# LA Health

COUNTY OF LOS ANGELES
**Public Health**

# BONE HEALTH AND OSTEOPOROSIS

## Introduction

Osteoporosis is the most common bone disease in the United States,[1] affecting 10 million U.S. adults.[2] This chronic, age-related bone disease causes increased bone thinning and fragility, increasing a person's risk for fractures. In fact, osteoporosis is the leading cause of fractures in the U.S., which often lead to disability and poor quality of life. An additional 34 million U.S. adults have low bone mass, or osteopenia,[2] and are also at risk for developing fractures and osteoporosis.

Osteoporosis also imposes a significant economic burden, with the total medical cost attributable to osteoporosis and fractures among older U.S. adults (age ≥65 years) estimated to be $22 billion in 2008.[3] Results from the 2011 Los Angeles County Health Survey (LACHS) show that 18% of adults 65 years or older in Los Angeles County reported having been diagnosed with osteoporosis. As our population ages, the percentage of adults with osteoporosis is expected to rise even more. By 2030, an estimated 76 million U.S. adults will be affected by either osteoporosis or osteopenia.[2]

Osteoporosis occurs both in men and women, though there is often greater focus on this disease in women because of the higher prevalence and fracture burden. It is estimated that 1 in 2 postmenopausal women and 1 in 5 men over the age of 50 will experience an osteoporosis-related fracture.[1] However, hip fractures that occur in men result in higher mortality.[4] Osteoporosis continues to be underdiagnosed in both men and women.

**TABLE 1** — **Percent of Adults (65+ years old) Ever Diagnosed with Osteoporosis, LACHS 2011**

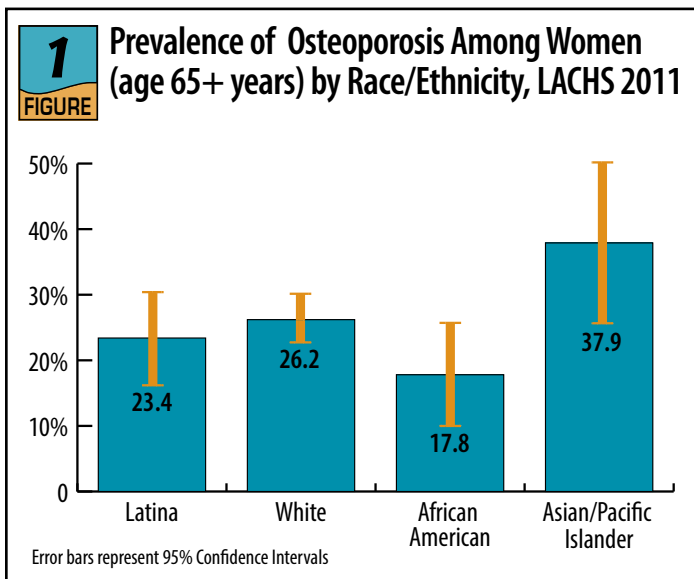| | Percent (%) | 95% CI | Est # |
|---|---|---|---|
| **Los Angeles County** | 17.8 | 15.6 - 20.1 | 180,000 |
| **Gender** | | | |
| Male | 6.0 | 3.8 - 8.2 | 26,000 |
| Female | 26.7 | 23.3 - 30.1 | 155,000 |
| **Race/Ethnicity** | | | |
| Latino | 16.7 | 11.5 - 21.9 | 34,000 |
| White | 17.7 | 15.0 - 20.4 | 95,000 |
| African American | 11.5* | 6.3 - 16.8 | 11,000 |
| Asian/Pacific Islander | 23.3 | 15.5 - 31.1 | 38,000 |
| **Education** | | | |
| Less than high school | 20.3 | 14.1 - 26.5 | 40,000 |
| High school | 22.9 | 17.1 - 28.6 | 48,000 |
| Some college or trade school | 16.1 | 12.4 - 19.7 | 53,000 |
| College or post graduate degree | 13.1 | 10.1 - 16.1 | 34,000 |
| **Federal Poverty Level $** | | | |
| 0-99% FPL | 19.0 | 12.6 - 25.4 | 25,000 |
| 100-199% FPL | 19.9 | 14.3 - 25.4 | 42,000 |
| 200-299% FPL | 19.3 | 13.3 - 25.4 | 34,000 |
| 300% or above FPL | 16.1 | 13.2 - 18.9 | 78,000 |
| **Service Planning Area** | | | |
| Antelope Valley | 14.7* | 7.2 - 22.1 | 4,000 |
| San Fernando | 17.5 | 13.1 - 22.0 | 40,000 |
| San Gabriel | 20.2 | 14.4 - 26.1 | 41,000 |
| Metro | 20.2 | 12.5 - 28.0 | 22,000 |
| West | 17.1 | 11.1 - 23.1 | 15,000 |
| South | 14.3* | 7.0 - 21.6 | 10,000 |
| East | 18.5 | 11.4 - 25.6 | 23,000 |
| South Bay | 15.6 | 10.4 - 20.7 | 25,000 |

**\*** The estimate is statistically unstable.

**$** Based on U.S. Census 2009 Federal Poverty Level (FPL) thresholds which for a family of four (2 adults, 2 dependents) correspond to annual incomes of $21,756 (100% FPL), $43,512 (200% FPL) and $65,268 (300% FPL). [*These thresholds were the values at the time of survey interviewing.*]

1. U.S. Department of Health and Human Services. Bone Health and Osteoporosis: A Report of the Surgeon General. Rockville, MD: US Department of Health and Human Services, Office of the Surgeon General, 2004.
2. National Osteoporosis Foundation. Clinician's Guide to Prevention and Treatment of Osteoporosis. Washington, DC: National Osteoporosis Foundation; 2013..
3. Blume SW, Curtis JR. Medical Costs of Osteoporosis in the Elderly Medicare Population. Osteoporosis Int, 2011. 22:1835-44..
4. B. Abrahamsen, T. van Staa, R. Ariely, M. Olson, C. Cooper. Excess mortality following hip fracture: a systematic epidemiological review. Osteoporos Int. 2009; 20:(10):1633–1650.

## Osteoporosis Affects Nearly One in Five Older Adults in LA County

Overall, 17.8% of older adults (age 65 years or older) reported a diagnosis of osteoporosis (Table 1).

- The prevalence of osteoporosis was four times higher in women (26.7%) than in men (6.0%).

- The prevalence was highest among Asian/ Pacific Islanders (23.3%) and lowest among African Americans (11.5%*).

- Among women, Asians/Pacific Islanders (37.9%) had the highest rate of osteoporosis, followed by whites (26.2%), Latinas (23.4%), and African Americans (17.8%) (Figure 1). (*Note: Corresponding data for males are not presented as rates are unstable.*)

- The prevalence of osteoporosis was higher among adults with lower levels of education.

**FIGURE 1** Prevalence of Osteoporosis Among Women (age 65+ years) by Race/Ethnicity, LACHS 2011



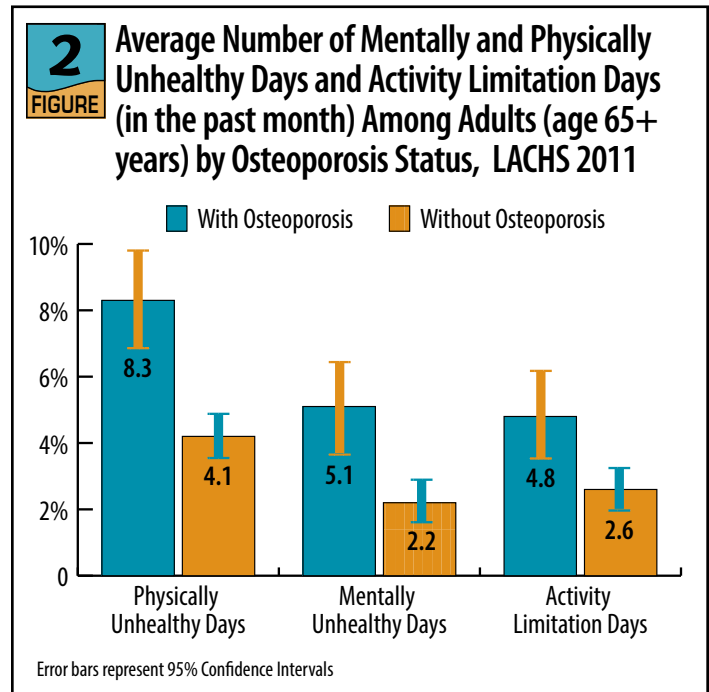Error bars represent 95% Confidence Intervals

## Adults with Osteoporosis Report Poorer Health-Related Quality of Life

Although osteoporosis itself is asymptomatic, fractures due to osteoporosis can have significant negative impacts on function and quality of life.[5]

- The 2011 LACHS found that older adults who reported being diagnosed with osteoporosis were more likely to report having a disability (52.6%), compared to adults without osteoporosis (33.3%).

- Those with osteoporosis reported twice as many mentally and physically unhealthy days as those without osteoporosis, and also reported more days where their daily activity was limited by poor physical or mental health. (Figure 2).

**FIGURE 2** Average Number of Mentally and Physically Unhealthy Days and Activity Limitation Days (in the past month) Among Adults (age 65+ years) by Osteoporosis Status, LACHS 2011



Error bars represent 95% Confidence Intervals

- Adults with osteoporosis were also more likely to perceive their health as being poorer than adults without osteoporosis, with 45.4% reporting their health as being fair or poor compared to only 25.9% of those without osteoporosis.

## Risk Factors for Osteoporosis

Osteoporosis becomes more common particularly after age 65. Although it affects both men and women, women are at much higher risk. Women who are postmenopausal are at increased risk for developing osteoporosis because the loss of estrogen accelerates bone loss. In men, secondary causes of osteoporosis are more common, e.g. resulting from certain medical conditions or medications (refer to text box).

* The estimate is statistically unstable.
5. U.S. Preventive Task Force. Screening for Osteoporosis: US Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2011; 154:356-365.

## Risk Factors for Osteoporosis:[1,2]

- Family history of osteoporosis
- Low body weight for height
- White or Asian
- Having a diet poor in calcium or vitamin D
- Physical inactivity or prolonged immobilization (e.g., being confined to a bed)
- Amenorrhea and premature menopause
- Smoking cigarettes
- Heavy alcohol intake (i.e., >1 drink for women and >2 drinks for men per day)
- Certain medications (e.g., long-term corticosteroid use, anticonvulsants, chemotherapeutic agents, heparin)
- Certain medical conditions (e.g., rheumatoid arthritis and thyroid disease)

## Osteoporosis Prevention and Management

It is important to increase awareness that osteoporosis is preventable. Adequate intake of calcium and vitamin D, and regular physical activity can help maintain or improve bone density.

Regular physical activity in the pre-teen and teenage years is especially important for building increased bone mass and reduces the risk of developing osteoporosis later in life. Adequate calcium intake is also important to prevent and treat bone loss, and vitamin D is important for calcium absorption. Studies suggest that vitamin D may help prevent falls in older adults who are low in vitamin D and may also reduce fractures.[6,7,8]

In addition to prevention, osteoporosis screening and early diagnosis and treatment are important for preventing fractures. Following recommended screening guidelines is very important because there are typically no clinical signs of the disease until a fracture occurs. The recommended test to screen for osteoporosis is dual-energy x-ray absorptiometry (DEXA) of the hip and lumbar spine.[5]

### Assessing Bone Mineral Density (BMD)

Assessment of BMD is used to diagnose osteoporosis. Lower bone density means greater risk of fracture. Results are reported using T-scores which compare results to those of young adult women. Osteoporosis is defined as a BMD that lies 2.5 standard deviations (SD) or more below the average for young adult women.[9]

| Category | T-Scores |
|---|---|
| Normal BMD | ≥ -1 SD |
| Low BMD (Osteopenia) | Between -1 & -2.5 SD |
| Osteoporosis | < -2.5 SD |

The US Preventive Services Task Force (USPSTF) recommends screening:[5]

- All women 65 years or older without previous known fractures or secondary causes of osteoporosis, and
- Women <65 years whose 10-year fracture risk is equal to or greater than that of a 65-year-old white woman without additional risk factors (refer to text box below).
- The USPSTF does not provide a screening recommendation for men due to insufficient evidence.

### Assessing 10-year Fracture Risk

Fracture risk can be assessed using the FRAX risk assessment tool developed by the World Health Organization (WHO), http://www.shef.ac.uk/FRAX/. This tool can be used to assess fracture risk in patients and gives the 10-year probability of fracture relying on easily obtainable information, such as age, body mass index (BMI), tobacco and alcohol use, etc. An iPhone app for FRAX is available, as well as an online calculator (http://www.shef.ac.uk/FRAX/tool.aspx?country=9) and simplified paper versions.

6. Gillespie LD, et al. (2009). *Interventions for preventing falls in older people living in the community. Cochrane Database of Systematic Reviews.*
7. Bischoff-Ferrari HA, et al. (2009). *Prevention of nonvertebral fractures with oral vitamin D and dose dependency. Archives of Internal Medicine, 169(6): 551-561.*
8. American Geriatrics Society Workgroup on Vitamin D Supplementation for Older Adults (2013). *Recommendations Abstracted from the American Geriatrics Society Consensus Statement on Vitamin D for Prevention of Falls and Their Consequences. J Am Geriatr Soc. 2013 Dec 18. [Epub ahead of print].*
9. World Health Organization (WHO). *WHO scientific group on the assessment of osteoporosis at primary health care level: summary meeting report. Available at: http://www.who.int/chp/topics/Osteoporosis.pdf. Accessed November 7, 2013.*

- In LA County, 72.9% of women aged 65 years or older reported ever being screened for osteoporosis (Table 2).

- Screening rates varied widely by race/ethnicity. Screening rates were highest among white and Asian/Pacific Islander women, intermediate among Latinas, and lowest among African American women.

- The percent of women who reported being screened increased as education and income increased.

| **2** TABLE | Percent of Women (65+ years old) Ever Screened or Tested for Osteoporosis, LACHS 2011 | | |
|---|---|---|---|
| | Percent (%) | 95% CI | Est # |
| **Los Angeles County** | 72.9 | 69.3 -76.5 | 420,000 |
| **Race/Ethnicity** | | | |
| Latino | 63.4 | 53.7 -73.2 | 80,000 |
| White | 80.5 | 76.8 -84.1 | 239,000 |
| African American | 46.0 | 35.5 -56.5 | 25,000 |
| Asian/Pacific Islander | 78.5 | 68.8 -88.3 | 72,000 |
| **Education** | | | |
| Less than high school | 61.2 | 51.3 -71.1 | 79,000 |
| High school | 72.0 | 64.2 -79.9 | 94,000 |
| Some college or trade school | 75.8 | 70.3 -81.2 | 144,000 |
| College or post graduate degree | 81.7 | 76.4 -86.9 | 98,000 |
| **Federal Poverty Level $** | | | |
| 0-99% FPL | 60.5 | 49.5 -71.4 | 56,000 |
| 100-199% FPL | 67.5 | 59.4 -75.7 | 98,000 |
| 200-299% FPL | 72.9 | 64.8 -80.9 | 70,000 |
| 300% or above FPL | 80.9 | 76.5 -85.3 | 196,000 |
| **Service Planning Area** | | | |
| Antelope Valley | 71.8 | 57.5 -86.0 | 12,000 |
| San Fernando | 81.6 | 74.7 -88.4 | 105,000 |
| San Gabriel | 75.9 | 67.4 -84.3 | 88,000 |
| Metro | 69.8 | 59.0 -80.6 | 44,000 |
| West | 74.6 | 62.9 -86.3 | 36,000 |
| South | 44.3 | 30.7 -58.0 | 18,000 |
| East | 70.7 | 58.3 -83.1 | 51,000 |
| South Bay | 73.0 | 65.3 -80.7 | 66,000 |

$ Based on U.S. Census 2009 Federal Poverty Level (FPL) thresholds which for a family of four (2 adults, 2 dependents) correspond to annual incomes of $21,756 (100% FPL), $43,512 (200% FPL) and $65,268 (300% FPL). [*These thresholds were the values at the time of survey interviewing.*]

## Discussion

Osteoporosis is a serious chronic condition that can significantly impact health-related quality of life. As our population ages, more and more people will be at risk for developing osteoporosis. Fortunately, steps can be taken to help maintain or increase bone density and prevent osteoporosis.

For those at risk, bone density screening and assessing fracture risk are important for early identification and intervention to prevent further bone loss and fractures. Although the prevalence of osteoporosis is lower among Latinos and African Americans, these groups also have the lowest rates of screening, with less than 50% of African American women reporting ever being screened.

For those already diagnosed with osteoporosis, therapies are available that can slow further bone loss or increase bone density. Specific strategies to reduce the burden of osteoporosis in Los Angeles County are listed in the next section.

## Recommended Actions
### *Individuals:*

- Begin or maintain being physically active in accordance with the CDC recommendations[10] which include weight-bearing and muscle-strengthening exercises to improve and maintain bone mass and reduce the risk of falls.[2,5]

- To reduce the risk of falling[1]:
  - Remove loose rugs or cords that can lead to tripping or falling.
  - Provide adequate lighting.
  - Avoid walking on slippery surfaces.
  - Have your vision checked and wear eyeglasses as appropriate.

- Assure a healthy diet rich in:[1,5]
  - Calcium (e.g., milk, other dairy products, and green vegetables). Men ≤70 years and premenopausal women should consume 1000 mg of calcium per day; men >70

10  *2008 Physical Activity Guidelines for Americans, US Department of Health and Human Services. Washington, DC.* http://www.health.gov/paguidelines/pdf/paguide.pdf.

years and postmenopausal women should consume 1200 mg of calcium per day.[11]

- ◆ Vitamin D (e.g., milk supplemented with Vitamin D). Premenopausal women and men ≤70 years should consume 600 IU of Vitamin D per day, and postmenopausal women and men >70 years should consume 800 IU of vitamin D per day.[11]

- If you smoke, seek help to quit as smoking cigarettes increases bone loss. Call 1-800-NO-BUTTS for free help.[2]

- If you consume alcohol, do so in moderation.[2]

### Health Care Providers:[1]

- Follow recommended screening guidelines.[5]

- For patients diagnosed with osteoporosis, prescribe appropriate medications, as necessary, and monitor patients for effectiveness and side effects.[2]

- Review patient medications and substitute medications that increase fall risk with medications less likely to cause falls.

- Monitor patients who are taking medications that can increase bone loss.

- Inquire about patients' diets, and advise accordingly.

- Counsel patients on fall prevention. The STEADI Toolkit can be used to incorporate fall risk assessment and fall prevention into your clinical practice. www.cdc.gov/homeandrecreationalsafety/Falls/steadi/index.html.

### Cities and Communities:

- Promote community activities that improve physical activity and balance training.

- Create safer sidewalks (e.g. age-friendly pavements).[12]

## on the web

The **National Osteoporosis Foundation (NOF)** is dedicated to preventing osteoporosis and broken bones, promoting strong bones for life and reducing human suffering through programs of public and clinician awareness, education, advocacy and research.
**nof.org/**

The National Institutes of Health **Osteoporosis and Related Bone Diseases National Resource Center** provides patients, health professionals, and the public with resources and information on metabolic bone diseases, including osteoporosis.
**www.niams.nih.gov/Health_Info/Bone/**

The **National Bone Health Alliance (NBHA)** is a public-private partnership that brings together expertise and resources to collectively promote bone health and prevent disease; improve diagnosis and treatment of bone disease; and enhance bone research, surveillance and evaluation.
**www.nbha.org/**

The mission of the **California Hispanic Osteoporosis Foundation (CHOF)** is to increase the quality of life for Latino women, men and children through awareness, prevention, diagnosis, and treatment of osteoporosis.
**www.chofound.org/**

- Provide accessible and affordable public transportation options with age-friendly design (e.g. low-floor buses, priority seating, well-lit transit stops with clearly visible signage).[12]

- Support and encourage participation in evidence-based community health promotion programs on fall prevention. www.ncoa.org/improve-health/center-for-healthy-aging/falls-prevention/community-programs.html.

11. National Research Council. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC; The National Academies Press, 2011
12. World Health Organization (2007). Global Age-friendly Cities: A Guide. http://www.who.int/aeing/age_friendly_cities_guide/en/.

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# In this issue:
# BONE HEALTH AND OSTEOPOROSIS

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## For additional information about the LA County Health Survey, visit: www.publichealth.lacounty.gov/ha

The Los Angeles County Health Survey is a periodic, population-based telephone survey that collects information on sociodemographic characteristics, health status, health behaviors, and access to health services among adults and children in the County. The 2011 survey collected information on a random sample of 8,036 adults and 6,013 children.  The survey was conducted for the Los Angeles County Department of Public Health by Abt SRBI Inc., and was supported by grants from First 5 LA, the Los Angeles County Department of Mental Health, and Department of Public Health programs including the Tobacco Control and Prevention Program, the Emergency Preparedness and Response Program, Substance Abuse Prevention and Control, and Environmental Health.