Original Article

Comprehensive Evaluation of Treatment Patterns in Postmenopausal Patients with Osteoporosis without Fractures: Insights from Tertiary Care Institutions and Nationwide OMOP-CDM Data

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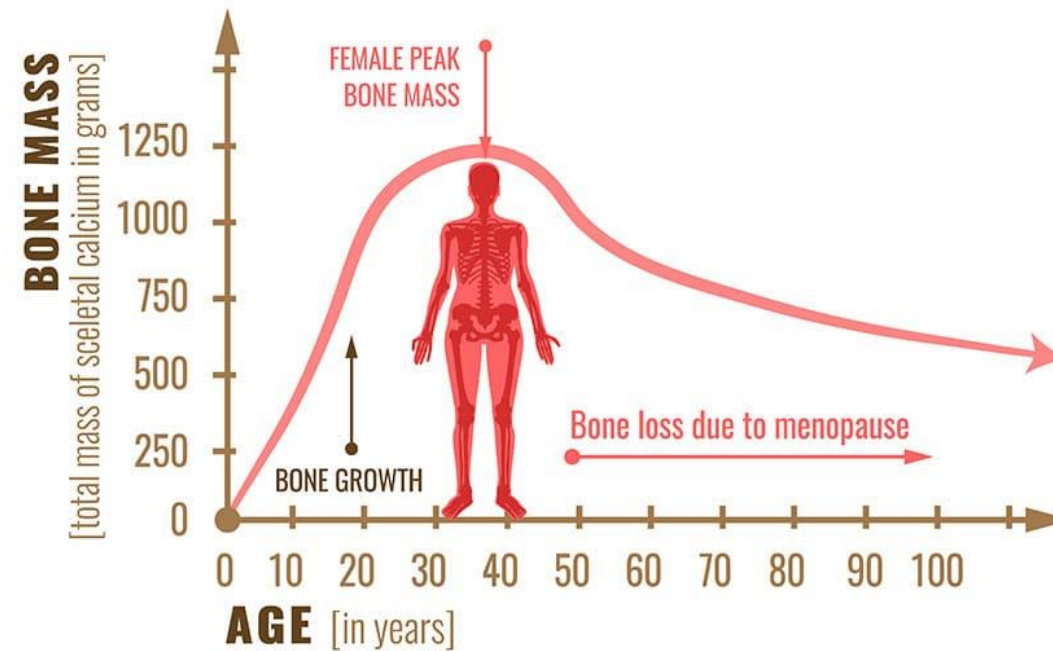Seng Chan You[2,3] iD

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Osteoporosis

- Osteoporosis, a skeletal disease characterized by weakened bones and a heightened risk of fractures, is **particularly prevalent among postmenopausal women**

DECREASING BONE MASS WITH AGE IN WOMEN

Anti-osteoporosis medications (AOMs)

	Antiresorptive agents				Anabolic agents	
Name	Selective estrogen receptor modulators (SERMs)	Oral bisphosphonates (oral BPs)	Intravenous bisphosphonates (intravenous BPs)	Denosumab (*novel drug)	Teriparatide	Romosozumab (*novel drug)
Ingredients	raloxifene, bazedoxifene	alendronate, risedronate, ibandronate, etidronate	ibandronate, zoledronate	denosumab	teriparatide	romosozumab
Target	Moderate risk	Moderate risk, High risk	High risk, Very high risk	High risk, Very high risk	Very high risk	Very high risk
Type	Oral	Oral	Intravenous injection	Subcutaneous injection	Subcutaneous injection	Subcutaneous injection
Long-Term Use	Safe for long-term use	Usable up to 5 years / Drug holiday required (side effect prevention)	Usable up to 3 years / Drug holiday required (side effect prevention)	Safe for long-term use	Usable up to 2 years	12 months use

* Abaloparatide was excluded because it is unavailable in South Korea

Objectives

- We aim to provide a comprehensive overview of osteoporosis medication patterns in South Korea and capture shifts in treatment approaches over time in response to evolving therapies and policy changes

Data sources

- Osteoporosis Analysis and Surveillance Initiative using Standardized data (OASIS)
  - Severance Hospital (6.27 million individuals from January 2006 to August 2023)
  - Asan Medical Center (4.95 million individuals from October 2004 to December 2020)
  - Korea University Anam Hospital (2.18 million individuals from January 2009 to June 2021)
  - Inha University Hospital (1.98 million individuals from February 2001 to February 2019)

- Health Insurance Review and Assessment Service (HIRA)
  - A total of 9,822,577 patients were enrolled between January 2018 and April 2022, representing approximately 20% of the Korean population

Definition of cohorts

- Target cohort
  - Definition: Postmenopausal patients diagnosed with osteoporosis from 2012 to 2021
  - Index Date: Date of first osteoporosis diagnosis (M81)
  - Inclusion Criteria: Women aged 50 years or older
- Sub target cohort (before 2017, 2017–2018, and 2019 or later)
  - To investigate the impact of drug approval and insurance coverage on treatment patterns, the periods were roughly divided into three segments: *before 2017, 2017–2018, and 2019 or later*
  - Denosumab was launched in Korea in November 2016 and approved as a first-line drug for osteoporosis in April 2019
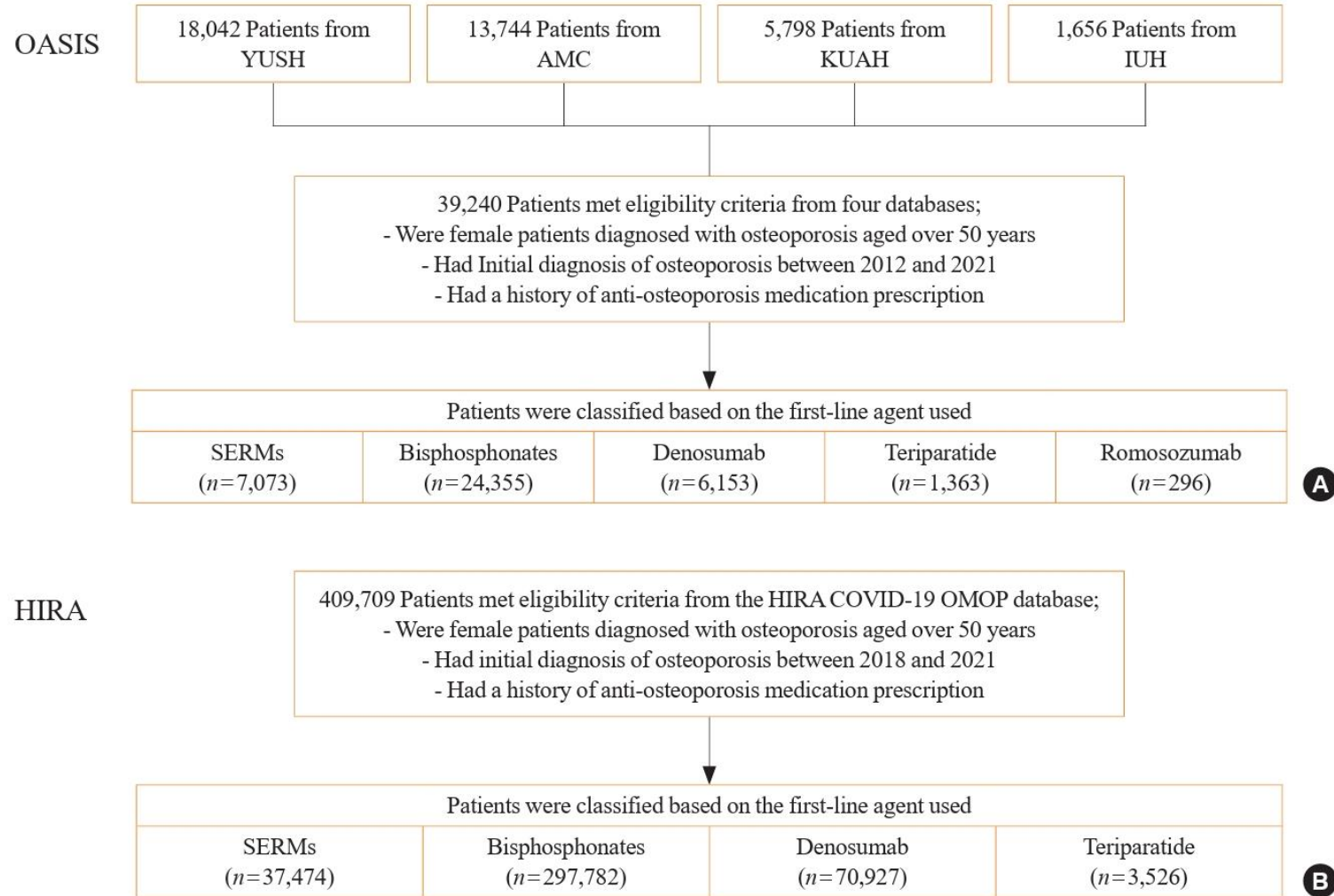
Definition of medication

- Medication cohort
  - Definition: Women over 50 diagnosed with osteoporosis and taking osteoporosis medications for more than a month
    - For oral medications: at least 28 days of use
    - For injectable medications: at least one administration
  - Index Date: Date of first prescription of osteoporosis medication
    - SERMs
    - Oral BPs
    - Intravenous BPs
    - Denosumab
    - Teriparatide
    - Romosozumab (Only OASIS)
  - Inclusion Criteria: At least one osteoporosis diagnosis prior to the Index Date
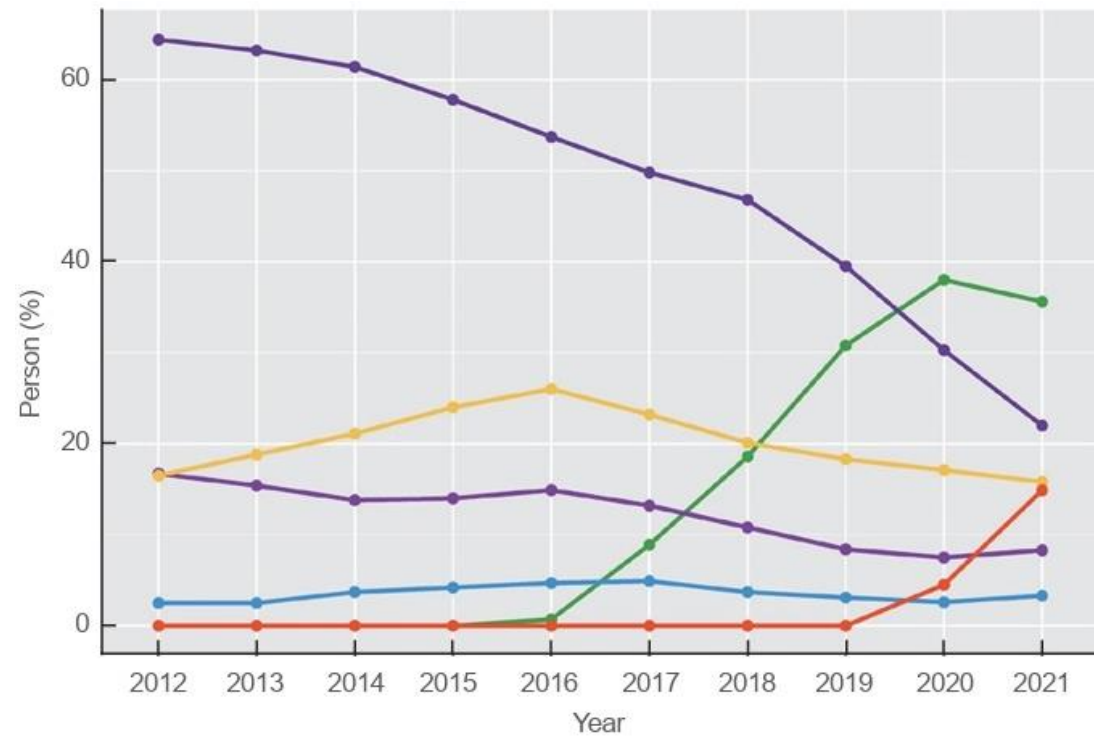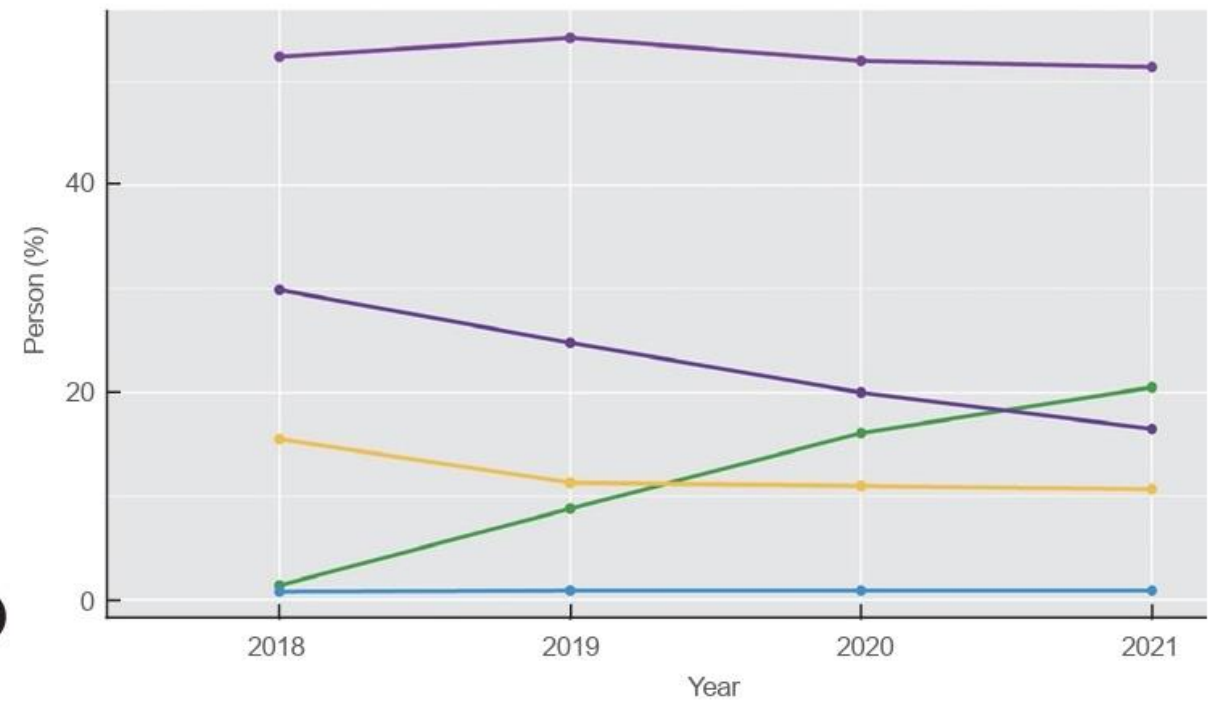 - Cohort End Date: End of persistence period (180 days)

Study populations

OASIS

18,042 Patients from YUSH	13,744 Patients from AMC	5,798 Patients from KUAH	1,656 Patients from IUH

39,240 Patients met eligibility criteria from four databases;
- Were female patients diagnosed with osteoporosis aged over 50 years
- Had Initial diagnosis of osteoporosis between 2012 and 2021
- Had a history of anti-osteoporosis medication prescription

Patients were classified based on the first-line agent used

SERMs (n=7,073)	Bisphosphonates (n=24,355)	Denosumab (n=6,153)	Teriparatide (n=1,363)	Romosozumab (n=296)

A

HIRA

409,709 Patients met eligibility criteria from the HIRA COVID-19 OMOP database;
- Were female patients diagnosed with osteoporosis aged over 50 years
- Had initial diagnosis of osteoporosis between 2018 and 2021
- Had a history of anti-osteoporosis medication prescription

Patients were classified based on the first-line agent used

SERMs (n=37,474)	Bisphosphonates (n=297,782)	Denosumab (n=70,927)	Teriparatide (n=3,526)

B

Secular trends
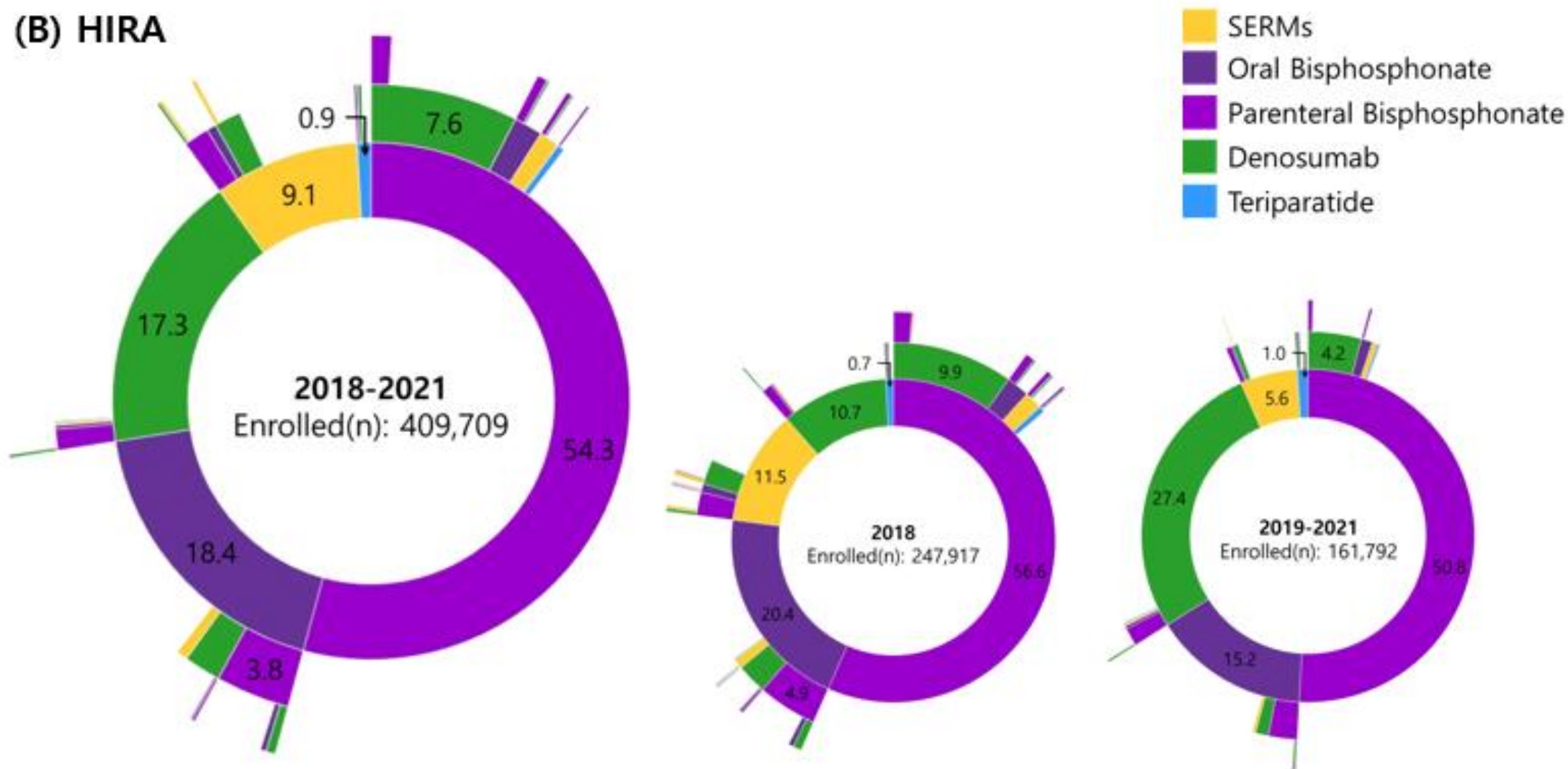
(A) OASIS

(B) HIRA

AOM treatment patterns in OASIS

AOM treatment patterns in HIRA

Key findings

- Different prescribing patterns between specialized and general hospitals
    - In the OASIS cohort, denosumab has replaced as the most prescribed first-line treatment between 2019 and 2021
    - In the HIRA cohort, parenteral BPs have remained the most prescribed first-line treatment
- This study shows how national health insurance policies influence prescribing practices, indicating that institutional characteristics and policy changes should be considered in osteoporosis treatment

Thank you!

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