

NEW ZEALAND

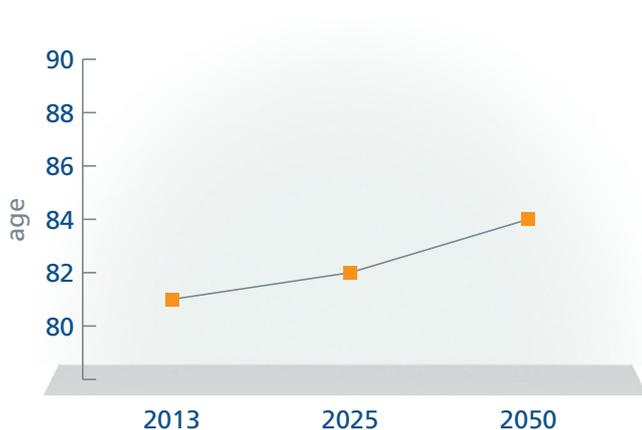
COUNTRY OVERVIEW

The New Zealand demography is experiencing a marked ageing of the population, but at an earlier stage and lower rate than in many other countries (with significant internal migration patterns). The current life expectancy is 81 years, and this is expected to increase to 84 years by 2050 (Figure 1). The total population is expected to increase 9% by 2025 and experience a further 9% increase by 2050 going from 4.3 million today to 5.1 million in 2050. However, the population aged over 50 years and 70 years is expected to increase at a higher rate. Those over 50 years make up 32% of the population today at 1.4 million, and there is a projected increase of 25% to 1.7 million in 2025 and another 21% increase to 2.1 million by 2050, by which time 41% of New Zealand's population will be aged over 50 years (Figure 2). The proportion of older persons in New Zealand is increasing at a higher rate than the rest of the population. Those aged over 70 years are projected to rise from 414,050 to 927,683 between now and 2050, which represents a 124% increase (Figure 2)¹.

State of osteoporosis/osteopenia

According to Osteoporosis New Zealand, the nation's Maori and Pacific island populations have a low incidence of osteoporosis but with highly prioritized

FIGURE 1 Life expectancy in New Zealand



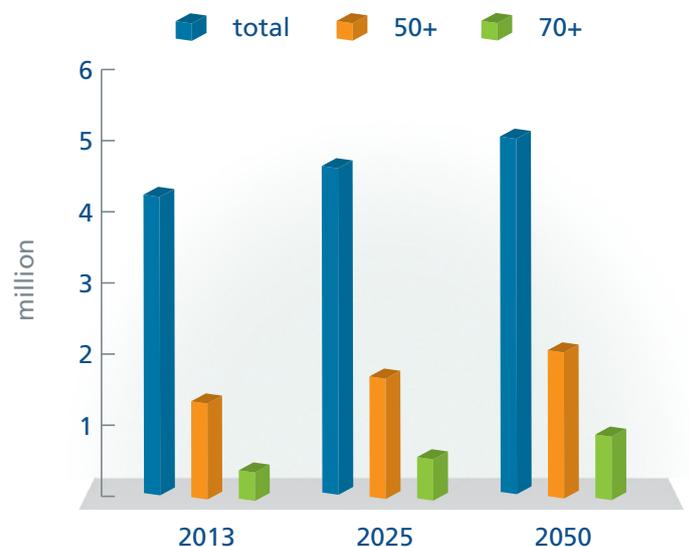
CURRENT

- Population **4.3 million**
- Aged over 50 years **32%**
- Life expectancy **81 years**
- Hip fracture incidence per year **218/100,000**
- Cost per hip fracture **22,322 USD**
- Number of DXA per million population **12**
- Fracture liaison services **implementation in 2014**

PROJECTED 2050

- Population **5.1 million** ↑
- Aged over 50 years **41%** ↑
- Life expectancy **84 years** ↑

FIGURE 2 Population projection for New Zealand



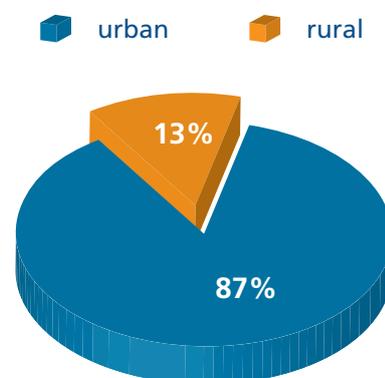
health needs in other areas. A report in the year 2007 estimated that approximately 70,000 people over 50 years were diagnosed with osteoporosis (*Table 1*), almost 90% of them being female. It is estimated that the actual prevalence of osteoporosis may be higher than reported due to several factors such as the high cost of dual-energy X-ray absorptiometry (DXA), low reimbursement, under-reporting of vertebral fractures and under-documentation of osteoporosis cases².

Table 2 is reproduced from Osteoporosis New Zealand's, 'The Burden of Osteoporosis in New Zealand 2007–2020.' It details the estimated number of osteoporosis diagnoses taken from the New Zealand Health Survey in 2002–2003. The table shows the number of men and woman diagnosed with osteoporosis, by the occurrence of a fracture or by other means, and is arranged by age².

Lifestyle

The population of New Zealand living in urban areas is high, at 85% (*Figure 3*)³. The urban lifestyle contributes to osteoporosis risks with less sun exposure due to more time spent indoors and lower activity levels³. Access to sunlight and dairy produce is widespread but not always for those who have the highest risk for osteoporosis. Surveys still show that New Zealand shares the international propensity to vitamin D insufficiency and a low calcium intake in many sub-groups.

FIGURE 3 Urban versus rural population in New Zealand⁵



The National Nutrition Survey conducted in New Zealand in 1997 found that milk and milk products were the main source of calcium intake in this country. This survey also found that 20% of the New Zealand population and one in four women did not have an adequate intake of calcium compared to the UK recommendations⁴. Overall, women showed higher prevalence of inadequate intake compared to men; especially for those aged 15–18 years, Maori and people living in low socioeconomic areas⁴. This means that these women will reach a lower peak bone mass and enter the high-risk menopausal period with weaker bones².

TABLE 1 Estimated number of men and women diagnosed with osteoporosis in New Zealand in 2007 (from New Zealand Health Survey 2002–2003)

| | | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85+ | TOTAL |
|------------------------------|--------------|-------------|-------------|-------------|-------------|--------------|-------------|--------------|-------------|--------------|
| DIAGNOSED BY FRACTURE | Men | 903 | 1046 | 9 | 1082 | 407 | 11 | 0 | 474 | 3932 |
| | Women | 467 | 1363 | 982 | 12 | 0 | 1255 | 1100 | 273 | 5452 |
| | Total | 1370 | 2409 | 991 | 1094 | 407 | 1266 | 1100 | 747 | 9384 |
| DIAGNOSED OTHER | Men | 1175 | 1100 | 3285 | 1458 | 2749 | 1907 | 1284 | 2498 | 15456 |
| | Women | 3662 | 5043 | 5269 | 5110 | 7472 | 6532 | 8159 | 4544 | 45791 |
| | Total | 4837 | 6143 | 8554 | 6568 | 10221 | 8439 | 9443 | 7042 | 61247 |
| DIAGNOSED | Men | 2078 | 2146 | 3294 | 2540 | 3156 | 1918 | 1284 | 2972 | 19388 |
| | Women | 4129 | 6406 | 6251 | 5122 | 7472 | 7787 | 9259 | 4817 | 51243 |
| | Total | 6207 | 8552 | 9545 | 7662 | 10628 | 9705 | 10543 | 7789 | 70631 |

SOURCE Osteoporosis New Zealand, Inc., 'The Burden of Osteoporosis in New Zealand: 2007–2020'

Level of awareness

Awareness about osteoporosis in New Zealand has improved significantly, and so has the knowledge that there is a gap in care leaving fragility fracture patients vulnerable. The statistics from recent studies, as detailed later, have prompted New Zealand to improve osteoporosis care by taking measures to implement fracture registries and fracture liaison services (FLS) to help close this care gap.

As reported in Osteoporosis New Zealand's, 'Bone Care 2020: a systematic approach to hip fracture care and prevention for New Zealand,' findings from eight New Zealand orthopedic units about osteoporosis interventions for patients admitted with fragility fractures highlighted the need to increase awareness about the care gap in osteoporosis management⁵:

- Less than half of inpatients with fragility fractures were taking a bisphosphonate.
- Of 77% of inpatients who were not taking osteoporosis medication on admission, less than 3% had a DXA scan organized in response to their new fracture.
- Just 12% of patients were initiated on treatment, of which the majority was started by a visiting Orthogeriatrician Service which was available at two

of the hospitals; nearly all of these patients were hip fracture sufferers.

- Just 11% of patients were started on medication during their admission.
- Osteoporosis was mentioned in the discharge summaries for only 30% of the patients that were already taking osteoporosis treatment.

FRACTURE RATES

Hip fracture, fragility fractures and vertebral fractures

The 2007-2020 burden of osteoporosis report in New Zealand indicated hip fracture rates to be 218/100,000 per year (288/100,000 per year in women and 140/100,000 per year in men)². The same report estimated 84,354 fragility fractures in 2007². Vertebral fractures were the most common at 33% of all fractures, followed by rib (25%) and forearm (14%) and finally, hip at just 5% (*Table 2*). Of all fractures, women suffered the most at 60%². The same report projected the fracture increase between 2013 and 2020 and estimated fragility fractures will increase over 30% to approximately 115,914 fractures in 2030. These fracture rates due to osteoporosis are comparable with those identified elsewhere, including Australia, the USA and Europe².

TABLE 2 Total projected osteoporotic fractures in 2007, 2013 and 2020

| | | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85+ | TOTAL |
|------|--------------|-------------|--------------|-------------|-------------|--------------|--------------|--------------|--------------|---------------|
| 2007 | Hip | 46 | 87 | 107 | 171 | 274 | 555 | 890 | 1673 | 3803 |
| | Vertebra | 2552 | 1890 | 2258 | 2209 | 3319 | 4569 | 4309 | 6889 | 27994 |
| | Other | 4572 | 6678 | 3512 | 4775 | 4384 | 6212 | 8266 | 14157 | 52556 |
| | Total | 7170 | 8654 | 5877 | 7155 | 7977 | 11336 | 13465 | 22720 | 84354 |
| 2013 | Hip | 54 | 94 | 128 | 212 | 338 | 574 | 965 | 2170 | 4585 |
| | Vertebra | 2970 | 2052 | 2708 | 2735 | 4101 | 4720 | 4702 | 8976 | 32965 |
| | Other | 5345 | 7222 | 4214 | 5922 | 5419 | 6412 | 9056 | 18410 | 61999 |
| | Total | 8369 | 9368 | 7051 | 8869 | 9858 | 11706 | 14722 | 29556 | 99500 |
| 2020 | Hip | 57 | 105 | 147 | 235 | 429 | 715 | 1070 | 2591 | 5350 |
| | Vertebra | 2676 | 2253 | 2985 | 3034 | 5177 | 5885 | 5317 | 10917 | 38244 |
| | Other | 5030 | 7965 | 4818 | 6598 | 7031 | 8169 | 10329 | 22381 | 72321 |
| | Total | 7763 | 10324 | 7950 | 9866 | 12637 | 14769 | 16715 | 35889 | 115914 |

SOURCE Osteoporosis New Zealand, Inc., 'The Burden of Osteoporosis in New Zealand: 2007-2020'

COST OF FRACTURE

Osteoporosis New Zealand used the figures given in *Table 2* to estimate total costs of fracture for the year 2007. From the estimated 84,954 fragility fractures that occurred in 2007, the cost of treating the fractures is estimated to have exceeded 248 million USD (300 million NZD), with another 27.3 million USD (33 million NZD) spent on management of osteoporosis and over 662 million USD (800 million NZD) to treat and manage secondary illnesses related to osteoporosis. If nothing is done, these numbers are expected to increase significantly by 2013 and 2020².

It is reported that over 90% of hip fractures in New Zealand are managed surgically, each costing approximately 12,336 USD (14,937 NZD) for the hospital visit and 9,986 USD (12,062 NZD) for the rehabilitation². The wait time to receive surgery varies by the hospital and the clinical status of the patient.

Every effort is made to access surgery immediately, but in reality it takes about 2–3 days before most patients are actually in the operating room (*Table 3*). Records are kept as quality markers and are frequently aligned with clinical pathways. Improvements will be seen in this process when the new hip fracture registry, the ‘Australia and New Zealand Hip Fracture Registry’, is in place.

TABLE 3 Hip fracture in New Zealand

| HOSPITAL COSTS PER HIP FRACTURE (USD) | AVERAGE HOSPITAL BED DAYS | SURGICALLY TREATED |
|---------------------------------------|---------------------------|--------------------|
| Hospital \$12,336 | 13.9 | >90% |
| Rehab \$9,986 | 22 | |



FRACTURE REGISTRIES

New Zealand has made significant progress towards developing a national hip fracture registry in association with Australian counterparts, but it is not yet in place in New Zealand and sustainable resourcing remains to be confirmed.

The website that will host the hip fracture registry, called the Australia and New Zealand Hip Fracture Registry, is live at www.anzhfr.org. The lead agency for New Zealand is the Health Quality & Safety Commission who is viewing this project as a quality of care framework. A steering group is active with support from collaborative organizations.

FRACTURE LIAISON SERVICES

FLS will be implemented in all District Health Boards by July 2014 through a national planning directive. It is hoped the resourcing for the Hip Fracture Registry will be resolved in parallel with this.

The implementation and outcome of FLS as well as hip fracture registries in other countries, notably the UK, has been influential. As a small country, New Zealand has had the opportunity to benefit from this well-documented experience and knowledge and as a result should be able to implement FLS in a shorter period of time. In this respect New Zealand has been fortunate to have a leading exponent of these initiatives immigrate to New Zealand and become a resource of strength to the country and to Osteoporosis New Zealand as an organization. New Zealand also has well respected researchers in bone physiology, metabolism and clinical treatments who make a big impact internationally and keep the osteoporosis community well informed.

SPECIALISTS RESPONSIBLE FOR OSTEOPOROSIS

Osteoporosis care is primarily managed by the general practitioners (i.e. family doctors, primary care physicians). Geriatricians, along with endocrinologists and rheumatologists, form the majority of the secondary specialists involved, and some of these clinicians also provide DXA scanning services.

Speciality training for osteoporosis care is a major component in the medical curriculum mainly for internal medicine, geriatric medicine, rheumatology,

endocrinology and orthopaedic surgery. Other specialists, however, are also free to follow a path of osteoporosis management if their personal interest lies in the management of this disease.

GOVERNMENT POLICIES

Osteoporosis as a documented national health priority

Osteoporosis is not a designated national health priority in New Zealand. According to the National Health Board, the health priorities in New Zealand focus on improving the infrastructure of the care system as a whole. While not specifically directed at osteoporosis, the priorities will likely have an indirect benefit on the field through improvements to health-care infrastructure as a whole. The four key priority areas include⁶:

- Strengthening the health workforce
- Improving hospital productivity
- Speeding up the implementation of the Primary Health Care Strategy
- Improving value for money

Guidelines

New Zealand does not have formal guidelines on osteoporosis care that have been rolled out on a national level. Specialized practitioners are familiar with and rely on guidelines from demographically similar countries. On a regional level, some groups have developed their own local clinical guidance on osteoporosis care, and such documents are available from the Auckland Bone Group and other special interest groups in Christchurch.

Audit and quality indicator systems

Formal audit and quality indicator systems for osteoporosis are underway and will become formalized with the implementation of the Australia and New Zealand Hip Fracture Registry. In the meantime, the Health Round Table benchmarking can be used for audit and quality purposes on the national level and on the regional level there are various reporting and audit systems that include falls reports, clinical pathways, quality projects and initiatives, local osteoporosis and falls clinics and community services.

TREATMENT

For osteoporosis care, treatment is often reimbursed through the national health service; however, the overall picture is complex. The reimbursement levels are determined by the Pharmaceutical Management Agency (PHARMAC) who, on behalf of the District Health Boards, decides which medicines and related products are subsidized for use in the community and public hospitals (<http://www.pharmac.health.nz/>)⁷. Some

major treatments are only funded under certain criteria. Not all available medications are registered for and/or supported as best practice for osteoporosis treatment. Medications generally carry a small cost 4.16 USD (\$5 NZD) which varies according to a range of subsidy arrangements (*Table 4*).

Access to osteoporosis medications in New Zealand has generally been restricted and delayed, and there are not any formalized ‘first-line’ treatments. This is less marked than in previous years but, for example, denosumab is still not funded and its designation is not formalized. Additionally, zoledronate is funded under tight criteria, and the administration (by infusion) of zoledronic acid is not funded which creates an access issue due to the high cost of administration that must be borne by the patient. On a positive note, New Zealand is a small country and there is a body of interested clinicians who are generally well linked, informed and active in the policies surrounding osteoporosis management.

TABLE 4 Osteoporosis treatments and respective reimbursement in New Zealand

| | YES | NO | IF YES, % REIMBURSED |
|-----------------------------|-----|----|---------------------------------------------------------|
| Risedronate | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Alendronate | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Ibandronate | | x | |
| Zoledronic acid | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Clodronate | | x | |
| Pamidronate | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Raloxifene | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Bazedoxifene | | x | |
| Denosumab | | x | |
| Strontium Ranelate | | x | |
| Teriparatide | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| PTH (1-84) | | x | |
| Vitamin D/Ca supplements | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Calcitonin | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Hormone Replacement Therapy | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Testosterone | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Alfacalcidol | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |
| Calcitriol | x | | Patient is responsible for a co-pay of USD 4.16 (NZD 5) |

DIAGNOSTICS

In New Zealand there are 12 DXA scanners per one million of the population⁸. They cost approximately 100–134 USD per scan and have relatively reasonable wait times ranging from a number of days in the private sector to a few weeks in the public sector (*Table 5*). However, DXA is not reimbursed which creates a barrier to access as the patients must pay directly. Due to this, in the public sector especially, DXA scans have variable to

TABLE 5 Diagnostics access and cost in New Zealand

| | DXA | ULTRASOUND |
|----------------------------------------------------|---------------------------------------------------------------------------------|------------|
| Waiting time (d) | Usually a short number of days privately, maybe weeks publically – if available | not used |
| Cost (USD) | \$100–134 (NZD 75–100) | |
| Is it reimbursed? | no | |
| Is reimbursement a barrier to access to treatment? | yes | |

very poor usage despite being frequently required as a prerequisite to access funded medication. As an example, one study found that less than 3% of patients with a new fragility fracture had a DXA scan organized⁵.

RECOMMENDATIONS

Osteoporosis remains an under-appreciated, under-valued, under-treated and under-resourced disorder of high prevalence. As a chronic disorder affecting predominantly older people, it has traditionally had a low national priority and low organizational support. The consequences of population ageing and associated health and disability costs are slowly drawing attention to fracture prevention through osteoporosis and falls prevention. These two contributors have recently been linked more closely in initiatives and this has been reflected in the direction of Osteoporosis New Zealand as an organization. The move from QUALYs to DALYs, as disability rather than premature mortality drives health systems, has been slow to impact at national level.

Thus fracture liaison services, a hip fracture registry, a national priority for fracture prevention, and improved access to DXA scans are all critical moves needing final national commitment if New Zealand is not to fall behind. This deficit does not align with the perceived quality of the rest of the New Zealand Health System. Lifestyle aspects fit well with other health directions and can be leveraged against the New Zealand culture. These developments will drive the associated missing data collections, national guidelines and standards that are needed for review and audit to obtain quality.

Despite the above need and opportunity, New Zealand is currently lagging behind international developments in fracture prevention and the associated 'bone health' infrastructure. The next 2 years are likely to be critical. The advocacy and evidence are there; national commitment, national training, and perception change for an increased prioritization will hopefully be the drivers. The potential exists for New Zealand to come from behind and be one of the leading health systems for the prevention of fragility fractures.

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