

# Current Trends in the Risk of Subsequent Fracture After Initial Fracture, and Post-fracture Treatment Among Commercially Insured Postmenopausal Women in the United States



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## BACKGROUND

- Osteoporosis (OP) is a chronic disease warranting lifelong management
- Secondary fracture prevention with pharmacologic management has been declining in the U.S., even among those at highest risk of future fracture<sup>1</sup>
- Studies among older patients have shown that recent fracture is associated with a particularly high near-term risk of subsequent fracture, though data is lacking among younger, commercially-insured patient populations<sup>2,3</sup>

## OBJECTIVE

- To estimate the incidence of new osteoporotic fracture among women aged  $\geq 50$  years
- To assess the risk of subsequent fracture among postmenopausal women with an initial OP fracture
- To assess the rates of OP treatment initiation after an index fracture

## METHODS

### Study Population & Outcome Definitions

- Women aged  $\geq 50$  years were identified using an administrative health claims database for members of large commercial and Medicare Advantage plans (Optum's de-identified Clininformatics® Data Mart Database) from 2012 to 2021
- Incident fractures (no evidence of fracture 90 days prior to and including the index event) were identified by  $\geq 1$  insurance claim with a relevant diagnosis and/or repair procedure code for an open or closed fracture at all sites (excluding extremities)
- Treatments for osteoporosis were identified by prescription fills or medical claims for a relevant procedure (i.e. intravenous medication administered by a health care provider)

### Analyses

- The cumulative incidence of a new, subsequent fracture either at the same or a different anatomic site was estimated for the following fracture sites occurring  $\geq 90$  days of initial index fracture for up to 2 yrs:
  - Any clinical vertebral, hip, femur, pelvis, tibia, fibula, radius/ulna/distal forearm, humerus, clavicle, rib, sternum
  - Major fracture (i.e. any fracture excluding face/skull, finger/toes, clavicle, rib, sternum)
  - Hip fracture
  - Clinical vertebral fracture
- Women with an initial fracture were followed from the date of index fracture for up to 2 years to estimate the cumulative incidence of the first OP treatment initiated overall, and stratified by age, and by treatment class (women who initiated multiple types of treatment during follow-up only contributed to the earliest of the initiated treatments) including:
  - anabolic agents (abaloparatide, teriparatide, romosozumab)
  - injectable antiresorptives (denosumab, ibandronate, zoledronic acid)
  - oral antiresorptives (alendronate, oral ibandronate, risedronate)
- All analyses used inverse probability weighting to adjust for differential censoring due to differences in demographics and baseline clinical risk factors

## RESULTS

### Patient Characteristics

Table 1. Baseline characteristics (%) of postmenopausal women

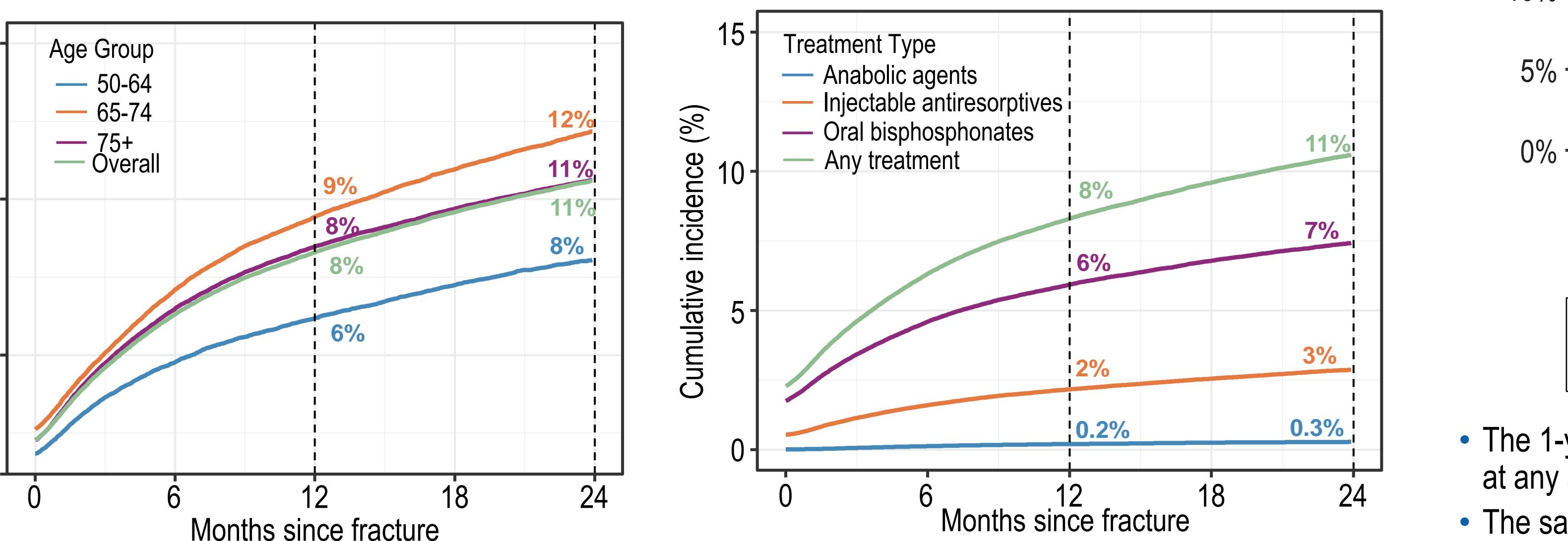
	Postmenopausal women in 2021 (N=3,403,864)	Postmenopausal women with an incident fracture (N=483,564)
Age, yrs		
50-64	971,464 (28.5%)	81,789 (16.9%)
65-74	1,248,267 (36.7%)	138,163 (28.6%)
$\geq 75$	1,184,133 (34.8%)	263,612 (54.5%)
Comorbidities		
Marker of frailty or history of fall	678,722 (19.9%)	253,828 (52.5%)
Endocrine disorder	679,065 (19.9%)	125,920 (26.0%)
Chronic kidney disease	227,182 (6.7%)	60,020 (12.4%)

### Fracture Incidence

- Women who had an incident fracture had a mean age of 74.8 years and had a higher prevalence of frailty or history of fall, endocrine disorders and chronic kidney disease as compared to postmenopausal women overall.
- The yearly incidence of fractures has remained stable through time among women aged  $\geq 50$  years (1.74% in 2012; 1.57% in 2021).
- Hip fractures (0.55%) were the most common fractures in 2021, followed by clinical vertebral fractures (0.39%), lower extremity fractures (0.28%, includes ankle, fibula and tibia), humerus (0.22%), and the radius/ulna/distal forearm (0.16%).

### Post-Fracture Osteoporosis Treatment Initiation

Figure 2. Cumulative incidence of the first OP treatment initiated after an incident fracture, stratified by age and treatment class



- Post-fracture treatment rates remained low overall, reaching 11% at 2 years post fracture.
- Women aged 50-64 had lower rates of treatment initiation (8%) compared to women aged 65-74 (12%) and 75+ (11%).
- Post-fracture treatment rates were the lowest among patients initiating anabolic bone-forming agents, followed by injectable antiresorptives and oral antiresorptives, respectively.

Figure 1. Risk of subsequent fracture after an index OP fracture

Cumulative incidence of subsequent fracture after initial fracture



- The 1-year cumulative incidence of a subsequent fracture at any site among women with an initial fracture at any site was 11.6%, increasing to 19.1% at 2 years.
- The same-site subsequent fracture risk was highest for women with an initial clinical vertebral fracture: 10.1% experienced a subsequent vertebral fracture at year 1 and 15.9% at year 2.
- Among women with an initial hip fracture, 12.2% and 19.6% experienced a subsequent fracture at any site after 1 and 2 years, respectively, while 8.0% and 12.2% experienced a subsequent hip fracture at 1 year and 2 years, respectively.

## STRENGTHS AND LIMITATIONS

- Study included a large, representative cohort of commercially-insured postmenopausal women (N~8.3M unique patients) using 10 years of data from 2012 to 2021
- Although we used validated algorithms<sup>3</sup> with high positive predictive value to identify OP fractures, there is still some potential that subsequent fractures may be misclassified as incident events
- The incidence of vertebral fractures may be underestimated, as these fractures are often asymptomatic and may remain undiagnosed

## CONCLUSIONS

- The risk of experiencing a subsequent fracture is high among postmenopausal women experiencing an initial OP fracture
- Vast majority of women do not receive pharmacological treatment after an initial fracture
- Although clinical guidelines specify that OP is a lifelong, chronic disease requiring ongoing management, recent data over a 10-year period show that recurrent fracture risk remains high, while osteoporosis treatment with approved medications remains underutilized in this high-risk population.

## REFERENCES

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## DISCLOSURES

This study was funded by Amgen. MP and KEH are employees of and own equity in Target RWE. MK, VCB, MTM, and TCL are employees of and own equity in Amgen. PS is a former employee of and owns equity in Target RWE. FC: Amgen- consultant, advisor, speaker; UCB- advisor; Radius Health- advisor, speaker, grant recipient; Enterabio- advisor, consultant; Pfizer/Myovant- consultant; Biocon- consultant. JRC: Amgen – consultant, research grants. EML: Amgen - consultant, investigator and speaker, Radius - consultant and investigator. In the past 18 months, MAB: scientific advisory committee- American Academy of Allergy, Asthma & Immunology, Amgen, Atara Biotherapeutics, Brigham and Women's Hospital, Gilead/Kite, Intercept, National Institute of Diabetes and Digestive and Kidney Diseases, Regeneron, and Vertex; equity- Accompany Health, Target RWE