

# IRAN

## OVERVIEW

Osteoporosis, also known as the silent disease, is considered a health priority in Iran. The disease is believed to be responsible for a large number of fractures, which impose a heavy burden on society<sup>1,2,3</sup>. Previous studies conducted in this field have revealed that the prevalence of osteoporosis and osteopenia in at least one measured site in the Iranians aged 50 years or older is 22.2% and 59.9% in women and 11.0% and 50.1% in men, respectively. Among subjects younger than 50 years, about 33.0% of women and 31.6% of men have reduced bone mass<sup>4,5</sup>.

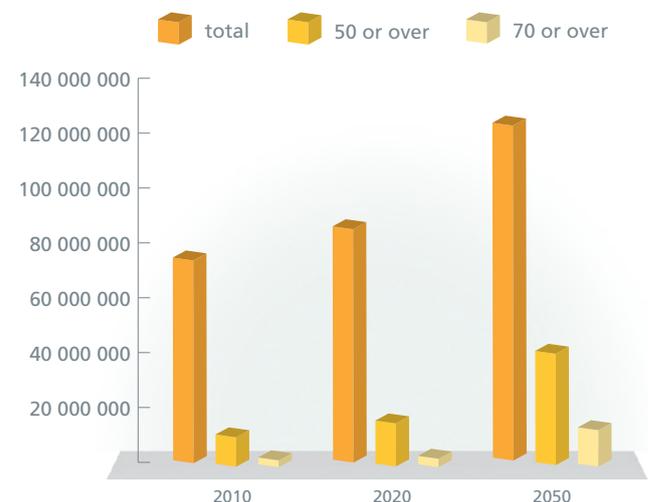
Despite the high prevalence of osteoporosis and osteopenia in Iran, there is not enough information regarding the prevalence of osteoporosis-related fractures and the burden of the disease. In view of the lack of data in this field, the Osteoporosis Research Center - Endocrinology and Metabolism Research Institute affiliated with the Tehran University of Medical Sciences (a collaborative member of WHO and IOF) is conducting numerous national projects. These include: Developing Osteoporotic Hip Fracture Registry, The Burden of Osteoporosis in Iran, Developing an Iranian version of FRAX<sup>®</sup>, Assessment of Geometry in Iranian Population and expanding the Iranian Multi-Center Osteoporosis Study' (IMOS), previously performed in five main cities in the country, to two other provinces. Fortifying Milk with Vitamin D Supplements is another main project conducted by the center with the aim of tackling vitamin D deficiency, a major risk factor contributing to osteoporosis in Iran. The Osteoporosis Research Center has also initiated a programme to develop an electronic medical recording and registry system for osteoporotic patients. In the next phases of the programme, the software would be distributed throughout the whole country in order to develop a national registry system.

In the modern world, websites play an important role in educating not only the general public but also healthcare providers. The Osteoporosis Research Center has launched both a Persian (<http://emir.tums.ac.ir/osteo>) and an English website (<http://emir.tums.ac.ir/osteo-en>), aiming

to provide everyone with their required information in the field of osteoporosis. Among other activities, the Osteoporosis Research Center publishes a set of educational brochures and booklets and holds various national and international congresses and workshops, both for the general public and healthcare providers, with the aim of informing the general population about different aspects of osteoporosis. These brochures are commonly distributed among patients referring to osteoporosis clinics. It should be added that the Iranian Ministry of Health and Medical Education is aiming to approve the modified version of the 'National Osteoporosis Guideline', developed in our centre, to be used for family physicians working in this field.

The National Osteoporosis Research Network was established in the first days of the year 2011. The network, which has members of research centres from different medical universities, aims to provide a basis for carrying out various multi-centre studies in the field of osteoporosis in order to pave the way for tackling the silent disease. The network also aims to improve the monitoring, treatment and prevention of the disease in different parts of the country.

**FIGURE 1** Population projection for Iran until 2050



REF US Census Bureau

**KEY FINDINGS**

The present population in Iran is estimated to be 76 million, of this 14% (11 million) is 50 years of age or over and 3% (2.6 million) is 70 or over. By 2050, it is estimated that 34% (42 million) of the population will be 50 or over and 11% (14 million) will be 70 or over while the total population will increase to 127 million (fig 1).

**EPIDEMIOLOGY**

In Iran, it is estimated that currently around 34% of the total population has osteopenia, and according to the Endocrinology and Metabolism Research Center (EMRC), two million people are at risk of fracture, establishing osteoporosis as one of the chief health problems in the country<sup>6,7</sup>.

In a 2008 study by Hosseinapanah et al., 11% of 245 randomly selected postmenopausal women with a mean age of 57.7 ± 7 years were found to be osteoporotic in the femoral neck and 25.3% were osteoporotic in the

lumbar spine<sup>8</sup>. In a cross-sectional investigation assessing risk factors for osteoporosis, ninety women aged 48.5 ± 8.3 years, 27.8% were found to be osteopenic at the lumbar spine and 35.6% at the femoral neck. The prevalence of osteoporosis was 13.3%<sup>6</sup> (table 1 and fig 2).

**Hip fracture**

In a nationwide prospective study assessing the burden of hip fracture in Iran, Iran accounted for 0.85% of the global burden of hip fracture and 12.4% of the burden of hip fracture in the Middle East<sup>9</sup>.

In 2010, the number of hip fractures in people aged over 50 years is estimated to be 472.1 cases per 100 000 population (fig 3).

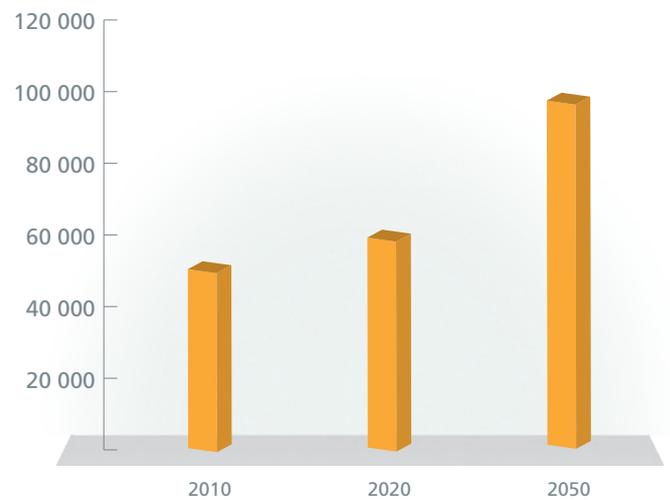
**TABLE 1 Osteoporosis and osteopenia in 2010 and projection**

YEAR	OSTEOPENIA	OSTEOPOROSIS
2010	25 969 046	3 024 798
2020	40 303 730	3 592 708
2050	44 276 071	5 548 203

**FIGURE 2 Number of people (in millions) with osteopenia and osteoporosis in 2010, 2020 and 2050<sup>6</sup>**



**FIGURE 3 Number of hip fractures in 2010 and projections for 2020 and 2050 in people aged over 50 years<sup>7</sup>**



A 2005 cohort study in Shiraz, Iran, included 1,833 hip fracture patients with a mean age of 74.3 years in women and 74.2 years in men. The age-adjusted incidence rates of hip fracture standardized to the 1985 US white population were 325.7/100 000 for men and 519.1/100 000 for women. The age-adjusted incidence rates of hip fracture standardized to the 1989 US white population were 384.6/100 000 for men and 548.2/100 000 for women<sup>10</sup>. In a prospective survey by Moayyeri et al. conducted in 9 provinces across the country, the age-standardized annual incidence rates of hip fracture were estimated at 127.3/100 000 and 164.6/100 000 for males and females respectively<sup>11</sup>.

In an Iranian study assessing falls leading to hip fracture, Abolhassani et al found that the crude annual incidence of fall events and related hip fractures for those over the age of 50 years were 237.1 and 93.6 per 100 000 person-years, respectively<sup>12</sup>.

In Iran, 84.3 % of cervical and trochanteric femoral fractures are surgically treated. The average number of hospital bed days for all hip fractures is 8.3 days.

**TABLE 2 Direct costs of hip fractures (USD)<sup>13</sup>**

YEAR	TOTAL DIRECT COST (IN MILLION USD)
2010	28
2020	51
2050	250

**TABLE 3 Comparative tables of hospital bed days and costs**

PATHOLOGY	HOSPITAL BED, DAYS PER YEAR	DIRECT COSTS (IN MILLION USD)	TOTAL COSTS (IN MILLION USD)
Hip fractures (surgical treatment)	300 000	28	n/a
Heart disease <sup>15,16</sup>	328 904	74	n/a
Other <sup>17</sup>	2429	590	743

Ahmadi-Abhari et al. conducted a study in which the Global Burden of Disease method created by the WHO was applied. It was found that hip fractures yielded an overall 1.9 DALY (disability-adjusted life years) per 1000 of the population above 50 years of age<sup>14</sup>. The DALY per 1000 for both Iranian men and Iranian women was lower than that of their counterparts worldwide<sup>9</sup>.

### Vertebral fracture

No available information.

### DIAGNOSIS

In total, there are 126 DXA machines in Iran (0.017 per 10 000 population). Considering the available data there

are about 52 DXA in Tehran, the capital of Iran, and about 74 other devices in the other 30 provinces in the country (the number of devices in these provinces range from 1 to 8). DXA is available in nearly all big cities all across the country. It should be noted that DXA is not available in five provinces. There is no waiting time for a DXA scan as it is performed at the same time the patient is referred to the imaging centre.

The cost of a DXA assessment is USD 48.50 and ultra sound costs the same.

### REIMBURSEMENT POLICY

The governmental insurances reimburse 70% of the cost of a DXA assessment. It should be noted that Khadamat Darmani, one of the main governmental insurances, only reimburses the cost if the prescription is written by an endocrinologist, rheumatologist or nephrologist. The governmental insurances pay the price of all Iranian-made osteoporotic medications, except for PTH analogues.

Private health care insurance reimburse 100% of the DXA exam and all Iranian made osteoporotic medications.

### CALCIUM AND VITAMIN D

Calcium, vitamin D supplements and fortified foods are available in Iran. However, only milk and some fruit juices are products fortified with calcium and vitamin D in Iran. These products are not available everywhere and few individuals use them. In collaboration with the Iranian Ministry of Health and Medical Education, EMRI is conducting a project aiming to point out the benefits of using fortified milk in different groups. Apart from this project, the country holds several seminars and congresses to increase public awareness regarding osteoporosis and the importance of taking supplements and fortified milk to strengthen bones. Many programmes on related issues are also broadcast in the national mass media (television, radio and newspapers).

### PREVENTION, EDUCATION, LEVEL OF AWARENESS

As a health priority in Iran osteoporosis related fractures form part of the country's surveillance programme, undertaken by various governmental and non-governmental agencies:

- The country has managed to develop an Iranian osteoporosis network which aims to increase public awareness in different parts of the country and improve patient care, and to conduct multi-centre research in this field. In a study applying the Health Belief Model for Osteoporosis Prevention among middle school girl students, 76% of students admitted to ingestion of less than 670 mg of calcium daily before the study intervention. After the intervention, 74% of the students increased their intake to between 650 and 1300 mg of calcium. Furthermore, 50% of the girls in the intervention arm had less than 20-30 minutes of physical activity three times a week before, and this increased to 89%<sup>18</sup>.
- Holding various public education seminars, particularly in October concurrent with World Osteoporosis Day.
- Several pamphlets, booklets and posters on various osteoporosis-related topics are developed and sent to different parts of the country.
- A national osteoporosis guideline has been developed.
- A multicenter study on the prevalence of osteoporosis and vitamin D deficiency is being conducted in several major Iranian cities.
- Several workshops and seminars are being held to keep health professionals working in the related fields updated.

A National Guideline for Osteoporosis Prevention, Diagnosis and Management has already been developed and is to be revised and translated in English for regional use. Guidelines have been issued for nurses, physiotherapists and nutritionists working in this field.

The Iranian Osteoporosis Society (IOS) is actively collaborating to increase public awareness in the field of osteoporosis. In this regard, it provides both general public and healthcare providers with related information through its site ([emir.tums.ac.ir/ios](http://emir.tums.ac.ir/ios)). It also helps in the development of material on various osteoporosis-related topics and sends it to different parts of the country. While multi-centric projects are being carried out, a recent study has shown that Iranians have a low knowledge regarding the importance of calcium and vitamin D consumption in improving bone health. Their knowledge regarding sources of foods rich in calcium, on the other hand, was relatively higher<sup>19</sup>.

## RECOMMENDATIONS

Considering the lack of information regarding the accurate burden of osteoporosis in Iran and the lack of any fracture registries in the countries, the majority of the reports and studies conducted in this field seem to be incomplete. However, certain national projects will be implemented, which will give us more accurate data on the mentioned fields in the coming years.

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