

**CALIFORNIA HEALTH CARE SYSTEM:  
OVERVIEW OF THE HOSPITAL/EMS CRISIS  
WINTER OF 1997-98  
FINDINGS AND RECOMMENDATIONS**

**Task Force Report**

*December, 1998*

## Executive Summary

In December 1997 the state Emergency Medical Services Authority (EMSA) and Department of Health Services (DHS), (Licensing and Certification (L&C) and Emergency Preparedness Programs were alerted to a “hospital overcrowding” problem by local Emergency Medical Services Agencies (LEMSAs) in Southern California. A large number of hospital emergency departments reported overcrowded conditions and requested ambulance diversions. A similar pattern spread throughout most of the state in January and February.

On January 9, 1998, an initial task force consisting of representatives from L&C, EMSA and the California Healthcare Association (CHA) began conducting conference calls with LEMSAs, local health officers and others to identify the scope and severity of the overcrowding problem throughout California. The task force developed into a multidisciplinary group that also included researchers and representatives of prehospital providers. This group accepted the responsibility of researching, recommending and reporting solutions to avoid a repetition of the events experienced the previous winter.

This report on the overcrowding of California’s health care system includes:

- a retrospective narrative addressing the many contributing factors;
- a review of current data collection;
- lists of current standards, authorities and practices;
- resources affecting the availability of services; and
- recommendations to avert a repetition of the previous winter’s situation and assist with future planning related to stress on the health care system.

The initial precipitating factor was a sudden increase in the incidence of influenza-like illness (ILI). This was subsequently determined to be due in large part to an epidemic of influenza type A/Sydney, a strain for which the 1997-98 vaccine was not protective. This epidemic followed a number of years of apparently light influenza activity in California, so hospitals that based their preparations on these preceding years were not prepared for this epidemic.

The increase began in Southern California during the period between Christmas and the New Year’s holiday. Compounding the problem was limited access to physicians’ offices that were closed beginning mid-week, since Christmas and New Year’s days fell on Thursdays. Patients calling their doctors’ offices frequently received instructions to go to their local emergency department.

The increased number of patients treated in emergency departments and admitted to hospitals resulted in a shortage of staffed beds. In some cases hospital beds were physically available but could not be occupied because of staff unavailability, principally registered nurses and physician specialists. As hospitals became overcrowded, many requested ambulance diversions based on subjective and hospital-specific criteria. Hospitals that were geographically distant required ambulance transport over longer distances, further impacting the system. Ambulances were committed for longer periods of time than during non-diversion periods. This reduced the overall availability of ambulances to the system.

This experience raises questions regarding the ability of the state's health care industry to effectively respond to similar situations and/or a major medical disaster. As evident from this incident, there exists little residual capacity in the current California health care system to respond to and accommodate catastrophic events that involve moderate to large numbers of casualties and displace thousands of residents. The capacity to respond to disasters of moderate impact may be questionable in many areas. This is especially true when the system is already overburdened as with the flu epidemic of Winter 1997.

Lowered reimbursement and changes in the managed care environment have brought about many of these situations as the system is forced to take care only of the sickest patients with a limited number of staff.

The task force developed several recommendations to better prepare for and manage periods of high service demand coupled with low staffing availability including those caused by ILI. The implementation of these recommendations, together with additional research to identify certain problematic aspects, would improve California's ability to provide necessary health services for its populace in a rapidly changing health care environment. This only can be accomplished through a partnership of industry, government and the general public.

# Summary of Recommendations

## **Hospital Utilization Data**

- Support implementation of Senate Bill (SB) 1973 (Maddy) (Chapter 735, Statutes of 1998)(Appendix E) that requires the Office of Statewide Health Planning and Development (OSHPD) to:
  - speed up collection and processing of hospital inpatient discharge data,
  - begin collection of emergency department encounter data in 2002, and
  - undertake a study of hospital accounting and utilization data to eliminate redundancies and identify ways to make the data more useful (including the support of EMS planning and coordination which could involve more detailed changes in definitions).
- Examine possible discrepancies between numbers of staffed beds and their utilization as reported to OSHPD, and as reported to investigators during crisis.
- Make data and information available to LEMSAs, county health departments and hospitals for planning and evaluation of local emergency response systems.
- Ensure that OSHPD and EMSA work closely in the development of their data systems. Wherever possible and practical, their systems should complement each other and provide the most important data and information while limiting reporting burdens on providers.

## **Emergency Medical Services Data**

### ***Short Term***

- Implement the provisions of Assembly Bill (AB) 2103 (Gallegos) (Chapter 995, Statutes of 1998)(Appendix F) under which:
  - counties or their designated LEMSAs must develop policies on or before June 30, 1999, specifying criteria they will consider in conducting impact evaluations of proposed downgrades or closures of hospital emergency departments (EDs), and
  - EMSA must develop guidelines for development of local impact evaluation policies.
- LEMSAs and their area hospitals collect and obtain the data required to assess and project EMS resources and needs based upon the policies developed under AB 2103.
- LEMSAs work with hospitals to develop an ongoing monitoring system for managing peak demand.

### ***Long Term***

- Support health-planning research to better project and monitor EMS need and utilization.
- Support implementation of SB 1973 as noted above.
- Develop recommendations from EMSA to OSHPD regarding ED data set, collection methods and local interfaces with LEMSAs.
- Develop recommendations for monitoring and communicating systems to manage peak demand in collaboration with CHA and EMSA. The current Reddi-Net network in Southern California is an example of a system that meets many of these needs and ongoing data collection should not be redundant to this system.
- Support the development of a computerized, statewide, inter-hospital monitoring system with interactive capabilities.
- Communicate and coordinate with public health officials and programs at both state and local levels.

## **Public Health Data**

- The DHS Division of Communicable Disease Control (DCDC) plans to implement a more active, complete and timely surveillance system for influenza activity in California. This system should utilize sentinel indicators that would provide the earliest possible indications of increases in influenza activity, including primary care physicians who see or receive calls from patients with ILI, and prompt and complete reporting of institutional ILI outbreaks.
- DCDC will be conducting a pilot program of such a system during the 1998-99 season. This system will use sentinel physician reporting based in Southern California Kaiser health care facilities to monitor the ILI occurrences. It will attempt to enhance the reporting of institutional ILI outbreaks through regular reporting by local health departments. Enhancement of reporting for nursing home ILI outbreaks will be attempted through the annual mailing of a set of recommendations to long-term-care facilities for reporting and management of influenza outbreaks and a regular survey of nursing homes by the Los Angeles County Department of Health. Public health laboratories will be asked to report and forward all influenza isolates to the DCDC virus laboratory for typing.

## **Hospitals and EMS Systems–General Authorities**

- LEMSAs, as the lead agencies, develop in collaboration with ambulance providers, communication centers, hospitals and L&C, a comprehensive area-wide diversion program based on the *Model Ambulance Diversion Program* standards (Appendix G).
- Design ambulance diversion programs to limit diversion requests.
- The saturation of an emergency department or other hospital unit may initiate a request for diversion. Internal policies and procedures to avoid or/relieve saturation should be in place. (Saturation is when all stations or beds are filled to capacity and/or traditional staffing-to-patient ratios are at the maximum of the hospital's written staffing plan.)
- LEMSAs plan for situations when multiple hospitals could experience saturation simultaneously (see next section regarding disaster planning).

## **Hospitals-Emergency Planning**

- All hospitals review their emergency response plans and develop procedures related to high census and low staffing (saturation). These procedures should be part of an aggressive coordinated plan for dealing with any high periods of hospital utilization (e.g.; flu season).
- Hospitals coordinate with LEMSAs, health officers and other local disaster officials in the early, partial or complete implementation of emergency preparedness plans necessary to meet community health care needs.
- Hospitals review and revise their emergency response plans to follow the Incident Command System outlined in the Hospital Emergency Incident Command System (HEICS).
- Hospitals use the *Individual Hospital Response Strategies for Saturation* (Appendix K) as a model.
- Hospitals contact their local DHS L&C district offices and request either staffing or bed waivers as necessary to maximize the availability of patient care and treatment options.

### **EMS Systems-Emergency Planning**

- Hospitals coordinate community disaster planning with their LEMSAs (See Appendix G).
- LEMSAs and hospitals develop area-wide response strategies for hospital saturation that coordinate local resources and minimize requests for ambulance diversions.
- LEMSAs develop diversion programs that ensure patients are transported to EDs for stabilization and continuity of care. When saturation is the result of a lack of critical care beds, transfer agreements must be implemented for secondary transfers. (Hospitals are required to have transfer agreements in place at all times).

### **Disaster Response and Emergency Proclamations**

- Hospitals and health care providers must identify, in advance of a disaster, their projected resource needs to cope with a disaster event. They also must identify alternate sources of personnel, supplies and equipment. Requests to government for these resources only should be made when personnel registries and/or suppliers are unable to meet a facility's needs or if a disaster has interrupted normal communication or transportation systems.
- Hospitals and health care providers develop and test emergency preparedness plans in concert with county medical/health officials to develop coordinated approaches to disaster planning and response.
- DHS L&C district offices must be prepared to grant hospitals, after review and when appropriate statutory and regulatory waivers for both hospital staffing and licensed bed requirements. DHS will monitor facilities for appropriateness of care during a waiver period. This will enable hospitals to continue to provide care to the maximum number of patients for the duration of an emergency or disaster situation.
- DHS L&C will develop guidelines to ensure consistent review, approval and monitoring of waivers for staffed or bed-capacity requirements. During a disaster, DHS L&C headquarters staff will coordinate and monitor all district office response activities.

### **EMS Community Education**

- LEMSAs, hospitals and other EMS participants, along with the health care community, join together to more fully understand the needs of the individuals using prehospital and hospital EMS and work together to create effective public education campaigns that help individuals obtain appropriate services and guide others to use alternate services.
- LEMSAs utilize and implement public education campaigns to promote appropriate use of EMS systems through 9-1-1. Specific campaigns can be targeted for known medical conditions where the value of EMS system utilization is well-established (e.g. heart attack, stroke and trauma).
- Local hospital emergency departments coordinate efforts with LEMSAs to create an add-on or complementary public education campaign promoting appropriate use of hospital emergency departments.
- LEMSAs, in coordination with flu immunization programs, and public and private health care providers, develop and promote education programs for flu like illness care that emphasize when to call primary care physicians, clinics, hospital emergency departments and/or 9-1-1. Flu immunization programs traditionally commence in May each year.

### **Public Health Prevention of Influenza and Influenza-Like Illness**

- DCDC seek resources to develop an adult immunization program; influenza immunization would be a major focus of such a program. The Immunization Branch of DCDC has been developing an adult immunization plan, but the resources to implement this are lacking. Components of such a plan would include a yearly assessment of immunization levels in long-term-care facilities; the development and distribution of materials to inform and educate the public about methods of protection against influenza; and the training and education of health care professionals related to immunization.
- Until such a program can be developed, advice on compliance with the Advisory Committee on Immunization Practices (ACIP) recommendations for prevention and control of influenza (Reference in Appendix A) and other measures to reduce the risk of respiratory infection should be distributed as widely as possible, including through public service announcements.

### **Resources--Nursing Shortage**

- Support specialty training for nurses in critical care areas.
- Prepare and use unlicensed assistive personnel for tasks not requiring licensed nurses.
- Request relaxation of intensive care unit (ICU) staffing ratios from DHS as appropriate for safe care.
- Provide childcare (especially during the holiday vacation period).
- Contact nurse unions and ask for their cooperation to delay strikes until a crisis is over.
- Establish contacts with out-of-state nurse registries prior to a crisis.
- Consider and encourage overtime.
- Support state legislation to fund educational programs for nurses at all levels.
- Support the work of the California Strategic Planning Committee for Nursing (CSPCN) to study the nurse shortage and make recommendations as to the need for nurses, especially in critical care areas.
- Staff for anticipated fluctuations due to an expected influx of patients during the “flu” season.
- Restrict vacation requests.
- Request all critical personnel be excused from jury duty during the crisis.
- Implement flexible working hours to increase on-call staffing.

### **Resources--Specialty Physician Shortage**

- Explore enhanced funding for specialty physicians taking call.
- Partner with medical societies/associations to assist in enforcement of medical staff bylaws that require specialty physicians to take call.
- Support the work of the Hospital Emergency Call task force.
- Explore alternatives to physician specialty house staff including use of physician intensivists and advance practice nurses.

### **Resources--Medical Equipment and Supplies Shortages**

- Contact medical equipment companies and make them part of a plan to access additional equipment if necessary.
- Hospitals review their equipment inventory procedures to assure adequate supplies are available.

- Convene a statewide task force to address the issue of multiple suppliers that depend on only a few vendors.
- Assure backups of synthetic blood products are available and develop criteria for their use during times of crisis.
- Work with local blood donor organizations to plan additional blood drives prior to a time of increased need.
- Work with local pharmacies to assure the availability of adequate supplies of flu remedy type medications.

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# **Health Care System: Overview of the Hospital/EMS Crisis - Winter of 1997-98**

## **I. INTRODUCTION**

This report focuses on the overcrowding of California's health care system that occurred during the winter of 1997-98. It includes the following:

- a retrospective narrative that addresses the many contributing factors;
- a review of current data collection;
- lists of current standards, authorities and practices;
- resources affecting the availability of services; and
- recommendations to avert a repetition of the previous winter's situation and assist with future planning related to stress on the health care system.

A list of agencies and organizations contributing to this report is included as Section VIII. The authors wish to thank the many people who participated in countless meetings and provided research that made the analysis of this unusual situation possible. Those involved share a common purpose - to avoid a repetition of, or possibly an even worse situation than last winter's experiences.

## **II. RETROSPECTIVE**

### **A. General Background**

In December 1997 state Emergency Medical Services Authority (EMSA),<sup>1</sup> and the Department of Health Services (DHS), (Licensing and Certification (L&C)<sup>2</sup> and Emergency Preparedness Programs<sup>3</sup> were alerted to a "hospital overcrowding" problem in Southern California. The problem was first identified through local Emergency Medical Services Agencies (LEMSAs)<sup>4</sup> attempting to deal with large numbers of hospital emergency departments reporting overcrowded conditions and requesting ambulance diversion. An initial task force, consisting of representatives from EMSA, L&C, Emergency Preparedness and the California Healthcare Association (CHA)<sup>5</sup>, began conducting conference calls with LEMSAs, local health officers<sup>6</sup> and

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<sup>1</sup> The California Emergency Medical Services Authority has the overall responsibility for coordinating and integrating emergency and disaster medical care throughout California.

<sup>2</sup> The California Department of Health Services Licensing and Certification Program has overall responsibility for licensing and certifying health care facilities throughout California.

<sup>3</sup> The California Department of Health Services Emergency Preparedness Program coordinates the department's response to public and environmental health emergencies.

<sup>4</sup> Local Emergency Medical Services Agencies are responsible for actual day-to-day EMS system operations and implementation.

<sup>5</sup> The California Healthcare Association, formerly the California Association of Hospitals and Health Systems, represents more than 6300 California hospitals, health systems and physician groups.

<sup>6</sup> Local Health Officers are charged with the protection of public health within their jurisdiction.

others. The purpose was to identify the scope and severity of the overcrowding problem throughout California. This in itself was a difficult task in that no single state agency is responsible for monitoring hospital patient census on a day-to-day basis. The task force soon discovered that emergency department and hospital overcrowding, particularly in critical care units, seemed to be a constant “rolling” issue in metropolitan areas. LEMSAs deal with this situation on almost a daily basis when trying to coordinate ambulance diversion requests.

The initial precipitating factor was a sudden increase in influenza-like illness (ILI) that was the heaviest since 1992. It peaked in Southern California during the last week of December (approximately two to four weeks earlier than usual). Background information on influenza and ILI is provided as Appendix A. A similar pattern of illness spread throughout the rest of the state in January and February. The influenza vaccine supplied to many at-risk populations during the fall of 1997 was not protective against the influenza strain most people contracted during December 1997 and January 1998.

Compounding the problem, particularly in Southern California, was limited access to physicians’ offices that were closed for four or four-and-a-half days because Christmas and the New Year’s holidays fell on Thursdays. Many offices took a half day before Christmas and New Year’s day which is common practice, and did not return until the following Monday. Patients calling their doctors’ offices frequently received instructions to go to their local emergency department. Hospitals reported that the number of patients presenting in emergency departments during the last two weeks of 1997, as compared to the last two weeks of 1996, increased as much as 100 percent in some facilities.

The increased number of patients treated in emergency departments and subsequently admitted to hospitals resulted in a shortage of staffed beds. In some cases, hospital beds were physically available but could not be occupied because of staff unavailability, principally registered nurses and physician specialists. Some hospitals did report, however, that at times they did not have beds physically available. As hospitals became overcrowded, many requested ambulance diversions based on subjective and hospital-specific criteria. In some areas, so many hospitals requested diversions that there was no place to send patients, making diversion impossible. At least three counties proclaimed countywide emergencies. And, one hospital called the National Guard for assistance.

Hospitals that were geographically distant required ambulance transport over longer distances, further impacting the system. Ambulances were committed for longer periods of time than during non-diversion periods. This reduced the overall availability of ambulance service to the system. However, one county discovered that adding more ambulances did not solve the problem; rather, the increase in patient transports resulted in more ambulances shopping for emergency departments as more hospitals became unable to accept patients for treatment.

Additionally, patients were taken to hospitals that did not have access to their medical records, resulting in longer stays in the emergency department and negative impacts on continuity of care. Longer treatment time and resulting secondary transports further exacerbated emergency department overcrowding. Also, when ambulances are diverted, families often arrive at the wrong emergency department.

It was difficult to determine exactly what occurred in the various hospitals statewide. Some hospitals requested ambulance diversions while they continued to perform elective surgeries and other procedures. Other facilities experienced full intensive care units but not medical/surgical areas, while others were bursting at the seams in every unit. Lack of information coordination among health care providers, facilities and government agencies caused duplication and confusion within the system.

There exists no template for addressing an on-going, “disaster-like” situation involving high census and low staffing in hospitals. However, plans do exist for situations involving labor actions or identified disaster events such as floods, earthquakes or other catastrophes.

Some areas of the state met the challenge by taking unusual actions. For example, San Diego County health officials requested all health care professionals be relieved of scheduled jury duty. In some areas, hospitals, applied to L&C for relief from meeting certain staffing and bed requirements. In hospitals where elective surgeries were curtailed, post-anesthesia recovery units were used to care for critical patients. Many hospital staff members worked overtime to meet the crisis.

There was some speculation by task force members that the decreased availability of staffed beds and services may be due to reductions made by hospitals to remain competitive in the marketplace. It was further speculated that there could no longer be the depth of nursing staff that was available five years ago. Added to this were the unavailability of staff who were suffering from the flu and a general shortage of nurses, exacerbated by a lack of registry nurses who took the holidays off to be with their families. A decrease in the number of house staff resident physicians because of limited funding for medical education may contribute to the lack of specialists available in emergency departments and critical care areas.

The hospital overcrowding experienced in metropolitan areas during the winter of 1997-98 raises questions regarding the ability of the state’s health care industry to effectively respond to these types of situations, let alone a major medical disaster. The rapidly increasing state population now includes large numbers of children, seniors and medically fragile individuals/groups that are at greatest risk in disasters. While California has successfully responded to many natural and man-made emergencies to date, the state faces the probability of potentially catastrophic events that may simultaneously cause tens of thousands of casualties, displace hundreds of thousands of residents and wreak havoc on the responding health care system. This scenario does not bode well for an already over burdened health care system, with little, if any, residual capacity.

The inevitability of these events occurring must be acknowledged. This report contains recommendations to better prepare for and manage periods of high service demand coupled with low staffing availability, including those caused by ILI. The implementation of these recommendations, together with additional research to more fully explore certain aspects of the problem, would improve California’s ability to provide necessary health services for its populace in a rapidly changing health care environment. This only can be accomplished through a partnership of industry, government and the general public.

## **B. Los Angeles County Influenza Investigation: 1997-98**

Shortly after the first reports of EMS diversions and hospital overcrowding in Los Angeles County in late December 1997, and early January 1998, the DHS Division of Communicable Disease Control (DCDC) began to collect information to assess the magnitude of ILI and determine the causes of diversions and overcrowding in the county. After it became clear the necessary information was not readily available, a study was initiated to identify sources of information, and to collect and analyze that information as it became available. Because information necessary for a complete analysis still is being collected, a summary of preliminary analyses is included here.

The numbers of acute care respiratory admissions (ICD9-487) for the six Los Angeles County public hospitals and the University of California at Los Angeles (UCLA) Medical Center were obtained for the 1997-98 season as well as for the previous six seasons. The number of influenza-related admissions was significantly higher in 1997-98 than in the previous six seasons. The peak of admissions was between week 52 of 1997 and week one of 1998. Though the absolute number of admissions was higher in 1997-98, a predictable increase in admissions occurred each year. This peak in admissions coincided with the peak in ambulance diversions that also occurred each year. The age groups affected were similar for all seven influenza seasons examined, with the highest numbers in those over age 65. Similar data was obtained from UCLA, and the same trends were observed. Even with the limitations of the current data, it is clear that the respiratory disease burden was higher than the previous six seasons. More recently, data from CDC indicates that the predominant influenza strain in California, as in the rest of the country, was A/Sydney, for which the vaccine available in 1997-98 provided little or no protection.

Anecdotal reports from hospitals indicated some unavailability of staffed beds. The primary source of data on staffed beds is the Office of Statewide Health Planning and Development (OSHPD)<sup>7</sup> annual financial disclosure reports. According to those reports, the actual number of general acute care staffed beds has remained relatively stable over the past four years. In Los Angeles County, the number of staffed general acute care beds per 100,000 people has decreased approximately 7 percent over the same period.

More recently, we began to acquire information about the actual number of staffed beds in Los Angeles County during the 1997-98 period. This data preliminarily indicates that the available staffed beds during the influenza epidemic may have been significantly decreased compared to 1992-93. Comparable decreases were reported for specialty care unit and total beds. This decrease was compounded by staff vacations during the winter holidays and staff illnesses due to the same respiratory diagnoses observed in the population.

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<sup>7</sup> The Office of Statewide Health Planning and Development collects and provides health care information to support statewide health policy development and evaluation.

Summary (Preliminary):

- One new strain of influenza virus was predominate in California in 1997-98, for which the influenza vaccine essentially provided no protection.
- The disease burden of respiratory illness, including influenza and ILI, in 1997-98 was relatively high and the highest since at least 1992-93.
- The peak respiratory disease burden occurred in Los Angeles County beginning approximately two weeks prior to January 1, 1998.
- The number of staffed, general acute care beds adjusted for changes in population has decreased since 1992-93.
- Additional staff shortages occurred due to vacations and illness.
- These above factors combined to create a demand for hospital resources that exceeded the supply at many hospitals.
- A predictable pattern of increases in respiratory illness accompanied by increases in ambulance diversions occurs annually during the influenza season, even in seasons of moderate influenza activity.

Given the lack of a similar seasonal respiratory disease burden over the preceding years and decreasing hospital staff resources, hospitals were unprepared to deal with the sudden demand for services.

### **III. CURRENT DATA COLLECTION**

#### **Hospital Utilization, Emergency Medical Services and Public Health Data**

Several factors could have contributed to the hospital/EMS crisis of 1997-98. They include increased utilization compounded by a lack of resources, planning and coordination. Resources involve hospital facilities, specifically emergency departments, critical care units, and related personnel. Planing and coordination involves hospitals, local EMS authorities and local health departments as well as related state-level departments and organizations.

Data exist that can help in prepare for hospital/EMS crises in the future. These data need improvement in order to make them more useful. Data do not uniformly exist to help in responding to crises when they occur and will need to be developed to meet this important need.

Section III of this report examines the adequacy of current hospital, EMS and public health data. It discusses the implications those data have on preparing for and responding to hospital/EMS crises and offers recommendations for improving those data.

#### **A. Hospital Utilization Data**

##### ***Background***

Data currently collected by the state are helpful in assessing many aspects of the hospital and EMS systems. They include measures of selected resources and their utilization. Appendix B describes current data resources including purpose, content, timing and availability.

Normally, data are used only in retrospective assessments because they are collected after-the-fact. No system of day-to-day hospital monitoring exists at the statewide level and its existence at the local level is sporadic. A discussion of system monitoring follows in the EMS section.

State data can be used in planning and evaluation and will be discussed below. However, the data often are lacking in ways that do not permit evaluation of specific situations such as the hospital/EMS crisis of 1997-98.

### Limitations

The *Hospital Annual Disclosure Report*, collected by OSHPD from every general acute care hospital in California, includes data on the numbers and types of licensed, available and staffed hospital beds. Unfortunately, the data reflect a “daily average complement” of beds during the year. Therefore, while data for any particular facility may reveal an increase or decrease in “average” staffed beds over time, they do not indicate the level of staffed beds that existed during a particular week or month. This presents a problem because statewide data reveal consistently low average, annual occupancy rates for hospitals, even in critical care areas. However, information gathered during the crisis revealed a shortage of both staffed and available beds. A contributing factor might be the fact that the number of staffed beds varies so much from day to day that it is difficult for hospitals to calculate a daily average complement of beds. As such, the measure of a daily average of staffed beds may be of little value in assessing the readiness of the hospital system to respond to emergencies.

The *Hospital Quarterly Financial and Utilization Reports* collected by OSHPD provide more time specific data on staffed beds (by quarter instead of a year). The data also are not separated into bed types, and do not differentiate between critical care and general care. Also, Kaiser hospitals report as a group and not by individual facility in both quarterly and annual reports, further limiting the usefulness of the data.

Hospital inpatient discharge data collected by OSHPD provide a more detailed look into care rendered during given periods. They include dates, diagnoses and treatment, and identify inpatient admissions originating from emergency departments. However, data are currently not available for a period of 6 to 12 months after the reporting period. As such, discharge data related to the 1998 portion of the hospital/EMS crisis of 1997-98 (January/February 1998) will not be reported to OSHPD by hospitals until December 1998, much too late for planning and preparing for the next flu season. The only alternative is to request data from hospitals directly, as was done in the Los Angeles County influenza investigation. This may be appropriate in certain circumstances but is costly and cumbersome for everyone involved. Better uses of existing reporting mechanisms are more warranted.

No information currently is collected by the state on emergency department care other than total annual visits by type of visit (critical, urgent and non-urgent). Unlike hospital inpatient discharge data, no statewide, patient level, hospital emergency data exist.

## Use of Data

Despite these limitations, the data can be used in planning, as noted above. They do provide a larger view of system use over time and can be used to measure general capacity and availability.

### County Level

Tables with county-specific data are included in Appendix C. It should be noted, however, that data at the county level are not always useful in analysis of resource availability or utilization. For example, while there may be a limited number of hospital beds in a county, the fact may be that a large number of its residents live near the county border and find it most practical to use nearby hospitals in the adjacent county. Resource data are available by sub-county planning areas to assist with proper planning but were not included in the appendices due to their volume. County data are presented as examples.

Some data for Los Angeles County from 1996 to 1997 reveal:

- The number of licensed general acute care beds decreased by 3.4 percent after adjusting for increases in population.
- At the same time, the number of staffed beds decreased by 7.5 percent.
- The number of acute care discharges, adjusted for population, increased by 1.7 percent.

Several tables and charts contained in Appendix D display statewide hospital data from 1991 through 1997. They include measures of selected hospital resources and utilization. They also include population and age-adjusted measures to permit evaluation over time.

### Statewide

The statewide data offer an overall picture, most notably:

- California's population has increased by 7.8 percent between 1991 and 1997.
- The number of general acute care hospitals has remained relatively constant during that same period.
- Despite the fact that the total number of licensed general acute care hospital beds per 100,000 people has decreased by 16 percent, their occupancy has declined by 12 percent.
- Despite the fact that the number of licensed critical care beds per 100,000 people has decreased by 7.7 percent, their occupancy has declined by 8.2 percent. However, it appears to be on the way up and increased by 7.6 percent just last year.
- During the period from 1994 through 1997, the total number of annual average staffed general acute care hospital beds per 100,000 people as reported to OSHPD has **decreased** by 2.22 percent. At the same time, the number of annual average staffed critical care beds per 100,000 people has **increased** by 4.13 percent.
- The actual number of basic emergency departments has declined slightly while the number of emergency department treatment stations (the beds used in emergency departments) has increased, almost keeping pace with population growth.
- Overall emergency department usage is down in both real numbers as well as age-adjusted rates.

- Accounting for population growth, visits have declined by 12.1 percent since 1991. Non-urgent visits have declined by 25.1 percent. Urgent visits have declined by 5.4 percent. Critical visits have fluctuated up and down and are currently 8.5 percent higher than they were in 1991 but 1 percent lower than in 1993. This could be reflective of the cycle of ILI or some other phenomenon or it could be a variation in data collection. Without more specific encounter level data, the causes can not be determined.

### ***Implications***

Timely and useful hospital data and information would not have prevented or mitigated the crisis of 1997-98. However, if combined with timely and useful EMS data and a comprehensive and responsive emergency planning and coordination system, they would have helped significantly. If data on the specific types of hospital emergency and critical care delivered during the months of December, January and February were available, even as late as September or October, they would have been used to accurately assess the situation in specific locations. If data on the availability and use of staffed critical care beds and emergency department resources for the same period were available ahead of time, they would have allowed hospitals, local EMS agencies and local health officials to better prepare.

### ***Recommendations***

- Support implementation of Senate Bill (SB) 1973 (Maddy) (Chapter 735, Statutes of 1998)(Appendix E) that requires the Office of Statewide Health Planning and Development (OSHDP) to:
  - speed up collection and processing of hospital inpatient discharge data,
  - begin collection of emergency department encounter data in 2002, and
  - undertake a study of hospital accounting and utilization data to eliminate redundancies and identify ways to make the data more useful (including the support of EMS planning and coordination which could involve more detailed changes in definitions).
- Examine possible discrepancies between numbers of staffed beds and their utilization as reported to OSHPD and as reported to investigators during crisis.
- Make data and information available to LEMSAs, county health departments and hospitals for planning and evaluation of local emergency response systems.
- Ensure that OSHPD and EMSA work closely in the development of their data systems. Wherever possible and practical, their systems should complement each other and provide the most important data and information while limiting reporting burdens on providers.

## **B. Emergency Medical Services Data**

### ***Background***

State EMSA issues standards for reporting data to the state; however, these standards are not mandated and funding is not readily available to collect and enter this data at the provider level. At this time, reporting to EMSA remains voluntary and only some LEMSAs are able to meet the guidelines EMSA sets forth.

LEMSAs may study the capability of hospitals to care for certain types of patients, but do not routinely measure or monitor hospital capacity. Most often the, local EMS communications center tracks a hospital's status as to whether they are open or diverting ambulance patients. In systems that permit multiple hospitals to divert, communicating and tracking this information becomes even more important. And, as we experienced last winter, this was the first indication of a serious health problem in our local communities.

Some diversion data does exist and is monitored and collected in a variety of ways around the state. There are computerized hospital communication systems to monitor and report diversion activity in five counties. Some counties use manual monitoring systems. However, others do not track diversion status at all.

### ***Implications***

LEMSAs do not currently have access to timely data regarding hospital activity or capacity. This leads to the obvious need for reliable systems of communication and data reporting. If emergency personnel, hospitals and local officials are to work together effectively, they must have current information. If they are to plan and prepare for future crises, they must have the right data at the right time.

In those counties where diversion data are monitored and reported, they have provided valuable information to assist in system planning and preparation. In those areas where data are computerized, information becomes available sooner and is more useful in preparing for and responding to crises. Additionally, computerized systems provide for communications for other types and levels of disasters.

Because hospital resources are changing rapidly as the population increases and changes, the EMS system and hospitals need to work together to plan and project needs and services.

Some systems attempted to collect data to project hospital capacity prior to last winter's experience. In Northern California, where work stoppages were occurring, daily monitoring by phone assisted in projected day-to-day capacity. In Los Angeles County, special counts were done by the LEMSA.

### ***Recommendations - Short Term***

- Implement the provisions of Assembly Bill (AB) 2103 (Gallegos) (Chapter 995, Statutes of 1998)(Appendix F) under which:
  - counties or their designated LEMSAs must develop policies on or before June 30, 1999, specifying criteria they will consider in conducting impact evaluations of proposed downgrades or closures of hospital emergency departments (EDs), and
  - EMSA must develop guidelines for development of local impact evaluation policies.
- LEMSAs and their area hospitals collect and obtain the data required to assess and project EMS resources and needs based upon the policies developed under AB 2103.
- LEMSAs work with hospitals to develop an ongoing monitoring system for managing peak demand.

### ***Recommendations - Long Term***

- Support health-planning research to better project and monitor EMS need and utilization.
- Support implementation of SB 1973 as noted above.
- Develop recommendations from EMSA to OSHPD regarding ED data set, collection methods and local interfaces with LEMSAs.
- Develop recommendations for monitoring and communicating systems to manage peak demand in collaboration with CHA and EMSA. The current Reddi-Net network in Southern California is an example of a system that meets many of these needs and ongoing data collection should not be redundant to this system.
- Support the development of a computerized, statewide, inter-hospital monitoring system with interactive capabilities.
- Communicate and coordinate with public health officials and programs at both state and local levels.

## **C. Public Health Data**

### ***Background***

The DHS Division of Communicable Disease Control (DCDC), is responsible for surveillance for communicable diseases in California other than AIDS. Currently, there is no systematic public health surveillance for influenza or influenza-like-illness (ILI) in California. Instead, surveillance consists of reports received by DCDC of influenza virus isolation from sporadic cases, and of occasional outbreaks of influenza or ILI.

### ***Implications***

Reports received of influenza and ILI outbreaks probably represent only a fraction of such occurrences in the state, are at best only qualitative indicators of influenza activity, and are received too late to provide any assistance in planning responses to possible increases in influenza activity. As a result, the DCDC did not learn of the influenza epidemic of 1997-98 in Southern California until one to two weeks after its onset and then as the result of anecdotal information from emergency services providers, health care facilities and the media. Information about influenza virus strains in California was not available until after the epidemic.

### ***Recommendations***

- The DHS Division of Communicable Disease Control (DCDC) plans to implement a more active, complete and timely surveillance system for influenza activity in California. This system should utilize sentinel indicators that would provide the earliest possible indications of increases in influenza activity, including primary care physicians who see or receive calls from patients with ILI, and prompt and complete reporting of institutional ILI outbreaks.
- DCDC will be conducting a pilot program of such a system during the 1998-99 season. This system will use sentinel physician reporting based in Southern California Kaiser health care facilities to monitor the ILI occurrences. It will attempt to enhance the reporting of institutional ILI outbreaks through regular reporting by local health departments. Enhancement of reporting for nursing home ILI outbreaks will be attempted through the

annual mailing of a set of recommendations to long-term-care facilities for reporting and management of influenza outbreaks and a regular survey of nursing homes by the Los Angeles County Department of Health. Public health laboratories will be asked to report and forward all influenza isolates to the DCDC virus laboratory for typing.

#### **IV. CURRENT STANDARDS, AUTHORITIES AND PRACTICES**

##### **A. Hospitals and EMS Systems – General Authorities**

###### **Hospitals**

###### ***Background***

Regulation authority and requirements of general acute care hospitals (GACH) are extensive and found in a variety of areas. The DHS L&C is the primary state agency responsible for enforcement of GACH statutes and regulations. Most hospitals also elect to meet the accreditation standards set forth by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). GACH regulation, California Code of Regulations (CCR) Title 22 Section 70701 requires licensees to be responsible to the community (Section 70701 (a) (1) and participate in planning to meet the health needs of the community (Section 70701 (a) (4)).

###### ***Implications***

While there are extensive statutes, regulations and other standards governing the operation of hospitals, there is very little addressing the collective operation of hospitals when dealing with community crises of high census and low staffing periods. The most common response is to try and continue in a “business as usual atmosphere,” while requesting ambulance diversion in an attempt to decrease the flow of patients entering the system.

###### **Local Emergency Medical Services Agencies**

###### ***Background***

The primary role of LEMSAs is the integration of system services, provision of medical direction and appropriate medical standards, and system planning. Integration of services requires a balance of provider autonomy and multi-organizational cooperation. LEMSAs strive to integrate services within the EMS system both horizontally, between similar types of providers, and vertically, between providers delivering EMS at different phases of a patient’s care.

The formal relationship between individual hospitals and the local EMS system varies from county to county in California.

Within their respective communities, LEMSAs plan for appropriate destination of ambulance patients. LEMSAs do, depending on available resources, allow hospital emergency departments

to divert patients arriving by ambulances to other hospitals. This program, called ambulance diversion<sup>8</sup>, is one method that hospitals consider when coping with emergency department saturation. Diversion requests have been used over the years on an occasional basis; however, last winter, because of the peaks in demand for service in hospitals and emergency departments, hospitals throughout California were requesting ambulance diversion in inordinate amounts.

The root cause of most diversion requests is a sudden or evolving decrease in a hospital's capacity to receive patients, whether due to a physical or staffed beds limitation, or to a significant increase in the number of or type of patients arriving in the emergency department. There are of course other factors that influence a hospital's capacity to receive patients.

LEMSAs are able to monitor shifts in supply and demand through the number of requests for ambulance diversion. There are no other entities monitoring and projecting the emergency medical needs of communities and comparing this need to local resources, private and public, prehospital and hospital.

### ***Implications***

Inordinate numbers of requests for ambulance diversions are not manageable by most local EMS systems. Patients are rerouted to unfamiliar environments, continuity of care is lost and increased services are required.

Last winter's increased EMS demand was projected in some communities, although not to the extent that it actually occurred. The concern remains that without changes in our systems, the same situation is likely to reoccur.

This points out the need for EMS planning that both assesses the emergency medical needs of communities and identifies local resources that can meet those needs.

### ***Joint Recommendations for Hospitals and LEMSAs***

- LEMSAs, as the lead agencies, develop in collaboration with ambulance providers, communication centers, hospitals and L&C, a comprehensive area-wide diversion program based on the *Model Ambulance Diversion Program* standards (Appendix G).
- Design ambulance diversion programs to limit diversion requests.
- The saturation of an emergency department or other hospital unit may initiate a request for diversion. Internal policies and procedures to avoid or/relieve saturation should be in place. (Saturation is when all stations or beds are filled to capacity and/or traditional staffing-to-patient ratios are at the maximum of the hospital's written staffing plan.)
- LEMSAs plan for situations when multiple hospitals could experience saturation simultaneously (see next section regarding disaster planning).

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<sup>8</sup> Ambulance diversion describes a situation in which a hospital that would normally receive patients by ambulance into its emergency department, requests through an established local mechanism to have ambulance patients diverted away from its emergency department.

## **B. Hospitals and EMS Systems-Emergency Planning**

### **Hospitals**

#### ***Background***

Hospitals in California are required by both statutes and regulations to prepare for disasters and other emergencies. California Health and Safety Code 1336.3. requires hospitals:

“to adopt a written emergency preparedness plan and make that plan available to the state department upon request. The plan must comply with the requirements in this section and the state department's Contingency Plan for Licensed Facilities. As part of emergency preparedness planning, facilities must enter into reciprocal or other agreements with nearby facilities and hospitals to provide temporary care for patients in the event of an emergency.”

Title 22, California Code of Regulations §70741 (Appendix H), requires the development of a disaster and mass casualty program.

- The plan must be developed and maintained in consultation with representatives of the medical staff, nursing staff, administration, fire and safety experts. The program must be in conformity with the California Emergency Plan and the California Emergency Medical Mutual Aid Plan developed by the Governor's Office of Emergency Services (OES).
- The program must cover disasters occurring in the community and widespread disasters, and be updated annually.
- The disaster plan must be rehearsed and evaluated at least twice each year.

Hospitals that are JCAHO accredited are required to develop emergency preparedness plans under Environment of Care Standard 1.6 (Attachment J).

National Fire Protection Agency (NFPA), 1996, Standard for Health Care Facilities, *Health Care Emergency Preparedness*, Chapter 11 also requires hospitals to develop and maintain extensive emergency preparedness plans modeled after the “Incident Command System” (ICS).

Up to now, hospitals have not defined periods of high census and low staffing (saturation) as an indicator for activating all or part of their emergency preparedness plan.

The Hospital Emergency Incident Command System (HEICS) model for hospital emergency preparedness planning allows for the flexible activation of all or part of a hospital's emergency response system based on the level and type of the emergency. The task force reviewed a number of California hospitals' emergency preparedness plans and found few, if any, that used the HEICS model and none that addresses periods of high census and low staffing as a reason for activating all or part of its emergency response plan (Appendix J).

## ***Implications***

By not following the HEICS model and planning for high census/low staffing situations, facilities do not institute their emergency plans and are forced to react to crisis on a shift by shift basis, requesting ambulance diversion and government assistance to activate mutual aid systems when other alternatives may be available.

The HEICS model may have helped hospitals see this peak demand for emergency services as a catalyst for activating relevant portions of their disaster plan. Many hospitals and some LEMSAs worked to devise contingency plans as this situation unfolded. These plans included public service announcements, canceling or limiting elective surgery, requesting bed or staffing flexibility from L&C, and many other innovative ideas.

## ***Recommendations***

- All hospitals review their emergency response plans and develop procedures related to high census and low staffing (saturation). These procedures should be part of an aggressive coordinated plan for dealing with any high periods of hospital utilization (e.g.; flu season).
- Hospitals coordinate with LEMSAs, health officers and other local disaster officials in the early, partial or complete implementation of emergency preparedness plans necessary to meet community health care needs.
- Hospitals review and revise their emergency response plans to follow the Incident Command System outlined in the Hospital Emergency Incident Command System (HEICS).
- Hospitals use the *Individual Hospital Response Strategies for Saturation* (Appendix K) as a model.
- Hospitals contact their local DHS L&C district offices and request either staffing or bed waivers as necessary to maximize the availability of patient care and treatment options.

## **Local Emergency Medical Services Agencies**

### ***Background***

LEMSAs are charged with planning and coordinating emergency preparedness plans for prehospital emergencies. These plans address the distribution and receipt of patients to hospital emergency departments in various levels and types of disasters. Periods of high census and low staffing, such as last winter, are not addressed in most hospital or LEMSA emergency plans.

### ***Implications***

The lack of early recognition and an orchestrated system of response to last winter's the hospital overcrowding is evidence of lack of coordinated community-wide disaster planning. Because hospitals and other EMS system providers operate as autonomous institutions and have limited resources for disaster planning, it is difficult to bring them together to share in disaster planning efforts. Where there are shared experiences (like what occurred last winter) LEMSAs are able to facilitate planning for similar events.

## ***Recommendations***

- Hospitals coordinate community disaster planning with their LEMSAs (See Appendix G).
- LEMSAs and hospitals develop area-wide response strategies for hospital saturation that coordinate local resources and minimize requests for ambulance diversions.
- LEMSAs develop diversion programs that ensure patients are transported to EDs for stabilization and continuity of care. When saturation is the result of a lack of critical care beds, transfer agreements must be implemented for secondary transfers. (Hospitals are required to have transfer agreements in place at all times).

## **C. Disaster Response and Emergency Proclamations**

### ***Background***

California has the most comprehensive emergency management system in the country to prepare for and respond to disasters and mitigate the effects of future events. Under the state Emergency Services Act and Standardized Emergency Management System (SEMS)<sup>9</sup>, each level of government (cities and special districts, counties and the state) has specific responsibilities and authorities, and operates within a defined statewide organizational structure. The diverse agencies work together to protect lives, property and the environment during disasters.

Under Government Code Section 8558(c), the elected governing body (county board of supervisors when discussed here) may proclaim a “local emergency” when there are conditions of “disaster or of extreme peril to the safety of persons or property.” The “conditions of disaster or extreme peril” include conditions such as epidemic, infestation, pestilence or “other conditions, other than conditions resulting from a labor controversy, which conditions are or are likely to be beyond the control of the services, personnel, equipment, and forces of that political subdivision and require combined forces of other political subdivisions to combat...” The listing of specific conditions in Section 8558 is not exclusive. Therefore, a “declaration of local emergency may be proclaimed if the conditions fall within the specific conditions set forth or if the condition is sufficiently similar to those specified conditions to fall within the realm of other conditions.”

When hospitals have taken all necessary internal emergency actions, as well as external actions in concert with local EMS and health officials, to address a disaster but are still unable to cope, a board of supervisors has the power to respond through the emergency declaration process. Medical and health disasters such as the high demand/low capacity event experienced in the winter of 1997-98 fall within the definition listed above as “other condition.” This type of emergency declaration is not a “local health emergency” which is only declared in relation to the release of hazardous materials (Health and Safety Code, 101080).

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<sup>9</sup> The Standardized Emergency Management System is a group of principles for coordinating state and local emergency response in California by facilitating the flow of emergency information and resources within and between organizational levels.

June 18, 1998 letter to Jeff Rubin, Emergency Medical Services Authority, from Dave Zochetti, Governor's Office of Emergency Services.  
Government Code (Chapter 7 of Division 1 of Title 2, Emergency Services Act).

### ***Implications***

Notwithstanding the development and implementation of SEMS, the size, scope and complexity of disasters that regularly impact California can not be addressed by government alone. By necessity, the state must draw heavily on private industry and community-based organizations for resources and services. Nowhere is this relationship more critical than in the health care industry, largely owned and operated by private and not-for-profit organizations.

Unfortunately, these two worlds operate autonomously; usually interrelating only after a disaster has occurred, when it is too late for specific plans, procedures and activities to have been developed, implemented and tested to the satisfaction of all parties. When these relationships are not established in advance with roles, responsibilities and expectations clearly defined, the result may be an uncoordinated and potentially delayed response to an emergency.

### ***Recommendations***

- Hospitals and health care providers must identify, in advance of a disaster, their projected resource needs to cope with a disaster event. They also must identify alternate sources of personnel, supplies and equipment. Requests to government for these resources only should be made when personnel registries and/or suppliers are unable to meet a facility's needs or if a disaster has interrupted normal communication or transportation systems.
- Hospitals and health care providers develop and test emergency preparedness plans in concert with county medical/health officials to develop coordinated approaches to disaster planning and response.
- DHS L&C district offices must be prepared to grant hospitals, after review and when appropriate, statutory and regulatory waivers for both hospital staffing and licensed bed requirements. DHS will monitor facilities for appropriateness of care during a waiver period. This will enable hospitals to continue to provide care to the maximum number of patients for the duration of an emergency or disaster situation.
- DHS L&C will develop guidelines to ensure consistent review, approval and monitoring of waivers for staffed or bed-capacity requirements. During a disaster, DHS L&C headquarters staff will coordinate and monitor all district office response activities.

## **D. EMS Community Education**

### ***Background***

LEMSAs have, as one of their functions, public education and information. Commonly, programs in this area have focused on promoting use of the 9-1-1 system, promoting bystander cardio-pulmonary resuscitation (CPR) and other first aid measures.

Last winter's experience pointed out a number of areas in which well-coordinated, effectively marketed community education programs could impact the utilization of local and hospital emergency medical services.

During peak demand on EMS and hospitals last winter, the Los Angeles County Department of Public Health, for example, issued press bulletins to the public asking them to only access emergency departments for serious emergency conditions.

### Make the Right Call Campaign

The Make the Right Call Campaign was developed by the Federal Emergency Management Agency (FEMA) several years ago. This public education campaign is designed to increase appropriate use and reduce inappropriate use of EMS systems. However, it is difficult to project, let alone measure the impact of such a program, because there are not agreed-upon definitions of appropriate and inappropriate use of these services. Additionally, there are not established methods in EMS for evaluating the impact of a public education campaign.

We also know that individuals who call (or do not call) 9-1-1 and those individuals that access (or do not access) hospital emergency departments do so for different reasons. Many EMS providers and hospital emergency departments are concerned about the amount of resources used in caring for persons with complex social and medical problems that are not true emergencies, but for which there are no services readily available (e.g. a homeless person with substance abuse and/or mental health disorders). Traditional programs that simply promote the use of 911 programs have been abandoned in many communities (especially in urban settings where call volume into 911 centers has overwhelmed local resources).

### **Implications**

Our data indicates that although visits to hospital emergency departments have not increased significantly, the proportion of critically ill patients has increased. This increased demand for critical, urgent services creates a burden for busy EMS and hospital staff while simultaneously caring for other non-urgent patients accessing emergency departments. The effective use of resources becomes problematic.

### **Recommendations**

- LEMSAs, hospitals and other EMS participants, along with the health care community, join together to more fully understand the needs of the individuals using prehospital and hospital EMS and work together to create effective public education campaigns that help individuals obtain appropriate services and guide others to use alternate services.
- LEMSAs utilize and implement public education campaigns to promote appropriate use of EMS systems through 9-1-1. Specific campaigns can be targeted for known medical conditions where the value of EMS system utilization is well-established (e.g. heart attack, stroke and trauma).

- Local hospital emergency departments coordinate efforts with LEMSAs to create an add-on or complementary public education campaign promoting appropriate use of hospital emergency departments.
- LEMSAs, in coordination with flu immunization programs, and public and private health care providers, develop and promote education programs for flu like illness care that emphasize when to call primary care physicians, clinics, hospital emergency departments and/or 9-1-1. Flu immunization programs traditionally commence in May each year.

## **E. Public Health Prevention of Influenza and Influenza-Like Illness**

### ***Background***

The principal goal of public health prevention of influenza and ILI is to prevent severe morbidity and mortality as a result of these illnesses. To this end, prevention programs are targeted toward groups that have an increased risk of complications from influenza, principally persons aged 65 years or older, residents of nursing homes and other chronic-care facilities, and persons with chronic medical conditions that increase the risk of complications. Effective prevention programs will reduce influenza morbidity and mortality, but may have limited impact on the overall burden on the health care system during an influenza epidemic, when many of those affected are healthy persons under age 65.

### ***Implications***

Currently in California there is no program for adult immunizations (other than the distribution of influenza vaccine to public health clinics), even for those at increased risk of complications from vaccine-preventable diseases, and no funding, state or federal, currently is available to develop such a program. In spite of this, according to behavioral risk factor surveillance system data, approximately 65 percent of Californians age 65 or older received influenza immunizations in 1996, already exceeding the 60 percent Year 2000 goal. In 1995, the most recent year national data are available, the national average was 58.1 percent, California ranked about in the middle at 59 percent. Data on rates of immunization in nursing homes is not available. There is no statewide program to inform and educate the public about the risk of and means to prevent influenza and other infectious respiratory diseases.

### ***Recommendations***

- DCDC seek resources to develop an adult immunization program; influenza immunization would be a major focus of such a program. The Immunization Branch of DCDC has been developing an adult immunization plan, but the resources to implement this are lacking. Components of such a plan would include a yearly assessment of immunization levels in long-term-care facilities; the development and distribution of materials to inform and educate the public about methods of protection against influenza; and the training and education of health care professionals related to immunization.
- Until such a program can be developed, advice on compliance with the Advisory Committee on Immunization Practices (ACIP) recommendations for prevention and control of influenza (Reference in Appendix A) and other measures to reduce the risk of respiratory infection should be distributed as widely as possible, including through public service announcements.

## **V. RESOURCES**

### **A. Nursing Shortage**

#### ***Background***

The shortage of registered nurses in California is an issue that was recognized by nurse leaders in the early 1990s. In 1992, the California Strategic Planning Committee for Nursing (CSPCN) was formed to strategically plan for an appropriate nursing work force to meet the state's needs. In 1996, CSPCN received funding from a Robert Wood Johnson grant to synthesize data, strategically plan, and incorporate expertise into an advisory function within a state agency. The work of CSPCN has resulted in several interesting facts (Appendix L). For example, the average age of a registered nurse working in the acute care setting in California is 47; California ranks 50<sup>th</sup> in the number of registered nurses per 100,000 population and the number of nurses graduating from programs in California remains relatively constant while the population continues to grow. There also are a growing number of career opportunities for nurses, which were non-existent only a decade ago.

Managed care has resulted in a nursing work force with less depth than in prior years (Appendix M). Hospitals no longer have the back up that was previously thought necessary in the event of increased census. Instead, many of them depend on registry help.

Two additional issues led to the lack of available nursing personnel last winter. Many nurses working for registries scheduled time off during the holiday season to be with their families and some of the nurses fell ill themselves.

During the winter of 1997-98 most hospitals reporting overcrowded conditions lacked capacity not because of the number of licensed beds but because there was a lack of nurses to staff the available beds. There was a shortage of medical/surgical nurses in some areas but most hospitals reported a lack of critical care and emergency department nurses.

#### ***Implications***

Without the addition of a substantial number of registered nurses to the state's workforce and/or innovative approaches to taking care of patients, another flu season will create a crisis. Hospitals will not have the personnel necessary to appropriately care for additional patients.

#### ***Recommendations***

- Support specialty training for nurses in critical care areas.
- Prepare and use unlicensed assistive personnel for tasks not requiring licensed nurses.
- Request relaxation of ICU staffing ratios from DHS as appropriate for safe care.
- Provide childcare (especially during the holiday vacation period).
- Contact nurse unions and ask for their cooperation to delay strikes until a crisis is over.
- Establish contacts with out-of-state nurse registries prior to a crisis.
- Consider and encourage overtime.

- Support state legislation to fund educational programs for nurses at all levels.
- Support the work of the California Strategic Planning Committee for Nursing (CSPCN) to study the nurse shortage and make recommendations as to the need for nurses, especially in critical care areas.
- Staff for anticipated fluctuations due to an expected influx of patients during the “flu” season.
- Restrict vacation requests.
- Request all critical personnel be excused from jury duty during the crisis.
- Implement flexible working hours to increase on-call staffing.

## **B. Specialty Physician Shortage**

### *Background*

Hospitals are required to have physician specialists available 24 hours per day for basic services and all specialty services that appear on the hospitals’ licenses. Hospitals’ medical staff bylaws are required by the federal Emergency Medical Treatment and Active Labor Act (EMTALA) to adopt policies addressing on-call coverage. However, there are no requirements for physicians to take call as a condition of licensure. The hospital emergency call task force, composed of members of the California Medical Association, California Healthcare Association and California Association of Emergency Physicians, is attempting to develop solutions to improve physician specialty coverage for hospitals and their emergency departments.

Over the past several years, a growing number of California hospitals have reported physicians unwilling to take call unless they are reimbursed by the facility. Many hospitals cannot afford to reimburse each one of their specialty services for call. On the other hand, physicians frequently receive so little reimbursement for a high percentage of emergency patients that they are unwilling to take call without hospital subsidies.

In addition, many hospitals have curtailed their graduate medical education programs due to decreasing federal subsidies. Decreasing subsidies have eliminated specialty residency positions in several community and non-teaching hospitals and decreased their numbers substantially in teaching hospitals. For example, the number of specialty residents in the University of California systems has declined from 2405 in 1992 to 2140 in 1997 (Appendix N). As mandated by the Legislature, this number will continue to decrease. Residents in specialty programs provided a high percentage of specialty physician coverage that is no longer available nor will it be available again in the foreseeable future.

### *Implications*

A declining number of specialty residents coupled with the inability of hospitals to pay for continuous coverage for specialty physicians has lead to inadequate numbers of on-call specialists.

## ***Recommendations***

- Explore enhanced funding for specialty physicians taking call.
- Partner with medical societies/associations to assist in enforcement of medical staff bylaws that require specialty physicians to take call.
- Support the work of the Hospital Emergency Call task force.
- Explore alternatives to physician specialty house staff including use of physician intensivists and advance practice nurses.

## **C. Medical Equipment and Supplies Shortages**

### ***Background***

Because it is not financially effective, most hospitals no longer keep large inventories of equipment in stock. Instead, vendors have become much more efficient at supplying medical equipment on short notice. As in other industries, “just-in-time” supply practices are common. During the winter of 1997-98 the number of admissions diagnosed with respiratory problems increased significantly in hospitals across the state. Under normal circumstances, hospitals would request and receive additional respirators commensurate with need. Last winter, requests outweighed available resources.

Another issue that compounded the problem was while hospitals may use many different supply houses, suppliers obtain equipment from a small number of vendors. This practice provides an inadequate picture of what is actually available. Hospitals and vendors found themselves contacting sister hospitals or competing vendors as far away as Florida.

There also was a shortage of blood and blood products over and above the normal winter dip in supply. Some pharmacies reported a shortage of non-prescription medications used to treat flu symptoms, bringing some patients to the emergency department for treatment they should have been able to obtain from their local pharmacy.

### ***Implications***

If no arrangements are made in advance, hospitals could once again find themselves spending hours or even days looking for equipment and blood this winter. And, patients that could be cared for at home may find their way into emergency departments if there is another shortage of across-the-counter flu remedies.

### ***Recommendations***

- Contact medical equipment companies and make them part of a plan to access additional equipment if necessary.
- Hospitals review their equipment inventory procedures to assure adequate supplies are available.
- Convene a statewide task force to address the issue of multiple suppliers that depend on only a few vendors.

- Assure backups of synthetic blood products are available and develop criteria for their use during times of crisis.
- Work with local blood donor organizations to plan additional blood drives prior to a time of increased need.
- Work with local pharmacies to assure the availability of adequate supplies of flu remedy type medications.

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**RESPIRATORY ILLNESS**

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Influenza, commonly called "the flu," is caused by viruses that infect the respiratory tract. Compared with most other viral respiratory infections, such as the common cold, influenza infection often causes a more severe illness. Typical clinical features of influenza include fever (usually 100°F to 103°F in adults and often even higher in children) and respiratory symptoms, such as cough, sore throat, runny or stuffy nose, as well as headache, muscle aches, and often extreme fatigue. This combination of symptoms is called "influenza-like illness," and during outbreaks is often counted rather than diagnosed cases of influenza, given the difficulty in diagnosing influenza. In the past, diagnosis of influenza was made by virus isolation from nasopharyngeal secretions or by serologic conversion, but rapid diagnostic tests were recently developed. However, this still requires laboratory testing of nasopharyngeal samples, which is not performed routinely, particularly since most patients will not be treated differently based on the diagnosis. Most people who get the flu recover completely in 1 to 2 weeks, but some people develop serious and potentially life-threatening medical complications, such as pneumonia. In an average year, influenza is associated with about 20,000 deaths nationwide and many more hospitalizations. Flu-related complications can occur at any age; however, the elderly and people with chronic health problems are much more likely to develop serious complications after influenza infection than are younger, healthier people.

Influenza typically occurs annually in the winter between December and April; peak activity in a community usually lasts from 6 to 8 weeks during this period. Influenza is believed to be spread from person to person by direct deposition of virus-laden large droplets onto the mucosal surfaces of the upper respiratory tract of an individual during close contact with an infected person, as well as by droplet nuclei or small-particle aerosols. The most important reservoirs of influenza virus are infected persons, and the period of greatest communicability is during the first 3 days of illness; however, the virus can be shed before onset of symptoms, and up to 7 or more days after illness onset.

Influenza viruses are divided into three types, designated A, B, and C. Influenza types A and B are responsible for epidemics of respiratory illness that occur almost every winter and are often associated with increased rates for hospitalization and death. These are called epidemics since they are an increase above "expected, particularly when compared to the time preceding the onset of the epidemic." However, when compared to previous years, the annual flu epidemic may be heavier or lighter. In California in 1997-8, the annual flu epidemic was apparently heavier than in the preceding few years, but these were extremely mild, particularly when compared to the last heavy influenza year, 1992-3. It is difficult to gauge the extent of influenza or influenza-like illness in California, since there are no direct measures of each. Nationally, one measure that is used is pneumonia and influenza mortality, expressed as the percent of all deaths that are due to pneumonia and influenza. The precise relationship of pneumonia and influenza mortality to influenza incidence and morbidity is uncertain.

Influenza epidemics often occur explosively with simultaneous onset of illness in many persons within a relatively short time. This occurs because the incubation period for influenza is short (1-4 days) and a single infected person can transmit virus to a large number of susceptible individuals. Within communities, epidemic influenza often begins abruptly and peaks within 2 to 3 weeks, with a total duration of 5 to 8 weeks. That the spread of influenza may cause large increases in medical visits for febrile respiratory disease has been well demonstrated in past epidemics. School absenteeism due to influenza often occurs early in the epidemic, and children are believed to play an important role in disseminating the virus into the community during epidemics. The early part of the 1997-98 epidemic in Southern California occurred during the winter school vacation period; as a result school absenteeism did not serve as an early warning sign of the epidemic, while transmission may have been less. In usual epidemics, workplace absenteeism, hospitalizations for pneumonia, and deaths due to pneumonia and influenza all tend to peak later.

Influenza viruses continually change over time, usually by mutation. This constant changing enables the virus to evade the immune system of its host, so that people are susceptible to influenza virus infection throughout life. This process works as follows: a person infected with influenza virus develops antibody against that virus; as the virus changes, the "older" antibody no longer recognizes the "newer" virus, and reinfection can occur. The older antibody can, however, provide partial protection against reinfection. Influenza type A viruses undergo two kinds of changes. One is a series of mutations that occur over time and cause a gradual evolution of the virus. This is called antigenic "drift." This process accounts for most of the changes that occur in the viruses from one influenza season to another, and accounted for the change in the influenza type A virus (A/Sydney) in 1997-98 that resulted in the increase in influenza in California. The other kind of change is an abrupt change in the hemagglutinin and/or the neuraminidase proteins. This is called antigenic "shift." In this case, a new subtype of the virus suddenly emerges. Type A viruses undergo both kinds of changes, influenza type B viruses change only by the more gradual process of antigenic drift.

Antigenic shift occurs only occasionally. When it does occur, large numbers of people, and sometimes the entire population, have no antibody protection against the virus. This results in a worldwide epidemic, called a pandemic. During this century, pandemics occurred in 1918, 1957, and 1968, each of which resulted in large numbers of deaths:

- 1918-19 "Spanish flu" -- Caused the highest known influenza-related mortality: approximately 500,000 deaths occurred in the United States, 20 million worldwide.
- 1957-58 "Asian flu" -- 70,000 deaths in the United States.
- 1968-69 "Hong-Kong flu" -- 34,000 deaths in the United States.

A number of public health agencies worldwide have begun planning for the next influenza pandemic. A pandemic will cause disruption to society orders of magnitude greater than that caused by even the heaviest epidemics. Pandemic planning is beyond the scope of this document.

Much of the illness and death caused by influenza can be prevented by annual influenza vaccination. Influenza vaccine is specifically recommended for people who are at high risk for developing serious complications as a result of influenza infection. Although annual influenza vaccination has long been recommended for people in the high-risk groups, many still do not receive the vaccine. Recent surveys indicate that approximately 65% of persons over 65 years of age in California are vaccinated, which is near to the Year 2000 goal of 70%. The most recent recommendations for influenza vaccination are available in the below reference.

Vaccine efficacy also varies from one person to another. Studies of healthy young adults have shown influenza vaccine to be 70% to 90% effective in preventing illness. In the elderly and those with certain chronic medical conditions, the vaccine is often less effective in preventing illness than in reducing the severity of illness and the risk of serious complications and death. Studies have shown the vaccine to reduce hospitalization by about 70% and death by about 85% among the elderly who are not in nursing homes. Among nursing home residents, vaccine can reduce the risk of hospitalization by about 50%, the risk of pneumonia by about 60% and the risk of death by 75% to 80%. When antigenic drift results in the circulating virus becoming different from the vaccine strain, overall efficacy may be reduced, especially in preventing illness, but the vaccine is still likely to lessen the severity of the illness and to prevent complications and death. Recent studies indicate that the 1997 vaccine provided little if any protection against the influenza virus strain that was predominate in California.

Although only a few different influenza viruses circulate at any given time, people continue to become ill with the flu throughout their lives. The reason for this continuing susceptibility is that influenza viruses are continually changing, usually as a result of mutations in the viral genes. Currently, there are three different influenza virus strains, and the vaccine contains viruses representing each strain. Each year the vaccine is updated to include the most current influenza virus strains. The fact that influenza viruses continually change is one of the reasons vaccine must be taken every year. Another reason is that antibody produced by the host in response to the vaccine declines over time, and antibody levels are often low one year after vaccination.

In the United States, influenza usually occurs from about November until April. Typically, activity is very low until December, and peak activity most often occurs between late December and early March. Influenza vaccine should be administered between September and mid-November. The optimal time for organized vaccination programs for persons at high risk for influenza-related medical complications is usually the period from October to mid-November. It takes about 1 to 2 weeks after vaccination for antibody against influenza to develop and provide protection.

## **REFERENCES**

Centers for Disease Control and Prevention (CDC). Prevention and Control of Influenza. Recommendations of the Advisory Committee on Immunization Practices (ACIP). Morbidity and Mortality Weekly Report (MMWR) May 1, 1998, Vol. 47, No. RR-6.

## APPENDIX B

### **HOSPITAL AND EMSA DATA RESOURCES**

The chart on the following pages is an overview of databases, currently administered by State departments, that contain emergency department data. There are three State departments identified in the report; the Emergency Medical Services Authority, the Department of Health Services, and the Office of Statewide Health Planning and Development.

APPENDIX B

Overview of Statewide Resources  
Emergency Department Data

TITLE /AGENCY	DATA COLLECTED	PURPOSE	DATE AVAILABLE	SHARED WITH
<b>1995 Annual/Quarterly Statewide Aggregate Database Report</b> – Emergency Medical Services Authority	Scene patients by call level advanced life support (ALS) scene patients by base hospital contact patients by code of response & code of transport (all data collected are presented as percentages)	To track response time; types of injury; call level; patient age; unit ability to contact base hospital; zone type	Annually in September for the previous year; however, reporting is voluntary & not all local EMS agencies have the ability to meet reporting requirements (last available 1995)	With Local EMS agencies and other ad hoc requestors.
<b>1997 Management Information Systems Resource Guide</b> – Emergency Medical Services Authority	Local EMS agency's name, address, phone # contact person; an overview of the project; who developed it; when it was implemented; the last update; method(s) of collection of local data; database platform; linked databases; participation in state aggregate data collection or anticipation of participation; database utilization; strengths and weaknesses of local systems; reports available; data system experiences; other data applications; comments and suggestions.	To determine which Local EMS agencies are reporting; how they are collecting & using their data; what problems they had in implementation; the value of the information they have; what other applications it can be used for; their experiences in or comments on working with the system.	Annually in September	With Local EMS agencies and other ad hoc requestors.

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TITLE /AGENCY	DATA COLLECTED	PURPOSE	DATE AVAILABLE	SHARED WITH
<p><b>Annual Utilization Report Of Hospital</b> – Office Of Statewide Health Planning And Development</p>	<p>By hospital– licensed level of EMS services available; # of patient treatment stations; patient visits; # of non-urgent, urgent, and critical EMS visits; EMS visits that resulted in hospital admission, patient days; surgery utilization.</p>	<p>To disseminate information to health care participants, administrators, policy makers, and the public for use in the planning and development of health care policies and programs.</p>	<p>Acute care hospitals are required to submit an annual utilization report of hospitals by February 15<sup>th</sup> each year for the prior calendar year. It is available for dissemination approximately June 1<sup>st</sup> of the same year.</p>	<p>Healthcare participants, administrators, policy makers, ad hoc requestors, and the public.</p>
<p><b>Hospital Annual Financial Disclosure Report</b> –Office Of Statewide Health Planning And Development</p>	<p>By hospital– trauma center designation; emergency services inventory emergency services by hospitalcost center; inpatient/outpatient units of services by payor; patient census statistics (# of beds, patient days, average length of stay, etc); average unit patient care costs; gross inpatient/outpatient revenues; cost allocation; payroll costs by patient revenue producing centers; direct contracted cost by patient revenue producing centers (average hourly pay/productive hours for nurses and other contracted services)</p>	<p>Collect annual financial information pursuant to Section 443 of the Health and Safety Code; to provide timely and accurate information on each licensed hospital.</p>	<p>Acute care hospitals are required to submit a hospital annual disclosure report within four months of the hospital’ s fiscal year end. Data are available approximately one year from the date data are reported (i.e. Fiscal year 1996/97 data will be available in August 1998)</p>	<p>Healthcare participants, administrators, policy makers, ad hoc requestors, and the public.</p>

Overview of Statewide Resources, Emergency Department Data

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TITLE /AGENCY	DATA COLLECTED	PURPOSE	DATE AVAILABLE	SHARED WITH
<b>Patient Discharge Data</b> – Office Of Statewide Health Planning And Development	By hospital– patient demographics; clinical diagnosis and injuries; treatment information; other data on the hospital and hospitalization; admission is from the emergency department but is limited to principal & other diagnosis, principal & other procedures, diagnosis related group, major diagnostic category & principal & other external causes of injury.	To analyze hospital inpatient discharges, provide the public with information to promote informed decision-making in the health care marketplace, to assess the effectiveness of California's health care system, and support statewide health policy development and evaluation.	Hospitals licensed in California are required to submit patient discharge data semi-annually. Data are received for the previous six-month period. Data is available approximately six months after it is received.	Healthcare participants, administrators, policy makers, ad hoc requestors, and the public. All confidential patient information is protected by the Privacy Act and is released according to the Public Records Act and the basic mission of OSHPD.
<b>Medically Indigent Care Reporting Systems (MICRS)</b> – Department Of Health Services	By county– summary data are collected based on all indigent health care services the county provides or arranges for their medically indigent population. Reimbursement, utilization & socio-demographic information, unduplicated patient count for all county indigent services including inpatient outpatient, and emergency department services	To track services provided to the medically indigent in 24 counties under the California Healthcare for Indigents Program. The remaining 34 counties report data to the County Medical Services Program which is similar to the Medi-Cal Paid Claims File listed below.	Reported on a quarterly basis within 90 days of the end of the quarter, and annually within one year of the county fiscal year-end. Data is available for review approximately six months to one year after submission	Healthcare participants, administrators, policy makers, ad hoc requestors, and the public.
<b>Medi-Cal Paid Claims File</b> – Department Of Health Services	On Medi-Cal fee-for-services beneficiaries only - client, provider, fiscal & utilization information; total emergency users; users by ethnicity, gender, and age; expenditures by diagnostic code; expenditures by procedure code.	Data is collected to adjudicate Medi-Cal fee-for-service claims. Used to pay claims, research, fiscal and budget analyses, program monitoring, rate setting etc.	Data are reported to Medi-cal by providers on a monthly basis for the previous month's claims. These data are available for ad hoc reports almost immediately thereafter.	Healthcare participants, administrators, policy makers, ad hoc requestors, and the public.

Overview of Statewide Resources, Emergency Department Data

APPENDIX C

Report on Hospital Overcrowding and Emergency Department Diversi  
 Statewide and County Summary Data  
 1990-1997

			Lic	#	#	#	#	#	# of Emergency Departments by Level				# ED Visits by Level				Visits		
			GA	Other	GA	Avail	GA	Staffed	GA	Staffed									
			# of	Critical	Licensed	Critical	Other	Critical	Other	Compre-	# of ED				Non				Resulting
Population	GAC	Care	GAC	Care	GAC	Care	GAC	ensive++	Total++	Stations++	Urgent++	Urgent++	Critical++	Total++	Admission++				
(July 1)	Hosp+	Beds**+	Beds+	Beds** +	Beds+	Beds**+	Beds+	Standby++	Basic++	hensive++	Total++	Stations++	Urgent++	Urgent++	Critical++	Total++	Admission++		
<b>California</b>																			
1990	29,944,000	498	*	*	*	*	*	73	335	7	415	4340	3751064	4284853	949577	8985493	1208007		
1991	30,565,000	497	*	*	*	*	*	67	336	7	410	4443	4054939	4212920	1038635	9306494	1484140		
1992	31,188,000	500	*	*	*	*	*	66	336	7	409	4572	3839529	4351850	1147874	9339253	1216234		
1993	31,517,000	498	*	*	*	*	*	66	333	7	406	4604	3836381	4297387	1163288	9297056	1209986		
1994	31,790,000	494	10623	65138	10152	57684	9695	52244	63	322	7	392	4693	3515009	4266653	1014748	8796410	1205820	
1995	32,063,000	496	10933	65014	10380	56681	9772	51458	59	330	8	397	4798	3445321	4408395	1066486	8920202	1190369	
1996	32,383,000	500	10965	64811	10329	55060	9677	49829	58	327	9	394	4842	3393766	4188443	1053232	8635441	1162833	
1997	32,957,000	497	11724	69682	11226	58774	10466	52324	57	330	9	396	4814	3301225	4321673	1218811	8841709	1265195	
<b>Alameda</b>																			
1990	1,284,800	21	*	*	*	*	*	2	14	0	16	213	121317	355359	38615	515291	59133		
1991	1,301,100	19	*	*	*	*	*	2	13	0	15	228	162372	312425	48251	523048	56950		
1992	1,322,600	18	*	*	*	*	*	1	13	0	14	208	122091	303008	50427	475526	53080		
1993	1,334,200	18	*	*	*	*	*	0	13	0	13	210	171364	257241	45545	474150	54883		
1994	1,342,000	18	376	2861	386	2323	350	2135	0	12	0	12	207	97657	266740	39692	404089	54953	
1995	1,347,700	18	406	2624	406	2212	362	1902	0	12	0	12	208	151271	212000	46470	409741	59933	
1996	1,365,000	19	397	2649	430	2166	385	1834	0	12	0	12	215	185160	190850	44323	420333	62353	
1997	1,398,500	19	831	5885	897	4078	838	3714	0	12	0	12	209	170816	207017	53679	431512	65123	
<b>Alpine</b>																			
1990	1,100	0															0		
1991	1,120	0															0		
1992	1,140	0															0		
1993	1,130	0															0		
1994	1,120	0															0		
1995	1,170	0															0		
1996	1,190	0															0		
1997	1,200	0															0		
<b>Amador</b>																			
1990	30,300	1	*	*	*	*	*	0	1	0	1	5	7055	1881	471	9407	1027		
1991	31,250	1	*	*	*	*	*	0	1	0	1	5	7628	2034	508	10170	1156		
1992	31,750	1	*	*	*	*	*	0	1	0	1	6	7508	2002	501	10011	1396		
1993	32,300	1	*	*	*	*	*	0	1	0	1	6	7929	2114	529	10572	1475		
1994	32,450	1	5	38	5	38	5	38	0	1	0	1	6	8012	2136	534	10682	1468	
1995	32,600	1	5	38	5	38	5	38	0	1	0	1	6	8783	2342	586	11711	1569	
1996	32,950	1	5	38	5	38	5	38	0	1	0	1	6	7973	2899	610	11482	1626	
1997	33,450	1	5	38	5	38	5	38	0	1	0	1	6	8464	3056	259	11779	1552	

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<b>Butte</b>																			
1990	183,100	5	*	*	*	*	*	*	1	4	0	5	45	49056	33313	10704	93073	10693	
1991	186,200	6	*	*	*	*	*	*	1	4	0	5	45	55361	24443	16118	95922	10900	
1992	189,700	6	*	*	*	*	*	*	1	4	0	5	47	49286	35512	14604	99402	9804	
1993	191,400	6	*	*	*	*	*	*	1	4	0	5	47	49907	37098	10370	97375	9979	
1994	193,400	6	72	523	72	523	72	472	1	4	0	5	47	56759	37606	7655	102020	10096	
1995	196,100	6	72	543	72	546	72	505	1	4	0	5	47	63776	35867	5980	105623	10558	
1996	196,500	6	72	501	72	501	72	450	1	4	0	5	47	60649	35808	5931	102388	10863	
1997	198,500	5	72	501	72	501	72	450	1	4	0	5	48	64830	36389	5593	106812	11686	
<b>Calaveras</b>																			
1990	32,350	1	*	*	*	*	*	*	0	1	0	1	5	4460	5590	0	10050	833	
1991	33,750	1	*	*	*	*	*	*	0	1	0	1	5	3957	4709	0	8666	874	
1992	35,100	1	*	*	*	*	*	*	0	1	0	1	5	3444	3686	0	7130	972	
1993	35,750	1	*	*	*	*	*	*	0	1	0	1	5	3821	3747	0	7568	984	
1994	36,350	1	5	44	5	28	5	28	0	1	0	1	5	3826	3462	0	7288	1028	
1995	36,950	1	5	44	5	28	5	28	0	1	0	1	4	3699	4172	0	7871	1147	
1996	36,900	1	5	44	5	28	5	28	0	1	0	1	4	2194	3298	1459	6951	937	
1997	37,950	1	5	44	5	28	5	28	0	1	0	1	6	2467	3625	1620	7712	1046	
<b>Colusa</b>																			
1990	16,400	1	*	*	*	*	*	*	1	0	0	1	4	4317	1016	224	5557	516	
1991	16,750	1	*	*	*	*	*	*	1	0	0	1	4	4975	970	138	6083	597	
1992	17,050	1	*	*	*	*	*	*	1	0	0	1	4	4876	906	99	5881	632	
1993	17,350	1	*	*	*	*	*	*	1	0	0	1	4	5191	675	87	5953	718	
1994	17,600	1	6	34	6	34	4	22	1	0	0	1	4	4800	727	74	5601	496	
1995	17,850	1	4	34	6	34	4	22	1	0	0	1	4	4915	568	76	5559	468	
1996	18,250	1	6	44	6	44	4	26	1	0	0	1	4	4998	763	74	5835	609	
1997	18,600	1	6	44	6	44	6	26	1	0	0	1	4	5044	748	63	5855	670	
<b>Contra Costa</b>																			
1990	807,600	13	*	*	*	*	*	*	1	10	0	11	126	169486	115233	15102	299821	29213	
1991	821,500	13	*	*	*	*	*	*	1	10	0	11	125	166939	148331	13597	328867	31338	
1992	838,700	13	*	*	*	*	*	*	1	10	0	11	129	138608	159900	33450	331958	30237	
1993	851,400	13	*	*	*	*	*	*	1	10	0	11	130	145489	162860	23129	331478	32304	
1994	860,200	13	208	1553	197	1301	196	1241	1	10	0	11	140	141260	147873	23375	312508	31105	
1995	867,300	13	213	1521	200	1282	198	1168	1	10	0	11	143	134373	172642	17251	324266	31401	
1996	877,900	13	202	1349	196	1133	170	999	1	10	0	11	128	94101	148920	39595	282616	29669	
1997	896,200	13	292	1903	279	1543	250	1405	1	10	0	11	137	130405	155608	56106	342119	35641	
<b>Del Norte</b>																			
1990	24,150	1	*	*	*	*	*	*	1	0	0	1	9	20062	4247	750	25059	1166	
1991	26,150	1	*	*	*	*	*	*	1	0	0	1	8	20209	5928	0	26137	1445	
1992	26,850	1	*	*	*	*	*	*	0	1	0	1	13	17755	5505	1479	24739	1264	
1993	27,250	1	*	*	*	*	*	*	0	1	0	1	10	20860	3713	801	25374	1309	
1994	27,600	1	6	41	6	41	6	41	0	1	0	1	10	18255	5188	1119	24562	1167	

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1995	27,600	1	6	41	6	41	6	41	0	1	0	1	10	20044	3568	769	24381	1258
1996	27,500	1	6	41	6	41	6	41	0	1	0	1	10	19568	13266	3577	36411	1691
1997	28,400	1	6	41	6	41	6	41	0	1	0	1	10	20015	10535	3606	34156	1586
<b>El Dorado</b>																		
1990	127,500	2	*	*	*	*	*	*	0	2	0	2	22	25643	15668	752	42063	4095
1991	132,100	2	*	*	*	*	*	*	0	2	0	2	19	22466	17032	857	40355	4473
1992	136,300	2	*	*	*	*	*	*	0	2	0	2	24	16790	25151	2364	44305	4131
1993	140,000	2	*	*	*	*	*	*	0	2	0	2	24	16256	26635	2597	45488	4242
1994	141,800	2	17	155	15	126	13	119	0	2	0	2	22	12522	26420	2399	41341	4189
1995	144,200	2	17	157	15	129	13	117	0	2	0	2	21	23485	20800	2493	46778	4278
1996	144,700	2	17	157	15	129	13	117	0	2	0	2	25	30363	11327	2982	44672	4464
1997	147,400	2	17	157	15	129	13	126	0	2	0	2	25	29430	9398	2015	40843	4276
<b>Fresno</b>																		
1990	673,700	12	*	*	*	*	*	*	3	5	0	8	118	101070	111215	38036	250321	28642
1991	696,400	12	*	*	*	*	*	*	3	5	0	8	127	116500	115038	46846	278384	30119
1992	717,200	13	*	*	*	*	*	*	3	5	0	8	104	121746	99229	39936	260911	28797
1993	730,300	13	*	*	*	*	*	*	3	5	0	8	103	110624	117623	40815	269062	29722
1994	739,800	13	200	1323	185	1247	164	1065	3	5	0	8	105	98786	125985	23867	248638	28841
1995	754,100	14	178	1335	178	1256	169	1063	3	5	0	8	139	100165	121015	34994	256174	30715
1996	769,700	14	206	1524	205	1410	203	1214	3	5	1	9	132	99340	135479	21100	255919	32598
1997	778,700	14	251	1572	232	1440	228	1180	3	5	1	9	148	105698	136115	22848	264661	32199
<b>Glenn</b>																		
1990	24,900	1	*	*	*	*	*	*	1	0	0	1	3	1139	3274	652	5065	471
1991	25,400	1	*	*	*	*	*	*	1	0	0	1	3	2482	4450	1626	8558	297
1992	25,900	1	*	*	*	*	*	*	1	0	0	1	3	1645	2742	1097	5484	164
1993	26,050	1	*	*	*	*	*	*	1	0	0	1	5	4214	821	171	5206	261
1994	26,100	1	4	76	0	28	0	28	1	0	0	1	3	2605	1609	407	4621	116
1995	26,600	1	4	76	0	27	0	27	1	0	0	1	5	2616	1669	606	4891	217
1996	26,700	1	4	76	0	27	0	27	1	0	0	1	5	2458	1768	534	4760	284
1997	26,900	1	4	76	0	27	0	27	1	0	0	1	5	2049	1597	1038	4684	316
<b>Humboldt</b>																		
1990	119,600	6	*	*	*	*	*	*	2	4	0	6	26	41446	19752	3209	64407	6336
1991	121,000	6	*	*	*	*	*	*	1	4	0	5	28	38464	22621	4861	65946	5833
1992	123,000	6	*	*	*	*	*	*	1	4	0	5	31	41804	18779	3116	63699	5332
1993	124,100	6	*	*	*	*	*	*	1	4	0	5	33	40251	18412	3716	62379	5288
1994	124,000	6	32	259	32	259	26	220	1	4	0	5	33	39594	14491	4230	58315	5385
1995	124,500	6	32	259	31	242	25	203	1	4	0	5	33	27441	26686	4934	59061	5251
1996	125,100	6	32	276	31	246	25	223	1	4	0	5	33	24573	27872	5256	57701	5450
1997	126,100	5	31	276	30	246	25	223	1	4	0	5	33	29571	23194	5355	58120	6077

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<b>Imperial</b>																			
1990	110,800	3	*	*	*	*	*	*	*	0	3	0	3	20	18052	18337	3737	40126	4224
1991	115,900	3	*	*	*	*	*	*	*	0	3	0	3	20	27605	11680	4625	43910	4853
1992	122,500	3	*	*	*	*	*	*	*	0	3	0	3	20	29138	12658	4107	45903	4498
1993	130,700	3	*	*	*	*	*	*	*	1	2	0	3	19	32178	6205	3483	41866	4443
1994	133,600	3	24	194	26	190	26	188	1	2	0	3	19	27631	8055	4149	39835	4320	
1995	137,400	3	28	190	28	186	28	186	1	2	0	3	20	27400	13028	1437	41865	4913	
1996	141,200	3	28	224	28	220	28	220	1	2	0	3	20	25263	12286	1677	39226	5125	
1997	142,700	2	24	160	24	156	24	156	0	3	0	3	19	11283	21250	8523	41056	5438	
<b>Inyo</b>																			
1990	18,250	2	*	*	*	*	*	*	*	1	1	0	2	2	2698	5292	888	8878	954
1991	18,300	2	*	*	*	*	*	*	*	1	1	0	2	4	2142	5525	372	8039	777
1992	18,350	2	*	*	*	*	*	*	*	1	1	0	2	5	1948	3910	2124	7982	687
1993	18,400	2	*	*	*	*	*	*	*	1	1	0	2	5	1949	4795	1536	8280	732
1994	18,500	2	6	30	6	30	6	27	1	1	0	2	5	2513	4508	1453	8474	671	
1995	18,450	2	6	30	6	30	6	30	1	1	0	2	5	2778	4824	607	8209	652	
1996	18,250	2	6	30	6	30	6	30	1	1	0	2	5	2495	4580	584	7659	627	
1997	18,300	2	6	30	6	30	6	30	1	1	0	2	5	3101	4086	784	7971	736	
<b>Kern</b>																			
1990	549,600	11	*	*	*	*	*	*	*	4	5	0	9	65	93630	81700	9810	185140	24627
1991	569,600	11	*	*	*	*	*	*	*	3	6	0	9	78	111904	97298	8457	217659	26716
1992	589,500	11	*	*	*	*	*	*	*	3	6	0	9	77	88853	117717	9102	215672	20442
1993	598,500	11	*	*	*	*	*	*	*	3	6	0	9	85	104476	114674	28511	247661	20862
1994	609,600	11	137	1083	128	947	124	909	3	6	0	9	99	83130	99286	26120	208536	22349	
1995	616,700	11	146	1068	146	932	138	849	3	6	0	9	108	83732	94151	26075	203958	22992	
1996	624,100	11	152	1142	146	1020	136	941	3	6	0	9	108	63384	101732	30944	196060	21911	
1997	634,400	8	144	980	140	814	132	722	3	6	0	9	73	48106	61016	9685	118807	14539	
<b>Kings</b>																			
1990	102,300	4	*	*	*	*	*	*	*	2	2	0	4	21	31281	14168	1103	46552	3994
1991	105,500	4	*	*	*	*	*	*	*	2	2	0	4	21	35052	18206	946	54204	3814
1992	108,600	4	*	*	*	*	*	*	*	2	2	0	4	23	33775	15765	272	49812	3319
1993	111,000	4	*	*	*	*	*	*	*	2	2	0	4	21	31442	15812	316	47570	3708
1994	112,800	4	16	150	16	150	10	87	2	2	0	4	13	12008	1624	252	13884	1110	
1995	114,900	4	16	150	16	150	10	88	2	2	0	4	19	11969	16939	7011	35919	3594	
1996	115,700	4	16	150	16	150	11	88	2	2	0	4	19	17639	13059	1462	32160	3670	
1997	117,700	4	16	155	16	155	11	92	2	2	0	4	19	24730	14305	954	39989	4241	
<b>Lake</b>																			
1990	51,000	2	*	*	*	*	*	*	*	0	2	0	2	10	13478	5416	3024	21918	2056
1991	52,500	2	*	*	*	*	*	*	*	0	2	0	2	10	13722	8718	3254	25694	1916
1992	53,700	2	*	*	*	*	*	*	*	0	2	0	2	10	14691	6543	4613	25847	2049
1993	54,300	2	*	*	*	*	*	*	*	0	2	0	2	11	14315	8013	5761	28089	2306
1994	54,700	2	10	81	10	81	10	61	0	2	0	2	11	14747	11729	2617	29093	1944	

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1995	55,100	2	10	81	10	81	10	61	0	2	0	2	11	12830	7731	2199	22760	2045
1996	54,900	2	16	126	16	126	16	88	0	2	0	2	9	12734	8139	2042	22915	2085
1997	55,100	2	10	81	10	81	10	61	0	2	0	2	13	12382	8763	1820	22965	2120
<b>Lassen</b>																		
1990	27,700	1	*	*	*	*	*	*	1	0	0	1	5	4416	2208	736	7360	2053
1991	27,950	1	*	*	*	*	*	*	1	0	0	1	5	5374	2687	896	8957	715
1992	28,350	1	*	*	*	*	*	*	1	0	0	1	5	5319	3799	379	9497	678
1993	28,600	1	*	*	*	*	*	*	1	0	0	1	5	5850	2740	550	9140	599
1994	28,450	1	0	24	0	24	0	14	1	0	0	1	5	86	5552	3269	8907	645
1995	28,650	1	0	24	0	24	0	24	1	0	0	1	5	4856	2913	1944	9713	578
1996	32,650	1	0	20	0	20	0	20	1	0	0	1	5	3205	5582	366	9153	608
1997	33,850	1	0	20	0	20	0	20	1	0	0	1	5	3375	5620	375	9370	621
<b>Los Angeles</b>																		
1990	8,902,000	141	*	*	*	*	*	*	19	91	2	112	1234	807371	1017280	295223	2119874	410253
1991	9,049,700	139	*	*	*	*	*	*	18	89	2	109	1238	1011625	1133785	377086	2522496	415689
1992	9,200,100	137	*	*	*	*	*	*	17	87	2	106	1276	1006693	1197826	441110	2645629	450954
1993	9,244,700	135	*	*	*	*	*	*	18	84	2	104	1236	925942	1182780	449514	2558236	417919
1994	9,312,200	133	3851	22575	3628	20228	3517	18252	16	85	2	103	1241	922263	1112216	374617	2409096	418060
1995	9,352,200	133	3991	22517	3724	19721	3574	17807	13	84	2	99	1258	846986	1205564	338421	2390971	380087
1996	9,396,400	132	3968	21803	3572	18753	3332	16600	13	85	2	100	1271	878454	1154810	297932	2331196	379231
1997	9,524,600	132	4136	22917	3756	19906	3466	17263	11	82	2	95	1278	719252	1136401	437868	2293521	379432
<b>Madera</b>																		
1990	89,400	2	*	*	*	*	*	*	1	1	0	2	9	17113	5434	979	23526	2028
1991	94,100	2	*	*	*	*	*	*	1	1	0	2	8	17714	7792	1108	26614	2045
1992	98,300	2	*	*	*	*	*	*	1	1	0	2	8	15254	8901	668	24823	2304
1993	102,600	2	*	*	*	*	*	*	1	1	0	2	8	12961	8636	520	22117	2308
1994	104,900	2	6	83	6	72	6	72	1	1	0	2	9	13007	7366	467	20840	2029
1995	106,400	2	6	99	6	99	6	99	1	1	0	2	9	14775	7120	549	22444	1970
1996	110,300	2	6	99	6	99	6	99	1	1	0	2	9	13173	7464	632	21269	1622
1997	113,500	1	6	99	6	99	6	99	1	1	0	2	13	14735	6409	418	21562	2383
<b>Marin</b>																		
1990	230,200	4	*	*	*	*	*	*	0	3	0	3	32	24819	42055	3021	69895	6745
1991	232,900	4	*	*	*	*	*	*	0	3	0	3	37	33352	34292	2971	70615	6851
1992	235,900	4	*	*	*	*	*	*	0	3	0	3	44	34133	33539	3678	71350	6801
1993	236,900	4	*	*	*	*	*	*	0	3	0	3	44	28142	37823	4054	70019	7237
1994	237,700	4	56	412	56	395	56	387	0	3	0	3	44	24295	38045	4086	66426	6877
1995	238,900	4	62	381	62	365	62	365	0	3	0	3	44	37777	28133	2037	67947	7389
1996	239,500	4	62	415	62	384	62	384	0	3	0	3	43	37191	27219	2912	67322	7650
1997	243,300	4	62	381	60	273	44	204	0	3	0	3	43	42149	22830	3892	68871	8199

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<b>Mariposa</b>																			
1990	14,550	1	*	*	*	*	*	*	*	1	0	0	1	2	2065	436	304	2805	137
1991	14,900	1	*	*	*	*	*	*	*	1	0	0	1	2	2653	2608	270	5531	186
1992	15,400	1	*	*	*	*	*	*	*	1	0	0	1	2	1175	3144	256	4575	201
1993	15,700	1	*	*	*	*	*	*	*	2	0	0	2	2	1196	2390	259	3845	474
1994	15,850	1	0	24	0	24	0	9	1	0	0	1	2	848	2031	786	3665	482	
1995	15,900	1	0	24	0	24	0	9	1	0	0	1	2	824	2269	916	4009	286	
1996	15,950	1	0	24	0	24	0	9	1	0	0	1	3	1398	1418	1087	3903	312	
1997	15,950	0	0	24	0	24	0	9	1	0	0	1	2	1445	1060	1497	4002	286	
<b>Mendocino</b>																			
1990	81,000	5	*	*	*	*	*	*	*	1	2	0	3	20	15783	21700	2676	40159	2999
1991	82,100	5	*	*	*	*	*	*	*	1	2	0	3	21	19686	25382	1256	46324	3251
1992	82,800	5	*	*	*	*	*	*	*	1	2	0	3	20	18478	26595	2856	47929	3119
1993	83,400	4	*	*	*	*	*	*	*	1	2	0	3	20	20182	25631	1024	46837	3323
1994	83,800	4	22	171	22	171	22	161	1	2	0	3	26	11998	31401	3570	46969	3469	
1995	84,300	4	29	149	29	149	29	139	1	2	0	3	25	16973	27150	2387	46510	3940	
1996	84,800	4	29	149	29	149	29	139	1	2	0	3	25	9315	18160	10313	37788	4371	
1997	86,000	4	29	140	29	140	29	139	1	2	0	3	25	9783	15961	12193	37937	3441	
<b>Merced</b>																			
1990	180,200	6	*	*	*	*	*	*	*	3	3	0	6	18	15568	39931	2343	57842	4911
1991	186,200	6	*	*	*	*	*	*	*	3	3	0	6	21	25052	42228	5871	73151	5670
1992	190,300	6	*	*	*	*	*	*	*	3	3	0	6	21	27319	47072	3574	77965	5717
1993	194,100	6	*	*	*	*	*	*	*	3	3	0	6	31	25294	46005	6910	78209	5567
1994	197,600	6	30	298	28	297	28	287	3	3	0	6	29	26434	35730	7923	70087	5104	
1995	198,500	6	34	336	34	306	34	306	3	3	0	6	31	10604	49513	9304	69421	4894	
1996	198,400	6	30	290	30	270	30	270	3	3	0	6	31	12910	37624	9234	59768	4562	
1997	202,000	5	50	468	50	428	50	428	3	3	0	6	28	13789	35055	10555	59399	5191	
<b>Modoc</b>																			
1990	9,725	2	*	*	*	*	*	*	*	2	0	0	2	2	416	76	23	515	58
1991	9,800	2	*	*	*	*	*	*	*	2	0	0	2	2	1230	1500	273	3003	277
1992	9,975	2	*	*	*	*	*	*	*	2	0	0	2	3	2080	741	200	3021	236
1993	10,000	2	*	*	*	*	*	*	*	2	0	0	2	3	1493	1041	278	2812	282
1994	10,100	2	0	22	0	18	0	18	2	0	0	2	3	1658	1127	99	2884	165	
1995	10,050	2	0	22	0	18	0	18	2	0	0	2	3	1409	1083	97	2589	124	
1996	10,000	2	0	24	0	24	0	24	2	0	0	2	3	1950	576	86	2612	52	
1997	10,150	1	0	24	0	24	0	24	2	0	0	2	3	1471	599	108	2178	187	
<b>Mono</b>																			
1990	10,050	2	*	*	*	*	*	*	*	2	0	0	2	11	2078	4585	115	6778	605
1991	9,975	2	*	*	*	*	*	*	*	2	0	0	2	4	738	71	15	824	26
1992	10,100	2	*	*	*	*	*	*	*	2	0	0	2	7	4947	1093	44	6084	437
1993	10,450	2	*	*	*	*	*	*	*	2	0	0	2	7	5954	407	53	6414	476
1994	10,650	2	2	13	2	13	2	13	2	0	0	2	7	2402	4203	66	6671	467	

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1995	10,550	2	4	26	4	26	4	26	2	0	0	2	6	1577	3869	21	5467	304
1996	10,500	2	2	13	2	13	2	13	2	0	0	2	6	5263	638	55	5956	414
1997	10,500	2	2	13	2	13	2	13	2	0	0	2	6	138	5358	1099	6595	357
Monterey																		
1990	357,400	6	*	*	*	*	*	*	0	4	0	4	28	28859	44580	1863	75302	11631
1991	364,100	6	*	*	*	*	*	*	0	4	0	4	30	43990	39314	1880	85184	11662
1992	371,000	6	*	*	*	*	*	*	0	4	0	4	38	35033	51095	15486	101614	11423
1993	371,100	6	*	*	*	*	*	*	0	4	0	4	38	35095	59159	7833	102087	11661
1994	361,300	5	73	450	72	424	72	416	0	4	0	4	38	52550	44397	2177	99124	12446
1995	361,800	5	58	450	57	424	55	402	0	4	0	4	38	40898	42146	19909	102953	13205
1996	360,200	5	58	448	57	422	55	398	0	4	0	4	39	39601	36393	11749	87743	13916
1997	377,800	5	58	443	57	417	54	393	0	4	0	4	41	40429	45542	17866	103837	15311
Napa																		
1990	111,300	2	*	*	*	*	*	*	0	2	0	2	15	15753	22902	2419	41074	3926
1991	112,600	2	*	*	*	*	*	*	0	2	0	2	15	17349	22475	767	40591	3856
1992	114,800	2	*	*	*	*	*	*	0	2	0	2	15	16693	18349	3982	39024	3971
1993	116,100	2	*	*	*	*	*	*	0	2	0	2	15	18099	19970	4144	42213	3864
1994	116,800	2	44	233	44	188	44	188	0	2	0	2	15	16555	15305	4541	36401	3833
1995	117,800	2	93	208	93	162	67	162	0	2	0	2	19	14119	15714	6135	35968	4003
1996	119,000	2	44	236	44	198	44	172	0	2	0	2	23	9939	10236	24862	45037	7232
1997	121,200	2	44	230	44	198	44	172	0	2	0	2	23	8232	11145	6791	26168	3977
Nevada																		
1990	79,100	2	*	*	*	*	*	*	0	2	0	2	23	19644	13980	2829	36453	4180
1991	81,500	2	*	*	*	*	*	*	0	2	0	2	23	18855	14383	6059	39297	3346
1992	83,100	2	*	*	*	*	*	*	0	2	0	2	25	15598	19123	5145	39866	3666
1993	84,400	2	*	*	*	*	*	*	0	2	0	2	25	16103	19270	5249	40622	3729
1994	85,400	2	16	150	16	150	14	121	0	2	0	2	25	13337	19225	4817	37379	3283
1995	86,600	2	16	126	16	126	14	109	0	2	0	2	25	14796	14698	6590	36084	4387
1996	87,100	2	16	126	16	126	14	111	0	2	0	2	25	12584	15189	6372	34145	4372
1997	88,400	2	16	126	16	126	13	104	0	2	0	2	26	16244	16778	2949	35971	4815
Orange																		
1990	2,417,600	37	*	*	*	*	*	*	3	32	1	36	344	272071	230314	51968	554353	87443
1991	2,462,700	38	*	*	*	*	*	*	1	31	1	33	369	262147	276173	55017	593337	78434
1992	2,519,400	38	*	*	*	*	*	*	1	30	1	32	368	267810	247068	61968	576846	73338
1993	2,554,700	39	*	*	*	*	*	*	1	30	1	32	372	299645	219173	60945	579763	84423
1994	2,582,200	39	945	5043	939	4741	888	4274	1	30	1	32	398	267876	256454	58922	583252	84694
1995	2,614,800	40	926	5511	906	5119	838	4526	1	30	1	32	370	260786	262784	59780	583350	83090
1996	2,649,800	40	1003	4932	982	4455	914	4041	0	31	1	32	380	233523	258130	48046	539699	80515
1997	2,705,300	40	1033	5315	1012	4990	958	4645	0	30	1	31	414	238852	268817	97595	605264	94031
Placer																		
1990	175,000	2	*	*	*	*	*	*	0	2	0	2	28	28625	13184	2104	43913	6619

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1991	181,300	2	*	*	*	*	*	*	0	2	0	2	28	31650	13713	1978	47341	6552
1992	187,300	2	*	*	*	*	*	*	0	2	0	2	28	31598	14854	2047	48499	6100
1993	192,100	2	*	*	*	*	*	*	0	2	0	2	28	30341	16975	2342	49658	6744
1994	195,900	2	49	284	49	258	49	246	0	2	0	2	28	28955	16387	1955	47297	6530
1995	203,500	2	29	280	29	242	27	207	0	2	0	2	28	29029	17414	2467	48910	7230
1996	209,200	3	29	255	29	207	27	171	0	2	0	2	28	23489	22764	3359	49612	8071
1997	215,600	3	29	241	29	207	27	171	0	2	0	2	30	29739	19539	1608	50886	8243
<b>Plumas</b>																		
1990	19,750	4	*	*	*	*	*	*	4	0	0	4	8	4524	5627	844	10995	940
1991	19,950	4	*	*	*	*	*	*	4	0	0	4	8	7222	4096	619	11937	784
1992	20,550	4	*	*	*	*	*	*	4	0	0	4	8	5314	6527	604	12445	1031
1993	20,650	4	*	*	*	*	*	*	4	0	0	4	7	5148	6841	914	12903	1204
1994	20,550	4	0	62	0	62	0	62	4	0	0	4	9	8013	4364	223	12600	907
1995	20,500	4	0	54	0	54	0	54	4	0	0	4	9	6940	5952	610	13502	1005
1996	20,250	4	0	51	0	51	0	51	4	0	0	4	9	5645	4947	1203	11795	1090
1997	20,450	4	0	50	0	50	0	50	4	0	0	4	9	6356	5074	277	11707	1190
<b>Riverside</b>																		
1990	1,194,600	17	*	*	*	*	*	*	1	15	0	16	164	127804	154163	43973	325940	49103
1991	1,248,500	17	*	*	*	*	*	*	1	15	0	16	165	159702	149509	38427	347638	51803
1992	1,291,800	18	*	*	*	*	*	*	1	15	0	16	174	123694	184539	58724	366957	52499
1993	1,321,100	18	*	*	*	*	*	*	1	15	0	16	191	147747	192236	37244	377227	53950
1994	1,342,200	17	319	2210	318	2052	310	1851	1	14	0	15	200	113491	204681	45167	363339	52502
1995	1,370,300	17	336	2187	335	2007	322	1810	1	13	1	15	200	131968	201662	48177	381807	55954
1996	1,393,300	16	336	2161	333	1891	322	1675	1	13	1	15	193	124034	212400	37101	373535	57381
1997	1,423,700	18	445	2637	441	2316	421	1962	1	13	1	15	211	154423	204948	41549	400920	61350
<b>Sacramento</b>																		
1990	1,049,000	12	*	*	*	*	*	*	0	10	1	11	148	134103	122088	32590	288781	47103
1991	1,076,600	11	*	*	*	*	*	*	0	9	1	10	157	138426	125356	34218	298000	48547
1992	1,095,700	11	*	*	*	*	*	*	0	9	1	10	169	165487	154528	29034	349049	48044
1993	1,108,100	11	*	*	*	*	*	*	0	9	1	10	166	151213	140923	56219	348355	49036
1994	1,113,600	11	630	1798	609	1593	550	1554	0	9	1	10	159	125444	161561	27041	314046	55638
1995	1,117,700	11	648	1686	634	1547	557	1500	0	9	1	10	167	120364	160881	34707	315952	46185
1996	1,132,100	11	442	1886	453	1634	449	1532	0	9	1	10	168	131545	134536	27005	293086	46436
1997	1,146,800	12	448	1981	465	1763	461	1672	0	9	1	10	172	139384	140294	18216	297894	53298
<b>San Benito</b>																		
1990	37,000	1	*	*	*	*	*	*	1	0	0	1	6	12650	1860	373	14883	915
1991	37,550	1	*	*	*	*	*	*	1	0	0	1	6	9093	3031	3031	15155	900
1992	38,850	1	*	*	*	*	*	*	1	0	0	1	6	14118	1253	1250	16621	1132
1993	40,050	1	*	*	*	*	*	*	0	1	0	1	6	14082	954	940	15976	1065
1994	40,950	1	8	41	5	29	3	18	0	1	0	1	6	12616	855	839	14310	977

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1995	42,650	1	8	41	5	30	3	17	0	1	0	1	6	13764	789	779	15332	783
1996	44,000	1	8	41	5	30	3	14	0	1	0	1	9	12689	604	906	14199	774
1997	46,150	1	8	41	5	30	3	13	0	1	0	1	9	12959	701	1052	14712	984
<b>San Bernardino</b>																		
1990	1,436,700	18	*	*	*	*	*	*	3	15	0	18	179	174179	175229	58230	407638	58129
1991	1,488,700	18	*	*	*	*	*	*	3	15	0	18	184	184490	182101	62590	429181	56898
1992	1,531,800	18	*	*	*	*	*	*	2	15	0	17	204	160130	212002	61158	433290	55908
1993	1,552,200	19	*	*	*	*	*	*	3	15	0	18	211	129669	226584	52588	408841	55673
1994	1,565,400	20	483	2590	444	2479	442	2375	3	15	0	18	231	135202	229495	55115	419812	54256
1995	1,581,600	20	520	2767	487	2596	476	2369	3	15	0	18	235	144343	217045	58908	420296	57016
1996	1,592,600	21	524	2574	491	2423	481	2326	3	15	0	18	252	134414	227829	62886	425129	62580
1997	1,617,300	20	546	2635	507	2422	495	2262	3	16	0	19	254	132608	218021	75905	426534	78272
<b>San Diego</b>																		
1990	2,511,400	29	*	*	*	*	*	*	2	21	1	24	311	172991	282514	61795	517300	82702
1991	2,560,800	30	*	*	*	*	*	*	1	22	1	24	299	214808	291399	69044	575251	77139
1992	2,611,500	31	*	*	*	*	*	*	1	21	1	23	335	199721	372964	57695	630380	83977
1993	2,625,100	31	*	*	*	*	*	*	1	20	1	22	357	225851	345495	52482	623828	86276
1994	2,650,700	30	752	4260	728	3894	711	3636	1	22	1	24	344	211936	327907	52566	592409	88257
1995	2,669,200	30	772	4280	757	3892	713	3605	1	22	1	24	365	182556	353957	62590	599103	92831
1996	2,694,900	31	813	4591	797	4019	739	3690	1	22	1	24	365	178324	314227	87344	579895	85613
1997	2,763,400	31	773	3960	764	3596	690	3267	0	22	1	23	359	172207	366284	82835	621326	93485
<b>San Francisco</b>																		
1990	727,900	17	*	*	*	*	*	*	0	11	1	12	130	93279	108158	10736	212173	35843
1991	732,300	17	*	*	*	*	*	*	0	10	1	11	131	130160	87514	23322	240996	36363
1992	740,500	17	*	*	*	*	*	*	0	9	1	10	127	82672	100212	19742	202626	34197
1993	750,800	17	*	*	*	*	*	*	0	9	1	10	126	123149	98587	25824	247560	35313
1994	753,100	17	413	4121	379	2621	348	2085	0	9	1	10	128	84658	108159	37837	230654	35804
1995	751,500	17	445	3987	369	2423	346	1901	0	9	1	10	134	99728	105340	27794	232862	36165
1996	768,200	17	439	3942	367	2335	335	1840	0	9	1	10	130	96556	111806	21698	230060	35829
1997	777,400	16	368	4018	329	2195	304	1659	0	8	1	9	136	72407	127374	36681	236462	36817
<b>San Joaquin</b>																		
1990	483,800	8	*	*	*	*	*	*	0	8	0	8	82	85940	66884	13096	165920	17162
1991	495,400	8	*	*	*	*	*	*	0	7	0	7	90	82330	73662	16570	172562	18271
1992	505,500	8	*	*	*	*	*	*	0	7	0	7	90	87403	72032	22387	181822	17696
1993	510,400	8	*	*	*	*	*	*	0	7	0	7	86	89688	74349	24098	188135	18769
1994	515,600	8	143	864	142	827	138	757	0	7	0	7	86	91153	65924	26465	183542	20797
1995	524,600	8	158	814	158	791	154	749	0	7	0	7	91	90960	67312	26064	184336	17876
1996	533,200	8	158	785	158	750	154	695	0	7	0	7	93	87797	65647	23331	176775	17553
1997	542,200	8	158	770	163	738	159	683	0	7	0	7	91	89001	59278	20859	169138	19596
<b>San Luis Obispo</b>																		
1990	218,000	5	*	*	*	*	*	*	0	5	0	5	41	26746	23585	4865	55196	6659

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1991	219,700	5	*	*	*	*	*	*	0	5	0	5	41	29622	24290	6500	60412	7350
1992	222,200	5	*	*	*	*	*	*	0	5	0	5	41	23175	35192	3652	62019	7102
1993	224,500	5	*	*	*	*	*	*	0	5	0	5	41	24410	35340	1622	61372	8259
1994	226,300	5	73	424	72	379	68	343	0	5	0	5	42	34184	28405	9529	72118	7723
1995	228,400	5	71	441	70	396	66	365	0	5	0	5	44	30117	38659	8465	77241	7209
1996	230,700	5	65	438	64	393	60	361	0	5	0	5	36	25022	30574	8541	64137	6361
1997	234,700	4	75	427	74	353	71	321	0	5	0	5	46	29483	41216	8870	79569	8513
<b>San Mateo</b>																		
1990	651,400	9	*	*	*	*	*	*	1	7	0	8	110	122830	62943	18245	204018	19908
1991	659,400	9	*	*	*	*	*	*	1	7	0	8	111	88004	100582	11400	199986	20555
1992	670,400	10	*	*	*	*	*	*	1	7	0	8	114	78545	104712	13387	196644	19820
1993	676,100	10	*	*	*	*	*	*	1	7	0	8	115	68000	100949	15497	184446	19676
1994	681,700	10	157	1267	139	1073	133	935	1	7	0	8	117	69167	94620	13254	177041	19933
1995	689,700	10	157	1187	133	998	133	923	1	7	0	8	116	68763	95235	13635	177633	21165
1996	698,000	10	133	1234	130	1001	130	886	1	7	0	8	122	73272	88555	12029	173856	20280
1997	711,700	10	172	1606	171	1265	171	1046	1	7	0	8	120	68683	97262	12456	178401	19245
<b>Santa Barbara</b>																		
1990	370,900	9	*	*	*	*	*	*	1	6	0	7	58	23658	43359	26430	93447	10578
1991	377,000	9	*	*	*	*	*	*	1	6	0	7	59	20180	53779	18734	92693	11165
1992	382,500	9	*	*	*	*	*	*	1	6	0	7	59	20335	50570	19476	90381	10926
1993	382,900	9	*	*	*	*	*	*	1	6	0	7	59	21578	44223	25388	91189	11993
1994	386,700	9	95	951	88	797	86	706	1	6	0	7	57	33215	45184	13312	91711	11158
1995	391,400	9	91	861	84	691	82	607	1	6	0	7	58	35679	45067	14485	95231	11812
1996	393,700	9	103	809	94	610	94	575	1	6	0	7	58	37096	45410	13527	96033	10875
1997	400,800	8	121	975	105	701	103	661	2	6	0	8	59	32262	53470	12389	98121	12775
<b>Santa Clara</b>																		
1990	1,504,400	15	*	*	*	*	*	*	0	12	1	13	205	115042	247949	38567	401558	45734
1991	1,522,600	15	*	*	*	*	*	*	0	11	1	12	207	148518	251495	34277	434290	49701
1992	1,549,900	16	*	*	*	*	*	*	0	11	1	12	212	190882	184532	48096	423510	47559
1993	1,574,700	15	*	*	*	*	*	*	0	11	1	12	212	159467	225825	47187	432479	50519
1994	1,588,000	14	561	3363	526	2945	502	2510	0	11	1	12	220	194744	227360	37730	459834	49158
1995	1,603,300	14	558	3286	511	2450	483	2231	0	11	1	12	213	157459	203995	57653	419107	48933
1996	1,638,300	14	686	4002	627	2683	611	2611	0	11	1	12	224	157529	177270	78302	413101	50244
1997	1,671,400	14	602	3051	583	2464	510	1999	0	11	1	12	220	195339	225851	36778	457968	55946
<b>Santa Cruz</b>																		
1990	230,400	3	*	*	*	*	*	*	0	3	0	3	33	33780	30605	599	64984	6017
1991	232,200	3	*	*	*	*	*	*	0	2	0	2	33	46135	23138	2559	71832	6104
1992	235,500	3	*	*	*	*	*	*	0	2	0	2	34	39560	26917	3591	70068	6897
1993	236,700	3	*	*	*	*	*	*	0	2	0	2	35	42112	23715	5106	70933	6824
1994	238,800	3	47	327	47	242	35	219	0	2	0	2	35	39356	22693	4968	67017	6360
1995	241,500	3	42	332	42	242	30	216	0	2	0	2	35	37262	22277	4912	64451	6689
1996	243,600	4	42	332	42	237	30	202	0	2	0	2	35	29654	19671	5338	54663	6544

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1997	247,200	4	42	354	42	244	32	208	0	2	0	2	35	29428	20603	6032	56063	6623	
<b>Shasta</b>																			
1990	148,600	3	*	*	*	*	*	*	1	2	0	3	26	28339	31548	5312	65199	6862	
1991	153,500	4	*	*	*	*	*	*	1	2	0	3	26	50352	13791	2943	67086	6985	
1992	157,000	5	*	*	*	*	*	*	1	2	0	3	28	55478	5285	1735	62498	6905	
1993	158,600	5	*	*	*	*	*	*	1	2	0	3	28	41134	19098	6615	66847	7606	
1994	159,800	5	59	382	59	322	59	322	1	2	0	3	32	34221	25675	4988	64884	7933	
1995	160,900	5	71	374	71	321	71	297	1	2	0	3	38	47904	15526	5878	69308	7555	
1996	161,700	5	71	366	71	330	70	325	1	2	0	3	38	39638	27133	7789	74560	7667	
1997	163,300	5	59	384	65	330	64	303	1	2	0	3	44	34582	33597	9240	77419	8238	
<b>Sierra</b>																			
1990	3,320	1	*	*	*	*	*	*	1	0	0	1	1	46	743	0	789	42	
1991	3,300	1	*	*	*	*	*	*	1	0	0	1	2	50	755	0	805	22	
1992	3,300	1	*	*	*	*	*	*	1	0	0	1	2	131	542	0	673	28	
1993	3,350	1	*	*	*	*	*	*	1	0	0	1	2	136	533	76	745	17	
1994	3,350	1	0	6	0	6	0	6	1	0	0	1	2	99	406	93	598	21	
1995	3,390	1	0	6	0	6	0	6	1	0	0	1	2	52	467	0	519	28	
1996	3,370	1	0	6	0	6	0	6	1	0	0	1	2	48	495	0	543	24	
1997	3,370	0	0	6	0	6	0	6	1	0	0	1	2	31	550	0	581	43	
<b>Siskiyou</b>																			
1990	43,550	2	*	*	*	*	*	*	2	0	0	2	11	6381	4993	4133	15507	1715	
1991	43,750	2	*	*	*	*	*	*	1	1	0	2	11	6971	5412	4920	17303	1570	
1992	44,000	2	*	*	*	*	*	*	1	1	0	2	11	5963	6585	4435	16983	1708	
1993	44,400	2	*	*	*	*	*	*	1	1	0	2	11	9283	4324	2925	16532	1851	
1994	44,650	2	9	81	9	70	6	52	1	1	0	2	12	7448	7154	440	15042	1264	
1995	44,650	2	9	81	9	70	6	52	1	1	0	2	12	9462	3884	2619	15965	1406	
1996	44,000	2	9	81	9	70	6	52	1	1	0	2	12	9712	4544	1567	15823	1430	
1997	44,300	2	9	81	9	70	9	52	1	1	0	2	17	8607	6800	338	15745	1280	
<b>Solano</b>																			
1990	344,100	4	*	*	*	*	*	*	0	4	0	4	35	47401	61628	12473	121502	10134	
1991	355,700	4	*	*	*	*	*	*	0	4	0	4	42	55121	39832	18517	113470	12883	
1992	362,900	4	*	*	*	*	*	*	0	4	0	4	38	41017	78429	8417	127863	10164	
1993	368,200	4	*	*	*	*	*	*	0	4	0	4	25	41127	25967	4790	71884	4686	
1994	370,300	4	61	440	63	427	63	427	0	4	0	4	25	25456	27251	7303	60010	4379	
1995	370,500	4	64	438	67	428	67	428	0	4	0	4	40	21553	30509	8514	60576	10192	
1996	372,400	4	94	476	64	439	64	439	0	4	0	4	50	19453	36254	2976	58683	10898	
1997	378,600	4	62	476	62	437	62	437	0	4	0	4	47	52725	56398	11204	120327	11414	
<b>Sonoma</b>																			
1990	390,300	9	*	*	*	*	*	*	0	7	0	7	65	37633	66683	9473	113789	15531	
1991	397,200	9	*	*	*	*	*	*	0	7	0	7	67	33045	66309	13726	113080	14568	

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1992	405,300	9	*	*	*	*	*	*	1	7	0	8	67	29289	73860	12441	115590	14114
1993	411,300	9	*	*	*	*	*	*	1	7	0	8	79	38751	77006	14869	130626	15344
1994	414,500	10	120	714	120	651	120	645	1	7	0	8	77	23638	72955	18274	114867	14356
1995	419,500	10	111	722	105	706	705	687	1	7	0	8	76	26426	75946	21446	123818	14638
1996	424,500	10	149	863	137	840	137	821	1	7	0	8	76	34689	76423	19022	130134	14998
1997	432,800	10	127	751	119	705	119	691	1	7	0	8	76	44013	72196	18148	134357	14916
<b>Stanislaus</b>																		
1990	375,200	8	*	*	*	*	*	*	0	7	0	7	82	94286	56187	17332	167805	15398
1991	387,700	8	*	*	*	*	*	*	0	6	0	6	91	108191	63373	27116	198680	17189
1992	397,200	8	*	*	*	*	*	*	0	6	0	6	93	121096	44671	43679	209446	18548
1993	404,900	8	*	*	*	*	*	*	0	6	0	6	97	101384	57667	46511	205562	20217
1994	409,200	8	145	900	145	864	145	862	0	4	0	4	94	8690	80969	15270	104929	17282
1995	413,800	8	154	846	154	810	154	790	0	5	0	5	91	86139	80270	14879	181288	18050
1996	418,500	7	154	806	154	779	154	770	0	5	0	5	93	69803	80825	20402	171030	19810
1997	425,400	6	202	934	202	906	202	904	0	4	0	4	81	57983	93914	16257	168154	18888
<b>Sutter</b>																		
1990	65,000	1	*	*	*	*	*	*	1	0	0	1	4	5764	197	0	5961	837
1991	67,300	1	*	*	*	*	*	*	1	0	0	1	4	4794	96	0	4890	741
1992	69,300	1	*	*	*	*	*	*	1	0	0	1	4	4547	47	0	4594	711
1993	71,100	1	*	*	*	*	*	*	1	0	0	1	4	5624	17	0	5641	742
1994	72,400	1	8	120	8	120	8	120	1	0	0	1	4	5115	1142	41	6298	828
1995	73,800	1	12	120	12	120	12	120	0	0	0	0	4	5059	1334	64	6457	0
1996	74,600	1	12	120	12	120	12	120	0	0	0	0	0	0	0	0	0	0
1997	76,100	1	12	120	12	120	12	120	0	0	0	0	0	0	0	0	0	0
<b>Tehama</b>																		
1990	49,900	1	*	*	*	*	*	*	0	1	0	1	7	1738	15785	701	18224	1704
1991	51,300	1	*	*	*	*	*	*	0	1	0	1	7	1881	18335	350	20566	1811
1992	52,500	1	*	*	*	*	*	*	0	1	0	1	7	2937	17561	322	20820	1508
1993	52,900	1	*	*	*	*	*	*	0	1	0	1	7	5504	13761	1630	20895	1236
1994	53,400	1	8	46	8	41	8	41	0	1	0	1	9	2995	117	14341	17453	1701
1995	54,200	1	16	136	16	126	16	126	0	1	0	1	9	1565	16173	84	17822	1540
1996	54,400	1	8	68	8	63	8	63	0	1	0	1	9	1734	17897	405	20036	1492
1997	54,700	1	8	68	8	63	8	63	0	1	0	1	9	2894	17913	520	21327	1652
<b>Trinity</b>																		
1990	13,000	1	*	*	*	*	*	*	1	0	0	1	1	261	2288	719	3268	594
1991	13,050	1	*	*	*	*	*	*	1	0	0	1	1	268	2801	797	3866	626
1992	13,200	1	*	*	*	*	*	*	1	0	0	1	1	961	2369	758	4088	637
1993	13,250	1	*	*	*	*	*	*	1	0	0	1	2	2035	1608	218	3861	640
1994	13,450	1	0	23	0	23	0	23	1	0	0	1	2	1537	2102	113	3752	607
1995	13,400	1	0	23	0	23	0	23	1	0	0	1	4	1163	2700	96	3959	667
1996	13,350	1	0	23	0	23	0	23	1	0	0	1	4	2040	2222	134	4396	699
1997	13,250	0	0	23	0	23	0	23	1	0	0	1	4	1930	2204	105	4239	699

APPENDIX C

<b>Tulare</b>																			
1990	314,000	7	*	*	*	*	*	*	3	4	0	7	38	41685	31870	6561	80116	23270	
1991	324,000	7	*	*	*	*	*	*	3	4	0	7	40	52465	56311	12115	120891	10699	
1992	332,500	7	*	*	*	*	*	*	3	4	0	7	50	73625	39801	8954	122380	11257	
1993	338,200	7	*	*	*	*	*	*	2	5	0	7	56	72934	43668	9702	126304	9011	
1994	343,300	7	114	560	114	522	94	466	2	5	0	7	70	60920	45677	8135	114732	8057	
1995	349,800	7	87	620	87	579	67	509	2	4	0	6	70	60187	47284	11436	118907	11705	
1996	353,600	7	91	629	91	589	62	435	2	4	0	6	65	55563	41742	8464	105769	11258	
1997	358,300	6	87	618	82	488	61	400	2	4	0	6	64	56188	47203	9499	112890	12844	
<b>Tuolumne</b>																			
1990	48,650	3	*	*	*	*	*	*	0	2	0	2	13	10156	18911	4770	33837	2703	
1991	49,950	3	*	*	*	*	*	*	0	2	0	2	13	7727	22796	3519	34042	2948	
1992	50,700	3	*	*	*	*	*	*	0	2	0	2	14	8990	20315	1816	31121	2948	
1993	51,700	3	*	*	*	*	*	*	0	2	0	2	14	2182	24217	4752	31151	2910	
1994	51,900	3	11	96	11	93	11	84	0	2	0	2	14	2127	23413	4540	30080	2904	
1995	51,500	3	11	95	11	95	11	86	0	2	0	2	14	2147	24493	4703	31343	2810	
1996	51,600	3	11	92	11	95	11	86	0	2	0	2	15	6625	19664	4752	31041	2821	
1997	52,200	3	11	86	11	86	11	77	0	2	0	2	15	7517	16698	6321	30536	2906	
<b>Ventura</b>																			
1990	670,200	8	*	*	*	*	*	*	2	6	0	8	86	85589	76839	14847	177275	20539	
1991	678,600	8	*	*	*	*	*	*	1	7	0	8	86	113577	54558	11641	179776	20205	
1992	690,100	8	*	*	*	*	*	*	1	7	0	8	89	109567	61088	16624	187279	20046	
1993	697,900	8	*	*	*	*	*	*	1	7	0	8	89	106877	60345	12454	179676	19106	
1994	706,200	8	163	1020	135	958	114	780	1	7	0	8	88	97149	77076	9033	183258	18817	
1995	712,700	8	164	1000	143	972	107	740	1	7	0	8	88	59192	99433	21741	180366	19247	
1996	714,800	8	174	981	173	947	119	695	1	7	0	8	91	86889	63798	18538	169225	20364	
1997	727,200	7	164	975	163	916	134	705	1	7	0	8	92	79493	81889	20869	182251	23256	
<b>Yolo</b>																			
1990	141,500	3	*	*	*	*	*	*	0	3	0	3	18	22081	11426	2210	35717	3649	
1991	144,400	3	*	*	*	*	*	*	0	3	0	3	18	24495	7544	1556	33595	3263	
1992	146,700	3	*	*	*	*	*	*	0	3	0	3	15	18272	8522	1056	27850	3238	
1993	147,000	3	*	*	*	*	*	*	0	3	0	3	15	18271	8186	1054	27511	3520	
1994	148,100	3	14	144	14	144	14	125	0	3	0	3	20	14089	11536	1414	27039	3391	
1995	150,800	3	18	188	18	188	18	169	0	3	0	3	20	10020	16687	1381	28088	3323	
1996	152,500	3	14	148	14	148	14	129	0	3	0	3	8	765	10745	51	11561	1171	
1997	154,900	3	16	146	16	146	16	127	0	3	0	3	18	12434	21421	3309	37164	3424	
<b>Yuba</b>																			
1990	58,800	1	*	*	*	*	*	*	0	1	0	1	11	12049	15094	1274	28417	2668	
1991	60,000	1	*	*	*	*	*	*	0	1	0	1	11	4293	22963	1535	28791	2594	
1992	61,300	1	*	*	*	*	*	*	0	1	0	1	11	5794	19018	1242	26054	2522	
1993	61,600	1	*	*	*	*	*	*	0	1	0	1	11	2462	22531	1541	26534	2721	

## APPENDIX C

1994	62,000	1	12	101	12	101	12	101	0	1	0	1	11	1977	23094	1479	26550	3488
1995	62,300	1	12	101	12	101	12	101	0	1	0	1	11	781	26538	577	27896	3107
1996	60,500	1	12	101	12	101	12	101	0	1	0	1	24	4695	23449	324	28468	3472
1997	61,200	1	24	125	24	125	24	125	0	1	0	1	24	264	22698	340	23302	3821

+ Aggregate Hospital Financial Data excludes prepaid health plan hospitals, state hospitals, long-term care emphasis hospitals, psychiatric health facilities, and other non-comparable hospitals. Also excludes beds in suspense.

++ Annual Utilization Report of Hospitals; summary data from all reporting licensed acute care hospitals

\* Data not available (Alpine County has no hospital)

\*\* ICU/CCU/Acute Respiratory Licensed Beds

\*\*\* Population statistics from Department of Finance

**GAC:** Licensed (Dept Health Svcs) General Acute Care hospitals

**Standby:** the provision of emergency medical care in a specifically designated area of the hospital that is equipped and maintained at all times to receive patients with urgent medical problems, and capable of providing physician services within a reasonable time (Title 22, Div. 5, Sec. 70651-70657).

**Basic:** the provision of emergency medical care in a specifically designated area of the hospital that is staffed and equipped at all times to provide prompt care for any patient presenting urgent medical problems (Title 22, Div 5. Sec. 70413-70419).

**Comprehensive:** the provision of diagnostic and therapeutic services for unforeseen physical and mental disorders that, if not properly treated, would lead to marked suffering disability, or death. In-house capability for managing all medical situations on a definitive and continuing basis (Title 22, Div. 5, Sec. 70453-70459).

**EMS Station:** a specific place within the EMS Department adequate to treat one patient at a time. Holding or observation beds are not included.

**Non-Urgent Visit:** a patient with a non-emergent injury, illness, or condition; sometimes chronic; that can be treated in a non-emergency setting and not necessarily on the same day seen in the EMS Dept. (eg. Pregnancy tests, toothache, minor cold, ingrown toenail).

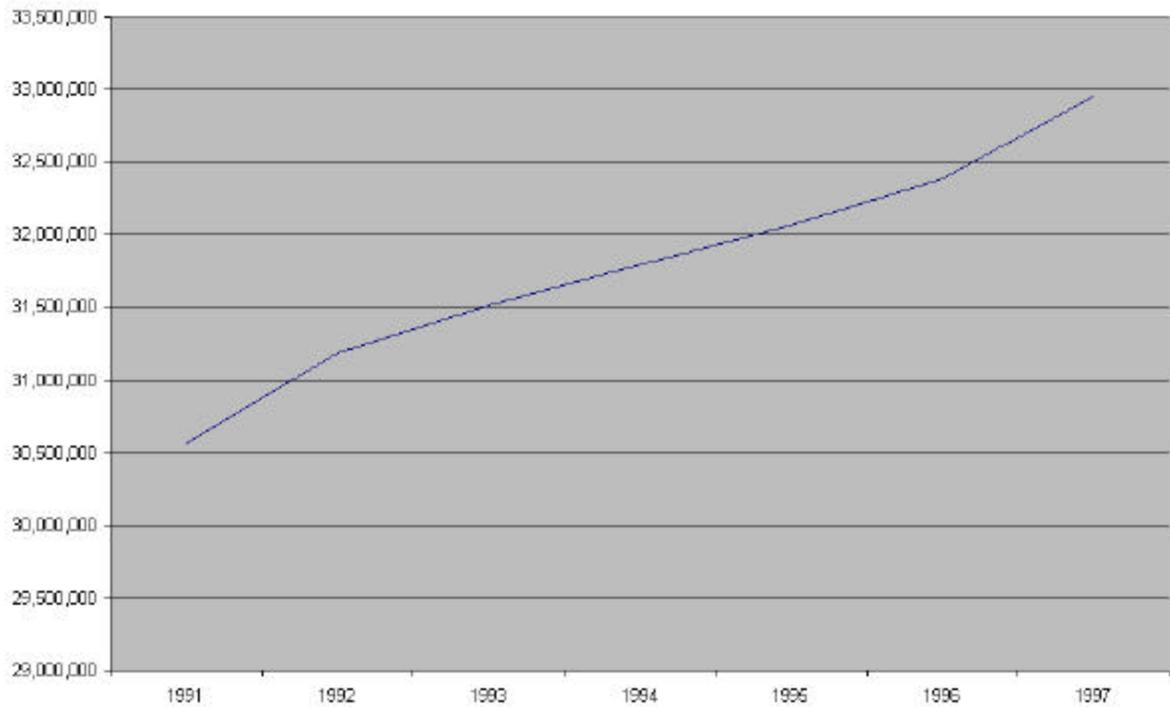
**Urgent Visit:** a patient with an acute injury or illness where loss of life or limb is not an immediate threat, or a patient who needs a timely evaluation (fracture or laceration).

**Critical Visit:** A patient with an acute injury or illness that could result in permanent damage, injury or death (head injury, vehicular collision, firearm incident).

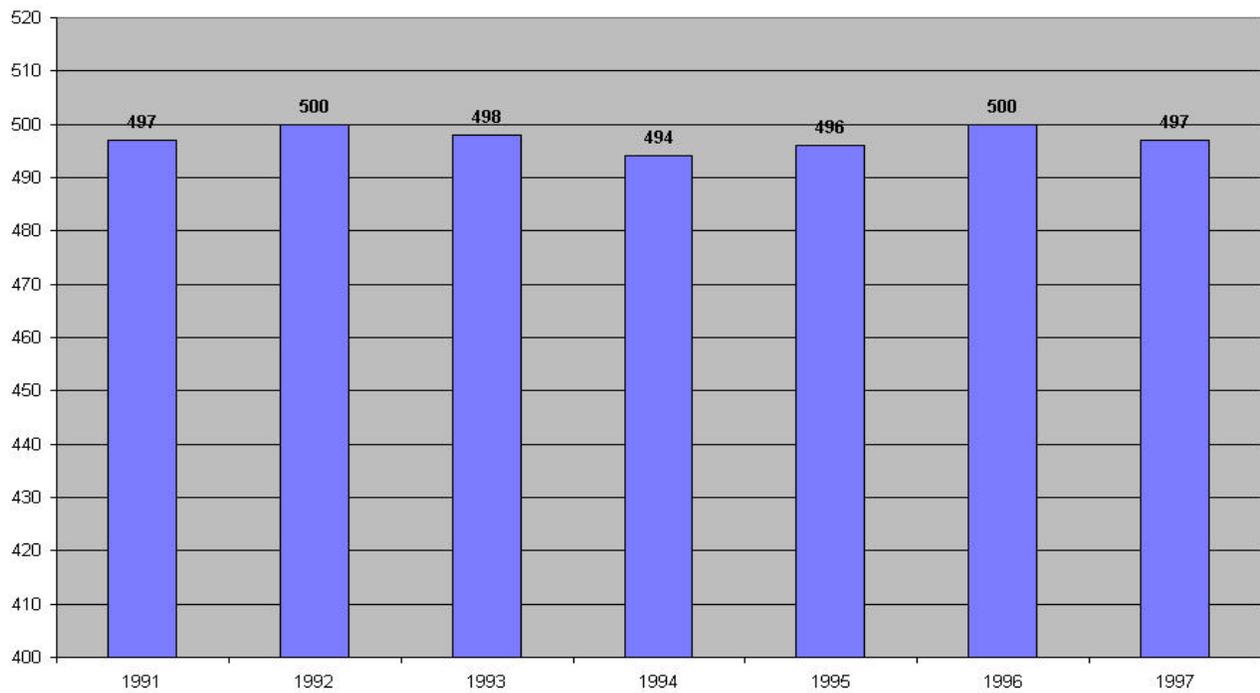
APPENDIX D

Figure 1

California Population

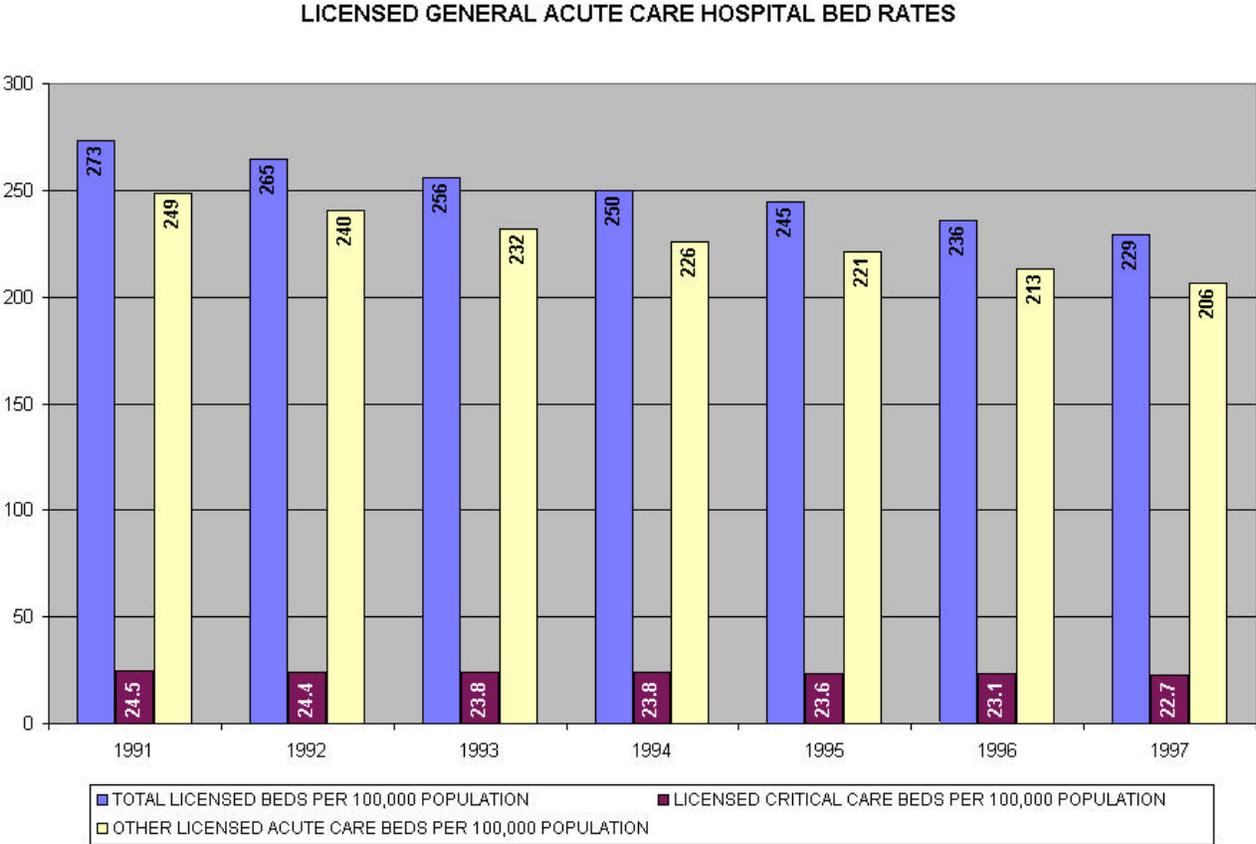


LICENSED GENERAL ACUTE CARE HOSPITALS



APPENDIX D

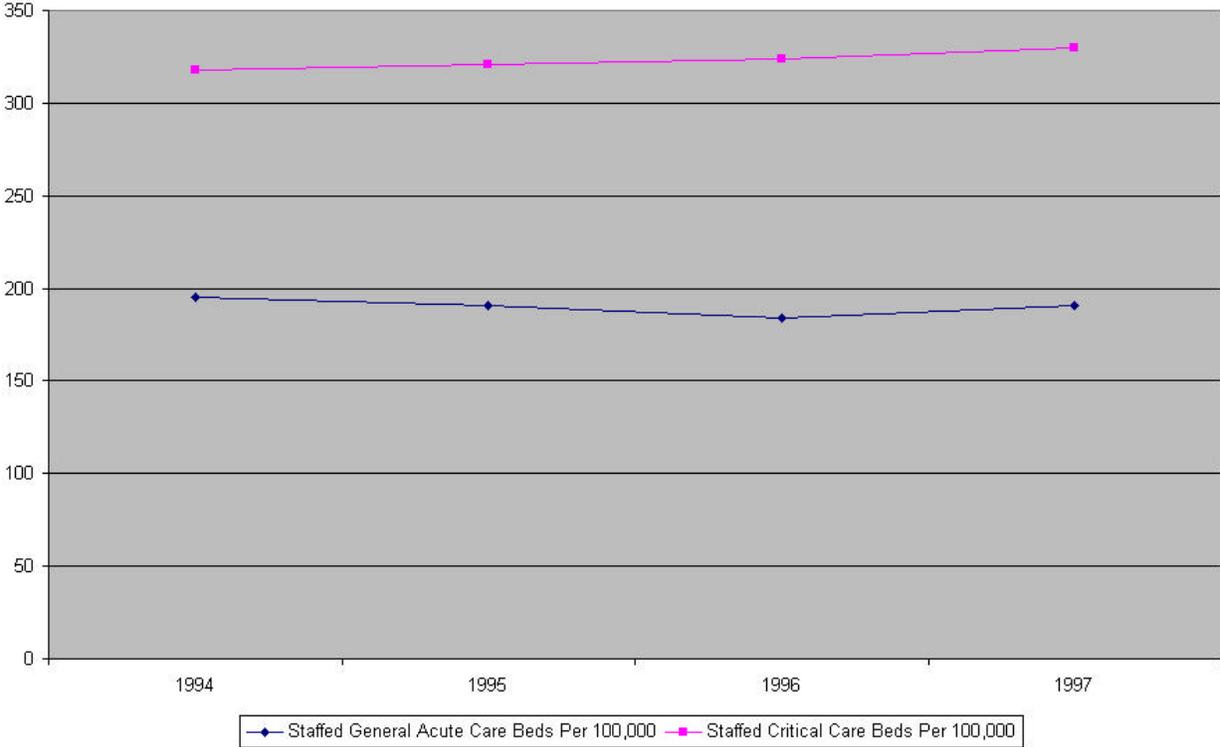
Figure 3



APPENDIX D

Figure 4

Average Annual Staffed Beds as Reported to OSHPD - Adjusted for Population



APPENDIX D

Figure 5

HOSPITAL EMERGENCY DEPARTMENTS

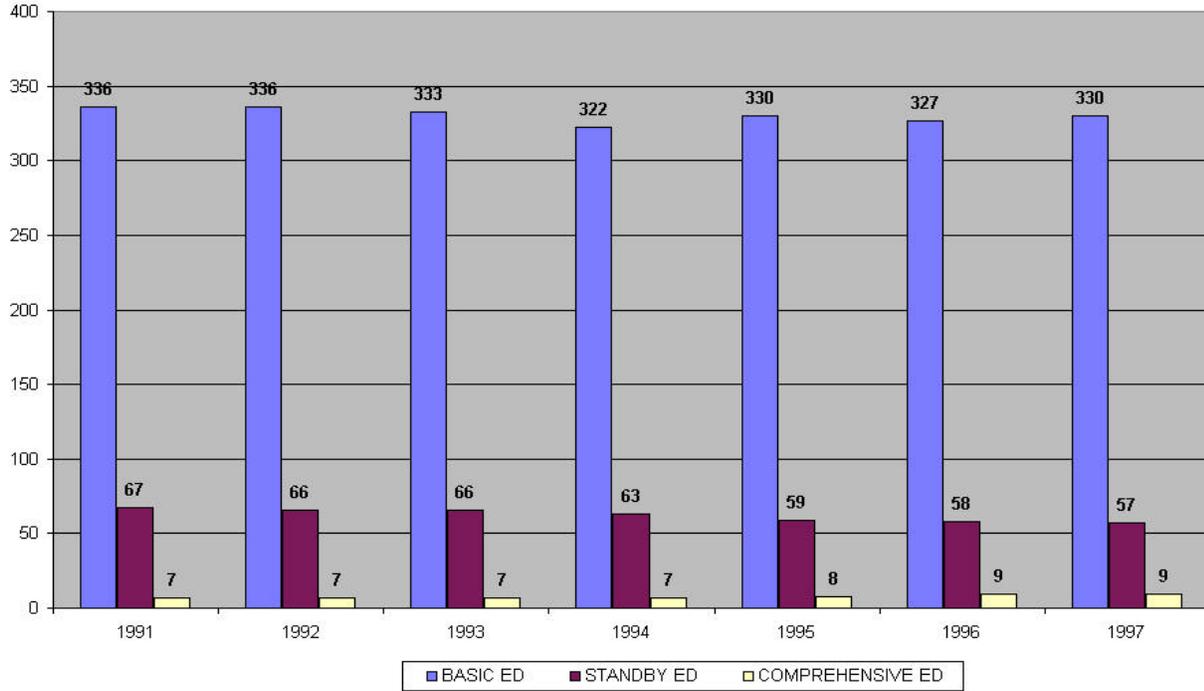
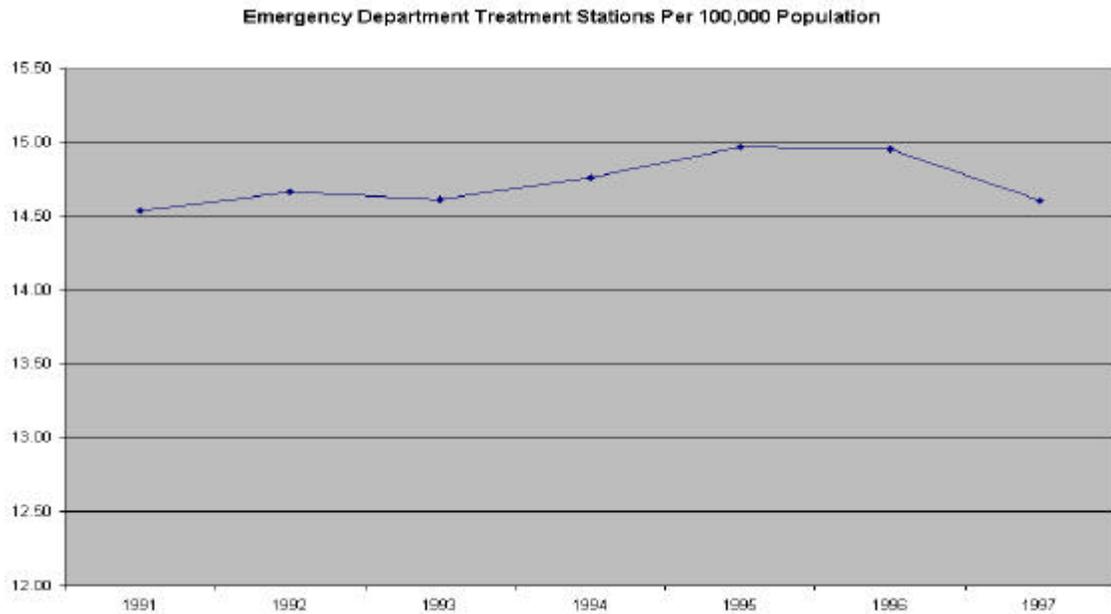


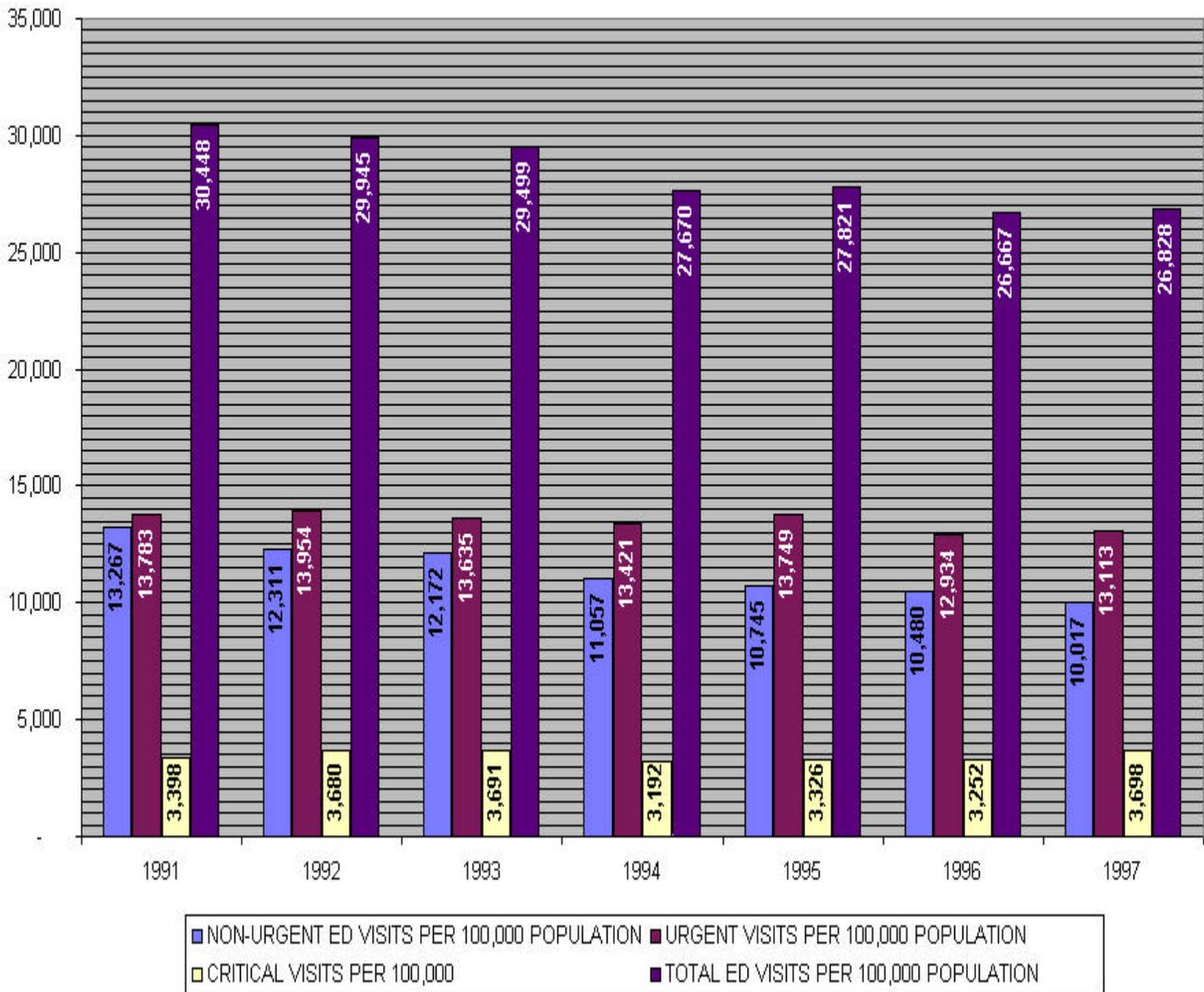
Figure 6



APPENDIX D

Figure 7

EMERGENCY DEPARTMENT UTILIZATION



## APPENDIX E

### **SENATE BILL 1973 (Maddy) Chapter 735, Statutes of 1998**

#### **SUMMARY**

In addition to extending the sunset date for the Health Facility Data Program to June 30, 2004, this legislation authorizes the Office of Statewide Health Planning and Development (Office) to:

- Accelerate the collection and public disclosure of hospital inpatient data.

This law reduces the lag time between a patient discharge and the availability of that discharge data by a minimum of nine months: patient discharge reports made available to the public would relate to discharges which occurred four to nine months earlier.

- As of 1/1/2000 all hospitals will be required to semi-annually submit patient discharge data on tape or diskette within 90 days of the end of a reporting period. OSHPD will have 15 days to accept or reject the data as reported and will have an additional 15 days to make the data available to the public.
- As of 1/1/2001 hospitals will be required to transmit patient level data to OSHPD electronically.
- OSHPD will develop tools to assist facilities in editing data prior to submission.
- Collect standardized patient-level information from hospital emergency departments and from hospital-based and licensed, freestanding ambulatory surgery clinics effective January 1, 2002.
- Review existing financial and utilization databases to evaluate the potential for combining, streamlining, or eliminating reporting requirements.
- Add or delete, with the advice of the Commission, patient-level data elements through the regulatory process. The number of new, non-standard reporting elements over a five-year period would be capped at a maximum of 15.
- Develop and submit to the legislature, prior to June 30, 2001, a plan to achieve the goal of electronic data interchange between and among health care facilities, health plans, providers and other state agencies in California.

## APPENDIX F

### ASSEMBLY BILL 2103 (GALLEGOS) Chapter 995, Statutes of 1998

#### SUMMARY

This legislation requires general acute care facilities (hospital) to notify the State Department of Health Services (DHS) prior to closing or downgrading emergency services. It also requires community impact evaluation of any such pending change.

This law:

- Requires any hospital that provides emergency medical services to notify DHS, local county government and contracting health service plans or providers as soon as possible, but no later than 90 days prior to a planned reduction or elimination of emergency medical services. Requires timely public notice.
- Specifies that a hospital is not subject to the requirements above if DHS does either of the following:
  - Determines that the use of resources to keep the emergency center open substantially threatens the stability of the hospital as a whole.
  - Cites the emergency center for unsafe staffing practices.
- Requires DHS, by June 30, 1999, and the Emergency Medical Services Authority, in consultation with hospitals and other health care providers and local emergency medical services agencies, to designate signage requirements for a health facility holding a special permit for a standby emergency medical service located in an urban area. Specifies the signage shall not include the word “emergency” and shall reflect the type of emergency services provided by the facility, and be easily understood by the average person.
- Requires DHS to use an impact evaluation of the county to determine the impact of a pending emergency services closure or downgrade upon the host community. Directs the host county to ensure completion of the impact evaluation, and permits the local emergency medical services agency to perform the evaluation.
- Requires a public hearing on the proposed change within 60 days. Requires the emergency Medical Services authority to develop guidelines for the development of impact evaluation policies. Requires each county or its designated local medical service agency, by June 30, 1999, to provide criteria for such an evaluation.
- Directs health care service plans with enrollees served by providers within the downgrading hospital to notify affected enrollees. Plans may require contracting medical groups to provide such notice.

## APPENDIX G

### MODEL AMBULANCE DIVERSION PROGRAM

(Adopted by the Emergency Medical Services Administrators Association of California, 1998)

#### **Purpose:**

The purpose of an EMS System's ambulance diversion program is to provide a mechanism for hospitals to request a temporary discontinuance of ambulances arriving at their emergency department.

#### **Background:**

Local EMS Agencies develop intricate ambulance destination policies based upon a number of patient care considerations including but not limited to: system response time, continuity of care, appropriate medical responses, and geographic proximity. Almost exclusively, EMS ambulances deliver patients to hospital emergency departments.

(This model policy does not include a discussion of non-emergency ambulance transportation nor interfacility ambulance transportation.)

Ambulance diversion programs are designed to assist local EMS systems to manage their available hospital resources so that the patients can be received at the hospital best suited to care for them. When hospitals experience brief periods of excess demand upon fixed resources, ambulance diversion may be a reasonable option if neighboring hospitals are adequately prepared and in close geographic proximity.

When a local EMS system's network of hospitals is experiencing demand that exceed capacity at multiple hospitals and all hospitals are impacted, ambulance diversion no longer serves the patient.

In some regions where the rerouting of ambulances would greatly prolong transport times, ambulance diversion is not beneficial because it impact the ability of the system to respond to additional emergencies.

#### **Principles:**

Ambulance diversion programs must be tailored to meet local needs and other available resources.

Ambulance diversion should exist as part of an EMS Systems' day to day management of resources. In situations where extreme demands are placed on the network of resources e.g. flu season or other disaster scenarios, ambulance diversion from the most appropriate hospital should not be permitted.

Diversion of ambulance patients from a hospital does not change the hospital's obligation to continue receiving all walkins (may be up to 85% of business).

Excessive diversion requests from hospital(s) result from a number of underlying causes; local diversion programs must address these underlying causes.

EMS Systems managers should work with local public health officials in promoting prevention and interventions to reduce disease and injury, e.g. flu shot campaigns, disaster preparedness.

## APPENDIX G

Public information campaigns regarding proper use of ambulance and emergency department services should be on going and reinforced during peak demand periods (e.g. flu season).

LEMSA should facilitate the design, development, implementation and evaluation of diversion programs with participation from hospitals, ambulance providers, and the Department of Health Services.

Excessive demand on emergency resources can quickly escalate; emergency preparedness plans should address action to be taken when diversion is no longer an option.

### **Components of a Diversion Program:**

Representatives from each of the key EMS System components in each local EMS System must collaborate to develop their local diversion program.

The roles and responsibilities for each of the participants is listed below:

### **LEMSA**

- Facilitate meetings to develop local diversion policy and procedures with representatives from all EMS service providers including but not limited to: first responders, ambulance providers, dispatch centers, receiving hospitals, physicians and urgent care centers.
- Facilitate joint meetings of the LEMSA, hospital council and regional DHS office staff to coordinate activities and review action plans and reports for their respective agencies.
- Define prehospital clinical triage criteria, transport and response time parameters.
- Develop monitoring mechanism, criteria for authorizing and denying diversion requests, data elements, reporting requirements and quality improvement plan.
- Develop alternative destination criteria and procedures.

### **Hospital** (facilitated by California Healthcare Association Area Coordinators)

- Define Internal Criteria for Ambulance Diversions:
  - Emergency department capacity (service demands/resources)
  - Inpatient bed capacity
  - Physical Plant
  - Loss of vital services
  - Other special circumstances
- Develop internal program for avoiding the need to request ambulance diversion, and rapidly coming off diversion as part of their emergency preparedness plan; submit to the LEMSA for review and approval.
- Participate in projects that develop standardized triage and acuity systems and benchmarks for measuring capacity.

### **Ambulance Providers/Communication Centers**

- Develop procedures and communications plan.
- Develop dispatch procedures

## APPENDIX G

### **Physicians**

- Assist in the development of sound clinical parameters for triaging patients in the field, emergency departments and within critical care units in hospitals.
- Collaborate with hospital executives and staff to develop policy and procedures to assist in decompressing units at times of saturation and other disaster scenarios.

### **Urgent Care Centers**

- Assist in development and dissemination of public education materials for appropriate utilization of emergency medical services and prevention campaigns.
- Develop action plans to extend hours of operation to assist in offloading non-emergent cases when emergency services are overwhelmed.

### **Department of Health Services and Hospital Council**

- Review policy and regulatory requirements for hospitals.
- Collect ED utilization data and develop capacity benchmarks.
- Support efforts to resolve the nursing shortage.
- Develop public education program about ED utilization, especially during peak periods.

## APPENDIX H

### TITLE 22 CALIFORNIA CODE OF REGULATIONS §70741

#### §70741. Disaster and Mass Casualty Program.

(a) A written disaster and mass casualty program shall be developed and maintained in consultation with representatives of the medical staff, nursing staff, administration and fire and safety experts. The program shall be in conformity with the California Emergency Plan of October 10, 1972 developed by the State Office of Emergency Services and the California Emergency Medical Mutual Aid Plan of March 1974 developed by the Office of Emergency Services, Department of Health. The program shall be approved by the medical staff and administration. A copy of the program shall be available on the premises for review by the Department.

(b) The program shall cover disasters occurring in the community and widespread disasters. It shall provide for at least the following:

(1) Availability of adequate basic utilities and supplies, including gas, water, food and essential medical and supportive materials.

(2) An efficient system of notifying and assigning personnel.

(3) Unified medical command.

(4) Conversion of all usable space into clearly defined areas for efficient triage, for patient observation and for immediate care.

(5) Prompt transfer of casualties, when necessary and after preliminary medical or surgical services have been rendered, to the facility most appropriate for administering definite care.

(6) A special disaster medical record, such as an appropriately designed tag, that accompanies the casualty as he is moved.

(7) Procedures for the prompt discharge or transfer of patients already in the hospital at the time of the disaster who can be moved without jeopardy.

(8) Maintaining security in order to keep relatives and curious persons out of the triage area.

(9) Establishment of a public information center and assignment of public relations liaison duties to a qualified individual. Advance arrangements with communications media will be made to provide organized dissemination of information.

(c) The program shall be brought up-to-date, at least annually, and all personnel shall be instructed in its requirements. There shall be evidence in the personnel files, e.g., orientation checklist or elsewhere, indicating that all new employees have been oriented to the program and procedures within a reasonable time after commencement of their employment.

(d) The disaster plan shall be rehearsed at least twice a year. There shall be a written report and evaluation of all drills. The actual evacuation of patients to safe areas during the drill is optional.

**Standard**

**EC.1.6** A management plan addresses emergency preparedness.

**Intent of EC.1.6**

The emergency preparedness management plan describes how the organization will establish and maintain a program to ensure effective response to disasters\* or emergencies affecting the environment of care. The plan provides processes for

- a. implementing specific procedures in response to a variety of disasters;
- b. defining and, when appropriate, integrating the organization's role with communitywide emergency preparedness efforts;
- c. notifying external authorities of emergencies;
- d. notifying personnel when emergency response measures are initiated;
- e. assigning available personnel in emergencies to cover all necessary staff positions;
- f. managing space, supplies, and security;
- g. evacuating the facility when the environment cannot support adequate patient care and treatment;
- h. establishing an alternative care site when the environment cannot support adequate patient care; and
- i. managing patients during emergencies, including scheduling, modification, or discontinuation of services, control of patient information, and patient transportation.

The plan identifies

- j. an alternative source of essential utilities;
- k. a backup communication system in the event of failure during disasters and emergencies;
- l. facilities for radioactive or chemical isolation and decontamination;
- m. alternate roles and responsibilities of personnel during emergencies; and

The plan establishes

- n. an orientation and education program for personnel who participate in implementing the emergency preparedness plan. Education addresses
  1. specific roles and responsibilities during emergencies,
  2. the information and skills required to perform duties during emergencies,
  3. the backup communication system used during disasters and emergencies, and
  4. how supplies and equipment are obtained during disasters or emergencies;
- o. performance standards that address one or more of the following:
  1. Emergency preparedness knowledge and skills for staff;
  2. The level of staff participation in emergency preparedness management;
  3. Monitoring and inspection activities;
  4. Emergency and incident reporting procedures that specify when and to whom reports are communicated;
  5. Inspection, preventive maintenance, and testing of applicable equipment;
  6. Use of space;
  7. Replenishment of supplies; or
  8. Management of staff.

The emergency preparedness management plan includes how it will be evaluated annually in terms of its objectives, scope, performance, and effectiveness.

**Examples of Evidence of Performance for EC.1.6**

- |   |  |
|---|--|
| ■ Staff interviews  | ■ Performance standards for the issue(s) addressed in the standard |
| ■ Management plans for the issue(s) addressed in the standard | ■ Emergency procedures for the issue(s) addressed in the standard  |

\* **disasters** Natural or man-made events that significantly disrupt the environment of care, such as damage to the organization's buildings and grounds due to severe wind storms, tornadoes, hurricanes, or earthquakes. Also, events that disrupt patient care and treatment, such as loss of utilities (power, water, and telephones) due to floods, riots, accidents, or emergencies within the organization or in the surrounding community.

## APPENDIX J

July 20, 1998

To: Dorel Harms  
California Healthcare Association

Jeff Rubin  
Emergency Medical Services Authority

From: Judith A. Scott, RN  
San Joaquin Emergency Medical Services

Subj: Task Force Issues

Due to serious hospital overcrowding and Emergency Department diversions during the months of December 1997 and January 1998, the state assembled a task force to study the causes and the issues contributing to the problem. Several issues were identified for further and deeper scrutiny. One such item is the Emergency Preparedness (Disaster) Plan, a required document in all facilities.

I have reviewed nine (9) Emergency Preparedness Plans. While this is a small number in comparison to the number of hospitals in the State of California, it does give a sample of plans in use at this time. The purpose of my review is to ascertain whether hospital plans address partial activation for reasons other than an identified "disaster" and to look for documentation for activation due to loss of staffing due to illness.

I was also interested in the number of hospitals that have adopted the Incident Command System under the Hospital Emergency Incident Command System (HEICS) guidelines. HEICS are recommended guidelines for putting incident command into the hospital setting. These guidelines were developed under a grant from the Emergency Medical Services Authority. I was interested in HEICS because these guidelines are a mechanism for partial activation. The Incident Command System teaches you to use only the positions that are needed to work the current situation.

**I. DEMOGRAPHICS**

**1. Location:**

Northern California	2
Central California	5
Southern California	2
Urban	7
Rural	2

OES Regions:

OES Region I	2
OES Region II	1
OES Region III	2
OES Region IV	3
OES Region V	1
OES Region VI	0

**2. Hospital Size (Bed Capacity):**

1 - 99	2
99- 349	4
350 +	3

**3. Ownership:**

Private	5
Public	4

District - 2

County - 1

University - 1

**II. ISSUES:**

**1 Use of the Incident Command System (ICS)/Hospital Emergency Incident Command System (HEICS) according to the written plan:**

ICS

HEICS

Yes - 9

Yes - 9

Discussion:

Since the Hospital Emergency Incident Command System (HEICS) is an available tool already in existence, I first documented the number of hospitals claiming to use HEICS and/or the Incident Command System. All nine (9) hospitals stated they were using the HEICS guidelines. It is obvious that some hospitals, while claiming to use HEICS, do not understand the makeup and the workings of this management process. Two hospitals did not have the five functions that comprise Incident Command System management.

A very important goal of the HEICS authors was standardization. Some of the hospitals had a partial adaptation of the codes and titles but it was difficult to find the tie to HEICS in four cases.

**2. Use of standard HEICS Job Titles:**

Yes - 4

Discussion:

When the HEICS guidelines were developed, users were asked not to change the job titles and mission statements.

**3. Use of standard HEICS Overhead Paging Codes:**

Yes - 2

Discussion:

Hospitals were encouraged to adopt a set of standard overhead paging codes.

**4. Use of Partial Activation written into the plan:**

Yes - 4 “Note: All positions are not always filled”

Yes - 2 Referred to number of patients to level of activation

Yes -1 “Any disaster that brings a significant number of patients to the emergency Department or seriously disrupts the quality services .... provides to its patient, staff and community.”

“The ECC may be activated at an appropriate staff level without activating a portion of the disaster plan as a precautionary action based on known or suspected events.”

No - 2

## APPENDIX J

### Discussion:

Management under the Incident Command System says to use only the positions needed for the particular incident. Four plans stated this but an explanation and/or examples would emphasize this point. No one addressed a medical crisis. The wording leaves the impression that Emergency Preparedness Plans are implemented for the influx of trauma patients.

### **5. Loss of Staffing addressed in the Emergency Preparedness Plan:**

Yes - 2

### Discussion:

Only two (2) hospitals had references to loss of staffing included in their hospital policy. Both of these addressed strike conditions.

“includes the threat of a walk-out of a substantial number of employees”

“Work Stoppage Contingency Plan”

This item should be an inclusion to all Emergency Plans under the listing of “Loss of Vital Services.

## **III. RECOMENDATIONS:**

### **1. Use of Incident Command System (HEICS) in all hospitals**

The tool necessary for partial activation is available. At the same time it also leaves many questions:

- This recommendation includes guidelines on what is an appropriate adaptation. HEICS gives the hospital community standardization amongst each other. Yes, it means change, but it is a good change.
- Use the guidelines as they are written. Adopt the standard organizational chart, the job titles, mission statements, vest color coding, overhead paging codes and forms
- Remember these are guidelines. HEICS gives a format to follow. HEICS needs inclusion in the narrative portion of your plan.
- How many hospitals really understand the concept of Incident Command
- How many hospitals think of partial activation in situations such as the overcrowding that recently occurred

### **2. Training**

As in most cases, two items always surface in critiques/reviews - training and communication. Training is the missing component in many cases. If hospitals used a more global approach to their emergency plan, they could utilize it as a resource for cases other than that single big event. The hospital population needs better exposure to ICS. Putting an Incident Commander in charge does not mean Incident Command System.

- How many hospitals have trained their staff in ICS concepts

## APPENDIX J

- How many hospitals have exercised to train employees in partial activation drill
- How many hospitals have exercised with situations other than the “sudden big event” immediately impacting the hospital

### **3. Inadequate Staffing Policy**

While the two hospitals addressing loss of staffing referenced strike or walk-out conditions only, these same concepts could be used for excessive illness situations. I would use the term “Inadequate Staffing” rather than “Loss of Staffing.” The “Work Stoppage Contingency Plan” had excellent information and ideas. It provided a good basis for all situations.

- Hospital Administration is ultimately responsible for all decision related to operations (Open an Emergency Operation Center)
- Decide which areas may temporarily be shut down to free other staff
- Maintain a Labor Pool - Use the Labor Pool Unit Leader Position
- Work closely with the In-Patient Areas Supervisor for bed control
- Reduce patient census
- Cancel scheduled admissions
- Cancel elective procedures
- Cancel out-patient appointments on a selective basis
- Transfer of patients unless this is a county wide problem
- Look at scheduled vacations
- Have a realistic list of all staffing positions for call back and temporary work detail
- Consider staffing the Dependent Care Unit Leader position for personnel with child/adult care issues

### **4. In cases of county wide impact, do public education via the newspaper, television and radio**

Copy: Elaine Hatch

## INDIVIDUAL HOSPITAL RESPONSE STRATEGIES FOR SATURATION

Hospital saturation\* response strategies was created by the Dept of Health Services, Licensing and Certification Program (DHS, L&C) and the Emergency Medical Services Authority (EMSA) to assist both Local Emergency Medical Services Agencies (LEMSA) and general acute care hospitals develop diversion policies and procedures. This document should be used in conjunction with the EMS Model Ambulance Diversion Program guidelines when developing diversion procedures.

It is not intended to be all inclusive as hospitals or LEMSAs may have developed their own guidelines that are just as effective, however, the concepts or strategies contained in the document should be used as a basis for all hospital saturation plan development.

### Stage I, Strategies

#### Pre-event

Plans for ED/Critical Care saturation, hospital saturation and disaster condition resolution developed in coordination with local EMS agency and other area hospitals.

- Identify available resources, medical material, equipment and staff.
- Distribute planning information
- Conduct hospital wide training
- Conduct scenario based practice exercises

### Stage II\*\*, Strategies

#### Event

ED/Critical Care – saturation/diversion

- Increase staffing, open anyunstaffed critical care beds
- Eliminate elective surgeries and diagnostic procedures
- Transfer critical care patients to step-down or other beds as appropriate
- Request ambulance diversion from LEMSA
- Set up clinics for non emergency cases
- Media release discouraging non-emergency visits
- Relaxation of staff: patient ratio (Requires verbal approval by DHS L&C)
- Activate emergency preparedness plan using hospital ICS (HEICS)
- Evaluate inventory of equipment and supplies

### Stage III, Strategies

#### Event

Hospital – saturation/diversion

- Increase staffing, open anyunstaffed Medical/Surgical beds
- Eliminate elective surgeries and diagnostic procedures
- Early transfer of patients to Extended Care Facilities or to home as appropriate

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- Temporary increase bed capacity of Hospital (Requires verbal DHS L&C approval)
- Request ambulance diversion from LEMSA
- Activate emergency preparedness plan using hospital ICS (HEICS)
- Evaluate inventory of equipment and supplies

### **Stage IV, Strategies**

#### **Event**

##### Disaster Condition

- Activate emergency preparedness plan
- Local proclamation of disaster
- State proclamation of disaster
- Federal declaration of disaster

\*Saturation is a collective term meaning when all stations or beds are filled to capacity and/or traditional staffing to patient ratios are at maximum under the hospitals written staffing plan.

\*\*Stage II, III or IV saturation may occur separately, in any order or combination, or all at once. Strategies should be considered in descending order prior to requesting diversion.

## APPENDIX L

### California Strategic Planning Committee for Nursing

#### Phase IIA Fact Sheet

(March 2, 1998)

#### DEMAND

- Nationally, California ranks the lowest out of the 50 states in the proportion of RNs per 100,000 population, from a high of 1,710 per 100,000 in the District of Columbia to a low of 566 per 100,000 in California. And, it will only continue to decrease as the state population increases by 21% from the 1997 to the year 2010.
- Between 1995 and 1998 there will be major shifts in the locations of employment sectors and anticipated growth for the need for nurses in clinics, home care, and medical centers.
- Increases in employment are anticipated for LVNs, RN staff nurses, and advanced practice roles.
- Hospitals have an increased need for intensive care and critical care nurses prepared at the baccalaureate level to manage complex patient care and to supervise unlicensed assistive personnel.
- Public Health and home care agencies need nurses prepared at the baccalaureate level to manage health care needs and provide health promotion services for people in their homes, clinics, schools, and work places.
- The health care system across all settings needs additional advanced practice nurses including nurse practitioners, nurse anesthetists, nurse midwives, and nurse case managers.
- Employers of LVNs project a need to increase by eight percent, LVN, FTEs this year.

#### SUPPLY

On the national level:

- According to the American Association of Colleges of Nursing's report of 1997-98: enrollments of first time basic nursing students in baccalaureate programs decreased by 6.6% regardless of region or type of institution. What's more, RN baccalaureate completion programs showed a minimal increase last year compared to 1996 (-2%). This means that California cannot rely on other states to continue to produce nurses for us. Yet:
- At this time, approximately half of California's nurses were educated in other states or countries.

## APPENDIX L

On the state level:

- In California, there are 76 licensed vocational nurse programs, 71 associate degree programs, 22 baccalaureate and higher degree programs, and seven entry level master's programs. The University of California system has only two schools of nursing, both of which focus on master's and doctoral levels.
- Eighty percent of the nurses educated in California are initially prepared at the associate degree level. California needs nurses prepared at all levels, but as stated earlier, it needs to increase the number prepared at the baccalaureate level to meet today's and tomorrow's health care needs.
- The current nursing work force does not reflect the ethnic/racial population representation in California. Graduations have not been reflective of the diversity; however, new enrollments are closer to the ethnic/racial representation.
- The work force is aging. Half the RNs in California are over 45 years of age and 30% are over 50.
- The LVN programs intend to increase their enrollments by 13% by 1999.
- Among ADN programs responding, the intention is to maintain enrollments at current levels for the next two years.
- Among baccalaureate and higher degree programs, plans are to increase RN completion programs from 399 graduates in 1997 to 745 in 1999. Projected increases fall extremely short of the projected numbers needed at the BSN level.
- Generic (entry level) baccalaureate programs intend a slight increase from 1,052 graduates in 1997 to 1,198 graduates in 1999.
- The majority of nursing school graduates are from associate degree programs and yet, employers indicate a need for more baccalaureate prepared nurses; however, baccalaureate programs predict a decrease in enrollments although there is an intention to increase post licensure programs.
- Generic (entry level) master's programs expect to increase graduates from 45 in 1997 to 135 in 1999.

Summary:

- Short term supply of nurses was adequate over the last year or two.
- There are already shortages in some regions for critical care nurses and nurses in a variety of settings who possess the skills obtained through baccalaureate education.
- These shortages will increase unless the pipeline for nursing education is widened in California.

## APPENDIX L

- We must act now to remedy the situation and provide an adequate supply of well-qualified California nurses.

### Recommendations:

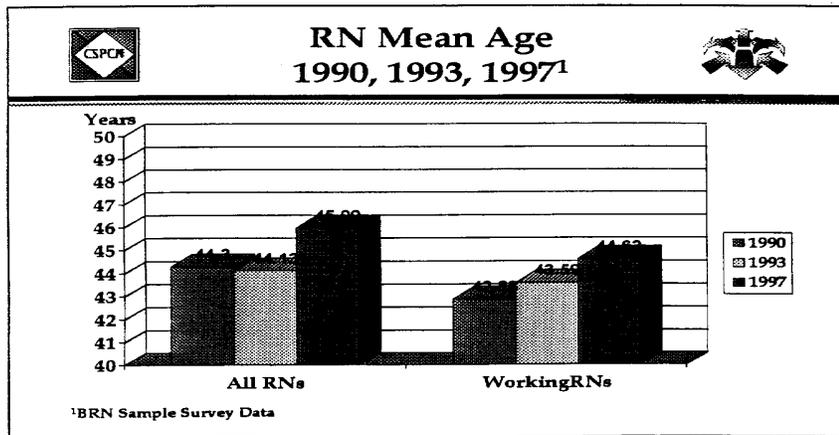
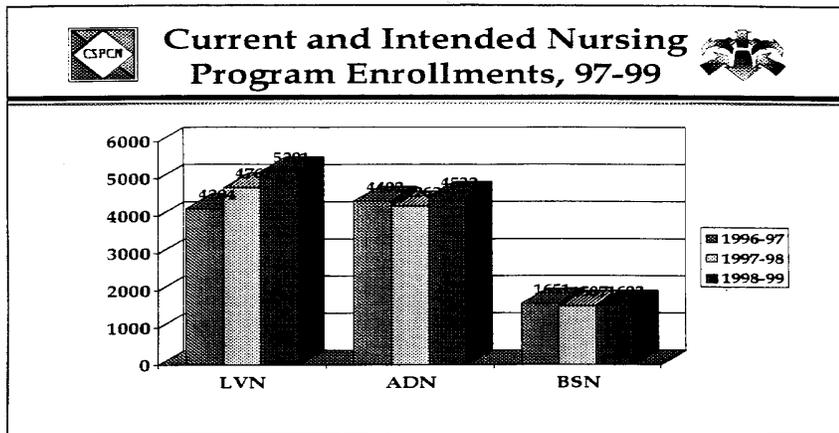
Develop a strategic master plan for nursing education in California to:

- provide adequate resources for CSU and UC systems to increase enrollments and facilitate timely graduations.
- improve access to all baccalaureate and higher degree programs (public and private) for diploma and associate degree graduates by removing barriers for entry into the programs, increasing articulation agreements, and providing increased traineeships and scholarships.
- integrate the CSPCN forecasting model into a state agency so that the workforce supply and demand data will always be available for planning.

# APPENDIX L

CSPCN/CIC Supply Data, Education Intention Study and BRN Survey Data

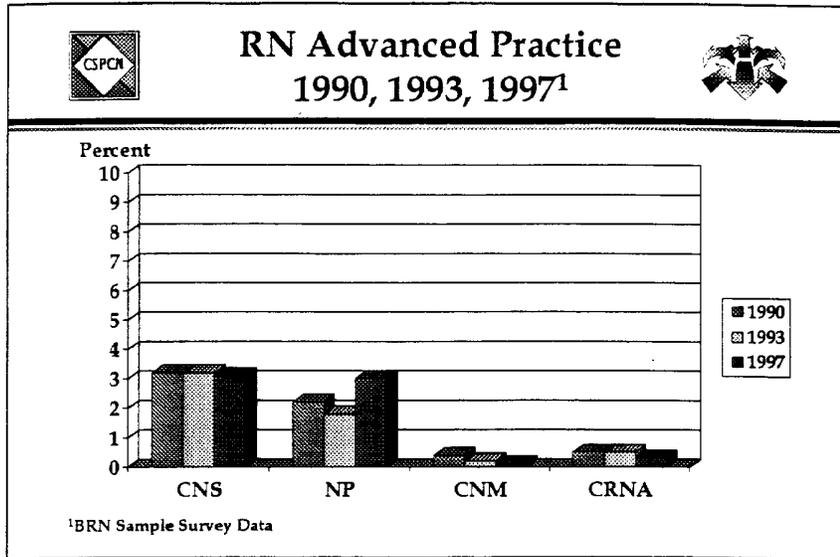
9/20/98



APPENDIX L

CSPCN/CIC Supply Data, Education Intention Study and BRN Survey Data

9/20/98



APPENDIX M

**Informational Hearing on Nursing: Shortages and Practice Issues**

**March 2, 1998; 2:00 to 5:30 p.m.**

**State Capitol, Room 4203**

Opening Comments

•Senator Richard Polanco, Chair; Committee Members (5 minutes)

Panel 1 -- Dimensions Of The Nursing Shortage: Workforce Data, Implications for Patient Care (45 minutes + Q&A)

•Ruth Ann Terry, Board of Registered Nursing •Teresa Bello-Jones, Board of Licensed Vocational Nurse and Psychiatric Technicians •Kit Costello, California Nurses Association •Sara Keating, California Strategic Planning Committee for Nursing

Panel 2 -- Contemporary Nursing Practice, Scope of Practice Issues (45 minutes + Q&A)

•Hedy Dumpel, California Nurses Association •Mary Dee Hacker, California Hospital Association •Lydia Bourne, California School Nurses Organization •Janet Coffman, Center for the Health Professions (Workforce Policy and Analysis), UCSF

Panel 3 -- Nurse Education and Training Programs: Current Status, Future Plans (45 minutes + Q&A)

•Catherine Dodd, American Nurses Association, California •Nancy Sprotte, California State University •Dixie Bullock, California Community Colleges •Ruth Ann Terry, Board of Registered Nursing

Public Comments (20 minutes)

Closing Comments ( 5 minutes)

•Senator Polanco; Committee Members

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Background Paper for Senate Business and Professions Committee

Informational Hearing on Nursing: Shortages and Practice Issues

March 2, 1998

California is beset by a shortage of nurses, and the shortage has serious implications for patient care. The Senate Committee on Business and Professions, chaired by Senator Richard Polanco, has

## APPENDIX M

convened a hearing for March 2, 1998, to explore the demographics of the nurse workforce, dimensions of the nursing shortage, the scope of contemporary nursing practice, nurse education programs, as well as planning and funding to sustain the nurse workforce of the future.

### Dimensions of the Nurse Shortage

Statewide media has brought the nursing shortage to the public's attention, citing reports from health departments, statewide health care associations, various hospitals, health plans and all nurse associations. The nursing shortage has caused significant concern among health care professionals -- the recent flu season underscored the problems when emergency rooms closed their doors and hospitals in almost every region of the state ran out of licensed beds for seriously ill patients. It is important to note that the current crisis is not related to a shortage of beds, but to a shortage of nurses. Understaffed hospitals threaten both the quality of health care for patients and the working conditions for nurses. If this shortage of nurses is not addressed, California will continue to face an ongoing crisis in health care delivery.

### Experts Cite Several Causes for the Nurse Shortage

Experts point to several causes for California's current nursing shortage. In a recent *Nurseweek* article, Katie Bray, nurse recruitment manager for Kaiser Permanente in Northern California, discussed several factors, including hospitals' downsizing policies, not offering new nursing graduates jobs, and an increased demand for health care as the improving economy provides more workers with health insurance. Bray said "The recruitment infrastructure was demolished during the downsizing." The California Nurses Association and other nurse organizations have been quoted extensively regarding the shortage and related issues such as the economics of managed care, increased utilization of nurses in public health settings due to the changes in the health care delivery system, the aging of the nursing population, and the retrenchment of public support for the education of professional, licensed nurses.

Newspaper stories from around the state in the past two months quoted nurses who were alarmed to find themselves stretched ever thinner in hospitals. During a shortage, these licensed nurses are stressed by the increased demand to work longer hours and to care for sicker patients. The nurse organizations perceive the shortage as the predictable result of years of downsizing by hospital management and the replacement of licensed nurses with unlicensed assistive personnel or UAPs.

### Implications of the Nurse Shortage

Given the projection of increases in the need for RNs and the current shortage, what factors are important to consider? First, many hospitals are now paying the price for aggressive costcutting practices during the advent of managed care over the last decade. California leads in the recent accession of managed care, the growth of HMOs, and the "restructuring" of hospital care delivery - and the growing pains in the California health care market seem to be commensurate. These growing pains are compounded by the strenuous activity over recent years of mergers of health systems and hospitals in both the private and public sector.

## APPENDIX M

According to the California Nurses Association (CNA), these changes are undermining the quality and safety of patients care and of the nursing profession. Many hospitals rushed to downsize as a response to unmanaged competition. In addition, there are widespread allegations that many hospitals have been replacing licensed nurses, especially RNs, with unlicensed assistive personnel (UAPs) to provide direct patient care as a cost-saving device. The CSPCN report noted a loss of 4000 full-time RN positions from the staff of hospitals during the years 1995-98. CNA argues that these changes have led to a diminution of both the skills and the professional stature of the nursing profession.

### Aging of the Nurse Workforce

Another cause for concern, and attention from policy makers, is the aging of the nurse workforce. Last year, the CSPCN report put the average age of California nurses at 46.5 years with 30 percent of full-time RNs over the age of 50. Many of these older nurses are retiring or looking for work elsewhere, especially as the shortage takes its toll on working conditions in the profession. The aging of the nursing population, and the impending retirement of large numbers of the current nurse workforce, exacerbates the shortage problem and underscores the need for increased state support for education and training for new nurses.

The entry-level population of nurses is also increasingly older, according to Jan Norbeck, Dean of the UC San Francisco School of Nursing. And according to Patricia Prescott, workforce consultant to the Robert Wood Johnson Foundation's Colleagues in Caring Project, nurses are beginning shorter careers: "You're looking at a 20 year career not a 40 year career. This will reduce the number of nurses in the work force just when baby boomers hit their decades of peak health care need," she says.

### Nursing Shortage Linked to Broader Changes in Health Care

A third cause for concern and attention from policy makers is the monumental change in medical care delivery systems in the United States over the last fifteen years, particularly the increased emphasis on cost reduction and shorter hospital stays, resulting in a widespread perception that patients are being released "quicker and sicker." The move toward cost reduction has caused an increase in medical care being delivered in the community, resulting in the growth of home health care facilities, ambulatory centers and community health organizations delivering care outside the traditional hospital setting.

The CSPCN study points out one of the problems with nurse education data, citing a 1991 report on California's capacity to prepare RNs by the California Postsecondary Education Commission (CPEC). CPEC concluded that the state lacks a definitive study of nursing supply and demand. Frequent discussions between the CNA and the OSHPD over the need for better nurse workforce data is the impetus behind SB 1125 (Alpert). The CSPCN study also cites enrollment from the National League for Nursing (NLN), which indicates that California's annual admissions to generic baccalaureate degree nursing programs have fluctuated markedly over the last ten years from a high of 2,111 in 1983-84 to a low of 1,371 in 1989-90. Discussions with OSHPD regarding the RN Education Fund bill, AB 895 (Escutia), revealed that one of the problems with the BSN scholarship program was that all of the programs have been reported to be "impacted" by the BRN.

## APPENDIX M

The term "impacted" means that there are too many qualified students and insufficient spaces in the four year programs to educate them. Representatives of California State University are expected to present updated data at the March 2, B&P Committee hearing though the data was not available for incorporation with the members' background materials.

Recently, there have been significant changes in the public support for nurse education programs. First, there has been a trend of diminished resources being directed to current educational programs, which has strained the programs' ability to provide all of the components of quality nurse education. Most programs can not expand, and many have been cut back. Some were in a position to be eliminated by the campus administration, such as the recent proposal at CSU, Fullerton, which was reversed and the program is not accepting students. At one point, CSU-Fresno, was reported to have 800 students on the waiting list for 60 slots in the first year BSN program. CSU provides all of the state-supported BSN or ADN to BSN programs and smaller masters degree nurse programs. Private institutions provide these programs as well but at extremely high tuition levels. This year, CSU reports that out of total enrollment at their segment of 250,000 full-time students, the CSU serves 6000 full-time nursing students in all programs. CPEC data from 1992-96 shows that the CSU graduated an average of 1,347 students per year.

The California Community Colleges (CCC) provided an average of 3,026 ADN degrees over the same time period, according to the CPEC statistics. In addition, the Community Colleges are increasingly providing the specialty training for RNs that in the past, hospitals were providing, such as intensive care, emergency, neonatal and other specialty training. Nurse organizations note that the CCC programs tend to be more accessible to underrepresented students and are an important factor in diversifying the nurse work force. All nurse groups believe that one of the important links for ADN degree RNs is improved access to publicly supported ADN to BSN programs to promote underrepresented students and are an important factor in diversifying the nurse work force. All nurse groups believe that one of the important links for ADN degree RNs is improved access to publicly supported ADN to BSN programs to promote underrepresented students to climb the ladder of the nurse profession in order to be eligible to work as public health nurses. In addition, all nurse groups believe that it is important to expand recruitment of underrepresented students for the entry level BSN programs.

UNIVERSITY OF CALIFORNIA SCHOOLS OF MEDICINE: TABLE A  
 1997-98 DISTRIBUTION OF MEDICAL RESIDENTS AND OTHER POST-M.D. TRAINEES BY CAMPUS AND SPECIALTY (1) (2)  
 (COMPARISON WITH 1992-93 BASE YEAR DISTRIBUTION)

997-98 (1) (4)

ATTACHMENT IV

SPECIALTY	Number of Medical Residents							TOTAL	%	Number of Other Post-M.D. Residents		Total All Categories	%	
	DAVIS	IRVINE	LOS ANGELES	SAN DIEGO	SAN FRANCISCO	LOS ANGELES	SAN FRANCISCO			Extended Year	Other			
PRIMARY CARE														
Family Practice	220	32.4	146	22.5	182	12.9	54	10.6	137	12.0	739	16.9	746	15.8
Internal Medicine	91	13.4	103	15.9	407	28.9	98	19.3	266	23.4	965	22.0	988	21.0
Obstetrics & Gynecology	32	4.7	27	4.2	66	4.7	20	3.9	44	3.9	189	4.3	206	4.4
Pediatrics	49	7.2	48	7.4	111	7.9	42	8.3	97	8.5	347	7.9	358	7.6
TOTAL PRIMARY CARE	392	57.8	324	50.0	766	54.4	214	42.1	544	47.8	2240	51.1	2298	48.8
TOTAL NON-PRIMARY CARE	286	42.2	324	50.0	643	45.6	294	57.9	593	52.2	2140	48.9	2414	51.2
GRAND TOTAL	678	100.0	648	100.0	1,409	100.0	508	100.0	1,137	100.0	4,380	100.0	4,712	100.0

1992-93 BASE YEAR FOR UC PRIMARY CARE EXPANSION PLANNING (3)

SPECIALTY	Number of Medical Residents							TOTAL	%	Number of Other Post-M.D. Residents		Total All Categories	%	
	DAVIS	IRVINE	LOS ANGELES	SAN DIEGO	SAN FRANCISCO	LOS ANGELES	SAN FRANCISCO			Extended Year	Other			
PRIMARY CARE														
Family Practice	164	26.5	107	16.2	109	7.8	18	3.6	123	10.6	521	12.0	571	12.0
Internal Medicine	82	13.2	91	13.8	385	27.4	76	15.3	254	21.9	888	20.5	988	21.0
Obstetrics & Gynecology	33	5.3	29	4.4	63	4.5	20	4.0	43	3.7	188	4.3	206	4.4
Pediatrics	49	7.9	54	8.2	109	7.8	41	8.3	84	7.3	337	7.8	358	7.6
TOTAL PRIMARY CARE	328	52.9	281	42.6	666	47.4	155	31.3	504	43.5	1,934	44.6	2,094	44.6
TOTAL NON-PRIMARY CARE	292	47.1	379	57.4	739	52.6	341	68.8	654	56.5	2,405	55.4	2,618	55.4
GRAND TOTAL	620	100.0	660	100.0	1,405	100.0	496	100.0	1,158	100.0	4,339	100.0	4,712	100.0

TOTAL NET CHANGE FROM 1992-93 BASE YEAR FOR UC PRIMARY CARE EXPANSION PLANNING

SPECIALTY	Number of Medical Residents							TOTAL	%	Number of Other Post-M.D. Residents		Total All Categories	%	
	DAVIS	IRVINE	LOS ANGELES	SAN DIEGO	SAN FRANCISCO	LOS ANGELES	SAN FRANCISCO			Extended Year	Other			
PRIMARY CARE														
Family Practice	56	34.1	39	36.4	73	67.0	36	200.0	14	11.4	218	41.8	218	41.8
Internal Medicine	9	11.0	12	13.2	22	5.7	22	28.9	12	4.7	77	8.7	77	8.7
Obstetrics & Gynecology	-1	-3.0	-2	-6.9	3	4.8	0	0.0	1	2.3	1	0.5	1	0.5
Pediatrics	0	0.0	-6	-11.1	2	1.8	1	2.4	13	15.5	10	3.0	10	3.0
TOTAL PRIMARY CARE	64	19.5	43	15.3	100	15.0	59	38.1	40	7.9	306	15.8	306	15.8
TOTAL NON-PRIMARY CARE	-6	-2.1	-55	-14.5	-96	-13.0	-47	-13.8	-61	-9.3	-265	-13.0	-265	-13.0
GRAND TOTAL	58	9.4	-12	-1.8	4	0.3	12	2.4	-21	-1.8	41	0.9	41	0.9

1) UC defines a resident as a medical school graduate (M.D./D.O.) who is participating in an accredited residency program for the minimum number of years required for specialty (or subspecialty) accreditation by the Accreditation Council on Graduate Medical Education (ACGME). An extended-year resident is a medical school graduate (M.D./D.O.) who is participating, based on a UC campus requirement, in an accredited residency program beyond the minimum number of years required for accreditation by the ACGME. An "other" clinical trainee is a medical school graduate (M.D./D.O.) who is participating in clinical, teaching, or administrative activities that are not part of ACGME or campus requirements and, therefore, is neither a medical resident nor an extended-year resident.

2) As reported by campus in Fall 1997 Health Sciences Enrollment Update.

3) Primary Care includes Family Practice, Internal Medicine, Obstetrics & Gynecology, and Pediatrics. Subspecialties for all disciplines including Family Practice are included in the Non-Primary Care category.

4) A table showing distribution of Non-Primary Care Residents by Specialty is included in the Appendix as Table C.

5) Data as reported in UC's June 1993 report titled "Changing Directions in Medical Education". Excludes all residents/other clinical trainees in Preventive Medicine and Occupational Medicine Specialties. 1992-93 specialty distribution for Extended-Year Resident and Other Clinical Trainees is not available. The specialty distribution of Extended Year Residents and Other Clinical Trainees was reported in the aggregate in 1992-93.

## **VII. LIST OF ACRONYMS**

ALS	Advanced Life Support
CCR	California Code of Regulations
CDC	Centers for Disease Control
CHA	California Healthcare Association
CPR	Cardio-Pulmonary Resuscitation
CSPCN	California Strategic Planning Committee for Nursing
DCDC	Division of Communicable Disease Control
DHS	Department of Health Services
ED	Emergency Department (s)
EMS	Emergency Medical Services
EMSA	Emergency Medical Services Authority
FEMA	Federal Emergency Management Agency
GACH	General Acute Care Hospitals
HEICS	Hospital Emergency Incident Command System
ICS	Incident Command System
ICU	Intensive Care Unit
ILI	Influenza-Like Illness
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
L&C	Licensing and Certification
LEMSA	Local Emergency Medical Services Agency
MICRS	Medically Indigent Care Reporting Systems
OSHPD	Office of Statewide Health Planning and Development
SEMS	Standardized Emergency Management System

## **VIII. TASK FORCE MEMBERSHIP**

### California Emergency Medical Services Authority, Convenor

Richard Watson, Interim Director  
Dan Smiley, Chief Deputy Director  
Jeffrey Rubin, Chief, Disaster Medical Services Division

### California Department of Health Services, Co-Chair

Brenda Klutz, Deputy Director, Licensing and Certification Program  
Ray Nikkel, Chief, Field Training Unit, Licensing and Certification Program  
Jon Rosenberg, M.D., Public Health Medical Officer, Division of Communicable Disease Control  
Jack McGurk, Chief, Environmental Management Branch

### California Healthcare Association, Co-Chair

Dorel Harms, Vice President, Professional Services

### California Office of Statewide Health Planning and Development

Mike Kassis, Deputy Director, Health Care Information Division  
Priscilla G. Leiva, Deputy Director, Primary Care and Community Resources Development  
Deborah Ryan, Research Specialist  
Charlene Zimmer, Analyst

### California Governor's Office of Emergency Services

Phyllis Cauley, Chief, Plans Unit  
Rick Tobin, Emergency Services Coordinator

### Riverside County Emergency Medical Services Agency/Emergency Medical Services Administrators Association of California

Michael Osur, Emergency Medical Services Administrator

### Sacramento County Health Department/California Conference of Local Health Officers

Bette Hinton, M.D., Sacramento County Local Health Officer

### San Francisco County Emergency Medical Services Agency/Emergency Medical Services Administrators Association of California

Abbie Yant, Emergency Medical Services Administrator  
Mary Magocsy, Agency Staff

### Region I Disaster Medical/Health Coordinator

Mitch Saruwatari, Project Staff

### Region IV Disaster Medical/Health Coordinator

Judy Scott, Staff

### American River Fire Department/California Fire Chiefs Association

Kevin White

### Emergency Physicians' Medical Group/Commission On Emergency Medical Services

Tim Sturgill, M.D.