Year 2000 Health Status Indicators: A Profile of California

James W. Sutocky
Sheila Dumbauld
George B. Abbott, MD MPH

All authors are with the Center for Health Statistics, Department of Health Services, State of California. Mr. Sutocky is a Research Program Specialist, and Ms. Dumbauld is a Research Manager in the Planning and Data Analysis Section. Dr. Abbott is the Acting Chief of the Center for Health Statistics and of the Health Information and Strategic Planning Division.

Address correspondence to Mr. Sutocky, Planning and Data Analysis Section, Center for Health Statistics, California Department of Health Services, 304 S Street, Third Floor, Sacramento CA 95814; tel. 916-445-1358; fax 916-327-8417; e-mail <jsutocky@hw1.cahwnet.gov>.

SYNOPSIS

Objectives. To examine the health status of Californians using a set of 18 health status indicators (HSIs) corresponding to goals set forth in *Healthy People 2000* and to develop a health status profile for use in research and surveillance, policy development, program planning, and program evaluation.

Methods. Federal, state, and county data were used to evaluate California's performance on 18 indicators of health status related to mortality, disease incidence, and health risks.

Results. By 1994, California had achieved Year 2000 objectives associated with seven HSIs and significant declines in mortality associated with two other HSIs. Nationally, California was ranked among the states with the lowest rates for infant mortality, lung cancer, female breast cancer, and syphilis but among states with the highest rates for homicide, AIDS, measles, tuberculosis, late prenatal care, childhood poverty, and poor air quality.

Conclusions. California's experience may provide a useful model for other state and local health agencies monitoring the health status of populations using HSIs associated with Year 2000 objectives.

In 1990, the Public Health Service established national goals for "increasing the span of healthy life, reducing health disparities, and achieving access to preventive services for all Americans by the end of the century."[1] The National Center for Health Statistics and the Health Status Indicators Work Group of the Centers for Disease Control set up a committee to meet one of the *Healthy People 2000* objectives: to "develop a set of health status indicators appropriate for Federal, State, and local health agencies and establish use of the set in at least 40 States."[1,2,3] In July 1991 the committee released an initial consensus set of 18 health status indicators (HSIs): nine mortality indicators, four disease incidence indicators, and five health risk factor indicators.[4]

Although a 1992 survey found widespread use of the 18 HSIs, as of 1996, California was one of only 10 states that had produced reports based on these indicators. (The other states were: Maine, Maryland, Nevada, New Jersey, North Carolina, Oregon, Pennsylvania, Texas, and Utah.)[5,6]

The Center for Health Statistics (CHS) of the California Department of

Health Services (CDHS) had begun monitoring the state's progress in achieving selected national health promotion and disease prevention objectives in 1980, and the state has published analytical reports and descriptive statistics related to these objectives since 1981.[7–11] Beginning in 1993, the CHS began publishing its *County Health Status Profiles* series—in conjunction with Public Health Week activities sponsored by the Association of State and Territorial Public Health Officers—to provide local health jurisdictions with data on the 18 consensus HSIs, the relative rankings of counties within the state on each indicator, and comparisons of county rates with statewide rates and with the national objectives.[12–15] In 1994, the CHS published a major study on the health status of 21 race/ethnic groups in California using the HSIs.[16]

In addition to monitoring health status, California has integrated the national *Healthy People 2000* objectives into its statewide health information and strategic planning goals.[17] The CHS has expanded its role to include the evaluation of data collected by various entities within the state government system including the Office of Statewide Health Planning and Development, the California Highway Patrol, the Department of Alcohol and Drug Programs, the California Environmental Protection Agency, the Department of Industrial Relations, and the Department of Justice.

The CHS is also in the process of developing a World Wide Web site from which users will be able to access national, state, and local health data and information.[18] Use of this communication network will help to increase public awareness of, and identify gaps in, the data essential for monitoring the health status of our population.[19]

The CHS's minority health study published in 1994 with the support of a Public Health Foundation minority health improvement minigrant has generated interest nationwide in using the HSIs and census data to examine differences between race/ethnic groups in health status.[16] This year, the CHS has submitted a proposal to Blue Cross of California for a HealthCare Partnership grant to support collaborative work between the CDHS, the University of California-Los Angeles Center for Health Policy Research, and the California Public Health Foundation to develop a health interview survey modeled after the National Health Interview Survey, from which reliable data on the health status of Californians by sub-populations and by subregions can be generated. The need for such data was made apparent after the passage of legislation that required hospitals in California to perform community needs assessments.

Within the CDHS, the Emergency Preparedness and Injury Control Branch has integrated the *Healthy People 2000* objectives into its framework for developing a comprehensive injury prevention and control program for California, and the Maternal and Child Health Branch has implemented a needs-based health care planning model based on the Year 2000 objectives in determining priorities for allocating Federal Title V Block Grant funds to local programs.[20,21] Similarly, the Cardiovascular Disease Outreach, Resources and Epidemiology program, the Diabetes Control Program, and the California Chronic and Sentinel Diseases Surveillance Program use data from the Year 2000 objectives in the development of strategic plans and programs for the prevention and control of cardiovascular diseases and diabetes.[22–24] The California Behavioral Risk Factor Survey (CBRFS) is an ongoing effort initiated in 1984 and currently administered by the CDHS Cancer Surveillance Section's Research and Surveillance Program, which uses the national objectives in determining priorities for selecting questions for the CBRFS.[25,26]

> Significant declines in the state's infant death rates were encouraging, as were significant declines in deaths caused by cardiovascular diseases, breast cancer, motor vehicle accidents, and suicide.

County-level HSI data are made available by the CHS in paper and electronic formats and are released in collaboration with the California Conference of Local Health Officers annually during Public Health Week along with technical information regarding the computation and interpretation of age-adjusted rates, standard errors, confidence intervals, relative rankings, and comparisons with statewide averages and national Year 2000 targets.[10–12] These reports provide useful information to local health jurisdictions for budget hearings, resource allocation, identifying priority areas for focused disease prevention and health promotion activities, and for public health policy and program development.

California implemented the first statewide Healthy Cities program in the United States in 1988 as a collaborative effort between the CDHS and the Western Consortium for Public Health to implement the health promotion activities outlined in *Healthy People 2000*.[27] At the local level, both large and small jurisdictions in California, such as the City of Los Angeles and the City of Chico, have adopted *Healthy People 2000* as a framework for commu-

nity-based health promotion and disease prevention activities.[28–30]

This paper details how California incorporated the *Healthy People 2000* HSIs into its state programs: collecting data from Federal, state, and local sources, comparing the health status of Californians in relation to the *Healthy People 2000* HSIs, and using these health statistics to enhance efforts to improve research and surveillance, policy development, program planning, and program evaluation.

The authors first looked at the health status of Californians in relation to national data, then looked at statewide trends over time, and finally looked at data for California's counties.

Because California is the nation's most populous state—with a 1994 population of 33 million and projections of at least 36 million by the year 2000 and 63 million by 2040[31]—our experience may serve as an important model for others interested in developing health status profiles using the HSIs.

Methods

The set of 18 HSIs used in this study, their definitions, and applicable *ICD-9* codes, are published elsewhere and summarized here (see box).[2–4] For this study, the 18 consensus HSIs were modified as follows: (*a*) We analyzed two components of the cardiovascular disease HSI separately (coronary heart disease [*ICD-9* codes 402, 410-414, 429.2] and stroke [*ICD-9* codes 430-438]). (*b*) We used California annual average workforce data (which includes both full-time and part-time workers) in the denominator of the work-related injury HSI. *(c)* We used the U.S. Census age category of "under 18" in defining the childhood poverty HSI instead of the "under 15" category used by the Centers for Disease Control.

Sources of data. California natality and mortality data—statewide and by county—were obtained from CDHS's Office of Vital Records, and infant mortality data were obtained from the CDHS Maternal and Child Health Branch. Disease incidence data were obtained from CDHS's Office of AIDS, Office of Statistics and Surveillance, and the Tuberculosis Control Branch. Data on children living in poverty were provided by the California Department of Finance's (CDOF) State Census Data Center. Work-related injury data were provided by the Division of Labor Statistics of the California Department of Industrial Relations and by the Labor Market Information Division of the California Employment Development Department. Data on California air quality were provided by the U.S. Environmental Protection Agency. Population denominator data used in the calculation of rates were provided by the California Department of Finance's Demographic Research Unit.

Statistical methods. Annual mortality rates were age-adjusted by the direct method using the 1940 U.S. population as the standard, consistent with the methodology used in *Healthy People 2000*.[32,33] For statewide data, time trends were developed from the baseline year specified in the

Consensus Set of Health Status Indicators

1. Infant mortality for specific population groups as measured by the rate of deaths among infants under one year of age per 1,000 live births
2. Overall death rate as measured by the age-adjusted death rate per 100,000 population due to all causes combined (001-E999)
3. Motor vehicle crash death rate as measured by the age-adjusted death rate per 100,000 population (E810-E825)
4. Work-related injury deaths rate as measured by the age-specific death rate for persons 16 years of age and over that have a positive response on their death certificate to the "injured at work" item (E800-E999)
5. Suicide rate as measured by the age-adjusted death rate per 100,000 population (E950-E959)
6. Homicide rate as measured by the age-adjusted death rate per 100,000 population (E960-E969, E970-E978)
7. Lung cancer death rate as measured by the age-adjusted death rate per 100,000 population (162)
8. Female breast cancer death rate as measured by the age-adjusted death rate per 100,000 females (174)
9. Cardiovascular disease death rate as measured by the age-adjusted death rate per 100,000 population (390–448)
10. AIDS incidence rate per 100,000 population
11. Measles incidence rate per 100,000 population
12. Tuberculosis incidence rate per 100,000 population
13. Syphilis incidence rate per 100,000 population
14. Low birth weight prevalence as measured by the percentage of live born infants weighing under 2500 grams
15. Births to adolescents (ages 10–17) prevalence as a percentage of all live births
16. Late prenatal care prevalence as measured by the percentage of mothers delivering live infants who did not receive care during their first trimester of pregnancy
17. Childhood poverty prevalence as measured by the proportion of children under 18 years of age living in families at or below the poverty level
18. Air quality nonattainment prevalence as measured by the proportion of persons living in counties failing to meet U.S. Environmental Protection Agency standards for air quality

national objectives, which varied from 1980 to 1990, through the most recent year for which data were available for analysis, in most cases 1994. Trends were tested for statistical significance using a least squares linear regression procedure.[34]

The numerator data used to calculate the California county rates and percentages presented in *County Health Status Profiles* were three-year averages compiled by county of residence of the decedent for mortality HSIs, by county of residence of the mother for HSIs measured with natality data, and by county of occurrence for morbidity HSIs. Three-year averages were used to reduce the year-to-year fluctuations resulting from small numbers of events occurring in many counties and thus increase the stability of rates.

Rankings on the HSIs for all 50 states and the District of Columbia for 1992 were compiled by the National Center for Health Statistics Division of Health Promotion Statistics (unpublished data, September 1995). Rankings on the HSIs for California's 58 counties were compiled by the CHS Planning and Data Analysis Section using 1992–1994 data. For some counties, data based on fewer than 10 events or a coefficient of variation (relative standard error) of 30% or greater, or both, were considered unreliable and were not ranked.

California profile on health status indicators associated with Year 2000 objectives

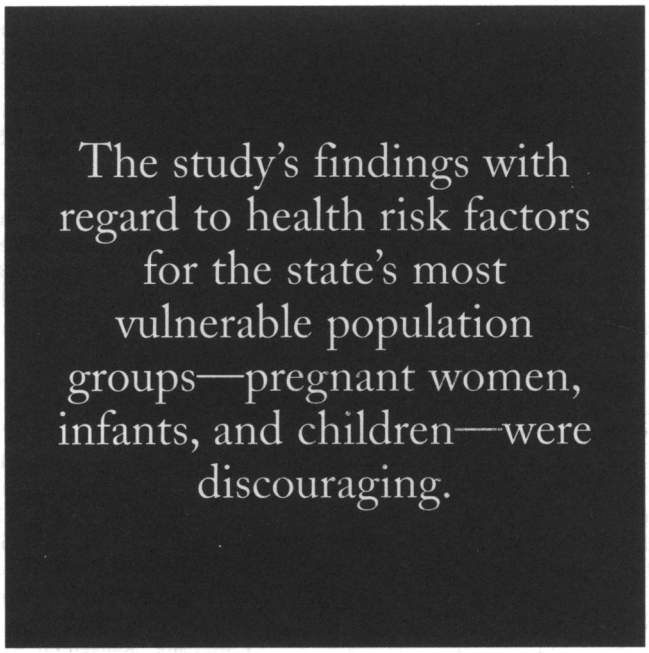
				California statewide data				*California county data 1992–1994*			
				Time trends		*Year 2000 objective*					
Health status indicator	*2000 target*	*CA rate*	*CA 1992 ranking*	*Years analyzed*	*Trend*	*Achieved*	*To be achieved by 2000*	*Counties with zero events*	*Counties with reliable rates*	*Range of rates*	*Counties achieving objective*
MORTALITY											
1. Infant	7.0	7.0	8	1987–1992	–	Yes	Yes	4	34	4.5–10.0	21
White	—	6.2	10	1987–1992	–	—	—	4	26	5.0–9.6	—
Black	11.0	15.6	21	1987–1992	–	No	No	32	8	10.2–25.6	33
Asian/Pacifc islander	—	5.8	12	1987–1992	–	—	—	NA	NA	NA	—
Native American	8.5	8.6	10	1987–1992	NS	No	NA	NA	NA	NA	—
Hispanic	—	6.5	2	1987–1992	–	—	—	16	21	5.4–8.8	—
2. Total	—	455.6	21	1989–1994	NS	—	—	0	57	252.7–599.4	—
3. Motor vehicle crash	14.2	13.2	18	1987–1994	–	Yes	Yes	2	43	7.2–35.1	20
4. Work–related injury	4.0	4.7	14	1993	NA	Yes	NA	11	13	2.0–12.3	14
5. Suicide	10.5	10.6	18	1989–1994	–	No	Yes	1	39	8.2–24.9	12
6. Homicide	7.2	12.7	43	1989–1994	+	No	No	6	23	3.6–21.9	11
7. Lung Cancer	42.0	32.2	12	1987–1994	NS	Yes	Yes	1	53	25.6–59.4	45
8. Female breast cancer	20.6	19.9	11	1987–1994	–	Yes	Yes	2	37	16.8–23.3	28
9. Cardiovascular disease	—	154.1	24	1987–1994	–	—	—	NA	NA	NA	—
Coronary heart disease	100.0	101.9	21	1987–1994	–	No	Yes	1	55	66.0–131.0	43
Stroke	20.0	25.4	33	1987–1994	–	No	No	1	49	17.7–34.4	5
DISEASE INCIDENCE											
10. AIDS	43.0	28.6	45	1989–1994	NS	Yes	Yes	9	33	6.1–291.1	37
11. Measles	0	61	48	1988–1994	NS	No	NA	42	2	0.3–3.3	42
12. Tuberculosis	3.5	14.9	43	1988–1994	NS	No	No	13	28	5.3–44.1	13
13. Syphilis	10.0	2.5	11	1969–1994	–	Yes	Yes	27	15	1.2–11.4	41
HEALTH RISK FACTORS											
14. Low birth weight	5.0	6.2	15	1987–1994	NS	No	No	1	50	4.2–7.9	14
15. Teenage births	—	5.0	28	1985–1994	+	—	—	1	51	1.3–8.3	—
16. Late prenatal care	10.0	22.1	40	1987–1994	NS	No	No	0	56	10.4–49.5	0
17. Childhood poverty	—	18.2	44	1980,1990	+	—	—	0	57	6.3–33.2	—
18. Air quality	85.0	28.4	50	1993	NA	No	No	0	58	28.4	41

NOTES: — Not applicable
NA Not available
NS Not statistically significant
\+ Statistically significant increase ($P < 0.05$)
– Statistically significant decrease ($P < 0.05$)

Results

Table 1 presents a summary for each of the 18 HSIs: the Year 2000 target, the latest available California data, California's national ranking as of 1993, California's data trends from the baseline year through the most recent year for which data were available, whether the trend was statistically significant and in what direction, and whether the national objective associated with an HSI was achieved or was projected to be achieved in California. Table 1 also shows summary data for California counties for each HSI: the number of counties with zero events, the number with reliable rates, the range of rates, and the number of counties meeting associated Year 2000 objectives.

Since a large portion of California's population is concentrated in a few counties (nearly one-third of the population lives in Los Angeles County alone and seven of the state's 58 counties have more than a million residents each), statewide progress in reducing mortality and morbidity is contingent in large part on these counties' experiences.



Mortality indicators. Of the nine mortality indicators (see table), California rates increased significantly for only one (homicide), declined significantly for five (infant mortality, motor vehicle crash death, suicide, female breast cancer, and cardiovascular disease rates), and showed no significant trends for two (overall death rate and lung cancer rate). Five associated Year 2000 objectives were being achieved in 1994 (infant mortality rate, motor vehicle crash death rate, work-related injury death rate, lung cancer death rate, and female breast cancer death rates), and two additional objectives were projected to be achieved by the year 2000 (suicide rate and coronary heart disease deaths rate).

Disease incidence indicators. California's progress in achieving objectives measured with disease incidence HSIs was mixed: two objectives were being achieved (AIDS and syphilis rates), and two were not being achieved (measles and tuberculosis rates). County profiles also reflect mixed performance in achieving reductions in infectious diseases.

Health risk factor indicators. Of the five health risk factor indicators examined in this study, California has shown significant increases in two (births to teenagers and childhood poverty levels) but was not achieving any of the associated Year 2000 objectives. County profiles indicate that very few are achieving objectives set forth in the maternal and infant health priority area and that poor air quality affects a majority of the state's population, who reside in a few Southern California and Central Valley counties.

Discussion

The primary objectives of this study were to compile comparable data from Federal, state, and local sources that could be used in monitoring the health status of Californians and to analyze these data using methods that generated meaningful information for use in research and surveillance, policy formulation, program planning, and program evaluation.

Our findings indicate that California is progressing well toward achieving national health status objectives for reductions in mortality. The mortality HSIs monitor causes of death that accounted for 56% of all deaths in the state during 1994, the latest year for which vital statistics data were available. The significant declines seen in the state's infant death rates among the overall population as well as among several race/ethnic groups were encouraging, as were the significant declines found in deaths caused by cardiovascular diseases (coronary heart disease and stroke), breast cancer, motor vehicle accidents, and suicide. Less encouraging was a significant increase in the statewide homicide rate.

Our findings also indicate that much more needs to be done toward achieving targeted reductions in disease incidence. Given that California has over 16% of the nation's AIDS cases and 20% of the tuberculosis cases, reductions in the incidences of these diseases are imperative for achieving national health objectives. The measles epidemic that peaked in 1990 in California is an indication of the need to maintain and enhance immunization programs for preschool-age children and other groups.

Our findings were especially discouraging with regard to health risk factors for our most vulnerable population groups: pregnant women, infants, and children. The significant increases in births to teenage mothers and children living in poverty as well as the proportions of women not receiving first trimester prenatal care and of low birth weight babies were some of the most disquieting findings in our study. These findings indicate a need to enhance mater-

nal and child health and family planning strategies and services statewide. Similarly, the large proportion of Californians living in counties that do not meet national ambient air quality standards was a finding that merits our close attention and appropriate follow-up action.

In conclusion, California's experience in using the HSIs has enabled the CDHS to gain valuable information and perspectives not only on the state's progress in achieving population-based disease prevention and health promotion objectives but also on areas in which improvement is needed if the public health goals set forth by the *Healthy People 2000* initiative are to be realized.

As we approach the next millennium with the challenge to provide quality health care to all Californians, the ability to share comparable data horizontally and vertically in formats that are accessible and that can be readily used in support of public health policies and programs becomes a more critical component of California's health information infrastructure.

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