California HealthCare Foundation

California's Emergency Departments

System Capacity and Demand

April 2002

ISSUE BRIEF

Background

In recent years, California has been confronted with the unsettling prospect that its emergency health care system may be losing its ability to serve the millions of patients that seek care each year.

The state's 364 hospitals with emergency departments (ED), which served 9.7 million patients in 2000, play a vital role in the state's health care system. They provide 24-hour outpatient emergency health services and are a critical point of entry to inpatient hospital care. Yet in recent years, many observers fear that hospitals are becoming overwhelmed by patient demand and contend that the system is approaching the breaking point.

Hospitals today operate in a rapidly evolving environment, facing increased financial and economic pressure from a variety of sources, including price competition and cost containment initiatives by employers and government payors.

At the same time, the demand for emergency care appears to be rising. Some 6.8 million Californians do not have health insurance, despite recent gains in expansion of coverage. Federal regulations mandate that all ED patients must be seen by a physician, regardless of their ability to pay. Thus, hospital EDs are the only source of guaranteed outpatient care for millions of underinsured and uninsured Californians. In addition, ED patients may be more seriously ill than they were a decade ago, creating greater demand on hospital resources.

These economic and financial pressures have led to a growing unease over the operational efficacy and financial stability of California's ED system. The state's emergency medical services system has undergone a series of highly publicized ED closures, seemingly chaotic periods of access problems for emergency care, and reports of the system's pending insolvency. This has spurred a growing chorus of demands for action, ranging from financial bailouts for hospitals to legislative proposals that would regulate emergency department operations.

It is important to study ED capacity issues for a number of reasons. Overcrowding can result in poorer outcomes for seriously ill patients, who must wait longer for care critical for their survival and/or recovery. Patients who wait longer are more likely to leave an emergency department without being seen by a physician — and studies have shown that those who leave are just as in need of medical care as those who stay.

The problems of perceived overcrowding at California's emergency departments may be due to a complex mix of factors. The perception that emergency department closures and increasing patient volume are the sole causes of ED overcrowding may be inaccurate. The true causes may be a combination of influences that lie outside the control of any individual emergency department.

Methodology

The study on which this brief was based was conducted by the USC Center for Health Financing, Policy & Management at the University of Southern California, and was commissioned by the California HealthCare Foundation as part of a larger research project focused on the economic and financial issues confronting California's EDs. The study examined overall ED capacity, ED openings and closures, patient demand, and patient acuity among California's emergency departments from 1990 through 2000. In addition, it examined trends in utilization and openings and closings among trauma centers from 1990 through 2001.

Data were combined from several sources. The state Office of Statewide Health Planning and Development (OSHPD), which requires all hospitals to file annual reports on utilization data, provided two data sets for this analysis: Annual Utilization Report of Hospitals, and the Annual Hospital Financial Data for California. These data were supplemented by federal census data.

The OSHPD data contain a number of variables relevant to ED capacity issues. These include licensure status, total emergency department visits, patient acuity, total number of ED beds, and general hospital organizational information, such as ownership, location, and operational status.

The study sought to answer the following questions on ED capacity in California:

- Is there evidence that the overall capacity of the ED system in California is being eroded?
- How has demand for ED care in California changed over time?
- Have California hospitals adjusted their ED capacity to cope with changes in demand?

There are three types of emergency departments in California:

- ***Standby.*** Hospital maintains a designated area for emergency services, but a physician is on-call only;
- ***Basic.*** Hospital has physician and staff on duty at all times for urgent medical problems;
- ***Comprehensive.*** Hospital has in-house capability for managing all medical conditions on a definitive and ongoing basis. This is typically associated with a large tertiary and/or academic medical center, with specialty programs such as burn centers and psychiatric units.

In addition to emergency departments, 48 hospitals statewide maintain trauma centers, whose in-house staffing and training levels represent the most comprehensive emergency medical care available in California. Under state law, hospitals with trauma centers must also maintain basic or comprehensive emergency departments.

For the study, the types of visits to emergency departments were defined as:

- ***Critical.*** Acute injuries or illnesses that could result in permanent damage, injury, or death without immediate intervention, such as head injuries, vehicular accidents, and gunshot wounds;
- ***Urgent.*** Acute injuries or illnesses where loss of life or limb is not an immediate threat, such as broken bones or lacerations;
- ***Non-urgent.*** Relatively minor injuries or illness, such as toothaches or colds.

Major Findings

Although the number of hospitals with emergency departments has declined over the past decade, California's hospitals have added considerable bed capacity to the state's ED system. In fact, growth in ED bed capacity has outstripped California's population growth, leading to an increase in the number of ED beds per capita. In addition, California's trauma center system has remained remarkably stable during the study period, and has even expanded slightly.

ED visit data for the past decade do not offer proof of a capacity crisis that can be attributed to volume increases or higher per capita utilization rates. However, significant volume growth in 1999 and 2000, coupled with higher patient acuity, may indicate that the state's hospital-based emergency medical services system is nearing its limit to absorb continued increases in demand, particularly in some facilities or communities.

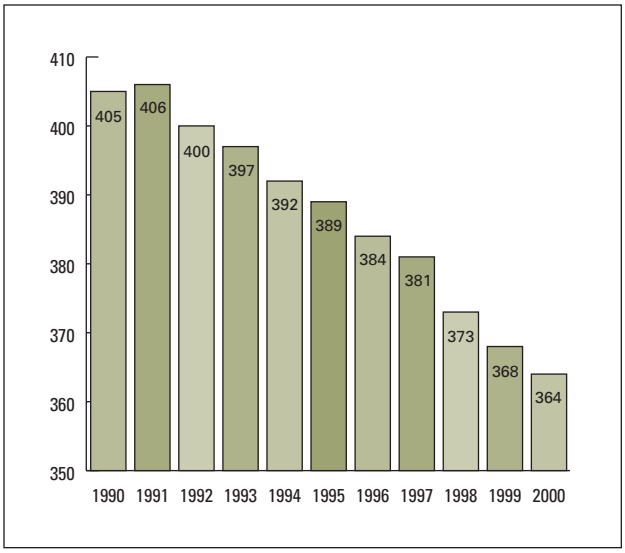
Use and Capacity of California Emergency Departments

Openings and Closures

Given the growing concern that financial pressures are forcing California hospitals to close their EDs, it is important to examine whether the state's hospitals have in fact reduced the availability of EDs over time.

California had 405 licensed emergency departments in 1990, but that number fell more or less continuously from its 1991 peak of 406, to 364 EDs at the end of 2000. During the same time, 41 new hospitals opened their doors; 25 between 1990 and 1995, and another 16 between 1996 and 2000. Only 19 of these hospitals included emergency departments in their service line.

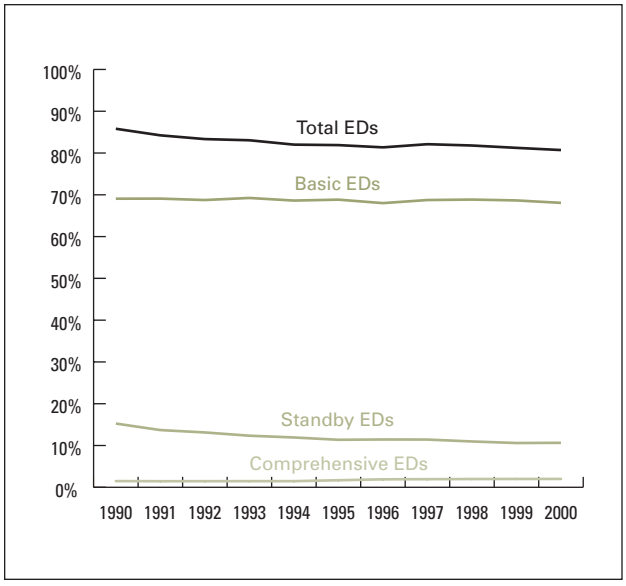
Figure 1. Number of California Hospitals with EDs, 1990–2000



Among hospitals statewide that remained in operation throughout the 1990 to 2000 time frame, 19 facilities shut down their EDs, while only four opened new emergency departments. However, the majority of closures—13 of the 19—took place between 1990 and 1995.

In total, the percentage of hospitals in California with ED operations shrank slightly, from 85 percent in 1990 to 81 percent in 2000. Basic EDs comprise the single biggest category, with 68 to 69 percent of all hospitals statewide offering basic ED services throughout the study period. Standby EDs are the next most common category, but their numbers showed the biggest proportional contraction, going from 15 percent of the total in 1990 to 10.6 percent in 2000. The number of hospitals with comprehensive ED services grew from seven to nine during the study period, but comprised only 1.9 percent of the total.

Figure 2. Percentage of California Hospitals with EDs by Service Level, 1990–2000



Trauma Centers

California's trauma centers provide the highest levels of emergency care to the most critically ill and injured patients, maintaining the highest level of service in terms of specialized equipment, and a wider array of specialized medical personnel, including panels of on-call specialist physicians. Trauma centers receive their patients under stringent formulas of patient condition assessment and geographic service areas. Under state law, hospitals with trauma centers also must maintain emergency departments.

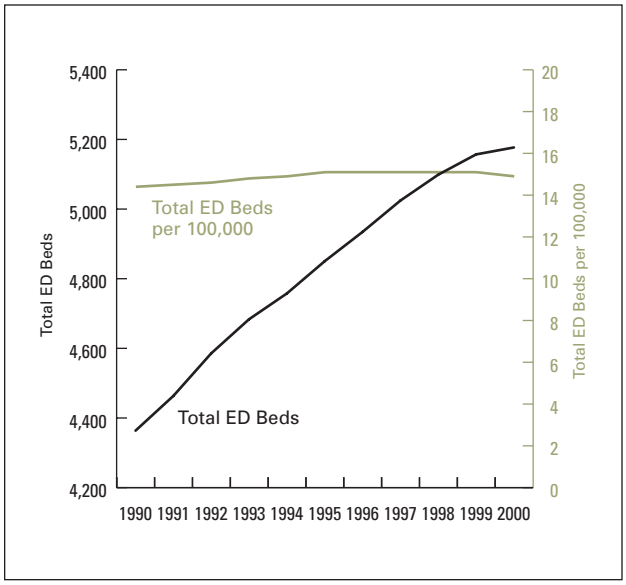
The number of hospitals statewide offering trauma services increased from 36 in 1990 to 48 in 2001.

Increases in ED Bed Capacity

Although the number of operational EDs in California declined over the study period, the capacity of the system grew, in terms of available emergency beds or treatment stations. An ED bed or treatment station is defined as a separate area within the department designed to treat one patient. Under this definition, holding areas and observation beds do not contribute to total bed capacity.

Statewide, the number of total ED beds increased 19 percent, from 4,364 in 1990 to 5,177 in 2000, more than keeping pace with California's population, which grew by 15 percent, to nearly 35 million. The growth of bed capacity peaked in 1991, and slowed in 1998–2000, the last three years of the study period. In addition, the proportion of ED beds licensed as basic or comprehensive has steadily increased. In 2000, 91 percent of total ED bed capacity was in the basic service category, and another 6 percent was in facilities with comprehensive ED licenses.

Figure 3. California ED Bed Capacity, 1990–2000



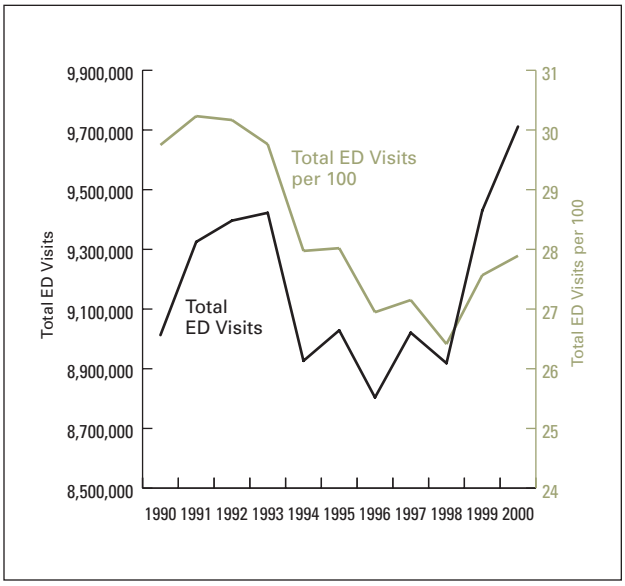
Increasing Patient Demand and Acuity Levels

In another important development, the medical conditions of those coming to emergency departments during the study period grew relatively more severe, with seriously ill patients comprising a substantially larger proportion of ED utilization.

Patient volume at emergency departments statewide grew substantially in 1999 and 2000, after periods of fluctuating demand in the early and mid-1990s. Overall, ED visits increased nearly 8 percent between 1990 and 2000. While visits actually declined from the previous year in three of the 11 years studied, ED visits in 1999 alone rose 5.7 percent, to 9.4 million —the largest single annual increase in the study. In 2000, visits rose another 3 percent.

The number of ED visits per 100 residents varied between 1990 and 2000, declining 6.2 percent over the total study period. The figures ranged from a high of 30 visits per 100 in 1991, to a low of 26.9 visits in 1998. However, 1999 and 2000 marked the first two-year period in which visits per capita increased in both years, with increases of 4.4 percent and 1.2 percent, respectively.

Figure 4. California ED Visits, 1990–2000

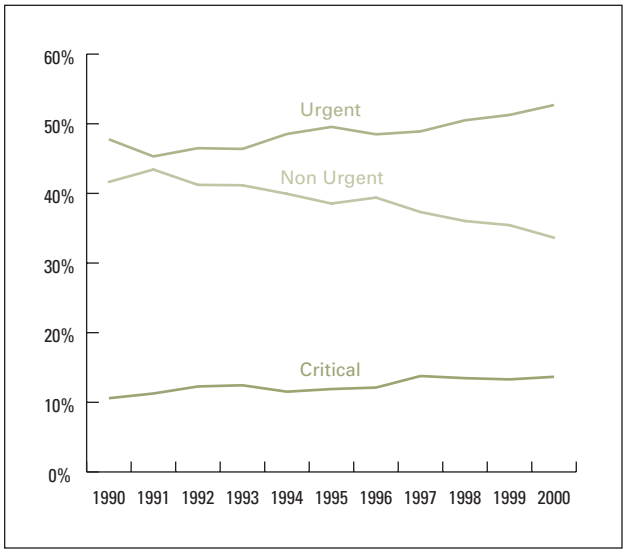


When the study reviewed the number of ED visits per ED bed as an indicator of volume, it found that the ratio of ER visits per bed declined nine percent overall, with a relatively steady decline in the early to mid-1990s after the study period's high of 2,089 visits per bed in 1991. By 1998, ED visits per bed reached a 11-year low of 1,749 visits per bed. In 1999 and 2000, the trend appears to have reversed. In 2000, the ratio increased to 1,876 ED visits per bed.

Another important variable in ED operations is how sick the patients are. Seriously ill patients may need more treatment time per visit and consume more resources than those whose needs are less urgent. Increases in patient severity can reduce the number of patients that a hospital ED can treat, or may lead to longer wait times and increased perceptions of overcrowding.

The study found that ED patient severity in California increased substantially between 1990 and 2000. Urgent and critical cases as a total of all visits rose by 14 percent, from 58 percent in 1990 to more than two thirds in 2000. Critical-care visits rose even more dramatically, to 14 percent of all ED visits in 2000 — a 29-percent increase over 1990.

Figure 5. Distribution of ED Visits by Severity



Meanwhile, non-urgent visits fell 19 percent during the study period, from nearly 42 percent of all visits in 1990 to just over 33 percent in 2000.

ED Admissions and Critical Care Capacity

One often mentioned explanation for ED overcrowding and ambulance diversion is a lack of available critical care beds to accommodate patients requiring admission, reducing an emergency department's capacity to treat other patients while the admitted patient waits for a bed.

The study found no consistent upward trend in inpatient admissions as a percentage of total ED visits, although there was evidence of additional pressure being exerted on ED capacity from reductions in staffed critical care beds.

The study found that in 1990, 13.5 percent of all ED visits resulted in an inpatient admission. In 2000, the admit rate was 14.5 percent, a 7.2-percent increase. However, the growth was uneven over that time. After rising annually between 1996 and 1998, the admit rate dropped by nearly four percent in 1999, before growing again by two percent in 2000.

Over a seven-year period, from 1993 to 1999, the only years for which data are available, staffed critical care bed capacity decreased statewide by 4 percent, from 9,034 beds to 8,667 beds. Overall staffed inpatient bed capacity declined 9.5 percent during this period. Overall, critical care occupancy has remained stable at approximately 66 percent for the past several years, virtually mirroring overall staffed bed occupancy rates in general acute care facilities.

The ratio of ED beds to staffed critical care beds increased by 14.8 percent during the study period, from 0.52 ED beds per critical care bed, to 0.6 ED beds per critical care bed. Finally, the ratio of ED admits to critical care beds rose from 134 in 1993 to 154 ED admissions per critical care bed in 1999, a 15-percent increase.

Policy Implications of Emergency Department Use and Capacity Issues

The study underscores the changing nature of health care in California. While there are a number of dynamic undercurrents at play, statewide data do not reflect an ED system hopelessly caught in the undertow. Certainly, hospital and ED capacity have been undergoing a consolidation statewide, as the number of general acute care facilities, EDs, and inpatient beds have been reduced. However, the capabilities of existing EDs, as reflected in their licensure mix, have grown stronger. ED bed capacity has risen and, adjusted for population growth, the ratio of ED beds per capita has remained more or less constant over the study period.

Total demand for ED services fell in the middle of the study period, but has increased in recent years. However, total ED visits per capita remain well below their high mark of the early 1990s. Data suggest that ED patients are sicker now than in previous years, and inpatient admissions from the ED have increased. Despite an increase in the ratio of ED admissions per critical care bed, staffed inpatient occupancy rates in critical care units have remained relatively flat over the study period.

Overall, it appears that the ED system is evolving and adapting, not eroding. Proposals to radically alter the structure or financing of the ER system thus appear to be premature, or too far-reaching. The analyses of changes in demographics and system-level capacity suggest that the ED system in California is adjusting and recalibrating.

However, the smoothing impact of statewide data may mask more turbulent scenarios within communities or among specific populations or payor groups. An important aspect of continuing study will be to explore whether there are specific areas within the ED system that may require further attention in the policy arena.

FOR MORE INFORMATION CONTACT

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