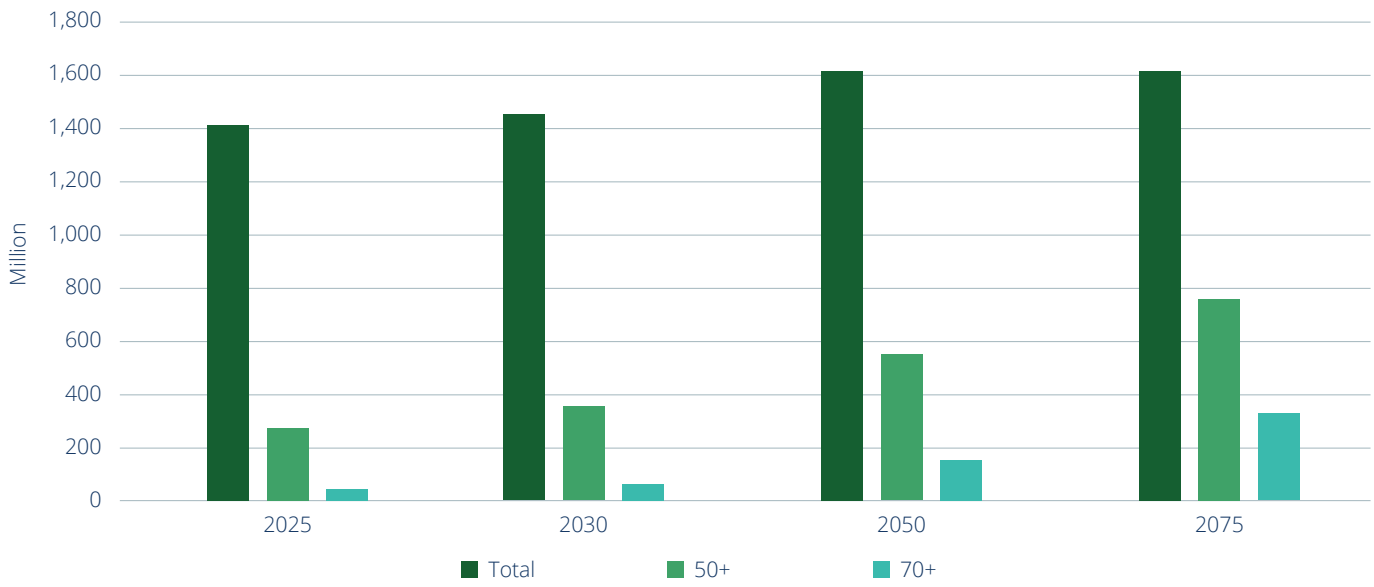
DEMOGRAPHIC TRENDS

India's population is projected to grow steadily until the mid-21st century, increasing by 14% from 1,419 million in 2025 to 1,622 million by 2050. However, population growth is expected to slow significantly in the second half of the century, with only a marginal increase of less than 1% to 1,625 million by 2075 *(Figure 1)*. Indians currently have an average life expectancy of 68.7 years, which is expected to rise to 82.5 years by 2075, an increase of 20%.

The proportion of Indians aged 50 years or older is set to rise significantly. In 2025, this group of 293.9 million people represents 21% of the total population. By 2075, this will increase to 45%, with numbers more than doubling to 730.9 million *(Figure 1)*.

The most dramatic demographic shift in India will be among those aged 70 years or older, whose numbers are projected to surge from 57.7 million in 2025 to 309.5 million in 2075, a 436% increase in absolute terms. Equally striking is their growing share of the total population. In 2025, those aged 70+ accounted for just 4% of India's 1,419 million people. By 2075, they will make up 19% of a larger 1,622 million population, reflecting a 368% relative increase in their proportion of the total population.

Figure 1. Population projections for India from 2025 to 2075 [1]



CENTRALISED DATABASES FOR FRACTURES AND EPIDEMIOLOGY

There is no centralised database for fractures in India.

HEALTHCARE COSTS ASSOCIATED WITH FRAGILITY FRACTURES

Average direct hospital costs for treating osteoporotic hip fractures (USD)	Average indirect hospital costs for treating osteoporotic hip fractures (USD)	Average bed days for hip fractures
764 [2,3]	No data	12 [4]

CLINICAL SPECIALTY RESPONSIBLE FOR MANAGEMENT OF OSTEOPOROSIS

Osteoporosis is not primarily managed by primary care physicians. Instead, it is under the care of rheumatologists, orthopaedic surgeons, gynaecologists, and endocrinologists. It is not recognised as a standalone medical specialty. However, osteoporosis is currently a formal component of specialty medical training.

PATIENT SUPPORT ORGANISATIONS

There are no patient support organisations that focus on osteoporosis in India.

OSTEOPOROSIS AS A DOCUMENTED NATIONAL HEALTH PRIORITY (NHP)

Osteoporosis is not documented as a National Health Priority (NHP) in India.

AVAILABILITY AND REIMBURSEMENT OF MEDICATION

As shown in *Table 1*, a variety of osteoporosis treatments are available in India. It is currently not possible to provide precise data on the percentage of reimbursement for individual osteoporosis medications in India, as no such data exists. Reimbursement is commonly available in public and government hospitals but is infrequent in the private sector. This is particularly significant given that more than 60% of healthcare in India is delivered through the private sector, where outpatient expenses, such as those for osteoporosis medications, are typically borne directly by patients. According to the *National Family Health Survey (NFHS)* 2019-21, approximately 40% of the population is now covered by some form of health insurance, but this coverage is often limited in scope.

Financial considerations play a critical role in access to treatment. Reimbursement is generally more accessible for generic medications than for innovative new drugs. Most osteoporosis therapies, except for romosozumab, are available as generics manufactured locally in India, which helps reduce costs. Romosozumab has been launched in the Indian market in 2024 and is not widely used as yet, due to the high cost.

In general, health insurance policies in India do not provide coverage for outpatient treatments, which includes routine osteoporosis management. While hospitalisation and surgery for conditions such as hip fractures may be reimbursed, the associated long-term osteoporosis medications often are not. As a result, treatment remains an out-of-pocket expense for most patients.

A recent initiative by the *National Health Authority of India* aims to expand insurance coverage, particularly for underserved populations. Notably, the scope of this programme was recently broadened to include all individuals over the age of 70 years. This expansion may significantly improve access to osteoporosis care for older adults, who are at the highest risk of fragility fractures.

Treatment reimbursement depends on the patient's insurance status. In some cases, costs are partially covered by private insurance providers, while in others, treatment may be fully reimbursed through the national health system. However, there are no standard conditions applied consistently across the system. Reimbursement policies are fragmented and, at times, may interfere with clinical decision-making, limiting physicians' ability to prescribe the most appropriate therapies. Access to reimbursed osteoporosis treatment remains uneven, and for most individuals, it continues to represent a significant out-of-pocket financial burden.

Table 1. Availability and reimbursement of osteoporosis treatments in India

Treatment	Available	Reimbursed
Risedronate	X	X
Alendronate	X	X
Ibandronate	X	X
Zoledronic acid	X	X
Clodronate		
Pamidronate		
Raloxifene		
Bazedoxifene		
Denosumab	X	X
Strontium Ranelate		
Teriparatide	X	X
PTH (1-84)		
Abaloparatide		
Romosozumab	X	X
Vitamin D/Calcium supplements	X	X
Calcitonin	X	X
Hormone Replacement Therapy	X	X
Testosterone	X	X
Alfacalcidol	X	X
Calcidiol		
Calcitriol	X	X
Tibolone	X	X

WAITING TIME FOR HIP SURGERY

Average waiting time for hip surgery after hip fracture	1 - 2 days
% of hip fractures surgically managed	76 - 90%

FRACTURE RISK ASSESSMENT TOOLS

India uses FRAX® [3], and its adoption is gradually increasing; however, it is not yet widely used across the country. The utility of FRAX® without DXA has been highlighted [5].

FRACTURE LIAISON SERVICES (FLS) REIMBURSEMENT AND AVAILABILITY

% of hospitals with an FLS	1 – 9 %
Hip fractures identified by or referred to an FLS	1%
Vertebral fractures identified by or referred to an FLS	1%
Other fracture types identified by or referred to an FLS	1%
Reimbursement mechanism to support FLS activities	Local health service & Private funding
% of patients recommended for treatment who actually receive treatment	20 – 49%

GUIDELINES FOR OSTEOPOROSIS MANAGEMENT

The 2021 *Indian Society for Bone and Mineral Research (ISBMR)* guidelines[6] aim to improve the diagnosis and management of osteoporosis in India, emphasising early screening, maintaining optimal vitamin D levels, and first-line pharmacotherapy for specific populations as follows:

- **Vertebral fractures:** Teriparatide is recommended as an initial anabolic treatment for 24 months, followed by antiresorptive agents. Zoledronic acid or denosumab are also effective, with zoledronic acid preferred due to clearer discontinuation protocols.
- **Hip fractures:** Intravenous zoledronic acid is the preferred agent, ideally administered before hospital discharge. Denosumab is a suitable alternative. Oral bisphosphonates may be used if injectables are declined. Teriparatide is less commonly used due to limited data for hip fracture prevention.
- **High-risk individuals without fractures:** Bisphosphonates (oral or intravenous) are typically first-line, with zoledronic acid favoured for its convenience. Denosumab is an alternative for those intolerant of bisphosphonates. Teriparatide is considered for very low BMD (T-score < -3.5) and high vertebral fracture risk. Timely dosing is critical to avoid rebound fractures with denosumab.
- **Low to moderate risk cases:** Alendronate, risedronate, zoledronic acid, and denosumab are all effective. Oral bisphosphonates are generally preferred in this group.

The guidelines address population-based screening. Fracture risk assessment is covered in the guidelines, considering factors such as prior fracture, age, bone mineral density, and FRAX®. However, the assessment guidance is not aligned with existing reimbursement policies. Treatment criteria are also outlined, including prior fracture, age, BMD, FRAX®, and glucocorticoid-induced osteoporosis. These criteria, however, are not compatible with reimbursement policies, as no formal reimbursement system currently exists. The guidelines were developed without direct patient involvement. Additional details on the development of these guidelines are included in *Table 2*. An updated version of the guidelines is under preparation.

Table 2. Development of clinical guidelines for the management of osteoporosis in India

Systematic literature review undertaken	No
Recommendations	Yes
Stakeholder involvement	Yes - ISBMR
External review	Yes
Procedure for update defined	No
Economic analysis	Yes
Editorial independence	Yes

ACCESS TO DXA AND/OR ULTRASOUND AND REIMBURSEMENT

DXA is available in India

Waiting time (d)	0 - 3 (longer in public sector)
Cost (USD)	25 - 50
Is it reimbursed?	Limited to none
Is reimbursement a barrier to accessing treatment?	Yes

Quantitative ultrasound is available in India.

Waiting time (d)	0
Cost (USD)	15
Is it reimbursed?	Sometimes
Is reimbursement a barrier to accessing treatment?	Yes

QUALITY INDICATORS

There are no quality indicators for hip and other fractures in India.

OVERVIEW OF OSTEOPOROSIS IN INDIA

Osteoporosis in India remains under recognised and undertreated. There is a pressing need for stakeholders across the healthcare system to collaborate in developing a national strategy. Life expectancy in India is now close to 70 years and continues to rise annually. As a result, the number of fragility fractures is also increasing, based on strong clinical impressions, although published data are lacking. While vertebral fracture rates in India appear comparable to those observed in Western countries, reliable data on hip fractures remain limited and inconsistent [7,8].

Despite the growing burden, osteoporosis and fragility fractures have yet to be recognised as national health priorities. These conditions compete for attention and resources alongside other rapidly increasing chronic diseases, such as diabetes, cardiovascular disease, and cancer. In 2021, the *Indian Society for Bone and Mineral Research (ISBMR)* released recommendations for the diagnosis and treatment of osteoporosis [6]. However, these are not graded recommendations and are primarily based on expert consensus.

Complementing these recommendations, a reference database for bone mineral density (BMD) in healthy Indian adults has been established [9], which may have important clinical implications for improving diagnosis and guiding intervention strategies for osteoporosis management.

Vitamin D deficiency is widespread across India, as demonstrated by numerous studies. The National Nutrition Survey (2016–2018) reported vitamin D deficiency, defined as a 25(OH)D level below 12 ng/mL, in 14% of preschool children (1–4 years), 18% of school-age children (5–9 years), and 24% of adolescents (10–19 years) [10]. Prevalence varies widely by region, with some areas, such as Delhi, showing rates exceeding 50%. Contributing factors include limited sun exposure and severe air pollution, particularly in urban settings. These findings make a strong case for national food fortification with vitamin D. Although not mandatory, government-recommended fortification of milk and edible oil is gaining popularity.

Calcium intake in India is also lower than recommended, with an estimated average daily intake of just 429 mg [11]. However, substantial variation exists across different states. Improving both calcium and vitamin D intake remains an important public health objective.

The ISBMR has undertaken several initiatives to raise awareness of osteoporosis in India. Academic symposia are conducted regularly across the country, including 16 IOF/ISCD *"Osteoporosis Essentials"* courses aimed at educating healthcare professionals, particularly orthopaedic surgeons. An annual national conference brings together leading Indian experts and invited international faculty. In addition, ISBMR members and office bearers have contributed to significant research publications in recent years, authored articles in major newspapers, and appeared on national television to highlight the public health implications of vitamin D deficiency and fragility fractures.

One of ISBMR's recent initiatives focuses on assessing bone health in individuals with diabetes, a population estimated to exceed 100 million in India. Some centres have begun incorporating bone health assessments into routine diabetes care, and efforts are underway to promote this as a standard practice nationwide.
A key priority moving forward is the collection of accurate data on hip fracture incidence, which is currently lacking. Reliable data would support the development of a more accurate, India-specific FRAX® tool, improving fracture risk prediction and patient management. In parallel, there is a need to expand access to and reimbursement for bone density testing and outpatient treatment for osteoporosis. Finally, broader implementation of vitamin D fortification programmes, alongside robust impact evaluations, is essential to address the widespread deficiencies and their long-term consequences.

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https://indianrheumatology.org/

Indian Society for Bone and Mineral Research (ISBMR)
https://isbmr.org/

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