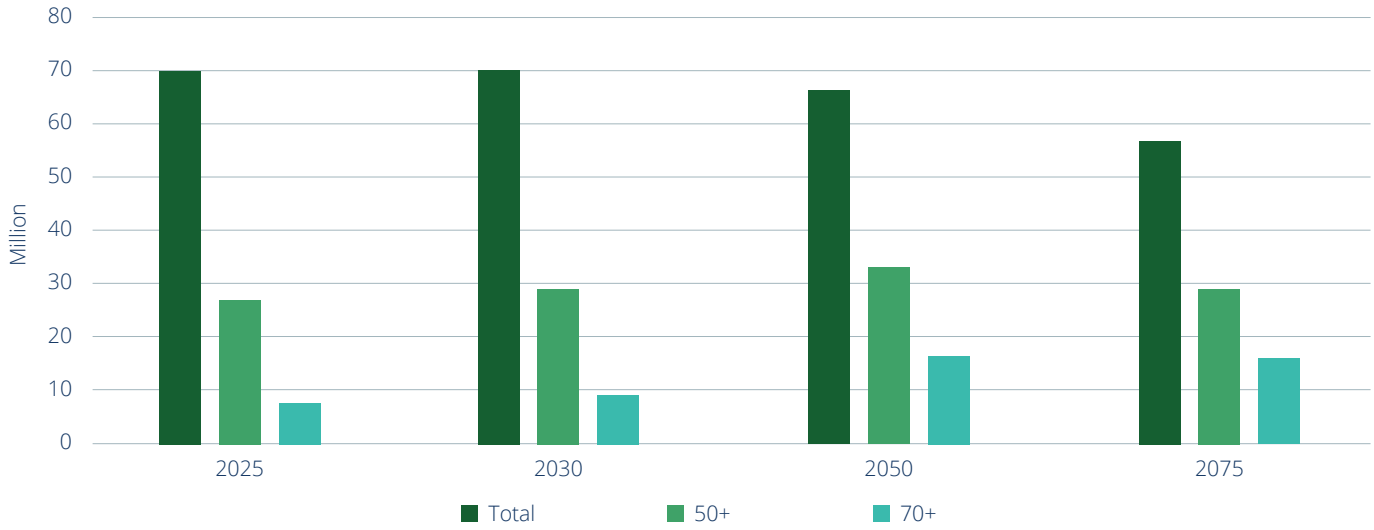
DEMOGRAPHIC TRENDS

Thailand's population is projected to grow marginally - from 70.0 million in 2025 to 70.3 million in 2030, an increase of less than 1% - before entering a period of significant decline. This downward trend is expected to accelerate in the second half of the century, with the population falling by 19% relative to 2025 levels, reaching 56.4 million by 2075 ***(Figure 1)***. Thais currently have an average life expectancy of 78.4 years, which is expected to rise to 87.9 years by 2075, an increase of 12%.

The proportion of Thais aged 50 years or older is projected to rise significantly in the coming decades. In 2025, this age group comprises 26.5 million people, accounting for almost 38% of the total population. By 2075, despite a declining overall population, the number of people aged 50 years or older is expected to grow to 29.4 million, representing 52% of the population ***(Figure 1)***.

The most dramatic demographic shift in Thailand will be among those aged 70 years or older, whose numbers are projected to increase from 7.0 million in 2025 to 15.9 million in 2075, a 126% increase in absolute terms. Equally striking is their growing share of the total population. In 2025, those aged 70+ accounted for 10% of Thailand's 70.0 million people. By 2075, they will make up almost 28% of a smaller 56.4 million population, reflecting a 180% relative increase in their proportion of the total population.

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



CENTRALISED DATABASES FOR FRACTURES AND EPIDEMIOLOGY

Two published studies have contributed to characterising the epidemiology of fragility fractures in Thailand.

In 2019, a retrospective cohort study analysed fragility hip fracture cases from Nan and Pua Hospitals in Nan province, Thailand, between September 2014 and December 2017, using ICD-10 codes S72.0–S72.2 [2]. A total of 876 patients were identified, with annual incidence rates of 211.6, 214.9, and 238.5 per 100,000 person-years for 2015–2017, respectively. Women had a markedly higher incidence than men (female-to-male ratio 2.5:1).

Most fractures (87.2%) occurred indoors, and 5.9% of patients experienced a refracture, with a median time to refracture of 143 weeks. The study classified the regional incidence as moderately severe and emphasised the need for coordinated, multidisciplinary homecare and fall-prevention strategies to reduce the burden of fragility hip fractures.

In 2023, a retrospective cohort study compared outcomes for patients aged ≥50 years admitted with fragility hip fractures to Police General Hospital, Bangkok, in the pre-pandemic period (2018–2019; n = 139) and during the COVID-19 pandemic (2020–2021; n = 125) [3]. The 30-day mortality rose from 0% pre-pandemic to 2.4% during the pandemic, and one-year mortality increased significantly from 1.4% to 4% (p = 0.033), though none of the deaths were directly related to COVID-19 infection. The pandemic period was associated with a shorter time to surgery, but longer delays to bone mineral density testing, initiation of osteoporosis medication, and higher loss to follow-up, resulting in reduced treatment uptake. These findings suggest that while acute surgical care improved, secondary fracture prevention pathways were disrupted during the pandemic.

In parallel with these research efforts, a national surveillance and prevention system for falls, hip fractures, and recurrent fractures has recently been established [4]. Data collection for this programme began in July 2025, meaning there are currently no national-level data to report. Once operational data accumulate, this system is expected to provide a centralised, comprehensive platform for ongoing monitoring and policy planning.

Is a centralised database established?	Yes
Level of database coverage	Hospital
Hip fracture records documented per year	100
Percentage of hip fractures treated surgically	90
All fracture records documented per year	110
Percentage of all fractures treated surgically	87.5
Age range and gender of patients in database	61-75+ years

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
6,719 (6,066 – 7,373)[5]	**1,592 (1,136 – 2,047)**	**16 (15 - 17)**

In 2023, Unnanuntana et al. assessed the in-hospital costs associated with treating elderly patients diagnosed with osteoporotic femoral neck fractures who underwent bipolar hemiarthroplasty at Siriraj Hospital in Thailand[5]. The mean and median total in-hospital costs associated with treating elderly patients diagnosed with osteoporotic femoral neck fractures who underwent bipolar hemiarthroplasty were USD 5,671 and USD 5,013, respectively, with a cost range spanning from USD 3,695 to USD 13,194. Notably, direct medical costs comprised 96.3% of total expenditures. Among cost components, intraoperative expenses were the most substantial, with prosthesis costs alone representing almost 30% of the total. Postoperative nursing care and medical treatment also accounted for a significant share of the costs. Factors such as prolonged hospital stays and postoperative pneumonia were associated with higher overall costs, with length of stay showing the strongest correlation.

When compared with previous Thai studies, the costs observed in this study were higher, likely due to an older patient population, greater burden of comorbidities, use of newer prosthetic technologies, and the

implementation of fast-track surgical pathways and Fracture Liaison Services. However, in an international context, the costs in Thailand were still lower than those reported in countries such as Singapore and Norway, underscoring the impact of differing healthcare systems and reimbursement models.

To reduce costs, the study recommends prioritising early surgical intervention, preventing postoperative respiratory complications, and minimising hospital length of stay. It should be noted that the findings are based on data from a single tertiary care hospital with a relatively small sample size, which may limit their applicability to other settings or treatment approaches. Nonetheless, the study offers timely and accurate cost data for the management of femoral neck fractures in Thailand and provides a valuable foundation for future health economic evaluations.

In 2023, Amphansap and colleagues presented a poster at the *Global Fragility Fracture Network Congress* in Oslo on the cost-utility of a Fracture Liaison Service for osteoporotic hip fracture patients in a tertiary care hospital in Thailand [6]. This study evaluated 71 patients with a mean age of 78.1 years, 73.2% of whom were female. Most had significant comorbidities (90.2% with a Charlson Comorbidity Index of 3–5) and ASA class 2 status (71.8%). Femoral neck fractures were most common (62.0%), followed by intertrochanteric (36.6%) and subtrochanteric (1.4%) fractures. The mean length of stay was 15.8 days. The mean total direct cost per patient was USD 6,719, comprising direct medical costs (USD 4,463) and direct non-medical costs (USD 2,255). Indirect costs averaged USD 1,591, bringing the mean total cost to USD 8,311, with a cost per QALY of USD 8,604. These locally derived cost and outcome data provide an important basis for future evaluations of secondary fracture prevention models in Thailand.

In 2024, Charatcharoenwitthaya et al. published a retrospective analysis of hip fracture hospitalizations among Thais aged 50 years or older within the *Universal Health Coverage System* from 2013 to 2022 [7]. They found that annual hospitalisation costs increased 2.5-fold over the decade, from USD 17.3 million in 2013 to USD 42.8 million in 2022 ($p < 0.001$). This cost escalation paralleled rising incidence and case numbers across all six regions of Thailand, highlighting the growing economic burden of hip fractures on the national health system and the urgent need for effective prevention strategies to curb future costs.

CLINICAL SPECIALTY RESPONSIBLE FOR MANAGEMENT OF OSTEOPOROSIS

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

PATIENT SUPPORT ORGANISATIONS

The *Thai Osteoporosis Foundation* (TOPF) is a scholarly organisation comprising a multidisciplinary team of healthcare professionals dedicated to the management of osteoporosis. In 2010, TOPF published Thailand's first clinical practice guideline for the diagnosis and treatment of osteoporosis, with subsequent revisions released in 2016 and 2021[8]. For more information, visit *https://topf.or.th/*.

The *Royal College of Orthopaedic Surgeons of Thailand* also plays a prominent and active role in advancing osteoporosis care and research. For more information, visit *https://www.rcost.or.th/th/*.

OSTEOPOROSIS AS A DOCUMENTED NATIONAL HEALTH PRIORITY (NHP)

Osteoporosis is included as one of the priority areas in the work plan for developing Thailand's healthcare system under the *20-Year National Strategy* (2018–2037) [9].

QUALITY INDICATORS

Level	Title	Topics covered	Frequency of reporting
National	Hip surgical rate	Hip fracture	Annually
National	Referral for Fracture Liaison Service	Hip fracture, osteoporosis management, fall prevention and multidisciplinary long-term management	Annually
National	Fast track hip surgery within 72 hours	Hip fracture	Annually
National	Thai Osteoporosis Foundation (TOPF) Clinical Practice Guideline on the diagnosis and management of osteoporosis 2021	Osteoporosis and secondary prevention of fragile fracture	Do not know

AVAILABILITY AND REIMBURSEMENT OF MEDICATION

As shown in *Table 1*, a range of osteoporosis treatments are available and reimbursed in Thailand. Bisphosphonates are designated as first-line treatments in the country.

Treatment is reimbursed either in full by the national health system or in part by the private insurance. Reimbursement is patient dependant and is subject to specific criteria, including prior fracture history, age, bone mineral density results, fracture risk threshold, secondary prevention, first- or second-line treatment option, and whether authorisation is required.

Reimbursement policies in Thailand may sometimes conflict with physicians' preferred treatment approaches for osteoporosis. Currently, alendronate is the only anti-osteoporosis medication reimbursed across all healthcare systems, and its coverage is limited to patients for a maximum duration of 5 years under the following clinical conditions:

1. **Patients aged ≥ 50 years:**
   Alendronate may be prescribed if the patient has a documented history of fragility fracture involving the hip or vertebrae. In cases where the patient has experienced fractures at the distal forearm, humerus, or pelvis. Treatment with alendronate is indicated only if the BMD T-score is ≤ -2.5.

2. **Patients without a prior history of fracture:**
   In individuals aged ≥ 65 years who have no history of fragility fracture, alendronate may be considered if the BMD T-score is ≤ -2.5. Alternatively, if the BMD T-score falls within the osteopenic range (between -1.0 and -2.5), treatment is justified when the 10-year probability of hip fracture, as calculated by the FRAX® tool using the Thailand database, is ≥ 3%.

Individuals under the civilian welfare system, which covers approximately 20% of the population, are eligible for full reimbursement of all approved osteoporosis medications. In contrast, the social security and universal coverage schemes offer more restrictive support. Under these schemes, reimbursement is generally limited to calcium and vitamin D supplementation. Romosozumab is not reimbursed under any scheme, and several other therapies are only reimbursed post-fracture and for patients with a BMD T-score below -2.5.

Table 1. Availability and reimbursement of osteoporosis treatments in Thailand

Treatment	Available	Reimbursed	% Reimbursed
Risedronate	X		
Alendronate	X	X	100%
Ibandronate	X		
Zoledronic acid	X		
Clodronate			
Pamidronate			
Raloxifene	X		
Bazedoxifene			
Denosumab	X		
Strontium Ranelate			
Teriparatide	X		
PTH (1-84)			
Abaloparatide			
Romosozumab	X		
Vitamin D/Calcium supplements	X	X	100%
Calcitonin	X		
Hormone Replacement Therapy	X	X	100%
Testosterone	X	X	100%*
Alfacalcidol	X		
Calcidiol	X		
Calcitriol**	X	X	100%
Tibolone	X		

* *Can be 100% reimbursed*
** *Only in case of CKD stage 5, ESRD, acute hypocalcaemia and hypoparathyroidism*

FRACTURE LIAISON SERVICES (FLS) REIMBURSEMENT AND AVAILABILITY

% of hospitals with an FLS
25 - 50%

Hip fractures identified by or referred to an FLS
60 - 90%

Vertebral fractures identified by or referred to an FLS
10-70%

Other fracture types identified by or referred to an FLS
10 - 50%

Reimbursement mechanism to support FLS activities
Local and National health service

% of patients recommended for treatment who actually receive treatment
50 - 69%

WAITING TIME FOR HIP SURGERY

Average waiting time for hip surgery after hip fracture	2 - 3 days
% of hip fractures surgically managed	76 - 90%

GUIDELINES FOR OSTEOPOROSIS MANAGEMENT

In 2021, the *Thai Osteoporosis Foundation (TOPF)* published the *Clinical Practice Guideline (CPG)* on the diagnosis and management of osteoporosis [8]. The guideline covers the management of osteoporosis in postmenopausal women, men, and individuals with glucocorticoid-induced osteoporosis (GIOP).

While the guidelines offer detailed recommendations on fracture risk assessment, including factors such as prior fracture, age, bone mineral density, and FRAX® scores, they do not include strategies for population-based screening. The guidance also sets out criteria for initiating treatment based on similar clinical risk factors.

Both the assessment guidelines and treatment recommendations are compatible with reimbursement policies. The guidelines were developed without direct patient involvement. Additional details on the development of these guidelines are included in *Table 2*.

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

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

ACCESS TO DXA AND/OR ULTRASOUND AND REIMBURSEMENT

DXA is available in Thailand.

Waiting time (d)	0 - 60
Cost (USD)	30 - 140
Is it reimbursed?	Yes. Only civilian welfare system (20% of Thai people) can be fully reimbursed. Since 2024, patients diagnosed with postmenopausal osteoporosis are eligible for 100% reimbursement under all healthcare system.
Is reimbursement a barrier to accessing treatment?	Yes partially. Especially for men and other secondary osteoporosis cause.

No data was provided on access to ultrasound in Thailand.

FRACTURE RISK ASSESSMENT TOOLS

Thailand uses FRAX®, and it is widely used within the country. When using FRAX®, treatment decisions are based on one of three approaches: a fixed probability threshold, an age-dependent probability threshold, or a combined threshold incorporating both FRAX® probability and bone mineral density values. These approaches are applied to both men and women.

OVERVIEW OF OSTEOPOROSIS IN THAILAND

Osteoporosis remains a significant but under-recognised health challenge in Thailand. Recent studies have shed light on the current state of care and ongoing gaps. These include findings from a three-year evaluation of a FLS model at a university-based tertiary care hospital [10], and another study that explored the persistent treatment gap following fragility hip fractures at a tertiary university medical centre [11].

A further example comes from the Police General Hospital in Bangkok, where a prospective cohort study assessed outcomes after five years of Fracture Liaison Service (FLS) implementation [12]. Among 353 patients aged 50 years or older presenting with fragility hip fractures between 2014 and 2019, post-injury bone mineral density testing rates rose from 28% before FLS to 86%, and osteoporosis treatment rates increased from 41% to 89%. Time to surgery and hospital stay decreased significantly (from 7.9 to 5.0 days and 23.2 to 19.6 days, respectively; $p < 0.001$). Secondary fracture rates at one year fell by 30% compared to pre-FLS levels, although the reduction in one-year mortality was not statistically significant. These findings illustrate the potential of well-implemented FLS models to improve secondary fracture prevention and care quality in the Thai context.

Despite these advances, substantial barriers hinder the nationwide implementation of effective osteoporosis management and FLS programmes. Public awareness of osteoporosis is low, and financial constraints prevent some patients from accessing bone mineral density testing and appropriate medications. Among healthcare providers, underdiagnosis and undertreatment remain prevalent. From a policy perspective, osteoporosis and fragility fractures have not been prioritised by the government, however, there is limited access to diagnostic tools such as DXA machines.

Nutritional factors further compound the issue, with the average daily calcium intake among Thai individuals estimated at only 300–400 mg, and over 85% of hip fracture patients exhibiting vitamin D deficiency (serum 25(OH)D < 20 ng/mL). In response to these challenges, a new collaborative project involving *Siriraj Health Policy (Faculty of Medicine, Siriraj Hospital, Mahidol University), Thai Orthopaedic Association, Royal College of Orthopaedic Surgeons of Thailand*, and *Krungthai Bank Public Company Limited* is currently underway, aiming to strengthen national efforts in osteoporosis prevention and care [4].

REFERENCES

1. US Census Bureau International Database (IDB) Website. 2025. https://www.census.gov/data-tools/demo/idb/#/dashboard?dashboard_page=country&COUNTRY_YR_ANIM=2025. Accessed 22 May 2025.
2. Sucharitpongpan W, Daraphongsataporn N, Saloa S, Philawuth N, Chonyuen P, Sriruanthong K, Waiwattana K. Epidemiology of fragility hip fractures in Nan, Thailand. Osteoporos Sarcopenia. 2019 Mar;5(1):19-22. doi: 10.1016/j.afos.2019.03.003. Epub 2019 Mar 17. PMID: 31008374; PMCID: PMC6452923.
3. Stitkitti N, Amphansap T, Therdyothin A. Mortality and outcome in fragility hip fracture care during COVID-19 pandemic in Police General Hospital, Thailand. Osteoporos Sarcopenia. 2023 Mar;9(1):22-26. doi: 10.1016/j.afos.2023.03.001. Epub 2023 Mar 23. PMID: 37035092; PMCID: PMC10034845.
4. International Osteoporosis Foundation. Thailand: Surveillance and prevention system for falls, hip fractures and recurrent fractures [Internet]. Capture the Fracture® News; 17 March 2025. https://www.capturethefracture.org/news/thailand-surveillance-and-prevention-system-falls-hip-fractures-and-recurrent-fractures. Accessed 12 August 2025.
5. Unnanuntana A et al. J Med Assoc Thai 2023;106(2):106-14. In-Hospital Costs of Hemiarthroplasty in Patients with Osteoporotic Femoral Neck Fracture at Faculty of Medicine Siriraj Hospital.
6. Amphansap T, Boontan C, Therdyothin A. A cost-utility analysis of Fracture Liaison Service in osteoporotic hip fracture patients at a tertiary care hospital in Thailand. Poster presented at: Global Fragility Fracture Network Congress; 2023 October 3-6; Oslo, Norway.
7. Charatcharoenwitthaya N, Nimitphong H, Wattanachanya L, Songpatanasilp T, Ongphiphadhanakul B, Deerochanawong C, Karaketklang K. Epidemiology of hip fractures in Thailand. Osteoporos Int. 2024 Sep;35(9):1661-1668. doi: 10.1007/s00198-024-07140-2. Epub 2024 Jun 4. PMID: 38832991.
8. Charatcharoenwitthaya N, Jaisamrarn U, Songpatanasilp T, Kuptniratsaikul V, Unnanuntana A, Sritara C, Nimitphong H, Wattanachanya L, Chotiyarnwong P, Amphansap T, Phruetthiphat OA, Valleenukul T, Chaiamnuay S, Petchlorlian A, Srinonprasert V, Tejavanija S, Kitisomprayoonkul W, Dajpratham P, Chaikittisilpa S, Somboonporn W. Summary of the Thai Osteoporosis Foundation (TOPF) Clinical Practice Guideline on the diagnosis and management of osteoporosis 2021. Osteoporos Sarcopenia. 2023 Jun;9(2):45-52. doi: 10.1016/j.afos.2023.06.001. Epub 2023 Jun 20. PMID: 37496989; PMCID: PMC10366425.
9. Strategy and Planning Division, Office of the Permanent Secretary, Ministry of Public Health (2018) Twenty-year national strategic plan for public Health (2017-2036) - First Revision 2018. In Strategy and Planning Division, Ministry of Public Health. Bangkok. https://spd.moph.go.th/wp-content/uploads/2022/09/Ebook-MOPH-20-yrs-plan-2017-Final-Eng-120961.pdf. Accessed 12 August 2025.
10. Chotiyarnwong P, Kitcharanant N, Vanitcharoenkul E, Anusitviwat C, Jarusriwanna A, Suthutvoravut W, Boonnasa W, Unnanuntana A. Three-year outcomes of a fracture liaison service model at a university-based tertiary care hospital in Thailand. Arch Osteoporos. 2023 Jan 24;18(1):26. doi: 10.1007/s11657-023-01215-z. PMID: 36692851; PMCID: PMC9873743.
11. Mahaisavariya C, Vanitcharoenkul E, Kitcharanant N, Chotiyarnwong P, Unnanuntana A. Exploring the osteoporosis treatment gap after fragility hip fracture at a Tertiary University Medical Center in Thailand. BMC Geriatr. 2023 Feb 3;23(1):70. doi: 10.1186/s12877-023-03778-5. PMID: 36737708; PMCID: PMC9898992.
12. Amphansap T, Stitkitti N, Arirachakaran A. The effectiveness of Police General Hospital's fracture liaison service (PGH's FLS) implementation after 5 years: A prospective cohort study. Osteoporos Sarcopenia. 2020 Dec;6(4):199-204. doi: 10.1016/j.afos.2020.11.004. Epub 2020 Nov 25. PMID: 33426309; PMCID: PMC7783107.

This document highlights the key findings for Thailand, published in "The Asia Pacific Regional Audit: Epidemiology, costs and burden of osteoporosis in 2025". ***View the complete report at: https://www.osteoporosis.foundation/asia-pacific-audit-2025***

ACKNOWLEDGMENTS

APAC Audit Contributors based in Thailand

Thai Osteoporosis Foundation (TOPF)
https://topf.or.th/

Metabolic Bone Disease Subspecialty (MBOG)
https://mbog.ac/en-about/

Mahidol University, Siriraj Hospital
https://www2.si.mahidol.ac.th/en/

Phramongkutklao College of Medicine, Phramongkutklao hospital
http://www.pcm.ac.th/