



Dementia Diagnosis and Osteoporosis Treatment Propensity: A Population-Based Nested Case-Control Study

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Background

- Osteoporosis, a skeletal disease, is a serious public health problem with an estimated 1.4 million Canadians and 10 million Americans affected.
- Increasing age and a diagnosis of dementia both dramatically increase the risk of serious osteoporosis related sequela.
- There remains an overall low rate of osteoporosis treatment particularly in older, frail adults despite the availability of effective antiresorptive treatments such as bisphosphonate drugs.
- The frequency in which persons with dementia are treated with osteoporosis medications has not been well described.
- There is some question whether low treatment rates in older adults are simply age related variations (in treatments) or due to the presence of co-morbid conditions.



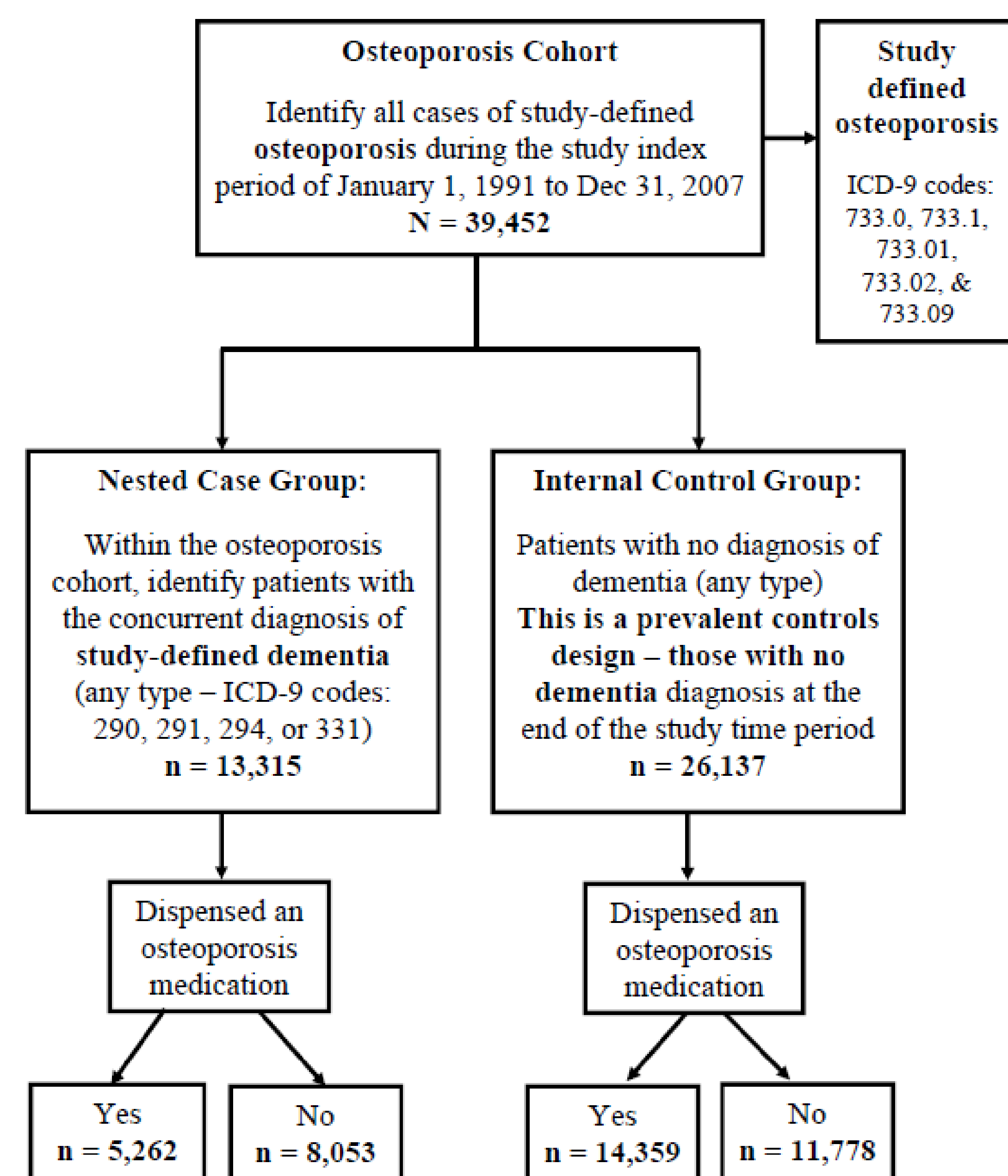
Purpose

To examine the relationship between dementia, co-morbidity, and osteoporosis treatment propensity.

Materials & Methods

- Design:**
- Population based, nested case-control study.
- Data Sources**
- De-identified administrative healthcare data derived from the British Columbia (Canada) Linked Health Database (BCLHD).
- Study Population**
- Community based individual's ≥ 65 years with an osteoporosis diagnosis that had continuous enrollment in the provinces' prescription drug plan between 1991 and 2007.
- Outcome Measures**
- Dependent variable - osteoporosis medication dispensation.
 - Independent variables (main) - dementia diagnosis.
 - Covariates - age, sex, chronic disease count, & residence.
- Statistical Analysis**
- A multivariate logistic regression model was assembled to examine the relationship between dementia diagnosis and osteoporosis medication dispensation.
 - The calculated ORs were considered statistically significant if the 95% CI did not include 1.

Selection Flow Chart



Results: Patient Characteristics *

Variable	No dementia diagnosis n = 26,137 (66.3)	Dementia diagnosis n = 13,315 (33.7)	Total osteoporosis cohort N = 39,452
Sex ‡			
Female	20,555 (78.6)	10,616 (79.7)	31,171 (79.0)
Male	5,329 (20.4)	2,606 (19.6)	7,935 (20.1)
Co-morbidity †			
No co-morbidity	1,277 (4.9)	927 (7.0)	2,204 (5.6)
1-3 diagnoses	13,873 (53.1)	6,693 (50.3)	20,566 (52.1)
4-13 diagnoses	10,987 (42.0)	5,695 (42.8)	16,682 (42.3)
Health region †			
Vancouver Coastal	6,918 (26.5)	4,351 (32.7)	11,269 (28.6)
Interior	4,962 (19.0)	2,140 (16.1)	7,102 (18.0)
Fraser	7,235 (27.7)	3,373 (25.3)	10,608 (26.9)
Vancouver Island	5,652 (21.6)	2,934 (22.0)	8,586 (21.8)
Northern	1,170 (4.5)	419 (3.1)	1,589 (4.0)
Missing	200 (0.8)	98 (0.7)	298 (0.8)

* All data are shown as number (percentage).
 † $p < 0.001$ for chi square differences between categories within group.
 ‡ $p < 0.05$ for chi square differences between categories within group.

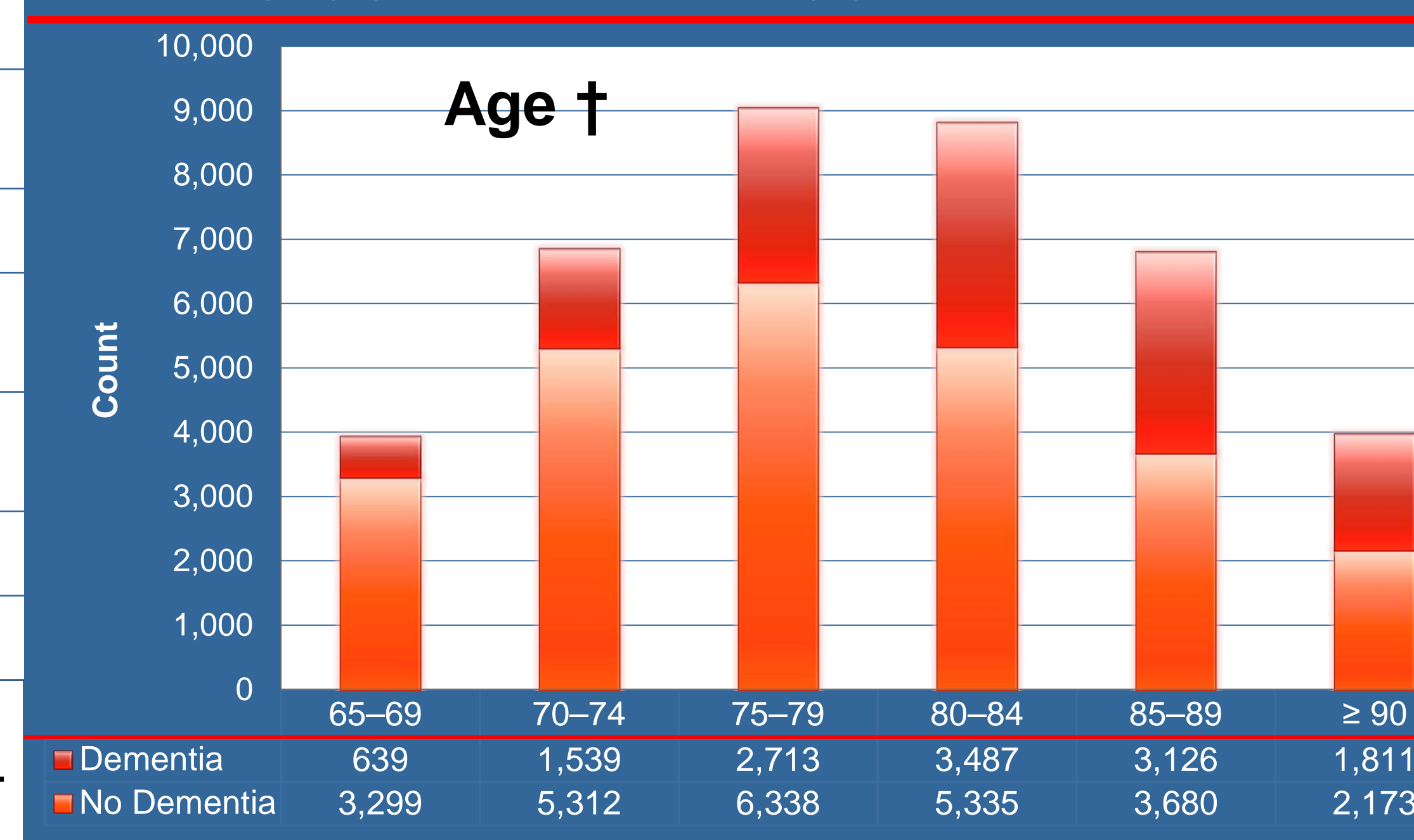
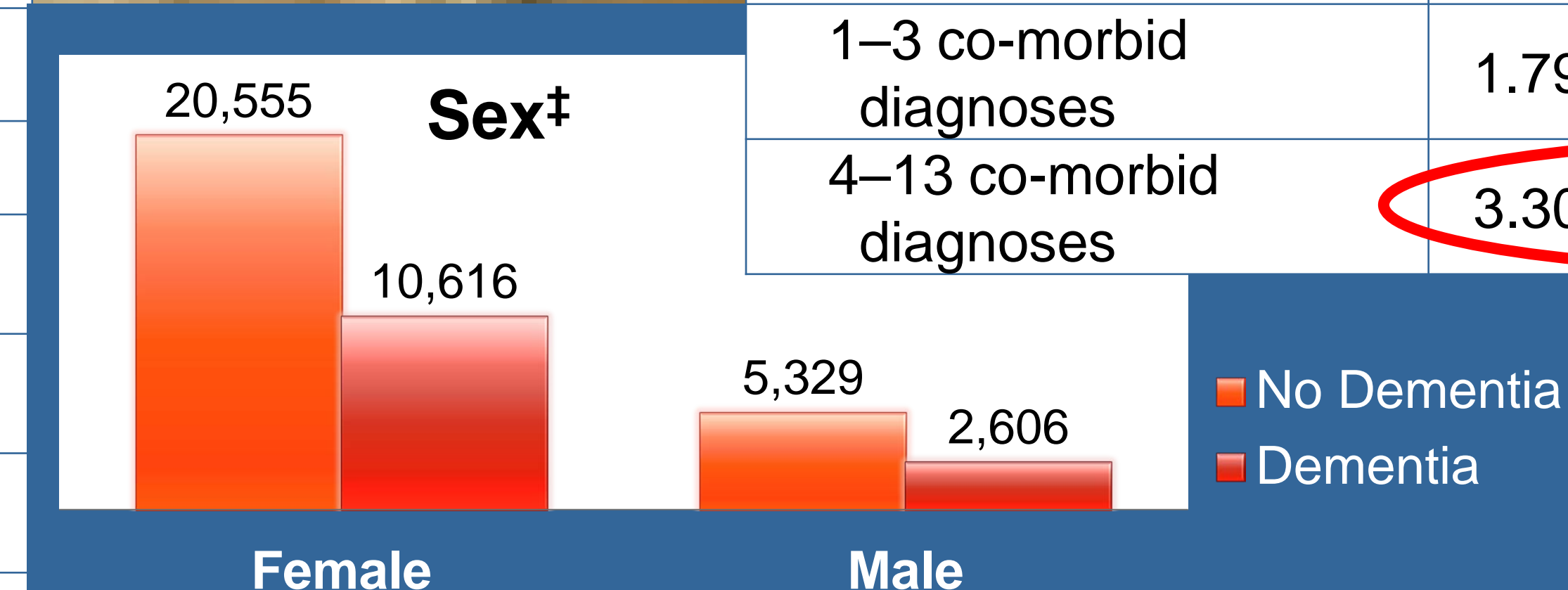


Those with a dementia diagnosis received treatment almost half as often

Factors Predicting Osteoporosis Treatment

Variable	Adjusted OR (95% CI)	p-value
Constant	0.67	0.000
Dementia status		
No diagnosis of dementia	1 (reference)	
Diagnosis of dementia	0.55 (0.44 - 0.69)	0.000
Age category (y)		
65-69	1 (reference)	
70-74	1.11 (1.02 - 1.21)	0.014
75-79	1.06 (0.98 - 1.15)	0.170
80-84	0.88 (0.81 - 0.95)	0.002
85-89	0.72 (0.66 - 0.79)	0.000
≥ 90	0.47 (0.42 - 0.52)	0.000
Sex		
Female	1 (reference)	
Male	0.14 (0.13 - 0.15)	0.000
Co-morbidity		
No co-morbidity	1 (reference)	
1-3 co-morbid diagnoses	1.79 (1.57 - 2.05)	0.000
4-13 co-morbid diagnoses	3.30 (2.88 - 3.78)	0.000

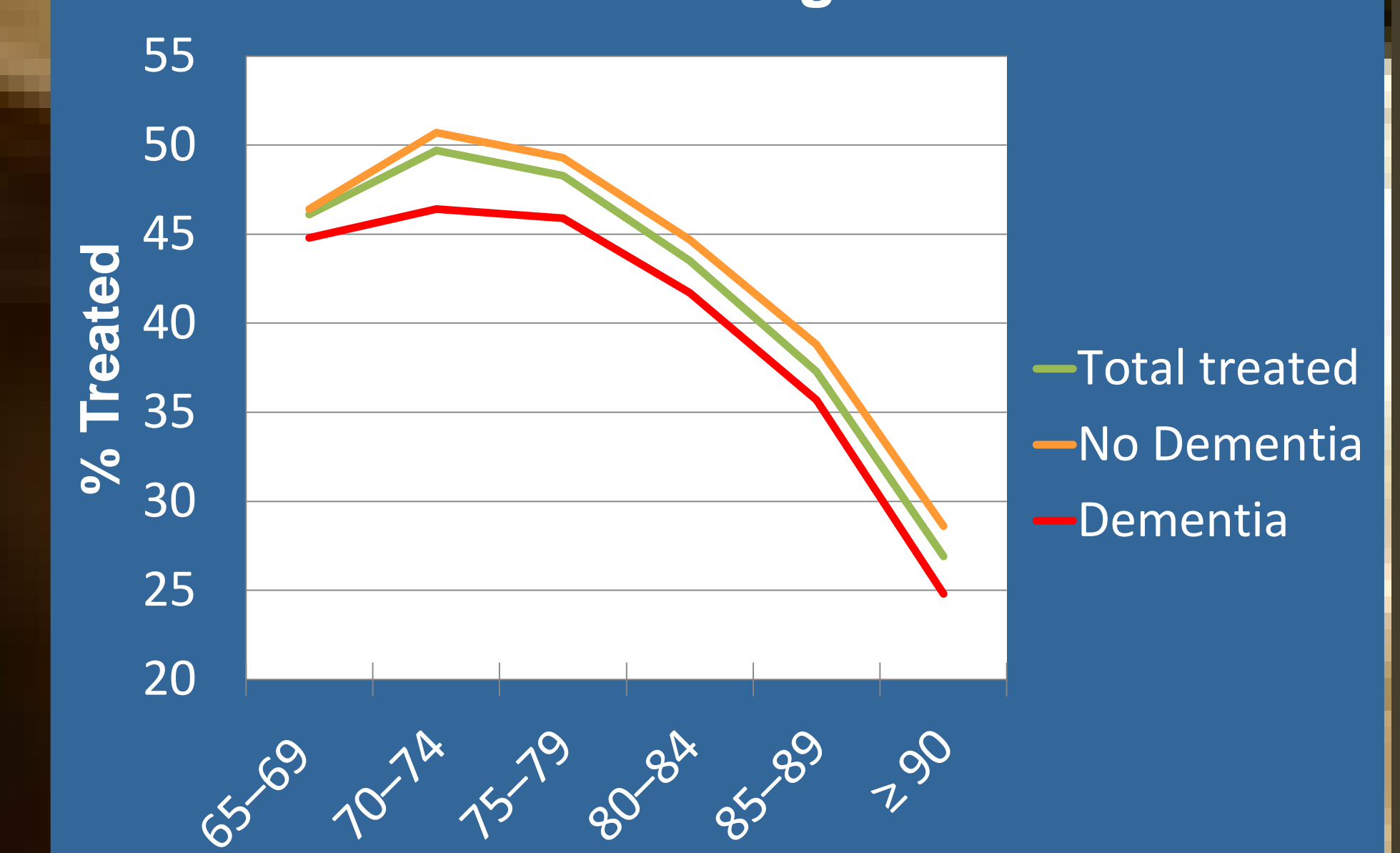
Males received treatment 7 times less often compared to females



Results

- Almost half of the total osteoporosis cohort were dispensed an osteoporosis medication (n = 17,040 [43%]; $p < 0.001$ for chi square differences between categories within each group).
- Patients with dementia received treatment significantly less often (n = 5,262 [40%]).
- Those with dementia who were dispensed treatment, were significantly ($p < 0.001$ for chi square differences) more likely to:
 - Be younger - 43% of those < 80 years received medications vs. 25% for those ≥ 90 years.
 - Be female - 46% of females received medications versus 14% of men.
 - Have more co-morbid conditions and to reside in a more central location.

Treatment Status by Age & Dementia Diagnosis †



Subjects ≥ 90 years were dispensed treatment less than 50% of the time compared to subjects 69 years and younger

Those with ≥ 4 co-morbidities were more than 3 times as likely to have been dispensed treatment

Conclusions

- The majority of older adults with a diagnosis of dementia, but not necessarily fewer co-morbid conditions, did not receive osteoporosis treatment.
- Decision makers should focus on strategies to improve osteoporosis treatment rates in this high-risk group.