



# Research Week 2023

## The prevalence of osteoporosis and low femoral neck bone density among never-smoking U.S. adults with exposure to secondhand smoke: a cross-sectional study using the National Health and Nutrition Examination Survey (NHANES)

Felicia Zhou and Mikaela Haglund; OHSU-PSU School of Public Health, Oregon Health and Science University

### Keywords

Epidemiology; Public Health; Osteoporosis; Tobacco Smoke Pollution; low femoral neck bone density; BMD; secondhand smoke; serum cotinine; never-smokers

### Abstract

**Objective:** Epidemiological studies have observed an association between exposure to secondhand smoke (SHS) and low bone mineral density (BMD) among current and past smokers. However, there is a knowledge gap in elucidating this association among never-smoking adults. The objective of this study is to examine the association between SHS exposure, measured by serum cotinine levels, and BMD for never-smoking U.S. adults

**Methods:** This cross-sectional analysis included 3,224 never-smoking U.S. adults aged 50 years and older from the National Health and Nutrition Examination Survey cycles 2007-2008, 2009-2010, and 2013-2014. Serum cotinine, a biomarker for tobacco exposure, was the exposure variable while low femoral neck bone density and osteoporosis were the outcome variables. We investigated the association between SHS exposure and low BMD and osteoporosis using weighted multinomial logistic regression models. Further, we performed subgroup analyses stratified by sex and tested for interaction.

**Results:** The crude weighted prevalence of low BMD was 41.6% (95% CI: 39.4%, 43.8%), and osteoporosis was 6.0% (95% CI: 5.1%, 7.0%). Among adults exposed to SHS, we found a not statistically significant inverse weak association between SHS and low BMD (aOR = 0.90, 95% CI: 0.67, 1.20). For SHS and osteoporosis, we found a not statistically significant moderate inverse association (aOR = 0.65, 95% CI: 0.40, 1.06). Additionally, we did not find evidence that the associations differed by sex ( $P = 0.41$ ).

**Conclusions:** Our study found null associations between SHS and low BMD or osteoporosis. Similarly, we did not find evidence to support this association differed by sex.