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County Health Facts is a series of reports using California Health Interview Survey data to describe the health status of California's counties.

2001 HIGHLIGHTS:

About 35.2 percent of women aged 50 and older have had a bone density test.

Women in Santa Barbara County were most likely to have had a bone density test (52.6 percent), while women in Stanislaus County were least likely (24.2 percent).

About 14.6 percent of women aged 50 and older have been diagnosed with high osteoporosis risk.

Diagnosed osteoporosis risk among women aged 50 and older ranged from 7.8 percent in Kings County to 27.5 percent in the Humboldt/Del Norte region.

Osteoporosis Risk in California Counties, 2001

By Laura E. Lund, M.A.¹ and Pam Ford-Keach, M.S.²

Osteoporosis is a serious health problem that is characterized by reduced bone mass and weak or brittle bones. Osteoporosis usually progresses without any physical signs or symptoms until a fracture occurs. Though any bone can be affected, fractures caused by osteoporosis are most common in the hip, spine and wrist. Osteoporosis can have serious long-term health consequences; about 24 percent of persons over age 50 with hip fractures die in the year following the fracture, one fourth of persons who could walk before their hip fracture required long-term care afterward, and most hospital admissions for hip fracture in persons aged 45 and older are due to osteoporosis.³

The development of osteoporosis occurs over the lifespan. During the bone building years, young children steadily, but slowly, accumulate bone mass. Young people achieve up to 60 percent of their bone growth during adolescence. Peak bone mass, the point at which the body accumulates the most bone it will ever have, is reached by about age 20. Until about age 30, new bone is formed faster than old bone is broken down. As people age, the cycle reverses and old bone is broken down faster than new bone is formed. Osteoporosis is likely to develop when bone loss occurs too quickly, bone replacement occurs too slowly, or if optimal bone mass is not achieved during the bone building years. Osteoporosis can only be diagnosed through bone density testing. A bone density test measures the density of bones and can detect osteoporosis before a fracture occurs, predict the chances of breaking a bone in the future, determine the rate of bone loss, and monitor the effectiveness of osteoporosis treatments.

Women are at especially high risk for osteoporosis because of rapid bone loss following menopause. According to the U.S. Department of Health and Human Services (DHHS), 16 percent of women aged 50 and older have osteoporosis, compared to 3 percent of men.⁴ Because women are at such high risk, the U.S. Preventive Services Task Force (USPSTF) recommends routine bone density testing for osteoporosis among women

¹California Department of Health Services, Center for Health Statistics.

²California Department of Health Services, Chronic Disease Control Branch, Center of Gerontology.

³National Institutes of Health, Osteoporosis and Related Bone Diseases National Resource Center. "Fast Facts on Osteoporosis." Available at <http://www.osteoporosis.org/osteolinks.asp>.

⁴United States Department of Health and Human Services. *Healthy People 2010: Understanding and Improving Health*. 2nd Ed. Washington, D.C.: U.S. Government Printing Office. November 2000.

aged 65 and older, or beginning at age 60 for women at increased risk for osteoporosis.⁵ DHHS *Healthy People 2010* (HP2010) has established multi-year national objectives to address the problem of osteoporosis in the U.S.⁴ Although not specific to women, one of these objectives is to reduce the proportion of persons aged 50 and older with osteoporosis to 8.0 percent.

This report presents data on osteoporosis risk and bone density testing in women aged 50 and older in California's counties. All data come from the California Health Interview Survey (CHIS 2001). (See "Methods" on page four for a description of the survey and analytic methods used in this report.) CHIS 2001 asked female respondents aged 50 and older if they had ever had a bone density test. Those who had a test were also asked if a doctor had ever told them that they had bone loss, osteopenia, or osteoporosis.⁶ Because of the wording of this question, it is not possible to differentiate between women who were told that they had osteoporosis and those who did not have osteoporosis but did have bone loss or osteopenia, conditions that may lead to osteoporosis. Therefore, this report assumes that women who were told that they had any of these three conditions (bone loss, osteopenia, or osteoporosis) have clinically significant bone loss and are, at a minimum, diagnosed as being at high risk for osteoporosis ("diagnosed osteoporosis risk"). Because a diagnosis of osteoporosis risk requires a bone density test, caution should be used in interpreting population-based county rates of diagnosed osteoporosis. Differences between counties may represent actual differences in the proportion of women who have clinically significant bone loss. However, counties in which more women are tested for bone loss have the opportunity to find more women with this condition; therefore, those counties may appear to have higher osteoporosis risk rates than counties with lower testing rates. The terms "rate", "percent", and "proportion" are used interchangeably throughout to refer to the prevalence of bone density testing and diagnosed osteoporosis risk in women aged 50 and older.

Bone Density Testing

As of 2001, more than 1.6 million California women, or about 35.2 percent of women aged 50 and older, had a bone density test (Table 1, page 5). There was considerable variation across counties in the proportion of women ever tested, from a low of 24.2 percent in Stanislaus County to a high of 52.6 percent in Santa Barbara County. Comparing county rates with the overall California rate, three counties (Stanislaus, San Joaquin, and Solano) had a testing rate significantly below California's rate of 35.2 percent. Eight counties and two regions (Tuolumne/Calaveras/Amador/Inyo/Mariposa/Mono/Alpine, Napa, Imperial, Shasta, Marin, Humboldt/Del Norte, Sonoma, San Luis Obispo, Santa Cruz, and Santa Barbara) had testing rates significantly higher than the State rate.

Prevalence of Osteoporosis Risk

Nearly 700,000 California women, or about 14.6 percent of women aged 50 and older, were diagnosed with high osteoporosis risk in 2001 (Table 2, page 6). There was substantial variation in the proportion of women with osteoporosis risk across counties, from a low of 7.8 percent in Kings County to a high of 27.5 percent in the Humboldt/Del Norte region. Comparing county rates with the overall California rate, three counties (Kings, San Mateo, and Sacramento) had rates of osteoporosis risk that were significantly lower than California's rate of

⁵United States Department of Health and Human Services. "USPSTF Osteoporosis—Screening: Summary of Recommendations". Available at <http://www.ahrq.gov/clinic/uspstf/uspstfoste.htm>.

⁶CHIS 2001 asked respondents: "Have you ever had a bone density test?" If yes, respondents were asked: "Have you ever been told by a doctor that you had bone loss, osteopenia, or osteoporosis?"

14.6 percent. Two counties and one region (Orange, Santa Barbara, and Humboldt/Del Norte) had rates significantly higher than the State rate. Eight counties and two regions (Sutter/Yuba, Kings, Solano, San Mateo, Sacramento, San Joaquin, Merced, San Bernardino, Stanislaus, and Monterey/San Benito) had rates of osteoporosis risk that were not significantly different from the 8.0 percent target rate for osteoporosis set by HP2010.

Summary

Only 35.2 percent of California women aged 50 and older have ever had a bone density test. Since osteoporosis can only be diagnosed through such testing, this means that nearly 65 percent of women aged 50 and older, more than three million women, do not know if they are suffering from bone loss, osteopenia, or osteoporosis. The proportion of women aged 50 and older having at least one bone density test varied significantly across counties, from a low of 24.2 percent in Stanislaus County to a high of 52.6 percent in Santa Barbara County.

About 1 in 7 California women aged 50 and older, 14.6 percent of women in this age group, have been told by a doctor that they have bone loss, osteopenia, or osteoporosis. However, rates of diagnosed osteoporosis risk are most certainly undercounts of the number of women actually at risk, since nearly two thirds of women in this age group have never been tested. About 41.7 percent of women who received a bone density test also received a diagnosis of osteoporosis risk. If the rate of osteoporosis risk is similar in untested women, as many as 1.2 million California women may have clinically significant bone loss and not know it.

Although sizable variations in diagnosed osteoporosis risk were observed across counties, from 7.8 percent in Kings County to 27.5 percent in the Humboldt/Del Norte region, these differences should be interpreted with caution. They may represent actual differences in the proportion of women across counties who have clinically significant bone loss. However, counties with high rates of diagnosed osteoporosis risk also tend to be counties with high rates of bone density testing, suggesting that at least some of the variation in rates of diagnosed osteoporosis risk may be due to differences in testing rates across counties rather than differences in the underlying condition.

Although there is no cure for osteoporosis, it is preventable and treatable. Californians can reduce their risk for osteoporosis across the lifespan by optimizing bone accumulation prior to age 20, consuming a balanced diet rich in calcium and vitamin D, engaging in regular weight bearing exercise, reducing the falls that lead to fractures, and knowing whether they are at increased risk for osteoporosis. Risk factors for osteoporosis include being female, Asian or Caucasian, having a small bone structure and low body weight, estrogen deficiency as a result of menopause, advanced age, being physically inactive, inadequate calcium and vitamin D consumption, having a history of falls or fractures, and having a family history of osteoporosis. Osteoporosis can also result from certain medical conditions or treatments that affect the bones. For example, glucocorticoids used in the treatment of asthma, rheumatoid arthritis, or inflammatory bowel disease may accelerate the rate of bone loss. Treatment of osteoporosis may include medication as well as lifestyle changes. People at risk for osteoporosis should consult with a physician to discuss their bone health and treatment options.

The California Osteoporosis Prevention and Education program (COPE) was established by the California Department of Health Services (CDHS) in 1999 to promote, develop, and implement sound public health interventions for the prevention of osteoporosis and osteoporosis-related disability for Californians 50 years of age and older. COPE works with community partners

throughout the State to increase the awareness of the causes of and options for the prevention and treatment of osteoporosis. For more information on osteoporosis, contact Pam Ford-Keach, M.S., Chief, California Osteoporosis Prevention and Education Program at (916) 552-9916 or by e-mail at pford@dhs.ca.gov.

Methods

Data: CHIS 2001 is a population-based household telephone survey, representative of the non-institutionalized adult population of California, with more than 55,000 Californians participating. In addition to statewide data, CHIS 2001 provides representative samples for California counties with populations greater than 100,000. For smaller counties, CHIS provides representative data estimates for contiguous county groups, referred to as “regions” in this report. Respondents to the survey were randomly selected California residents aged 18 and older living in households with telephones. The California Health Interview Survey is a collaboration of the University of California at Los Angeles Center for Health Policy Research, the California Department of Health Services, and the Public Health Institute. More information on the CHIS 2001 sample is available at <http://www.chis.ucla.edu>.

Analysis: In this report, age-specific rates are provided as measures of bone density testing and osteoporosis risk in women aged 50 and older. Age-specific rates reflect the actual number of women aged 50 and older affected by this condition. More information on the methods used to calculate rates is available from the first author.

The 95 percent confidence intervals (CIs) are presented for each rate. Because CHIS data are collected through a sampling method, there may be some random error in the rate estimate. The CIs represent the range of values likely to contain the “true” population rate 95 percent of the time. In this report, rates are considered to be significantly different from each other when their confidence intervals do not overlap. When comparing county or State rates to HP2010 objectives in this report, a rate is not considered significantly different from an HP2010 objective if the confidence interval of the rate includes the target rate for the HP2010 objective.

Cases with missing information for bone density testing or diagnosis of bone loss were excluded from this analysis.

Limitations: The CHIS data are self-reported by respondents to the survey, and may be subject to error, such as respondent failure to recall information about existing health conditions. Only persons living in households with telephones were included in the survey. Participation in CHIS is voluntary: persons who refused to participate may be different than those who were interviewed. Details on response rates, respondent characteristics, and other survey information can be obtained at <http://www.chis.ucla.edu>.

For more information on the California Health Interview Survey contact Laura E. Lund, CHIS Coordinator, California Department of Health Services, Center for Health Statistics, Office of Health Information and Research, MS 5103, P.O. Box 997410, Sacramento, CA 95899-7410.

**TABLE 1
BONE DENSITY TESTING AMONG WOMEN AGED 50 AND OLDER IN CALIFORNIA,
BY COUNTY OR REGION, 2001**

County of Residence	Age-Specific Rate ¹	95% Confidence Interval		Estimated N ²
		Lower	Upper	
Stanislaus*	24.2	18.0	30.4	14,000
San Joaquin*	26.6	20.6	32.6	20,000
Solano*	26.6	21.5	31.7	13,000
Kings	28.0	21.1	34.9	3,000
Merced	28.8	22.1	35.6	7,000
Sacramento	29.8	24.2	35.4	50,000
Tehama/Glenn/Colusa	30.8	24.6	36.9	5,000
Tulare	30.8	24.1	37.5	14,000
Santa Clara	30.9	25.5	36.3	71,000
San Mateo	31.5	24.5	38.5	37,000
San Bernardino	32.3	27.0	37.6	62,000
Alameda	32.4	26.7	38.2	66,000
Ventura	33.1	26.9	39.4	34,000
Los Angeles	33.2	31.2	35.2	410,000
Kern	33.4	26.9	39.8	27,000
Butte	34.2	28.0	40.3	13,000
Mendocino/Lake	34.6	28.3	41.0	9,000
San Francisco	35.1	29.7	40.5	47,000
CALIFORNIA	35.2	34.1	36.2	1,614,000
Contra Costa	35.4	29.4	41.3	52,000
Riverside	35.7	30.4	41.1	78,000
Yolo	35.9	27.9	44.0	7,000
Placer	36.1	29.2	42.9	13,000
Sutter/Yuba	36.1	28.8	43.3	7,000
Fresno	36.4	30.1	42.8	36,000
El Dorado	37.3	29.7	44.9	9,000
San Diego	37.7	33.6	41.7	139,000
Monterey/San Benito	38.3	31.0	45.6	21,000
Madera	39.0	32.0	46.1	7,000
Orange	40.2	35.9	44.5	147,000
Siskiyou/Lassen/Trinity/Modoc	42.1	35.9	48.4	7,000
Nevada/Plumas/Sierra	42.6	36.1	49.0	10,000
Tuolumne/Calaveras/Amador/Inyo/ Mariposa/Mono/Alpine*	42.8	36.5	49.1	14,000
Napa*	43.2	36.5	49.9	9,000
Sonoma*	43.5	36.5	50.6	32,000
Imperial*	45.8	37.4	54.1	8,000
Humboldt/Del Norte*	45.9	38.4	53.4	11,000
Shasta*	46.9	40.1	53.6	14,000
San Luis Obispo*	47.8	40.5	55.1	18,000
Marin*	48.1	40.8	55.4	18,000
Santa Cruz*	48.8	40.7	57.0	18,000
Santa Barbara*	52.6	45.7	59.5	30,000

¹Rate is per 100 county or State population of women aged 50 and older.

²Estimated by multiplying the age-specific rate times the county or State population of women aged 50 and older, rounded to the nearest thousand.

*County rate is significantly different from the State rate.

Sources: University of California at Los Angeles Center for Health Policy Research and State of California, Department of Health Services. 2001 California Health Interview Survey.

State of California, Department of Finance. Race/Ethnic Population with Age and Sex Detail, 2000 (May, 1998). Prepared by: Department of Health Services, Center for Health Statistics.

**TABLE 2
DIAGNOSED OSTEOPOROSIS RISK AMONG WOMEN AGED 50 AND OLDER IN CALIFORNIA,
BY COUNTY OR REGION, 2001**

County of Residence	Age-Specific Rate ¹	95% Confidence Interval		Estimated N ²
		Lower	Upper	
Kings* [#]	7.8	4.0	11.7	1,000
HP2010 Objective 2-9	8.0	--	--	--
San Mateo* [#]	9.4	6.1	12.8	11,000
Sacramento* [#]	10.0	6.4	13.7	17,000
Solano [#]	11.0	7.2	14.7	5,000
San Joaquin [#]	11.0	6.6	15.4	8,000
Merced [#]	11.0	6.5	15.5	3,000
San Bernardino [#]	11.6	7.9	15.3	22,000
Santa Clara	11.7	8.2	15.2	27,000
Stanislaus [#]	11.8	7.2	16.4	7,000
Sutter/Yuba [#]	12.2	7.3	17.0	2,000
Monterey/San Benito [#]	12.2	7.5	17.0	7,000
Nevada/Plumas/Sierra	12.6	8.3	16.8	3,000
San Francisco	12.9	9.2	16.6	17,000
Los Angeles	13.3	11.9	14.8	165,000
Ventura	14.2	9.6	18.8	15,000
Alameda	14.2	10.1	18.4	29,000
Mendocino/Lake	14.5	9.9	19.2	4,000
CALIFORNIA	14.6	13.8	15.3	668,000
Butte	14.7	10.2	19.2	5,000
Placer	14.7	9.7	19.7	5,000
Marin	14.8	9.6	20.0	5,000
San Diego	15.2	12.2	18.2	56,000
Contra Costa	15.7	10.9	20.5	23,000
Fresno	16.0	11.3	20.6	16,000
Madera	16.0	10.6	21.3	3,000
Tulare	16.2	10.8	21.5	7,000
Siskiyou/Lassen/Trinity/Modoc	16.3	11.6	20.9	3,000
Kern	16.5	11.5	21.5	13,000
Sonoma	16.8	11.1	22.6	12,000
Riverside	16.9	12.7	21.1	37,000
Yolo	17.0	10.7	23.3	3,000
Tehama/Glenn/Colusa	17.3	12.4	22.3	3,000
Imperial	18.2	12.3	24.1	3,000
El Dorado	18.3	11.6	25.0	5,000
Napa	19.0	13.6	24.4	4,000
Orange*	19.3	16.0	22.6	71,000
Tuolumne/Calaveras/Amador/Inyo/ Mariposa/Mono/Alpine	19.3	14.5	24.2	6,000
Santa Cruz	19.6	13.4	25.8	7,000
Shasta	20.4	15.0	25.8	6,000
San Luis Obispo	21.1	15.2	27.0	8,000
Santa Barbara*	24.9	18.5	31.3	14,000
Humboldt/Del Norte*	27.5	20.9	34.1	7,000

¹Rate is per 100 county or State population of women aged 50 and older.

²Estimated by multiplying the age-specific rate times the county or State population of women aged 50 and older, rounded to the nearest thousand.

*County rate is significantly different from the State rate.

[#]HP2010 Objective 2-9 falls within the 95 percent confidence interval for this county/region rate.

Sources: University of California at Los Angeles Center for Health Policy Research and State of California, Department of Health Services. 2001 California Health Interview Survey.

State of California, Department of Finance. Race/Ethnic Population with Age and Sex Detail, 2000 (May, 1998).

Prepared by: Department of Health Services, Center for Health Statistics.