to hospitals. The Hot Spots report can be a vehicle to monitor care for injury victims. The county EOC table was prepared with the hope that local injury advocates will find it useful.

Q. In my county, the rate of no procedures per 1,000 injury EOC increased from 365 to 393. This seems to be well above the state rate, which ranged from 287 to 306. What does this mean?

A. The no procedures variable measures whether any procedures of any kind were recorded as having been ordered for injured children during their hospitalization. Your county rate and the state rate suggests that, of young injury victims admitted, there was a time trend for fewer to receive any procedure. At a certain level, this is inconsistent, since children with less severe injuries theoretically would be screened out in the emergency room.

Begin to examine this using the FHOP templates. Test if the rate trend in your county is statistically different from the state. Depending on what you learn, talk with healthcare providers to understand what is happening in local hospitals.

Chapter 3

The County Small Area Table

These tables summarize information used to identify ZIP-level hotspots and to make state and county maps. They have no equivalent in the state tables.

The Small Area Table

These tables provide data for each ZIP code (ZIP) within each county. We divided Los Angeles County into four regions, and made small area tables for these regions and three cities with independent health departments. For easier reference, state and county injury information is repeated on each county page, printed in italics. Each ZIP is listed with its associated city or local area name in alphabetical order.

The small area table consists of five major sections. The first section summarizes information about the ZIP. The second summarizes information about the number of injuries. The third section presents the 3-year rate per 100,000 population. The fourth section assigns each ZIP to a quartile relative to all ZIPs in the state and in the county. The fifth shows the standardized injury rate, with lower and upper confidence intervals for each ZIP relative to all ZIPs in the state and county.

A similar table summarizes county-level statistics.

ZIP-level Description

- **Location**. The location is the city or local area name the United States Postal Service (USPS) has associated with the ZIP. The USPS assigns location name to facilitate mail delivery and this may or may not coincide with local naming conventions. Some ZIPs are missing location names. In these cases, location is indicated with a question mark ("?"). This indicates we were unable to associate the ZIP with a named location.

- **Recorded**. The recorded ZIP is the one found on the hospital or death record. Some records indicated a county of residence but not a ZIP. These records are indicated with the word blank ("Blank").

- **Map**. This column identifies whether the ZIP appears on the map in *Volume One, User Guide*. If so, the word "Yes" appears in this column. If the ZIP was a post office, split, or consolidated ZIP, the ZIP to which the injury data was transferred is shown. If for any reason the ZIP could not be mapped, the word "No" appears in this column.

- **Split**. For ZIPs with boundaries split between counties, this column identifies the other county or counties sharing the ZIP. For split ZIPs, the same data is repeated in the data tables and used to map the affected counties. However, on the maps, only that portion of the ZIP physically located within the county

boundary is shown. The notation (P) following a county name indicates the county used to estimate population.

- **1996 Population**. This is the estimated population, using ZIP-level data from Claritas, a commercial demographic company that does annual population estimates at the ZIP level and county-level data from the California Department of Finance. Some ZIPs lack a population. These are ZIPs associated with a post office box, those that split or consolidated, or those we could not identify.

Table 1 shows the ZIP-Level Description section of the Small Area Table. A real Small Area Table has three rows for each ZIP: total, unintentional, intentional. The example shows one row per ZIP, because the examples that follow examine only total injuries.

Table 1: ZIP-Level Description Example of the Small Area Table

ZIP				
Location	Recorded	Map	Split	1996 Pop.
Town A	ZIP 1	Yes		12,272
Town B	ZIP 2	Yes		19,136
Town B	ZIP 3	ZIP 2		
Town C	ZIP 4	Yes		394
Town D	ZIP 5	Yes	County Y (P)	
Town E	ZIP 6	Yes		8,980
Town E	ZIP 7	Yes		3,541
Town E	ZIP 8	Yes		4,769
Town E	ZIP 9	Yes		13,862
Town E	ZIP 10	Yes		6,971
Town F	ZIP 11	Yes		1,087
?	Blank	No		
?	ZIP 12	No		

Table 1 shows ZIP 1 thorugh ZIP 12 in Towns A through F in County X. Town A has one ZIP that can be mapped, that is, it has geographic boundaries. Population in ZIP 1 is 12,272.

Town B has two ZIPs. ZIP 2 is mappable and has a population of 19,136. ZIP3 is a post office box ZIP, located in Town B. It has no population. ZIP 3 injuries are assigned to ZIP 2.

Town D has ZIP 5 which is mappable, but its boundaries are split with County Y. The fact that County Y population was used to estimate ZIP 5 population is shown by the "(P)". Because County Y was used to estimate ZIP 5 population, no population shows in the County X table. ZIP 5 will show on maps in both County X and County Y. Town D actually is physically located in County Y. If ZIP 5 is a hot spot, the County X map will say Town D even though it is not in County X. This is because mail delivery for ZIP 5 comes out of Town D.

County X also had some injury records identifying it as the county of residence, but with ZIP missing. This is shown by "?" in the Location Column, "Blank" in the Recorded Column, and "No" in the Map column.

Finally, County X also had some injury records with one or more ZIPs that were bogus, that is, that we could find no record as ever having existed. This is shown by "?" in the Location Column, the bogus ZIP number (ZIP 12), and "No" in the Map column.

Injuries in these last two ZIPs will be used to calculate total county injuries but will not be used for any other statistics.

Injury Summary

- **Type**. Injuries are summarized into one of three categories: All injuries, unintentional injuries, and intentional injuries.

- **Number**. This column presents the number of injuries by intent over the 3-year period. If the number of injuries is less than 5, no rates are calculated.

- **Assigned**. This column indicates the number of injuries assigned to the ZIP as a result of post office boxes, consolidations, or splitting of ZIPs between 1995 and 1997.

- **Used**. This column indicates the total number of injuries used to calculate the injury rate. This is the sum of the Number column and the Assigned column.

Table 2 shows the injury summary information for the example county. The ZIP information is the same as in Table 1, without the population information. The Type column shows "All" because we are focusing on total injuries for this example.

Table 2: Injury Summary Example of the Small Area Table

ZIP			Injuries			
Location	Recorded	Map	Type	Number	Assigned	Used
Town A	ZIP 1	Yes	All	108		108
Town B	ZIP 2	Yes	All	244	5	249
Town B	ZIP 3	ZIP 2	All	5		
Town C	ZIP 4	Yes	All	7		7
Town D	ZIP 5	Yes	All	19		19
Town E	ZIP 6	Yes	All	229		229
Town E	ZIP 7	Yes	All	77		77
Town E	ZIP 8	Yes	All	31		31
Town E	ZIP 9	Yes	All	251		251
Town E	ZIP 10	Yes	All	109		109
Town F	ZIP 11	Yes	All	0		0
?	Blank	No	All	LT 5		
?	ZIP 12	No	All	20		

ZIP 1 in Town A had 108 injuries. Keep in mind that this is the number of injuries in this ZIP in the 3-year period from 1995 through 1997.

ZIP 2 in Town B had 244 injuries in the 3-year period, with 5 injuries assigned from ZIP 3 (the POB ZIP). This results in a total of 249 injuries for ZIP 2.

ZIP 11 in Town F had no injuries during the 3-year study period. County X had less than 5 blank injury records, and ZIP 12 (the bogus ZIP), had 20 injuries. Injuries in ZIPs that are blank or bogus will be used to calculate the county-wide rate and the resulting number and rate will be used to rank County X among all counties.

The column "Used" is blank for ZIP 3, "Blank", and ZIP 12, because rates are not calculated for ZIPs like these.

Rate per 100,000 Population

- **Rate**. The figure shown in this column is the three-year average rate for the small area. This rate is used to reduce or "smooth" random variations and fluctuations that occur when there are small numbers of events.[1]

  The numerator was calculated by summing the number of events for the three-year period and dividing the result by 3. The denominator was the 1996 estimated population. The three-year average rate was obtained by dividing the numerator by the denominator and multiplying the result by 100,000.

- **Lower (LCI) and upper (UCI) confidence interval**. The lower and upper confidence intervals of the rate indicate the range within which the true injury rate may lie with 95% probability.

  As discussed in *Chapter Two, Episode-of-Care Table*, the numerator, rate and confidence interval are affected by variation in local practice patterns for admitting injury cases and variations in hospital coding practices that made it difficult to identify injury patients. The denominator and the confidence interval are affected by uncertainty as to the true population size.

Table 3 shows the injury rate information for the example county. The ZIP information is the same as in Table 1, without the population information. This section of the table has three parts, the rate per 100,000 population, and the lower and upper confidence interval for the rate.

The injury rate for ZIP 1 is 293, the lower confidence interval for the rate is 238, and the upper confidence interval for the rate is 349.

Notice that ZIP 3, "Blank", and ZIP 12 have no rates because they have no population. ZIP 11 has a rate of 0 because it had no injuries in three years.

---

[1] More specific information regarding the rationale and method for calculating the raw rate, standardized ratio, and confidence intervals for the standardized ratio may be found in: Guidelines for the Statistical Analysis of Public Health Indicators in Small Geographic Areas or Where There Are Few Events. San Francisco, CA: Family Health Outcomes Project, August, 1998. This document is available on the world wide web at: http://www.ucsf.edu/fhop/docs/guides/smallnug.pdf.

Table 3: Rate per 100,000 Population Example of the Small Area Table

ZIP			Rate per 100,000 Population		
Location	Recorded	Map	Rate	LCI	UCI
Town A	ZIP 1	Yes	293	238	349
Town B	ZIP 2	Yes	458	401	514
Town B	ZIP 3	ZIP 2			
Town C	ZIP 4	Yes	610	158	1,062
Town D	ZIP 5	Yes	378	208	548
Town E	ZIP 6	Yes	873	761	984
Town E	ZIP 7	Yes	725	563	886
Town E	ZIP 8	Yes	217	141	293
Town E	ZIP 9	Yes	603	529	678
Town E	ZIP 10	Yes	521	423	619
Town F	ZIP 11	Yes	0		
?	Blank	No			
?	ZIP 12	No			

Small Area Quartiles

- **Number.** The number of injuries in a smaller area (ZIP or county) was ranked relative to all other small areas contained within the larger area (state or county), and the ranked value was assigned to quartiles. A value of 1 indicates the small area was in the lowest 25% for number of injuries, a value of 4 indicates it was in the highest 25% for number of injuries. Statewide rankings are based on 1,563 mappable ZIPs. Intra-county rankings are based on the number of mappable ZIPs in the county. If the county had fewer than 12 mappable ZIPs, intra-county rankings were not calculated.

- **Rate.** The injury rate was ranked relative to all other ZIPs/counties in the state and within the county, and the ranked value was assigned to quartiles. A value of 1 indicates the ZIP was in the lowest 25% for the injury rate, a value of 4 indicates it was in the highest 25% for injury rate. If the county had less than 12 ZIPs, intra-county rankings were not calculated.

Table 4 shows the small area quartile information for selected ZIPs in County X. The small area quartile section is divided into two main parts, the state quartile (State Qtile) comparison and the county intra-county quartile (County Qtile) comparison. To understand how these columns work, we will start our discussion with the state quartile comparison.

First, examine the column labeled "Number". ZIP 2, ZIP 6, and ZIP 9 ranked in the highest quartile of all ZIPs in California for their number of injuries, respectively 249, 229, and 251 injuries over a 3-year period. ZIP1, ZIP 7 and ZIP 10 ranked in the third highest quartile of all ZIPs , with 108, 77, and 109 injuries. These ZIPs are candidates for injury hot spots, in that they are in the third and fourth quartile for number of injuries.

Table 4: Small Area Quartile Example of the Small Area Table

ZIP			State Qtile		County Qtile	
Location	Recorded	Map	Number	Rate	Number	Rate
Town A	ZIP 1	Yes	3	2	2	1
Town B	ZIP 2	Yes	4	3	4	2
Town B	ZIP 3	ZIP 2				
Town C	ZIP 4	Yes	1	4	1	3
Town D	ZIP 5	Yes	2	3	1	2
Town E	ZIP 6	Yes	4	4	4	4
Town E	ZIP 7	Yes	3	4	2	4
Town E	ZIP 8	Yes	2	1	2	1
Town E	ZIP 9	Yes	4	4	4	3
Town E	ZIP 10	Yes	3	4	2	3
Town F	ZIP 11	Yes	1	1	1	1
?	Blank	No				
?	ZIP 12	No				

Examine the column labeled "Rate". ZIP 4, ZIP 6, ZIP 7, ZIP 9, and ZIP 10 ranked in the highest quartile of all ZIPs in California for their rate, respectively 610, 873, 725, 603, and 521. ZIP 2 and ZIP 5 ranked in the third highest quartile of all ZIPs in California for their rate, respectively 458 and 378. These ZIPs are candidates for injury hot spots, in that they are in the third and fourth quartile for their injury rate.

In order for a ZIP (or a county) to be flagged as an injury hot spot, both numbers must be a 3 or 4. ZIPs that are 4 on both dimensions are coded red on the map as "Hot". This means that ZIP 6 and ZIP 9 will be red, and Town E will be named. ZIP 2, ZIP 7, and ZIP 10 will be coded orange on the map as "Medium", and Town B will be named. Notice that Town E has several hot spots. Its name will appear only once on the map.

No ZIPs in our example will be coded yellow on the map as "Warm", because none of the example ZIPs are 3 on both dimensions. All other mappable ZIPs will show up as light gray.

Now turn attention to the intra-county comparison. Using the same criteria, i.e., 3 or 4 on both dimensions, only ZIP 6 will be red and ZIP 9 will be orange. All other ZIPs will be colored light gray on the intra-county map.

How can a ZIP be a hot spot statewide yet not be a hot spot within the county? When ZIPs were ranked statewide, the number of ZIPs to be ranked was 1,563. In such a situation, rankings approximate a "normal" distribution, and gradations among ranked ZIP neighbors can be quite small. When ZIPs are ranked within a county, the number of ZIPs is small compared with the total for the state, distributions rarely are "normal", and numeric distances among ranked ZIP neighbors can be quite large or quite small.

County X was picked as our example because it is a hot spot county. That is, at the county level, it ranks in quartile 3 or 4 on both dimensions. Rankings within this

limited distribution will be more extreme. This is because we are ranking within a disproportionate number of ZIPs that already are in the top half of the state distribution. And this is why ZIP 2, ZIP 7, and ZIP 10 can be orange on the state comparison, yet light gray on the intra-county comparison.

County X has relatively few ZIPs below the third quartile, compared with other counties. In such a case, rankings are not normally distributed. That is, more ZIPs are within the upper end of the state distribution.

Thus, in counties with few ZIPs or in hot spot counties, intra-county rankings can be very different from state rankings. On the maps, we identify all towns that are hot spots at the state or intra-county levels. If a county is a hot spot county with relatively limited resources to reduce injuries, the intra-county map together with information about the number of injuries on which those rates were based, might be helpful to identify the hottest of the hot in terms of where to direct program efforts.

The intra-county map also can be helpful for counties that are not hot spots, or that have few hot spot ZIPs. It identifies ZIPs that are relatively hotter given the local injury context. To further improve public safety for its young population, these counties might consider targeting intra-county hot spots for intervention.

In our opinion, every ZIP that is a state hot spot should be considered for injury prevention activities. If a county has many such hotspots, focusing on those that are also intra-county hot spots could greatly improve safety for young people living in those communities and markedly affect future rankings.

Small Area Standardized Ratio and Confidence Interval

- **Standardized Ratio**. A small area (ZIP, and sometimes county) has a relatively small population, and its rate may vary significantly from year to year either because of fluctuating population or small numbers of injuries. A larger area (state or county) typically will have a larger population and a relatively more stable rate.

  We used a technique known as indirect standardization to adjust the observed small area injury rate to reflect what the rate would be if the residents of the smaller area were injured as often as the "average" resident in the larger area. The resulting standardized ratio indicates the relationship between the observed and expected number of events if the rate in the smaller area was the same as in the larger one.

  The expected number of injuries during the 3-year period is calculated by multiplying the number of people living in the smaller area times the rate for the larger area, multiplying by 3, and dividing by 100,000.

  To obtain the standardized ratio, divide the 3-year observed number of injuries in the small area by the expected number, and multiply the result by 100.

  This ratio provides a basis for comparing the relative safety of different small areas. For example, a standardized ratio of 100 indicates that the number of events equals the expected number of events. A standardized ratio greater than

100 indicates there were more events than expected. A standardized ratio less than 100 indicates there were fewer events than expected.

- **Lower (LCI) and upper (UCI) confidence interval**. To test if the difference between the expected and observed number of injuries is statistically significant, one must calculate a confidence interval around the standardized ratio. The 95% confidence interval reflects the level of confidence that the injury rate in the smaller area is above or below the rate in the larger area.

  The confidence interval is calculated as the standardized ratio plus or minus the following quantity: 1.96 times the square root of the observed rate divided by the expected rate, times 100.

  This statistic does **not** estimate the range within which the "true" injury rate for the smaller area may be found. Instead, it tests whether the observed rate for the smaller area is similar to or different from the rate for the larger area.

  If the 95% confidence interval includes 100, then the smaller area rate is not significantly different from the larger area rate. If the 95% confidence interval does not include 100, then the smaller area rate is significantly different from the larger area rate. If the upper bound of the confidence interval is below 100, the rate for the smaller area is significantly below the rate for the larger area. If the lower bound of the confidence interval is above 100, the smaller area rate is significantly above the larger area rate.

  We used the standardized ratio and its confidence intervals to understand the distribution of ZIPs into quartiles, but we did not use these to classify hot spots.

Table 5 shows the small area standardized ratio information for selected ZIPs in County X. The standardized ratio section is divided into the state and intra-county ratio and confidence interval.

Table 5: Standardized Ratio Example of the Small Area Table

ZIP			State			County		
Location	Recorded	Map	Ratio	LCI	UCI	Rate	LCI	UCI
Town A	ZIP 1	Yes	70	57	83	56	46	67
Town B	ZIP 2	Yes	109	96	123	88	77	98
Town B	ZIP 3	ZIP 2						
Town C	ZIP 4	Yes	146	38	253	117	30	203
Town D	ZIP 5	Yes	90	50	131			
Town E	ZIP 6	Yes	208	182	235	167	146	188
Town E	ZIP 7	Yes	173	134	211	139	108	170
Town E	ZIP 8	Yes	52	34	70	41	27	56
Town E	ZIP 9	Yes	144	126	162	115	101	130
Town E	ZIP 10	Yes	124	101	148	100	81	118
Town F	ZIP 11	Yes	0			0		
?	Blank	No						
?	ZIP 12	No						

To understand how these statistics work, we will focus first on the state standardized ratio. Notice that the lower confidence intervals for ZIP 6, ZIP 7, ZIP 9, and ZIP 10 are greater than 100. These ZIPs were statewide hotspots, and the confidence intervals indicate that we are 95% confident that their rates are higher than the state rate.

ZIP 2 also was classified as a statewide hotspot, but its lower confidence interval is below 100. ZIP 2 was classified in the fourth quartile for number of injuries and third quartile for rate. Even though its rate overlaps the state rate, it should be considered for intervention because it has among the highest number of injuries in the state.

ZIP 1, ZIP 8, and ZIP 11 have standardized ratios and confidence intervals below the state average. ZIP 1 is in the third quartile for number of injuries, but the other ZIPs have few injuries and a low injury rate. What is different about these communities? Perhaps something could be learned by studying them to find out what residents in those parts of the county do to protect their children that other parts of the county may not be doing.

Classifying "Hot" Spots

The goal of the Child and Youth California Injury Hot Spots Project was to bring attention to areas where children and youth were disproportionately affected by injury, as reflected by the highest number and/or highest rate of injuries. By identifying these areas, local health planning bodies will be able to better target injury prevention activities and evaluate effectiveness of those prevention activities.

Given this goal, small areas were classified as to "hotness" using the ranked quartiles. ZIPs were identified as hot, warm, or lukewarm, in the following order:

1. "Hot Spots" are colored red on the maps and were flagged if they were in the highest quartile for number of events and rate.

2. "Medium Spots" are colored orange on the maps and were identified as follows:

   - The small area was in the fourth quartile for number of events and the third for rate, or

   - The small area was in the fourth quartile for rate and the third for number.

3. Finally, "Warm Spots" are colored yellow on the maps. They were identified as those areas in the third quartile for both rate and number.

All other ZIPs were not considered to be hot spots. They are light gray on the map.

FREQUENTLY ASKED QUESTIONS

Q. Our county map shows a town that is in a neighboring county. What is going on?

A. The ZIP boundaries are split between your county and the neighboring county, and the mail is delivered out of the post office in that town. On the Small Area Table, the column labeled "Split" will show this ZIP as in the other county. If the county name has a "(P)", the population was calculated using the neighboring county rather than yours, and the population will be blank in your county.

Q. The "Injuries" section of the small area table shows that 5 injuries were "Used" to calculate the total number of injuries in my ZIP. Where did these injuries come from?

Your ZIP was identified as the nesting or parent ZIP. The number shown is the number of injuries assigned from that ZIP. This happens when people give post office box ZIPs as their address, or when the post office consolidates or splits ZIPs. If you look down the Small Area Table column labeled "Map", you will see the ZIP(s) with injuries assigned to your neighborhood.

Q. Why is a ZIP in my town a hot spot on the state map, yet not a hot spot on the intra-county map?

We are assigning ZIPs to quartiles on both number of injuries and injury rate, and then identifying hot spots based on interrelationships between these. The state comparison uses 1,563 ZIPs, while the county comparison uses just those ZIPs in your county. Within the smaller pool of numbers at the county level, inter-relationships between the two dimensions change significantly. The result is an intra-county map with a completely different look than the state map. We think both ways of looking at injuries can be helpful to local communities.

Q. The standardized ratio lower confidence interval for my ZIP is greater than 100, but my ZIP is not a hot spot.

A ZIP can have this characteristic and not be a hot spot because two dimensions were used to assign hot spots: number of injuries and rate. Your ZIP had a high rate but probably did not have a high number of injuries. We examined many cases with high rates and below the median number of injuries. After calling a number of the affected jurisdictions, we found our ZIP population estimate typically was lower than local estimates and this inflated the rate estimate. As a result, we did not use the standardized ratio to assign hot spots. If you believe our population estimate is close to accurate, you may wish to look more closely at this neighborhood.

Q. We have a hot spot ZIP on the statewide map, but we do not have any intra-county maps.

We only ranked counties with 12 or more mappable ZIPs. If your county does not have intra-county maps, your county probably had fewer than 12 ZIPs.

COUNTY DATA

State

County

County and Sub-Region Small Area Table

Injury Episode Table

Injury Episode-of-Care Table

Small Area Table

Population Table (Excel Spreadsheet only)

County and Sub-Region Injury Episodes of Care
California Children, Adolescents, and Young Adults Age 0 to 24

Location		Injuries		Rate Per 100,000			State Qtile		Standardized Ratio		
County	1996 Pop.	Type	Number	Rate	LCI	UCI	Nbr	Rate	Ratio	LCI	UCI
Statewide	11,971,762	All	150,552	419	417	421					
		Unintentional	110,778	308	307	310					
		Intentional	37,168	103	102	105					
Alameda	459,799	All	5,616	407	396	418	4	3	97	95	100
		Unintentional	3,905	283	274	292	4	2	92	89	95
		Intentional	1,568	114	108	119	4	4	110	104	115
Berkeley	41,177	All	357	289	259	319			69	62	76
		Unintentional	234	189	165	214			61	54	69
		Intentional	107	87	70	103			84	68	100
Alpine	400	All	3	250	0	533	1	1	60	0	127
		Unintentional	3	250	0	533	1	1	81	0	173
		Intentional	0	0			1	1	0		
Amador	9,010	All	154	570	480	660	1	4	136	114	157
		Unintentional	111	411	334	487	1	4	133	108	158
		Intentional	40	148	102	194	2	4	143	99	187
Butte	65,536	All	853	434	405	463	3	3	104	97	110
		Unintentional	705	359	332	385	3	3	116	108	125
		Intentional	135	69	57	80	3	2	66	55	78
Calaveras	11,857	All	165	464	393	535	2	3	111	94	128
		Unintentional	140	394	328	459	2	4	128	106	149
		Intentional	18	51	27	74	1	1	49	26	71
Colusa	7,461	All	88	393	311	475	1	3	94	74	113
		Unintentional	73	326	251	401	1	3	106	81	130
		Intentional	15	67	33	101	1	2	65	32	98
Contra Costa	300,865	All	3,441	381	368	394	4	2	91	88	94
		Unintentional	2,520	279	268	290	4	2	91	87	94
		Intentional	823	91	85	97	4	3	88	82	94
Del Norte	9,893	All	106	357	289	425	1	2	85	69	101
		Unintentional	77	259	201	317	1	1	84	65	103
		Intentional	28	94	59	129	1	3	91	57	125
El Dorado	49,835	All	745	498	463	534	3	4	119	110	127
		Unintentional	632	423	390	456	3	4	137	126	148
		Intentional	90	60	48	73	2	2	58	46	70

County Injury Episodes of Care
California Children, Adolescents, and Young Adults Age 0 to 24

Location		Injuries		Rate Per 100,000			State Qtile		Standardized Ratio		
County	1996 Pop.	Type	Number	Rate	LCI	UCI	Nbr	Rate	Ratio	LCI	UCI
Fresno	327,803	All	4,268	434	421	447	4	3	104	100	107
		Unintentional	3,264	332	321	343	4	3	108	104	111
		Intentional	934	95	89	101	4	4	92	86	98
Glenn	10,823	All	119	367	301	432	1	2	87	72	103
		Unintentional	101	311	250	372	1	3	101	81	121
		Intentional	13	40	18	62	1	1	39	18	60
Humboldt	43,111	All	613	474	436	511	2	4	113	104	122
		Unintentional	493	381	348	415	2	4	124	113	134
		Intentional	112	87	71	103	2	3	84	68	99
Imperial	64,790	All	755	388	361	416	3	2	93	86	99
		Unintentional	567	292	268	316	3	2	95	87	102
		Intentional	171	88	75	101	3	3	85	72	98
Inyo	5,890	All	69	390	298	483	1	2	93	71	115
		Unintentional	52	294	214	374	1	2	95	69	121
		Intentional	17	96	50	142	1	4	93	49	137
Kern	260,331	All	3,666	469	454	485	4	4	112	108	116
		Unintentional	2,758	353	340	366	4	3	114	110	119
		Intentional	863	111	103	118	4	4	107	100	114
Kings	49,477	All	479	323	294	352	2	1	77	70	84
		Unintentional	377	254	228	280	2	1	82	74	91
		Intentional	89	60	48	72	2	2	58	46	70
Lassen	11,368	All	54	158	116	201	1	1	38	28	48
		Unintentional	42	123	86	160	1	1	40	28	52
		Intentional	9	26	9	44	1	1	26	9	42
Los Angeles	3,518,026	All	47,252	448	444	452	4	3	107	106	108
		Unintentional	32,337	306	303	310	4	2	99	98	100
		Intentional	14,160	134	132	136	4	4	130	128	132
Northeast Los Angeles	798,446	All	9,620	402	394	410	4	3	96	94	98
		Unintentional	7,088	296	289	303	4	2	96	94	98
		Intentional	2,381	99	95	103	4	4	96	92	100
Southeast Los Angeles	1,231,082	All	14,474	392	386	398	4	2	93	92	95
		Unintentional	10,260	278	272	283	4	2	90	88	92
		Intentional	4,002	108	105	112	4	4	105	101	108
Central Los Angeles	594,602	All	9,461	530	520	541	4	4	127	124	129
		Unintentional	5,982	335	327	344	4	3	109	106	111
		Intentional	3,318	186	180	192	4	4	180	174	186

County and Sub-Region Injury Episodes of Care
California Children, Adolescents, and Young Adults Age 0 to 24

Location		Injuries		Rate Per 100,000			State Qtile		Standardized Ratio		
County	1996 Pop.	Type	Number	Rate	LCI	UCI	Nbr	Rate	Ratio	LCI	UCI
West	893,895	All	13,697	511	502	519	4	4	122	120	124
Los Angeles		Unintentional	9,007	336	329	343	4	3	109	107	111
		Intentional	4,459	166	161	171	4	4	161	156	165
Long Beach	166,087	All	2,432	488	469	507			116	112	121
		Unintentional	1,643	330	314	346			107	102	112
		Intentional	751	151	140	162			146	135	156
Pasadena	49,876	All	662	442	409	476			106	97	114
		Unintentional	489	327	298	356			106	97	115
		Intentional	168	112	95	129			108	92	125
Madera	45,180	All	501	370	337	402	2	2	88	80	96
		Unintentional	418	308	279	338	2	3	100	90	110
		Intentional	75	55	43	68	2	1	53	41	66
Marin	65,939	All	512	259	236	281	2	1	62	56	67
		Unintentional	405	205	185	225	2	1	66	60	73
		Intentional	94	48	38	57	2	1	46	37	55
Mariposa	4,809	All	68	471	359	583	1	4	112	86	139
		Unintentional	57	395	293	498	1	4	128	95	161
		Intentional	10	69	26	112	1	2	67	25	108
Mendocino	30,504	All	386	422	380	464	2	3	101	91	111
		Unintentional	329	360	321	398	2	3	117	104	129
		Intentional	51	56	40	71	2	1	54	39	69
Merced	89,397	All	836	312	291	333	3	1	74	69	79
		Unintentional	669	249	231	268	3	1	81	75	87
		Intentional	155	58	49	67	3	2	56	47	65
Modoc	3,488	All	39	373	256	490	1	2	89	61	117
		Unintentional	30	287	184	389	1	2	93	60	126
		Intentional	7	67	17	116	1	2	65	17	113
Mono	3,396	All	52	510	372	649	1	4	122	89	155
		Unintentional	48	471	338	604	1	4	153	110	196
		Intentional	1	10	0	29	1	1	9	0	28
Monterey	137,593	All	1,449	351	333	369	3	2	84	79	88
		Unintentional	950	230	216	245	3	1	75	70	79
		Intentional	455	110	100	120	3	4	107	97	116
Napa	38,294	All	407	354	320	389	2	2	85	76	93
		Unintentional	346	301	269	333	2	2	98	87	108
		Intentional	53	46	34	59	2	1	45	33	57

County Injury Episodes of Care
California Children, Adolescents, and Young Adults Age 0 to 24

Location		Injuries		Rate Per 100,000			State Qtile		Standardized Ratio		
County	1996 Pop.	Type	Number	Rate	LCI	UCI	Nbr	Rate	Ratio	LCI	UCI
Nevada	27,175	All	411	504	455	553	2	4	120	109	132
		Unintentional	364	446	401	492	2	4	145	130	160
		Intentional	38	47	32	61	2	1	45	31	59
Orange	949,103	All	10,212	359	352	366	4	2	86	84	87
		Unintentional	7,776	273	267	279	4	2	89	87	91
		Intentional	2,257	79	76	83	4	3	77	73	80
Placer	73,855	All	937	423	396	450	3	3	101	94	107
		Unintentional	813	367	342	392	3	3	119	111	127
		Intentional	115	52	42	61	3	1	50	41	59
Plumas	6,429	All	90	467	370	563	1	4	111	88	134
		Unintentional	77	399	310	488	1	4	129	101	158
		Intentional	11	57	23	91	1	2	55	23	88
Riverside	537,123	All	7,319	454	444	465	4	3	108	106	111
		Unintentional	5,612	348	339	357	4	3	113	110	116
		Intentional	1,593	99	94	104	4	4	96	91	100
Sacramento	413,378	All	6,484	523	510	536	4	4	125	122	128
		Unintentional	4,945	399	388	410	4	4	129	126	133
		Intentional	1,420	115	109	120	4	4	111	105	116
San Benito	17,618	All	161	305	258	352	1	1	73	61	84
		Unintentional	128	242	200	284	1	1	79	65	92
		Intentional	30	57	36	77	2	1	55	35	74
San Bernardino	667,625	All	10,094	504	494	514	4	4	120	118	123
		Unintentional	7,613	380	372	389	4	4	123	120	126
		Intentional	2,297	115	110	119	4	4	111	106	115
San Diego	1,030,134	All	13,742	445	437	452	4	3	106	104	108
		Unintentional	10,815	350	343	357	4	3	113	111	116
		Intentional	2,784	90	87	93	4	3	87	84	90
San Francisco	194,432	All	2,701	463	446	481	4	3	110	106	115
		Unintentional	1,767	303	289	317	4	2	98	94	103
		Intentional	885	152	142	162	4	4	147	137	156
San Joaquin	213,299	All	2,478	387	372	402	4	2	92	89	96
		Unintentional	1,764	276	263	289	4	2	89	85	94
		Intentional	663	104	96	111	4	4	100	92	108
San Luis Obispo	83,352	All	964	386	361	410	3	2	92	86	98
		Unintentional	747	299	277	320	3	2	97	90	104
		Intentional	204	82	70	93	3	3	79	68	90

County and Sub-Region Injury Episodes of Care
California Children, Adolescents, and Young Adults Age 0 to 24

Location		Injuries		Rate Per 100,000			State Qtile		Standardized Ratio		
County	1996 Pop.	Type	Number	Rate	LCI	UCI	Nbr	Rate	Ratio	LCI	UCI
San Mateo	219,432	All	2,071	315	301	328	3	1	75	72	78
		Unintentional	1,519	231	219	242	3	1	75	71	79
		Intentional	511	78	71	84	3	3	75	69	82
Santa Barbara	142,250	All	1,473	345	328	363	3	2	82	78	87
		Unintentional	1,126	264	248	279	3	2	86	81	91
		Intentional	319	75	67	83	3	3	72	64	80
Santa Clara	557,008	All	5,412	324	315	333	4	1	77	75	79
		Unintentional	3,921	235	227	242	4	1	76	74	78
		Intentional	1,356	81	77	85	4	3	78	74	83
Santa Cruz	84,210	All	850	336	314	359	3	1	80	75	86
		Unintentional	642	254	234	274	3	1	82	76	89
		Intentional	200	79	68	90	3	3	76	66	87
Shasta	58,600	All	837	476	444	508	3	4	114	106	121
		Unintentional	683	389	359	418	3	4	126	117	135
		Intentional	141	80	67	93	3	3	78	65	90
Sierra	1,055	All	9	284	99	470	1	1	68	24	112
		Unintentional	9	284	99	470	1	2	92	32	152
		Intentional	0	0			1	1	0		
Siskiyou	15,141	All	185	407	349	466	2	3	97	83	111
		Unintentional	152	335	281	388	2	3	108	91	126
		Intentional	29	64	41	87	2	2	62	39	84
Solano	142,700	All	1,321	309	292	325	3	1	74	70	78
		Unintentional	991	231	217	246	3	1	75	70	80
		Intentional	308	72	64	80	3	2	70	62	77
Sonoma	141,584	All	1,725	406	387	425	3	3	97	92	101
		Unintentional	1,379	325	308	342	3	3	105	100	111
		Intentional	311	73	65	81	3	3	71	63	79
Stanislaus	170,952	All	2,133	416	398	434	3	3	99	95	103
		Unintentional	1,589	310	295	325	3	3	100	96	105
		Intentional	503	98	90	107	3	4	95	86	103
Sutter	28,689	All	328	381	340	422	2	2	91	81	101
		Unintentional	273	317	280	355	2	3	103	91	115
		Intentional	49	57	41	73	2	2	55	40	70
Tehama	19,556	All	208	355	306	403	2	2	85	73	96
		Unintentional	179	305	260	350	2	2	99	84	113
		Intentional	24	41	25	57	1	1	40	24	55

County Injury Episodes of Care
California Children, Adolescents, and Young Adults Age 0 to 24

Location		Injuries		Rate Per 100,000			State Qtile		Standardized Ratio		
County	1996 Pop.	Type	Number	Rate	LCI	UCI	Nbr	Rate	Ratio	LCI	UCI
Trinity	4,468	All	99	739	593	884	1	4	176	141	211
		Unintentional	90	671	533	810	1	4	218	173	263
		Intentional	8	60	18	101	1	2	58	18	98
Tulare	156,319	All	1,462	312	296	328	3	1	74	71	78
		Unintentional	1,159	247	233	261	3	1	80	76	85
		Intentional	279	59	53	66	3	2	57	51	64
Tuolumne	15,736	All	238	504	440	568	2	4	120	105	136
		Unintentional	184	390	333	446	2	4	126	108	145
		Intentional	46	97	69	126	2	4	94	67	121
Ventura	266,688	All	2,681	335	322	348	4	1	80	77	83
		Unintentional	2,080	260	249	271	4	2	84	81	88
		Intentional	561	70	64	76	4	2	68	62	73
Yolo	65,343	All	653	333	308	359	2	1	79	73	86
		Unintentional	504	257	235	280	2	1	83	76	91
		Intentional	137	70	58	82	3	2	68	56	79
Yuba	25,913	All	364	468	420	516	2	4	112	100	123
		Unintentional	299	385	341	428	2	4	125	111	139
		Intentional	62	80	60	100	2	3	77	58	96