ECONOMIST IMPACT



# Integrated Care Pathways for Bone Health: China

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### The burden of poor bone health

China has one of the fastest-growing ageing populations in the world. The number of people over 60 years old in China is projected to reach 402 million people (28% of total population) by 2040, due to longer life expectancies and declining fertility rates. This huge demographic shift presents many challenges for the Chinese healthcare system, particularly concerning bone health, which predominantly affects the ageing population. The prevalence of osteoporosis and the incidence of osteoporotic fractures in China have increased markedly over the last three decades. There are also financial concerns about these costly conditions burdening the already strained health sector in China.

Poor bone health encompasses a broad spectrum of diseases, but it is most often quantified as the cumulative burden of osteoporosis and osteoporosis-related fractures. Osteoporosis is characterised by low bone mineral density or the deterioration of bone tissue, and it is the most widespread bone disease worldwide.<sup>2</sup> Osteopenia, or reduced bone mass, is considered an early stage of osteoporosis, and many osteopenic individuals are at great risk for developing osteoporosis.<sup>2</sup> Osteoporotic fractures (or osteoporosis-related

fractures) result from an injury that would not typically break a normal, healthy bone.<sup>3</sup> This paper utilises the terms *osteoporosis-related fractures* and *osteoporotic fractures* as opposed to *fragility fractures* to avoid the stigma that often accompanies the term *fragility*.

Studies on the prevalence of osteoporosis vary, and there is a lack of published studies that specifically focus on the Chinese population.<sup>4</sup> Data on prevalence may be underreported in rural areas of China in particular, due to the lack of access to diagnostic tools and treatment compared with urban areas. 5 Regardless, some studies have found a high prevalence of osteoporosis and fractures in China: 5% of men and 20.6% of women aged 40 years or older have been diagnosed with osteoporosis, and 10.5% of men and 9.7% of women aged 40 or older have had vertebral fractures in 2018.6 The incidence of hip fractures is expected to rise from 411,000 in 2015 to more than 1 million hip fractures in 2050.5 With the ageing of the population, the prevalence of osteoporosis and fracture is anticipated to continue to increase in China.

A prospective study of the economic burden of osteoporotic fractures in western China showed

that the total annual cost of hip fractures was US\$4,386 per person-year, and the total annual cost of vertebral fractures was \$3,452.7 In 2010, it was estimated that over 2.3 million osteoporotic fractures cost the Chinese healthcare system approximately \$10 billion. The number and cost of osteoporosis-related fractures are predicted to double by 2035 and will grow to about 6 million fractures costing \$25.4 billion annually by 2050.8 In 2015, the incidence and economic burden of hip, vertebral and wrist fractures in China were modeled for the period of 2010 to 2050. The projected direct costs to the Chinese healthcare system for osteoporotic fractures for 2020, 2040, and 2050 were estimated to be \$12.8 billion, \$22.2 billion, and \$25.4 billion respectively.8 Given the substantial human and economic burden of poor bone health, it is vital to develop interventions that can reduce the burden and improve population health in China.

Projected direct costs to the Chinese healthcare system for osteoporotic fractures for 2020 and 2040 were estimated to be \$12.8 billion and \$22.2 billion respectively.8

# Public awareness and initiatives for bone health

Awareness of bone health among Chinese people has not yet reached an ideal level. A recent Chinese study conducted in 2020 found that only 49.2% of participants recognised the risk factors for osteoporosis. Many experts agree that there is a need for more public education on facts and practical skills for healthy bones.

Fortunately, initiatives are underway to increase the public's awareness of bone health. Many medical institutions in China have actively participated in education activities for the promotion of bone health. Online and offline forms of publicity, aimed specifically at women, have been created to raise awareness of the causes of osteoporosis and of bone density examinations and preventive actions for osteoporosis. One policymaker highlights the success of these educational activities in 2022: "The China Women's Development Foundation launched the Joyful Bone Program in 2020 for the health management of families. Through the project launch meeting, 300,000 bone health brochures were distributed, 76 women's health classes and bone health knowledge lectures were held and an online media platform was used to link 300 community health service centers across the country to launch science education programs." These public education activities across the country are vital to strengthen knowledge about healthy bones.

### Screening and prevention

Osteoporosis is greatly underdiagnosed and undertreated in Asia.5 Mainland China is ranked seventh out of eight Asian regions, with a diagnosis rate of 36% for osteoporosis.<sup>10</sup> Bone density (DXA) scans are the most useful tool for detecting osteoporosis by measuring bone mineral density (BMD). However, DXA machines are scarce, and there is currently no national screening program in China. Policymakers echo the need for regular screening, stating that "early detection and early diagnosis are essential for the prevention of osteoporosis; therefore, bone density screening should be performed regularly." A study found that BMD measurement had never been performed in more than 60% of the patients before or after experiencing osteoporotic fractures.4 According to the 2013 International Osteoporosis Foundation (IOF) Asia-Pacific audit report, access to DXA is limited in China, with only 0.46 DXA systems per million inhabitants.11 These are usually concentrated in the urban areas of China; there often are none in rural areas. For comparison,

the Republic of Korea, Japan, Hong Kong SAR, Australia, Singapore and New Zealand report availability of 12-24 DXA machines per million.<sup>5</sup>

Osteoporosis is a preventable and treatable disease; however, it is vital that preventive measures are taken appropriately. 12 According to experts, preventive measures for osteoporosis can be divided into two parts: "one aspect is basic measures and the other is drug treatment. Basic measures include leading a healthy lifestyle with adequate calcium and vitamin D. On this basis, if we still need treatment, the doctor can choose the most suitable drug according to your condition and special indications and/or contraindications." The promotion of appropriate weight management and reducing the risk of falls should also be considered.<sup>6</sup> Special attention should be paid to the elderly since the incidence of osteoporosis is very high and the occurrence of fractures and secondary fractures is common.

"Many people think that bone problems are only in the elderly. In fact, protection should start at a young age.... We must pay attention to our requirements for healthy bones at different life stages."

While much of the focus on poor bone health concerns the elderly population, prevention measures should start well in advance, in the younger population. To mitigate the high prevalence of osteoporosis in the future, prevention should start at an early age. A policymaker highlights the importance of this: "Many people think that bone problems are only in the elderly. In fact, protection should start at a young age. . . . We must pay attention to our requirements for healthy bones at different life stages." He emphasises the importance of sun exposure, calcium supplements, and physical

activity in maintaining a healthy lifestyle for healthy bones.

Bone health has been highlighted as an important part of the "Three Reductions and Three Health" campaign advocated by the Healthy China Action Promotion office, which is of great significance for the prevention and control of chronic diseases in China. It is a part of the "Healthy China 2030 plan" created by the Central Government and State Council.13 The "three reductions" include a reduction in salt, oil and sugar through guiding consumption behavior and families' cooking methods, while the "three health" part of the campaign proposes programs focused on weight management, oral health and bone health.14 Although bone health has been highlighted as a priority in the Healthy China 2030 plan, the effectiveness and impact of these programs at the population level must be evaluated.

## The treatment of osteoporosis

The treatment of osteoporosis and related fractures has been inadequate, and very few Chinese people receive drugs to treat and prevent fractures. High drug costs in China deprive many people of the opportunity to receive treatment. In 2014, it was found that only 28% of Chinese patients were prescribed pharmacologic treatment for osteoporosis other than calcium and vitamin D, with bisphosphonates prescribed in just 14% of patients and calcitonin in 13.7% due to high costs and poor access. These medicines are an integral part of osteoporosis management in post fracture patients, as suggested by guidelines in China.

Patient compliance with medication and rehabilitation after diagnosis is also a challenge in China. Only half of the patients diagnosed with a fracture were still taking any medication after one year, and only one-third of them were taking medication for three years or more. The self-

reported reasons for poor compliance included lack of confidence or ignorance of the disease (36.2%), reluctance to take medicine (23.9%), intolerance or side effects of the medication (14.8%) and too many medicines for comorbidities (13.2%). Rehabilitation or physical therapy after a fracture was also not widely utilised in China, mainly due to patients thinking it was not necessary. These shortcomings indicate poor awareness amongst the Chinese population regarding the importance of this type of therapy for bone health.

Fracture liaison services are the most widely used and supported multidisciplinary care programs for bone health. They emerged from the IOF's Capture the Fracture initiative, to implement hospital-based coordinated multidisciplinary models of care for secondary fracture prevention. Implementation of fracture liaison services in China, titled the Power Bone Program, was initiated in December 2020. However, there are no studies published on the effectiveness of this service yet.<sup>4</sup> Data regarding the efficacy of this program should be collected to evaluate this service at a population level.

#### The future of bone health in China

Although osteoporosis has been listed as one of the National Health Priorities since 2011 because of its high disease and economic burden, 11 more effort is needed to improve osteoporosis care and management in China. Integrated care pathways for bone health are needed to bring together primary and secondary care, to improve the comprehensiveness of care and services, and to use pharmacological and nonpharmacological approaches to improve outcomes. To establish integrated care pathways for bone health, China should focus on:

**Increasing public education and awareness.** Education initiatives and programs should be

tailored to the needs of the population. China should aim to expand education and awareness programs to all regions of China to increase awareness of osteoporosis and bone health.

**Promoting a healthy lifestyle.** Along with physical activity and appropriate weight management, the intake of calcium and vitamin D have been proven to reduce the risk of fractures and osteoporosis in populations worldwide. <sup>15</sup> China should continue to promote the importance of maintaining a healthy lifestyle and encourage the public to take care of their bones from an early age.

**Early screening and detection.** Early detection is essential for the management of a disease. The current underdiagnosing of osteoporosis hinders the ability for China to detect those at risk. Establishing a national screening program for osteoporosis would allow for early treatment and improved outcomes for those at risk of osteoporosis in China.

**Improving treatment outcomes.** High drug costs, poor access and poor patient compliance currently impede the effective management of osteoporosis. Access to medication and education on treatment adherence is vital to provide optimal care for osteoporosis patients in China.

#### **About this paper**

In March 2021, Economist Impact published a global research program, sponsored by Amgen, entitled *Integrated care pathways for bone health: an overview of global policies.* <sup>16</sup> This briefing paper is a synthesis of details from a bone health event broadcasted on China Health Television, supplemented by desk research conducted independently by Economist Impact, focused on applying insights from the global study within the Chinese context.

The research was conducted by the Economist Impact team. The research for this paper was led by Amanda Stucke, with the support of Chee Hew and Jocelyn Ho. This briefing paper was written by Jocelyn Ho and was edited by Melissa Lux.

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