



International  
Osteoporosis  
Foundation

# The Eastern European & Central Asian Regional Audit Epidemiology, costs & burden of osteoporosis in 2010





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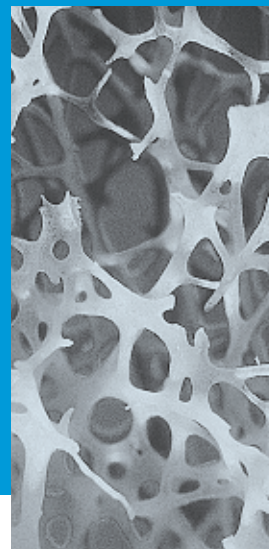
## What is osteoporosis?

Osteoporosis is a disease in which the density and quality of bone are reduced, leading to weakness of the skeleton and increased risk of fracture, particularly of the spine, wrist, hip, pelvis and upper arm. Osteoporosis and associated fractures are an important cause of mortality and morbidity.

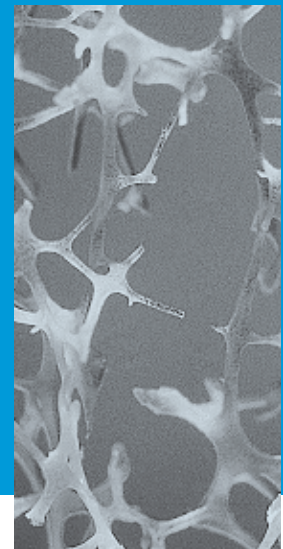
- In women over 45, osteoporosis accounts for more days spent in hospital than many other diseases, including diabetes, myocardial infarction and breast cancer<sup>1</sup>.
- It is estimated that only one out of three vertebral fractures come to clinical attention<sup>2</sup>.

1. Kanis JA, Delmas P, Burckhardt P, et al. (1997) Guidelines for diagnosis and management of osteoporosis. The European Foundation for Osteoporosis and Bone Disease. *Osteoporos Int* 7:390-406.

2. Cooper C, Atkinson EJ, O'Fallon WM, et al. (1992) Incidence of clinically diagnosed vertebral fractures: a population-based study in Rochester, Minnesota, 1985-1989. *J Bone Miner Res* 7:221-227.



Normal bone



Osteoporotic bone

## International Osteoporosis Foundation (IOF)

IOF is an international non-governmental organization, which is a global alliance of patient, medical and research societies, scientists, healthcare professionals and the health industry. IOF works in partnership with its members and other organizations around the world to increase awareness and improve prevention, early diagnosis and treatment of osteoporosis.

There are 196 member societies in 92 locations worldwide. IOF member societies represent approximately 5.33 billion people, which is equivalent to 82% of the world's population.

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## Foreword

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We know from the data collected in many regions of the world that osteoporosis is a major global public health problem. This report comprises the first attempt to assess the situation and burden of osteoporosis in Eastern European and the Central Asian Region.

It has been extremely difficult to estimate the exact incidence, prevalence and burden of osteoporosis and fractures in the Eastern European and Central Asian region as there is such a dearth of epidemiological studies and official statistics. In countries where epidemiological data are available, fracture rates are high, and also vary depending on the age of the population. Osteoporotic fractures are a severely neglected problem in many countries. Only two countries in the Audit recognize the disease as a health priority.

Hip fractures are the most devastating fracture in terms of morbidity and mortality. In some countries, morbidity and mortality rates are much higher than

the 20% given by global statistics. The main reason for this is the poor standard, and even complete lack, of specialized operative care given to patients who have suffered a hip fracture.

What we now know is that we need many more epidemiological studies in the region to try and ascertain the true burden of osteoporosis and fractures.

We were impressed by the enthusiasm shown by the doctors and investigators from the different countries involved in the Audit, many of whom are members of the IOF Committee of National Societies and/or our Committee of Scientific Advisors. We thank them for their assistance and support.

Now, having collated these data, we understand how much we need to do in the future. We also hope that the information gathered will encourage policy makers in the region to formulate and implement much needed strategies for the prevention and management of osteoporotic fractures.



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*UN terminology used*

# Table of contents

Foreword.....	1
Contributors.....	2
Executive summary.....	4
Key findings in Eastern Europe and Central Asia in 2009.....	5
Comparison tables Eastern Europe and Central Asia.....	7
Armenia.....	11
Azerbaijan.....	13
Republic of Belarus.....	14
Bulgaria.....	16
Czech Republic.....	18
Estonia.....	20
Georgia.....	22
Hungary.....	23
Republic of Kazakhstan.....	25
Kyrgyz Republic.....	28
Latvia.....	30
Lithuania.....	32
Republic of Moldova.....	34
Poland.....	36
Romania.....	38
Russian Federation.....	40
Slovakia.....	46
Slovenia.....	48
Republic of Tajikistan.....	50
Ukraine.....	52
Republic of Uzbekistan.....	55
Conclusions and recommendations.....	57

Without proper surgical treatment hip fracture patients are invariably left bedridden and unable to walk. This Russian patient suffered a fracture of the femur (hip) several years ago. She did not receive surgical treatment, or treatment of any kind. Now, even several years later, she is unable to walk. Twice a day, everyday, her husband pushes her in a wheelbarrow all the way to town. This way she is at least able to leave the house and maintain some social contact.



## Executive summary

Osteoporosis is a disease characterized by loss of bone density and quality, leading to an increased risk of fracture. Worldwide, osteoporosis and resulting fractures constitute a major public health burden with often devastating consequences, leading to increased levels of morbidity and mortality. Globally an osteoporotic fracture occurs every 3 seconds and at 50 years of age, one in two women and one in five men will suffer a fracture in their remaining lifetime.

It is extremely difficult to estimate the exact incidence, prevalence and burden of osteoporosis and fractures in the Eastern European and Central Asian region as there is a dearth of epidemiological studies and official statistics. Thus osteoporotic fractures are greatly under recognised as a major health problem, leading to lack of diagnosis and treatment. In countries where epidemiological data are available, fracture rates are high, and vary depending on the age of the population. Nevertheless, it is clear from the key findings of this Audit that osteoporosis and fractures are, and will continue to be, a major public health burden, escalating as the proportion of people over 50 years of age increases.

In the Russian Federation (RF) it is estimated that 14 million people (10% of the population) suffer from osteoporosis and 20 million have osteopenia such that 34 million people are at high risk of fracture. Every minute 7 vertebral fractures occur in people over 50 years, while a hip fracture occurs every 5 minutes.

In Hungary the incidence of hip fracture in 2007 was 43 per 10,000 for women and 22,3 per 10,000 for men, in the population over 50 years. In the Ukraine, the estimated number of postmenopausal women with osteoporosis and osteopenia (low bone density) is 7 million (28% of women); in the population over 50 years, the incidence of hip fractures in 2002 was almost twice as high in women compared with that in men (hip fractures: 117.1 – 171.1 per 100,000 population).

Hip fractures are the most devastating fracture in terms of morbidity and mortality as 20% of those who suffer a fracture die within 6 to 12 months after the fracture (global statistic). However in some countries in this audit, morbidity and mortality rates are much higher than this. The main reason is the poor standard, and even complete lack, of specialized care given to patients who have suffered a hip fracture. In many countries represented in this report, the level of hospitalization after hip fracture is extremely low, ranging from 25 to 40% depending on region.

Additionally, surgical treatment (such as a Total Hip Replacement), which, by modern standards should be provided to all patients during the first few days after fracture, is given only to a small percentage of

patients. For example, in the Russian Federation only 13% of those suffering a hip fracture go on to have surgical repair. In Georgia, rates of hospitalization after hip fracture are estimated to be only 25%.

Conservative methods for managing hip fracture (traction in bed, de-rotational boot) are widespread throughout the region. The repercussions for patients and the community when hip fractures are not surgically treated are devastating. Lack of hospitalization and surgery following hip fracture lead to extremely high rates of mortality and morbidity, with many patients remaining bedridden.

In some Russian cities, for example, mortality rates are 45-52% during the first year after fracture. Morbidity rates are also extremely high: of the surviving Russian patients after a hip fracture, 33% remain bed-ridden and 42% have very limited activities. Only 15% of them can ambulate outside and only 9% return to their previous level of daily activities.

Thus, it is obvious that in many countries throughout the region the development and introduction of modern unified standards of care for patients with hip fracture, in particular surgical treatment, are urgently required.

One of the main reasons that patients are not surgically treated after hip fracture is the prohibitive cost of the prosthesis for many people. Other reasons include lack of trained personal and services in many rural areas throughout the region.

The average daily calcium intake in nearly all countries outlined in the report falls far below the FAO/WHO recommendations. In addition the majority of populations in the region suffer from severe vitamin D insufficiency. This not only affects fracture rates, but also causes rickets. In recent years the incidence of rickets (symptomatic pediatric vitamin D deficiency) among Russian infants has ranged from 54% to 66% in some regions.

Now, thanks to the efforts of researchers and physicians in these countries - primarily members of national osteoporosis associations, we have succeeded in compiling some primary data that has allowed us to assess the situation in the region, and to draw some important conclusions. It is our hope that these findings will serve to focus the attention of governments and health authorities on the devastating and growing problems posed by osteoporotic fractures in the region. As a matter of urgency we recommend that systems are put in place to assist the collection of robust epidemiological fracture data throughout the region.

## Key findings in Eastern Europe and Central Asia in 2010

### High fracture rates throughout the region and major increases predicted by 2050

Projections for the vast majority of Eastern European and Central Asian countries predict a decrease in the total population but an important increase (up to 56%) in the percentage of people aged 50 years or older

- In Ukraine, it is predicted that by 2050, 50% of the population will be 50 years or older and 21% will be 70 or older.
- In 2010 the population of the Russian Federation (RF) is 142 million people with 32% (45.5m) aged 50 years or older.
- In Latvia, it is estimated that 36% of the population is aged 50 years or older in 2010.
- It is predicted that while the population of Russia will decrease to 110 million people by 2050, the population aged 50 years or older will increase to 56% of the population, and increase to 20% for those aged 70 or older.
- In Poland, population projections estimate that 23% (7.4 million) of the population will be 70 and over while the total population will decrease to 32 million.
- In the Russian Federation it is estimated that 14 million people (10% of population) suffer from osteoporosis and 20 million have osteopenia – leaving 34 million people at high risk of fracture.
- In the Ukraine, the estimated number of postmenopausal women with osteoporosis and osteopenia is 7 million (28% of total female population of the country).

- In Romania, the prevalence of postmenopausal osteoporosis is estimated at 11.5% which means that one in three women would be osteoporotic or osteopenic after the age of 55 in the country.
- In a recent study, 24% of women and 13% of men aged 50 years or older in the Russian Federation had experienced a previous fracture.
- The number of hip fractures in the Russian Federation is predicted to increase by 23% by 2030, reaching 144,000 cases annually.
- Wrist fractures also present a major problem for the Russian Federation and the region, with high numbers occurring due to falls during bad weather (rain, ice, snow), particularly from October to April. In cities such as Moscow, Tyumen, Khabarovsk and Yekaterinburg, the incidence of wrist fracture is over 1,200 fractures per 100,000, far exceeding the figure for nearby countries.
- In Georgia it is reported that 38% of all registered fractures are osteoporotic fractures: 20% are vertebral fractures, and 18% are other fractures due to osteoporosis.
- In Bulgaria, it is observed that 90% of all hip fractures occurred in the population aged over 50 years and affects 3 women for every 1 man.
- In Vinnitsa (Ukraine), between 1997 and 2002, the incidence of osteoporotic hip fractures varied from 117.1 to 171.1 per 100,000 population aged 50 years or older and was almost twice as high in women compared to men.

### Hip fractures represent a huge personal, social and economic burden; many people remain untreated after suffering a hip fracture

- Owing to a lack of hospitalization and surgery following hip fracture, there is an extremely high mortality rate after a hip fracture, reaching up to 45-52% during the first year after fracture in some Russian cities.

- Morbidity rates are also high: of the surviving Russian patients after a hip fracture, 33% remain bed-ridden and 42% have very limited activities. Only 15% of them can walk outside and only 9% return to their previous level of daily activities.
- Conservative methods for managing hip fracture (traction in bed) are widespread throughout the region. In the Russian Federation and other countries in this report, patients must pay for their surgery and prosthesis, a cost that is prohibitive for most people.
- In Kazakhstan, fewer than 50% of patients with a hip fracture are hospitalized, only 30% of them undergo hip replacement.
- In Georgia, it is estimated that only 25% of patients with a hip fracture are hospitalized.
- In Moldova, there are only four clinics with specialists (orthopaedists-traumatologists) qualified to perform hip fracture surgery. De-rotational boot and skeletal traction are widespread conservative methods of hip fracture treatment even at hospital.

## Osteoporosis and fractures are severely underestimated in the region

- The under recognition of osteoporosis on the part of governments and health care professionals in the region is mainly due to the lack of solid epidemiological and economic data on the costs and burden of the disease.
- There is an absence of formal hip or fragility fracture registries in most countries presented in this report.
- Vertebral fractures are common in the region, however very few are diagnosed and there is a dearth of evidence relevant to these injuries.
- Advancing age is a major risk factor for osteoporosis and fracture and many countries throughout the region have a rapidly ageing population.

## Calcium and vitamin D deficiency

- The average daily calcium intake in nearly all countries outlined in this report falls far below the FAO/WHO recommendations; for example, the average daily calcium intake in Moldova is  $383.5 \pm 22.4$  mg (recommendation 1,000-1,500mg/day).
- Vitamin D deficiency in the region has been confirmed in countries where studies have been conducted; at northern latitudes this is due in large part to the lack of sunlight for many months of the year.

- In recent years the incidence of rickets (paediatric vitamin D deficiency) among Russian infants is as high as 54% to 66% in some regions.

## Limited access to diagnostic tools and availability of anti-osteoporosis medications

- In most countries, DXA technology is only accessible in main cities.
- In about one-third of the presented countries, more than 40% of the population lives in a rural area.
- In countries without reimbursement, the population cannot afford DXA examinations.
- In some countries, many health professionals are not aware of DXA, the gold standard for diagnosing osteoporosis.
- Throughout the region availability and access to a range of anti-osteoporotic therapies is extremely limited.
- In the Russian Federation, while medications are free of charge for those with severe osteoporosis, the list of appropriate medications includes only Salmon Calcitonin.

## Education programmes

- In some Central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan) where the average age of the population is less than 30 years old, it is crucial that the public be educated regarding the importance of calcium and vitamin D for bone health and on general risk factors.
- Many of the national osteoporosis societies throughout the region carry out effective and important awareness and education programmes for the public and health care professionals. However their work is severely limited, in many cases, by a lack of government recognition and funding.

## Government commitment

- Out of the 21 countries presented in this report, only 2 (Republic of Belarus and Bulgaria) consider osteoporosis as a health priority.
- The lack of structured government sponsored awareness programmes for both physicians and the public contribute to the under recognition of osteoporosis.
- In many countries there are no official government approved national guidelines on osteoporosis diagnosis and treatment.
- In many countries, osteoporosis competes with other serious health issues for limited health care resources.

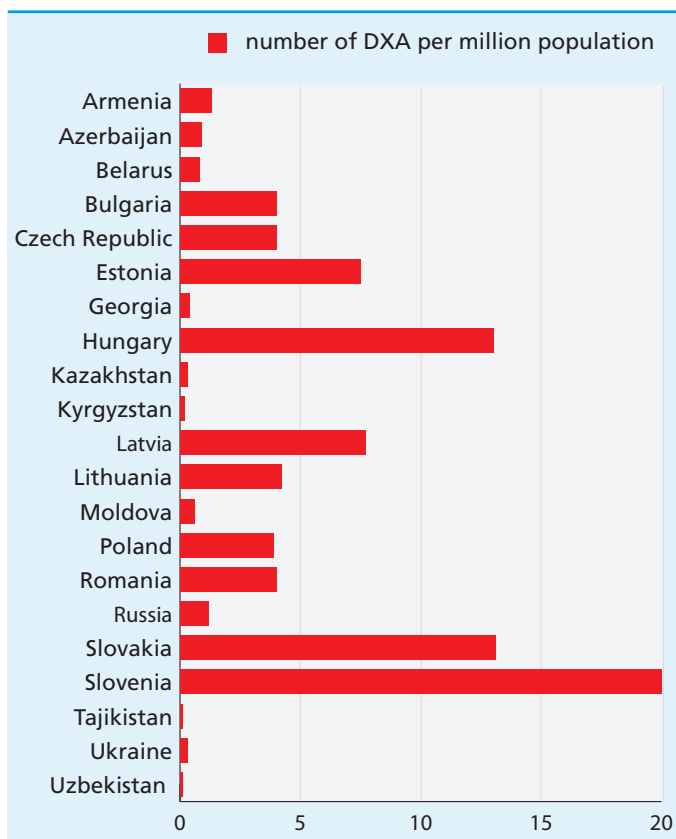


# Comparison tables Eastern Europe and Central Asia

## Diagnostic tools and cost

Bone mineral density (BMD) measured by dual-energy X-ray absorptiometry (DXA) is the standard diagnostic technique for osteoporosis. DXA technology is relatively expensive and is not widely available in most Eastern European and Central Asian countries listed

**Figure 1** Number of DXA machines per million population



in this audit. The generally recommended number of DXA per million population is 11 in Europe<sup>1</sup>.

## Cost (USD) of DXA scanning in the observed countries

Costs of DXA vary widely from place to place and must be compared with the average income in each country. For example, in Moldova, the average monthly income per person is approximately 100 USD (2009). Thus 23 USD for a DXA scan represents almost ¼ of the monthly income and patients have to pay for it themselves.

**Table 1** Cost of DXA in the countries

Country	Cost
Armenia	no info
Azerbaijan	50-100 USD
Belarus	10-15 USD
Bulgaria	40-75 EUR
Czech Republic	20 EUR
Estonia	23 USD
Georgia	70 USD
Hungary	30 EUR
Kazakhstan	17 USD
Kyrgyzstan	no info
Latvia	4.5 EUR
Lithuania	15-28 EUR
Moldova	23 USD
Poland	9 EUR
Romania	10-40 EUR
Russia	12-60 EUR
Slovakia	30 EUR
Slovenia	25-50 EUR
Tajikistan	no info
Ukraine	10-30 USD
Uzbekistan	4.5 USD

1. Kanis JA, Johnell O, Requirements for DXA for the management of osteoporosis in Europe, *Osteoporosis Int*, 2005, 16:229-238



**Table 4** Treatment available

	Reimbursement policy in each country		
	yes or partially	no	comments
<b>Armenia</b>		<ul style="list-style-type: none"> <li>no reimbursement for DXA</li> <li>no reimbursement for treatment</li> </ul>	<ul style="list-style-type: none"> <li>some centers offer a 50% discount</li> </ul>
<b>Azerbaijan</b>		<ul style="list-style-type: none"> <li>no reimbursement for DXA</li> <li>no reimbursement for treatment</li> </ul>	
<b>Belarus</b>	<ul style="list-style-type: none"> <li>free densitometry when prescribed by a physician and/or following medical indication</li> <li>10% discount for drugs prescribed by designated persons</li> <li>hip fracture treatment is free of charge for citizens of Belarus</li> </ul>		
<b>Bulgaria</b>	<ul style="list-style-type: none"> <li>most effective drug treatments are reimbursed up to 25%</li> <li>DXA: €10 reimbursement per scan for specific patients</li> </ul>		<ul style="list-style-type: none"> <li>female patients with proven postmenopausal osteoporosis by DXA and T score <math>\leq -2.5</math> are eligible for treatment reimbursement with or without fractures</li> </ul>
<b>Czech Republic</b>	<ul style="list-style-type: none"> <li>DXA + osteoporosis drugs are reimbursed for patients at risk or with confirmed osteoporosis</li> </ul>	<ul style="list-style-type: none"> <li>generics are mostly reimbursed (80%)</li> </ul>	<ul style="list-style-type: none"> <li>limited access to treatment due to the fact that prescriptions are limited because of fine charged by insurance to physicians for the limit violation</li> </ul>
<b>Estonia</b>	<ul style="list-style-type: none"> <li>DXA are fully reimbursed when prescribed by doctors</li> <li>bisphosphonates are reimbursed up to 90% in case of osteoporosis + fracture (50% for osteoporosis without fracture),</li> <li>all other treatments are reimbursed to 200 EEK (€20) per prescription</li> </ul>		
<b>Georgia</b>		<ul style="list-style-type: none"> <li>no reimbursement for DXA</li> <li>no reimbursement for treatment</li> </ul>	
<b>Hungary</b>	<ul style="list-style-type: none"> <li>axial DXA (hip or spine) reimbursed up to 1 scan every 2 years</li> <li>drugs are reimbursed up to 70%</li> </ul>		
<b>Kazakhstan</b>	<ul style="list-style-type: none"> <li>Health Centers provide screening and treat osteoporosis in women aged over 50</li> </ul>	<ul style="list-style-type: none"> <li>no reimbursement for DXA</li> </ul>	
<b>Kyrgyzstan</b>		<ul style="list-style-type: none"> <li>no reimbursement for DXA</li> <li>no reimbursement for treatment</li> </ul>	
<b>Latvia</b>	<ul style="list-style-type: none"> <li>osteoporosis treatments are reimbursed at 50%</li> </ul>		<ul style="list-style-type: none"> <li>patients at high risk of fracture are not eligible for treatment reimbursement before the first fracture</li> </ul>
<b>Lithuania</b>	<ul style="list-style-type: none"> <li>therapies are reimbursed only for patients after DXA scan and T-score <math>\leq -2.5</math></li> <li>proven therapies for treatment of osteoporosis are reimbursed to varying extents</li> </ul>	<ul style="list-style-type: none"> <li>no reimbursement for DXA</li> </ul>	

<b>Moldova</b>		<ul style="list-style-type: none"> <li>• no reimbursement for DXA</li> <li>• no reimbursement for treatment</li> </ul>	
<b>Poland</b>	<ul style="list-style-type: none"> <li>• DXA scans are reimbursed if the patient is sent to the specialist by a general practitioner.</li> <li>• only bisphosphonates are reimbursed up to 30%</li> <li>• patients at high risk are eligible for treatment reimbursement before the first fracture.</li> </ul>		
<b>Romania</b>	<ul style="list-style-type: none"> <li>• DXA reimbursement is €10 per scan.</li> <li>• proven therapies are reimbursed up to 50%, the main criteria for reimbursement is T-score &lt;-2.5 SD.</li> <li>• diagnosed osteoporotic patients are eligible for treatment reimbursement before the first fracture.</li> </ul>		
<b>Russia</b>		<ul style="list-style-type: none"> <li>• no reimbursement for DXA</li> <li>• no reimbursement for treatment</li> </ul>	<ul style="list-style-type: none"> <li>• medications for osteoporosis treatment are free of charge for disabled patients with severe osteoporosis only</li> </ul>
<b>Slovakia</b>	<ul style="list-style-type: none"> <li>• DXA exam is fully reimbursed.</li> <li>• treatment is reimbursed up to more than 90%, main criteria are a T-score &lt; -2.5 and/or a presence of low energy trauma fracture.</li> <li>• PTH analogues are reimbursed only for patients with severe osteoporosis (T-score &lt; -2,5)</li> </ul>		
<b>Slovenia</b>	<ul style="list-style-type: none"> <li>• DXA is not reimbursed for primary osteoporosis and the exam has to be paid by the patients</li> <li>• DXA is fully reimbursed for secondary osteoporosis.</li> <li>• reimbursement for osteoporotic treatment is generally provided for patients treated according to the National Guidelines</li> </ul>		
<b>Tajikistan</b>		<ul style="list-style-type: none"> <li>• no reimbursement for DXA</li> <li>• no reimbursement for treatment</li> </ul>	<ul style="list-style-type: none"> <li>• DXA scan is on a fee basis except for the privileged category of patients</li> <li>• the medications for osteoporosis are free of charge for a privileged category of patients only.</li> </ul>
<b>Ukraine</b>		<ul style="list-style-type: none"> <li>• no reimbursement for DXA</li> <li>• no reimbursement for treatment</li> </ul>	<ul style="list-style-type: none"> <li>• in the Ukrainian Scientific Medical Centre some categories of citizens (disabled, victims of Chernobyl's nuclear power plant accident, etc.) have free access to examination.</li> </ul>
<b>Uzbekistan</b>		<ul style="list-style-type: none"> <li>• no reimbursement for DXA</li> <li>• no reimbursement for treatment</li> </ul>	

# Armenia

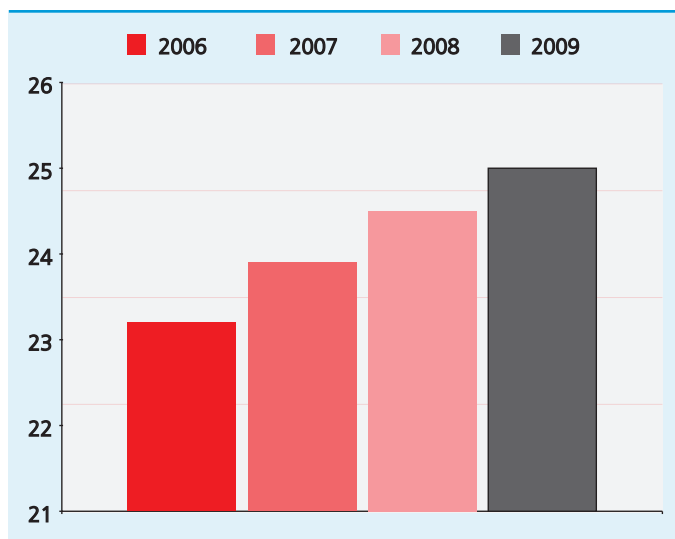
## Overview

The number of people over the age of 50 is increasing in Armenia. Consequently, the Armenian Osteoporosis Association estimates that the number of people with osteoporosis and osteoporotic fractures will increase accordingly. Although the disease is not recognized by the government as a major health care problem, medical doctors affiliated with the Armenian Osteoporosis Association are actively engaged in health promotion activities in the field of osteoporosis.

## Key findings

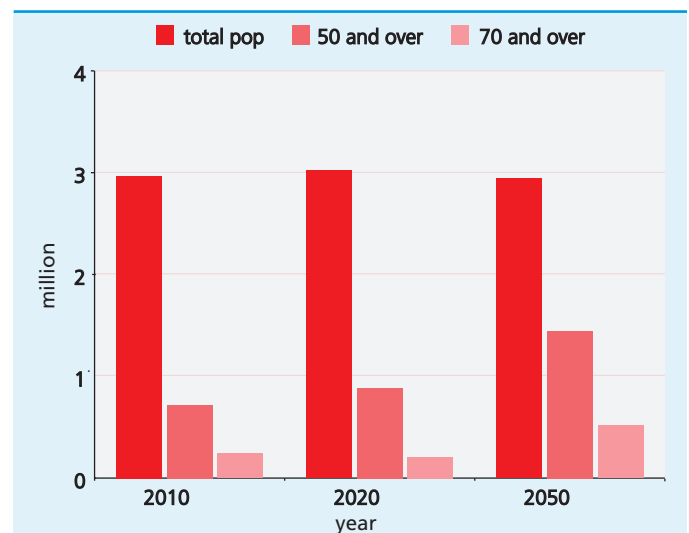
The total population of Armenia is estimated at 3.2 million people; 25% are aged 50 and over (820,000 people) and 56.8% are women. The average life expectancy for women is 76.9 years of age and for men 70.4. The National Statistical Service of Armenia has no prognostic data about the changes in the structure of the population older than 50 years by 2020 and

**Figure 1** Population (%) over 50 years from 2006 to 2009



2030. However, based on population data from 2006 to 2009 (fig. 1) it is possible to predict an increase in the number of people over the age of 50, and hence it can be expected that there will be a significant increase in the number of people with osteoporosis.

**Figure 2** Population projection for Armenia until 2050



Due to a lack of official statistics, it is practically impossible to judge the incidence of osteoporosis and associated fractures. There are no population-based studies quantifying osteoporosis rates in women and men over 50 years of age in Armenia.

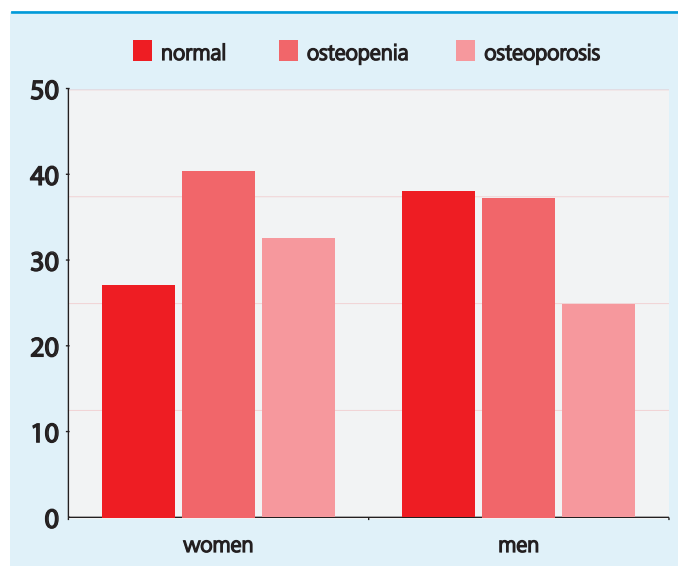
When data from all densitometry centres are integrated, of the 4,162 patients (3,980 women and 182 men over 50 years) examined from 2006 to 2009, osteoporosis was detected in 32.1% patients and osteopenia in 40.3% (fig. 3).

## Fragility fractures

Based on data from different departments of traumatology in Yerevan, 309 patients aged 50 and over were registered in 2009 with low energy osteoporotic fractures at different locations. This comprises 7.9% of all adult patients having been hospitalized with fractures at any location. 75% of these 309 patients had hip fractures. Osteoporotic fractures occurred more frequently

in women than men (2:1). Surgical treatment was performed in 72% of hospitalized patients. The prevalence of endoprosthesis insertion was limited as patients had to pay for it themselves.

**Figure 3** The incidence (%) of osteoporosis and osteopenia in women and men over 50 years tested at densitometry centres



## Vertebral fractures

No available information

## Diagnosis

In Armenia densitometry has been performed since 2006 and today there are 4 dual energy X-ray absorptiometry (DXA) scanners, 1.3 DXA per million population. Additional DXA scanners are due to be installed in regional hospitals of three large Armenian cities (Gyumri, Vanadzor, Martuni). Densitometry is not included in the state health care programme and patients have to pay for it themselves. Nevertheless, thanks to agreements made with the Osteoporosis Association, some densitometry centers offer patients a 50% discount for the examination.

## Prevention, education, government policy

Osteoporosis has not yet been recognized as an important medical and social problem in Armenia. However the Armenian Osteoporosis Association has issued a letter to the Ministry of Public Health, appealing for the necessity of accepting osteoporosis as an important state health problem.

The Armenian Osteoporosis Association was established in 2007 and is a member of the International Osteoporosis Foundation. In Yerevan and in different regions of Armenia an educational programme,

‘a School on Osteoporosis’ was set up to improve the awareness and knowledge of osteoporosis and its diagnosis and treatment among primary care doctors and different medical specialists. An osteoporosis school was organized for children where they are given lessons and learn the importance of an adequate diet, physical activity and avoidance of bad habits to maintain healthy bones throughout life. Guidelines on the prevention and treatment of osteoporosis have been published for patients and doctors. All medical institutions in Yerevan received the IOF One-minute Osteoporosis Risk Test, which helps to identify people who have risk factors for osteoporosis and osteopenia and should be recommended for clinical testing. The hope is that those in need will receive early treatment and prophylactics to prevent fracture. Initiatives are being taken that will eventually allow the development of a FRAX® – WHO Fracture Risk Assessment Tool for Armenia.

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4. Arustamyan K.K., et al. The status of bone mineral density and markers of bone metabolism in women with surgical menopause. *Problems of Theoretical and Clinical Medicine*, 2009, 12:3-28.
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# Azerbaijan

## Overview

In Azerbaijan many people are potentially at high risk of osteoporotic fractures. Osteoporosis is not recognized as a major health problem in Azerbaijan. However, everyday medical practice indicates that this disease is of great medical and social importance. A major problem arises with diagnostic tools: densitometry is not reimbursed and it is very expensive (100-120 USD) for the majority of the population. To date vitamin D and calcium deficiency has not been found to be a major problem. Health care workers are interested in the problem of osteoporosis and there is a particular interest among the Azerbaijan Rheumatology Association. Nevertheless, there is no public organization in the country with a specific sphere of interest in the field of osteoporosis. Our actions will be directed first of all to the creation of the Azerbaijan Osteoporosis Association, under the IOF umbrella. Then we will be able to raise awareness of osteoporosis and reveal problems and issues in the general media.

## Key findings

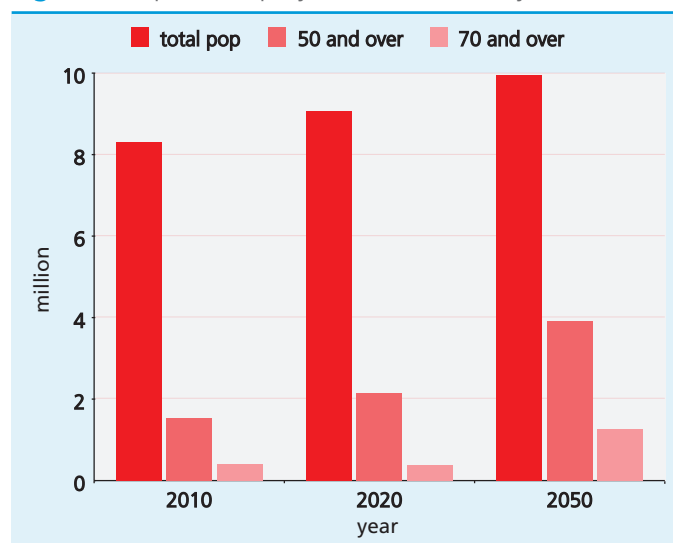
Azerbaijan is a rapidly developing country with a population of 9 million people. Currently it is estimated that 18% of the population is aged 50 and over while only 5% are 70 and over. By 2050, projections show that 39% of the population will be 50 and over and 13% will be 70 and over (fig. 1).

The main problem is the lack of accurate epidemiological data to estimate the medical and social significance of osteoporosis for the Azerbaijan population.

## Hip fractures

It is estimated that only 20% of patients receive surgical treatment after a hip fracture. The average cost of conservative treatment is 1,000 USD, while the average cost of an osteosynthesis is 1,000 USD and a hip replacement costs 4,000 USD. The average cost of rehabilitation after hip fracture is 4,000 USD.

**Figure 1** Population projection for Azerbaijan until 2050



Source: U.S. Census Bureau, International Data Base

## Diagnosis

In Azerbaijan there are 7 DXA scanners (0.9 per million population); all of them are located in the main city of Baku. There are also 3 quantitative ultrasound instruments (QUS). Densitometry is paid by the patient themselves and the cost of one examination varies from 50 to 100 USD.

In the country almost all modern methods of osteoporosis treatment are available. Nevertheless, the patient pays for the treatment from their own resources.

## Prevention, education, government policy

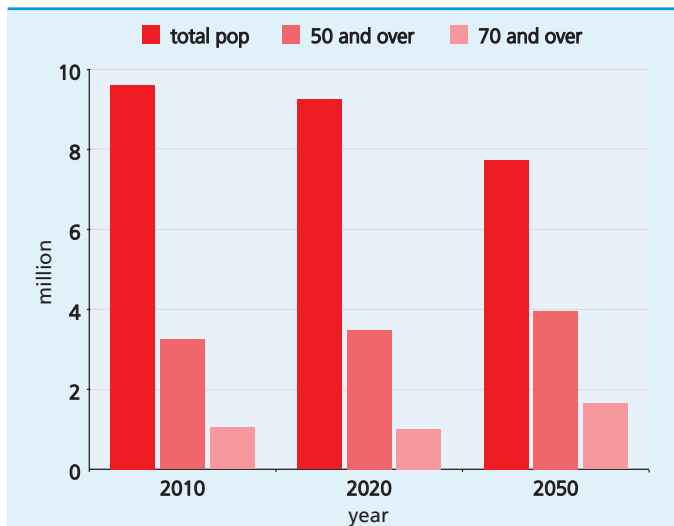
Osteoporosis is not recognized as one of the most significant social and medical problems in Azerbaijan. Health care workers take interest in the problem of osteoporosis and particularly great interest is displayed by the Azerbaijan Rheumatology Association. Nevertheless, there is no public organization in the country with a specific sphere of interest in the field of osteoporosis. It is expected that this situation will be rectified in the near future with the creation of the Azerbaijan Osteoporosis Association and its membership in the IOF.

# Republic of Belarus

## Overview

The first consulting room for osteoporosis prevention opened in 1997 on the premises of the M.P. Masherov's Republican Hospital for Veterans Affairs and the first densitometry clinic began in 1992 in the clinic of the Research Institute of Radiation Medicine and Endocrinology. In 2005, a Public Association 'Fight Osteoporosis Together', was established with more than 600 members. This association promotes knowledge of osteoporosis among health care workers and the general population. It conducts regional and international scientific conferences on the issue, supervises research work, provides treatment and consultation work for osteoporosis patients, organizes and conducts schools on osteoporosis for the general population and health care workers, and widely covers the problem of osteoporosis in the media (regular sessions on the first national channel on the Health Programme, and on radio – regional and republican printed media).

**Figure 1** Population projection for the Republic of Belarus until 2050

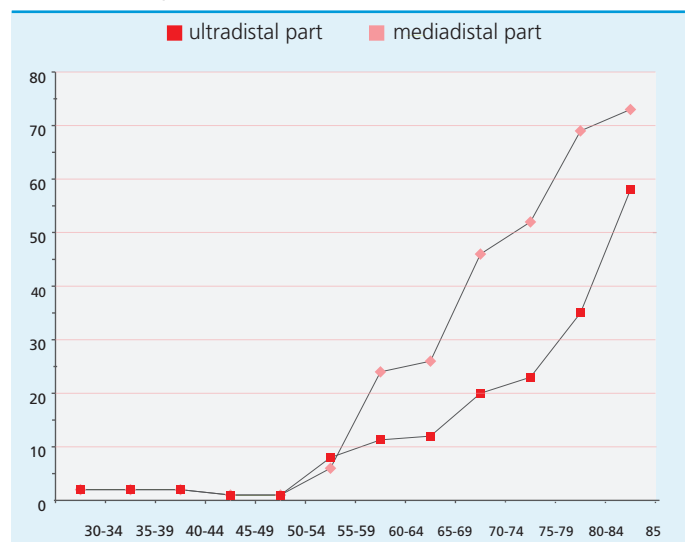


## Key findings

The present population of the Republic of Belarus is estimated to be 9.5 million, of this 34% (3.2 million) is 50 years of age and over and 11% (1 million) is 70 and over. By 2050, it is estimated that 51% (4 million) of the population will be 50 and over and 21% (1.6 million) will be 70 and over while the total population will decrease to 7.8 million<sup>1</sup> (fig. 1).

The population of the country is 9.5 million people. It is suggested that 30% of people over 50 suffer from osteoporosis with 1 in 5 women over 55 years (350-400,000 people) (fig. 2) and 1 in 8 men over 60 years (150,000 people) having osteoporosis. The number of people with osteopenia ranges from 900,000 to 1 million people<sup>2</sup>.

**Figure 2** Age-related changes in the incidence of osteoporosis in women of Belarus according to DXA forearm BMD(r) – ultradistal part, BMD (k) – mediadistal part<sup>3</sup>



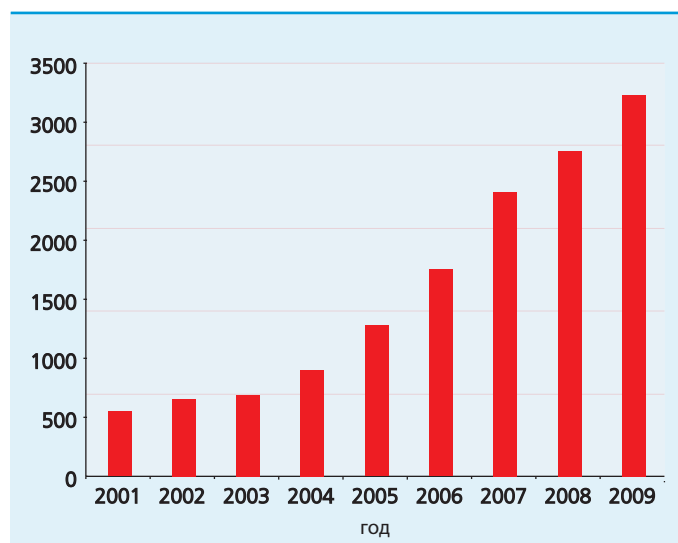
## Fractures

Nearly 160,000 traumas and fractures occur every year in the Republic of Belarus, and 70% of them are so-called osteoporotic fractures. Elderly people are at particularly high risk for such traumas: they affect 15% of women older than 50 and 6% of men in the same range.



In 2008, 642 people aged 18 and over were considered to be disabled due to hip or lower extremity traumas<sup>4</sup>.

**Figure 3** Number of endoprosthesis of hip joint from 2001 to 2009 in Belarus



The average stay at hospital for any fracture is about 12.9 days. The average cost of a hip fracture osteosynthesis is 1,500-2,000 USD and an endoprosthesis costs 3,000-5,000 USD. Around 30% of patients with hip fracture are provided with rehabilitation. The average cost of rehabilitation after hip fracture is 1,000 USD.

For the citizens of the Republic of Belarus the treatment is free of charge.

## Diagnosis

The total number of DXA machines in the country is seven (0.8 per million population). Five DXA are located in the capital city Minsk, as well as in Brest and Gomel. There are also six quantitative ultrasound instruments. The cost of one DXA exam is 10-15 USD. The mean waiting time for the examination is 1.5 months. For the citizens of the Republic of Belarus densitometry is free if they are referred by a doctor and have medical indications for the procedure.

## Reimbursement

Medications prescribed by the “concilium” (comprising the treating doctor, specialist in the field of osteoporosis and representative of the administration of the clinic) are given with a 10% discount. Calcium and vitamin D medications are available over-the-counter.

## Calcium and vitamin D

Marked vitamin D deficiency has been found in 30% of postmenopausal women and 40% have a moderate deficiency<sup>5,6,7</sup>. Milk consumption in Belorussia comprises around 260 liters per person annually. Nutritional products for children and certain milk and dairy products are also enriched.

## Prevention, education, government policy

As the state level osteoporosis is recognized as one of the most important problems in health care. The Health Ministry of the Republic of Belarus officially introduced and implemented the following two practices in medical institutions:

1. procedures to identify individuals at high risk of osteoporotic fractures;
2. procedures for the complex diagnosis of low bone mass and osteoporosis in children and young adults.

A telephone hotline was opened and a website devoted to osteoporosis has been established.

<http://osteoporosis.belmapo.by>

### Additional information about the activities of Minsk City Centre of Osteoporosis

The Osteoporosis Centre of the city of Minsk was opened in 2006. Every day 60-70 patients visit the centre with 35-40 densitometry examinations carried out each shift, followed by consultation with specialists. In 2009 activists of the Belarus Public Association ‘Fight Osteoporosis Together’ held the International Conference on the Problem of Osteoporosis which was attended by 500 doctors, and in 2010 the IOF Osteoporosis Diagnosis Course was held with 300 participants. The Osteoporosis Centre carries out regular educational courses for various medical specialists taking postgraduate medical courses at the Belarusian Medical Academy of Postgraduate Training. Lectures on the problems of osteoporosis are included in the programme of education within the departments of therapy, paediatrics, endocrinology, laboratory diagnostics and others.

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# Bulgaria

## Overview

Four IOF national society members are operating currently in Bulgaria: the Bulgarian League for the Prevention of Osteoporosis (since 1998), Women without osteoporosis (since 2000), the Bulgarian Society for Clinical Densitometry (since 2004), and the Bulgarian Medical Society of Osteoporosis and Osteoarthritis (since 2007).

The main tasks of the Societies include: training of health professionals; participation in scientific surveys and guideline elaboration; scientific and methodological aid on the problems faced by the country's health-care system; interaction with other scientific medical associations and/or independently organized scientific events; support of the higher medical institutes and medical centres; as well as the publication of specialised medical literature and information materials for physicians and patients.

A 5-year National Program against Osteoporosis supported by the Bulgarian Government and Ministry of Health was implemented from 2006 through 2010. It incorporated the following activities:

A Pharmacoeconomic Analysis of Osteoporosis in Bulgaria was issued in 2007 and specific reimbursement rates to the National Health Insurance Fund were proposed. Educational and certification courses for densitometry staff in 15 DXA centers in Bulgaria in 2007-8 along with the completion of a random community DXA screening of 2500 Bulgarian women. A national epidemiological survey (2000 women) was conducted in 2009 to investigate the prevalence of densitometric osteoporosis and reported fractures, the risk factors and fracture risk in the general female population aged 50 and over, with the results presented at the ECCEO'10 Florence and ECCEO'11 Valencia meetings.

The FRAX<sup>®</sup> calculation tool was introduced in everyday clinical practice by organizing special teaching sessions throughout the country and edu-

cational courses during two National Congresses in 2008 and 2010. National Conferences of Osteoporosis and Osteoarthritis in Bulgaria were also organized during this period.

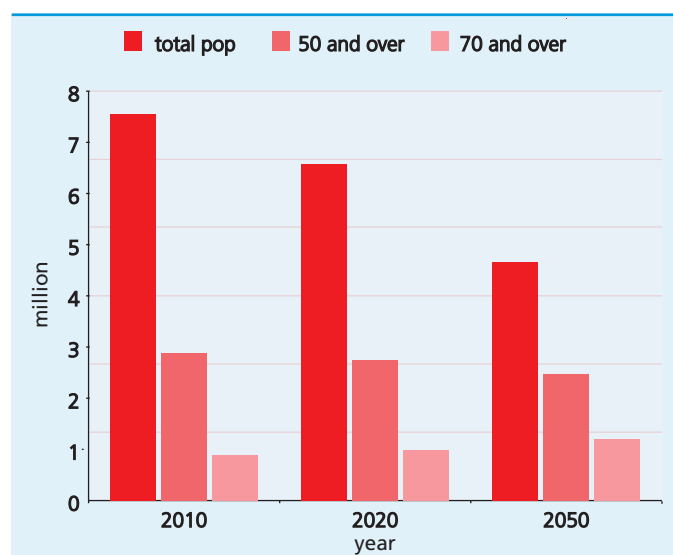
In 2010, the Bulgarian Bone Club for experts was founded, supported by three Bulgarian IOF-CNS member societies (the Bulgarian League for the Prevention of Osteoporosis, the Bulgarian Society for Clinical Densitometry and the Bulgarian Society of Osteoporosis and Osteoarthritis) as well as by the Bulgarian Society of Endocrinology and the Bulgarian Society of Rheumatology. The Second National Program against Osteoporosis is in preparation for 2011-2015. It pursues three strategic goals:

- To establish the epidemiology of vitamin D deficiency in Bulgaria.
- To implement a Government program for vitamin D food fortification.
- To build a national registry of hip and vertebral fractures.

## Key findings

The present population in Bulgaria is estimated to be 7.5 million (3.6 million men and 3.9 million women).

**Figure 1** Population projection for Bulgaria until 2050

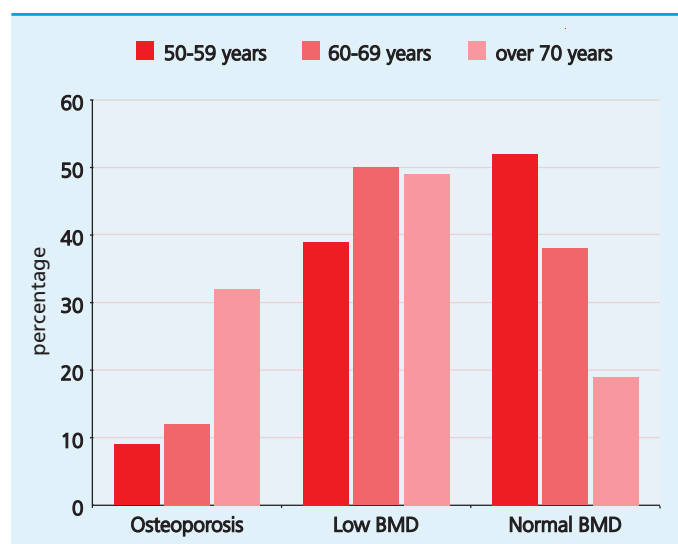


Of this 38% (2.8 million) are aged 50 and over and 12% (900,000) - 70 and over. By 2050, it is estimated that 53% (2.5 million) of the population will be 50 and over and 26% (1.2 million) will be 70 and over while the total population will decrease to 4.6 million<sup>1</sup> (fig.1).

The reported retrospective study, designed to determine the prevalence of osteopenia and osteoporosis in a female referral population, included 8,869 Bulgarian women (age 20–87 years). The prevalence of normal forearm bone mineral density in women aged over 50 years was 47.1%, the prevalence of osteopenia was 32.5%, and the prevalence of osteoporosis was 20.5%<sup>2</sup>. Preliminary data from one DXA center indicated a prevalence of total hip osteoporosis around 14%<sup>3</sup>.

In the National Osteoporosis Epidemiological Survey (including 1334 Bulgarian women 50-89-year old) the prevalence of femoral neck osteoporosis was 16.8%<sup>4</sup>. Thirty eight percent of the women had normal BMD and 46.5% had low BMD. The age-adjusted prevalence is shown in Fig. 2.

**Figure 2** The age-adjusted prevalence of osteoporosis and low bone mass at the femoral neck is shown



In the 50-59 age group 20.6% of all women had osteoporosis at the lumbar spine, 42.2% had low BMD and 37.2% had normal BMD<sup>5</sup>.

## Hip fractures

In 2009, it was estimated that 8,800 hip fractures (9% of all fractures) occurred<sup>6,7</sup>. This is a 15% increase compared to 2007 (7,500 hip fractures reported). About 90% of all hip fractures occurred in the population over 50 years old and affect 3 times more women than men.

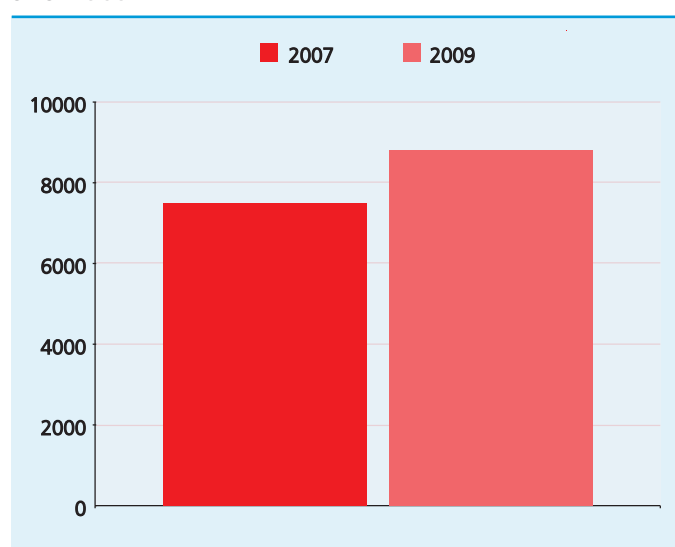
One point nine percent of the women participating in the National Epidemiological Survey reported previous hip fractures (1.7% - one fractured hip and 0.2% - two fractured hips). Four percent reported maternal history of hip fractures<sup>8</sup>.

The estimated direct cost of treating hip fracture is around €1,500 in 2010, with an average number of 6 hospital days in acute care and 14 hospital days in rehabilitation. Total direct hospital costs for hip fractures are around €15 million<sup>5,6,7</sup>.

## Vertebral fractures

Two point three percent of the women participating in the National Epidemiological Survey reported previous vertebral fractures (1.7% - one fractured vertebra, 0.4% - two fractured vertebrae and 0.2% - three or more). Thirty three percent reported height loss above 3 cm versus young age<sup>8</sup>.

**Figure 3** Number of hip fractures in Bulgaria in 2007 and 2009



## Diagnosis

In Bulgaria, there are 34 DXA scanners, that is 4.0 DXA per million population. Most DXA scanners are located in Sofia (10) and in large cities (17). There is no waiting time for a DXA exam in the public health system and the cost for a DXA scan of hip or spine varies from €30 to 50. DXA reimbursement is €10 per scan for patients with primary hyperparathyroidism, hypogonadism or after organ transplantation.

## Reimbursement

Most effective drug treatments are reimbursed up to 25%. Female patients with postmenopausal osteoporosis and central DXA T-score  $\leq -2.5$  are eligible for treatment reimbursement with or without fractures. Since August 2010 two bisphosphonates, Zoledronate and Risedronate, have been approved for the treatment of osteoporosis in men. The reimbursement rate is the same (25%).

## Calcium and vitamin D

The National Program against Osteoporosis in Bulgaria 2006-2010 and the National Guidelines for Osteoporosis Management (second revision, 2008) provide guidelines for optimum daily intake: at least 1200 mg/day of calcium and at least 800-1200 IU of vitamin D<sup>9</sup>.

### Prevention, education, government policy

Osteoporosis is considered a national health priority in Bulgaria and most national and regional osteoporosis campaigns are supported by the Bulgarian government. The Ministry of Health, the scientific societies of endocrinology, rheumatology, orthopaedic surgery and gynaecology are supportive partners. In 2004 Medical Standards in Endocrinology and the first Bulgarian Guideline for the Diagnosis and Treatment of Osteoporosis were issued (second revision 2008); in 2010, the Medical Standard in Rheumatology<sup>9,10</sup> was issued. However, currently no national fragility fracture registry has been established for data collection and monitoring. Most data are collected from the Regional Healthcare Centres.

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10. [www.mh.government.bg](http://www.mh.government.bg)

# Czech Republic

## Overview

The overall number of patients admitted to hospital for hip fracture has increased in the last few years. Unfortunately there is no special national fragility fracture registry at the present time. Despite the presence of the Czech Society for Metabolic Skeletal Diseases as well as the Czech National Forum against Osteoporosis, osteoporosis is not yet designated a governmental healthcare priority in the Czech Republic.

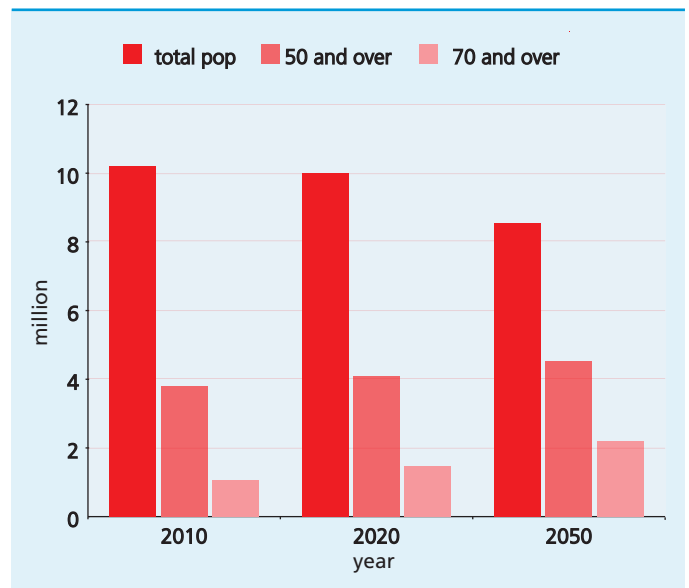
All proven therapies for the treatment (but not prevention) of osteoporosis are mostly (about 80%) reimbursed in all patients with accepted indications. But patients with osteoporosis are often prevented from accessing treatment because of low prescription limits for the doctors and consecutive fines charged by insurance companies to the physicians for the limit violation. This common practice may explain why only a small proportion of people with osteoporosis receive adequate treatment.

There is no direct governmental financial support of osteoporosis patient and scientific societies. There is no official national health programme in relation to osteoporosis. The solution can be found in convincing policy-making authorities of long-term savings in hospitalization and fracture treatment costs through prevention and early treatment of osteoporosis and prevention of fractures.

## Key findings

The present population in the Czech Republic is estimated to be 10 million, of this 37% (3.7 million) is 50 years of age and over and 11% (1.1 million) is 70 and over. By 2050, it is estimated that 53% (4.5 million) of the population will be 50 and over and 26% (2.2 million) will be 70 and over while the total population will decrease to 8.5 million<sup>1</sup> (fig. 1).

**Figure 1** Population projection for the Czech Republic until 2050



## Hip fractures

In 2004, the total number of hip fractures was estimated to be 21,000 cases, with 2.4 times more hip fractures in women than men. The incidence of hip fractures has been calculated to be 15.6 hip fractures /10,000 population. The average number of hospital days in acute care was 35.6 days in 1986, which decreased to 16.1 days in 2004. The total direct hospital cost of hip fractures is estimated to be €70 million per year.

## Vertebral fractures

No available information

## Diagnosis

The number of DXA scanners in the Czech Republic is 4 per million population and 75% are in the public system. The waiting time to access a DXA exam is between 1 and 3 weeks (2007). The cost of a DXA exam is around €20 in the public system (€26 in the private system) and it is fully reimbursed for patients at risk.

## Reimbursement

Regarding drug reimbursement, generics are mostly reimbursed but other drugs only partially. Patients with DXA proven osteoporosis and/or low trauma fracture are reimbursed; the same criteria allow reimbursement before the first fracture.

## Calcium and vitamin D

National Guidelines have been developed on optimum daily intake of calcium and vitamin D but currently there is no national public health programme. Information is provided through activities among physicians (CSMSD) and public education (CNFO).

## Prevention, education, government policy

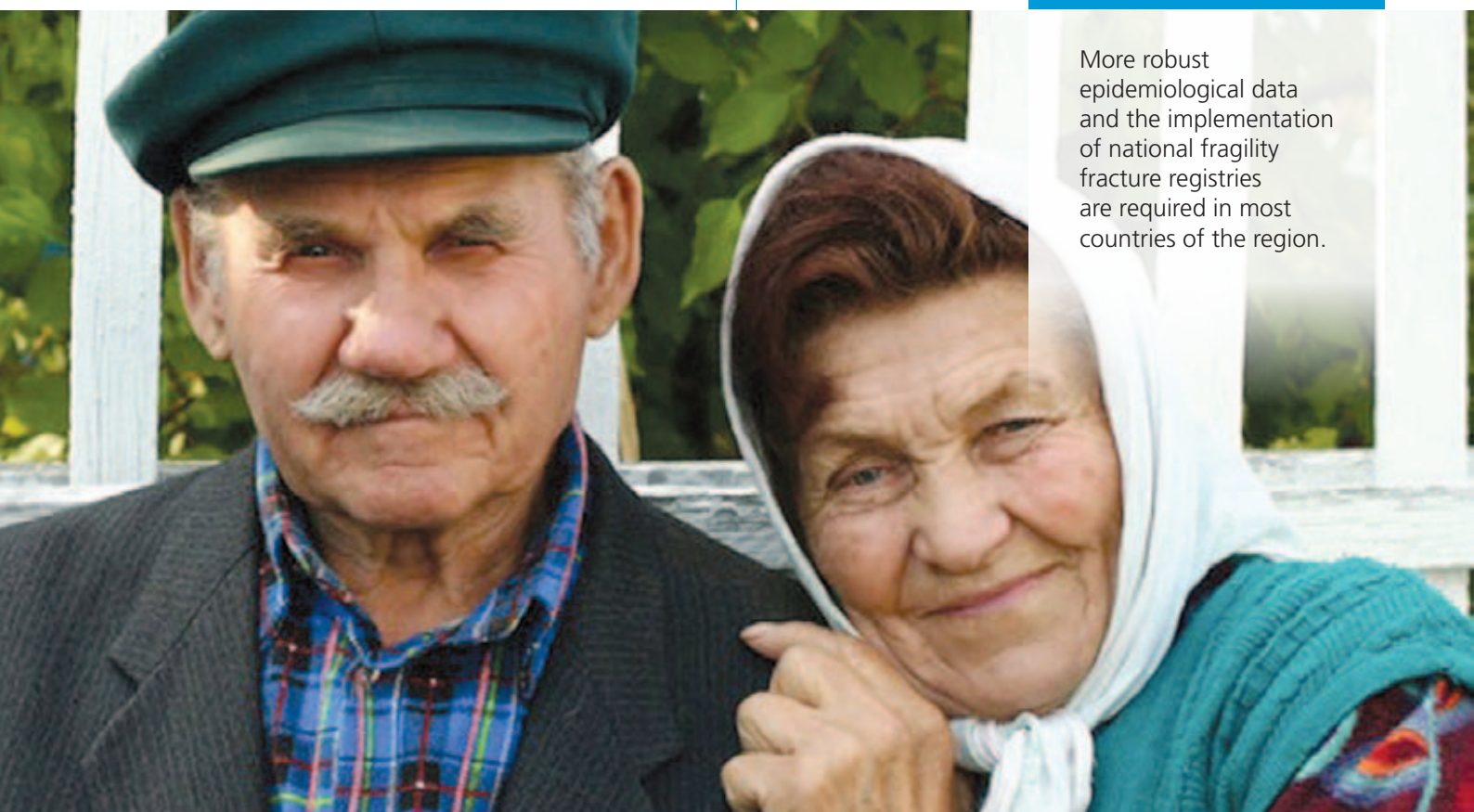
Osteoporosis is not considered a health priority in the Czech Republic and there is no national registry for fragility fractures. Fracture monitoring is achieved via hospitalization reports and the government does not support patient and scientific societies.

Osteoporosis is included in the curriculum of the medical faculties as well as in postgraduate training in several specializations. IOF has organized the Osteoporosis Diagnosis Course with Densitometry Certification in 2007. Specialisation in clinical osteology is newly established with innovation of postgraduate education system.

Specialization in clinical osteology has been newly established within the postgraduate educational system. Basic research is inhibited by the lack of financial means.

## References

1. Source: U.S. Census Bureau, International Data Base.



More robust epidemiological data and the implementation of national fragility fracture registries are required in most countries of the region.

# Estonia

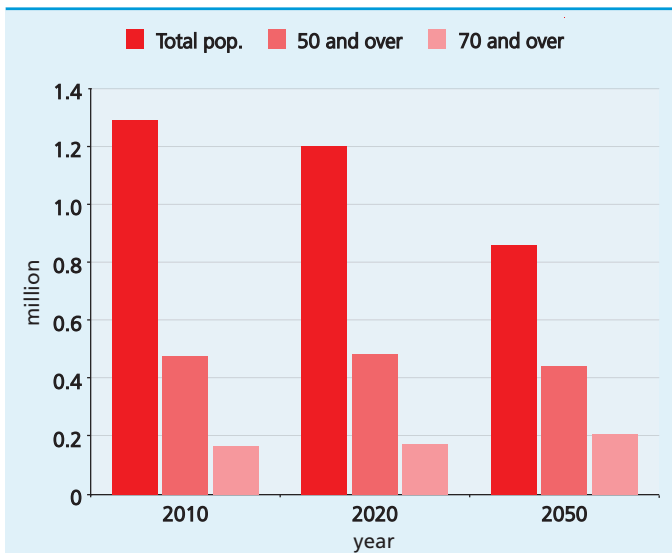
## Overview

The Estonian Osteoporosis Society is a nonprofit organization, in which medical doctors from various disciplines participate. The medical disciplines represented are rheumatologists, orthopaedic surgeons, general practitioners, endocrinologists, gynaecologists, gastroenterologists and physiotherapists. The Estonian Osteoporosis Society was founded in 1999 and since that time has been a member of the IOF.

The Society's goal is to identify the problems associated with osteoporosis and share information about prevention, diagnosis and treatment options particularly with medical doctors. The Society organizes lectures and conferences, and osteoporosis diagnosis and treatment guidelines have been prepared in collaboration with IOF. The IOF Osteoporosis Diagnosis Course with Densitometry Certification has also been organized.

Different campaigns have been carried out for the general population. These primarily prevention-oriented activities take place mainly in October.

**Figure 1** Population projection for Estonia until 2050



## Key findings

The present population in Estonia is estimated to be 1.3 million; of this 37% (480,000) is aged 50 and over and 13% (166,000) is 70 and over. By 2050, it is estimated that 52% (444,000) of the population will be 50 and over and 24% (209,000) will be 70 and over, while the total population will decrease to 862,000<sup>1</sup> (fig. 1).

## Hip fractures

The number of hip fractures in Estonia is estimated to be 1,000 cases per year.

## Diagnosis

In Estonia, there are 10 DXA scanners for a total population of 1.34 million inhabitants. The waiting time for a DXA scan in the public health system is 2 to 4 weeks. The cost of a DXA scan is 259 EEK (€17). The exam is fully reimbursed when the patient is directed to DXA by a GP or other doctors. Patients can self refer for DXA measurements, but need to cover the costs themselves.

## Reimbursement

In general, bisphosphonate treatments are reimbursed up to 50% for osteopenic patients and in the case of osteoporosis without fracture, and up to 90% in patient with osteoporosis with fracture. All other treatments to all patients are reimbursed to 200 EEK (€13) per prescription. Calcium and vitamin D are not reimbursed.

## Vertebral fractures

The prevalence rate of vertebral fracture for men and women over 50 years is estimated to be 200 cases per 10,000 population.

## Calcium and vitamin D

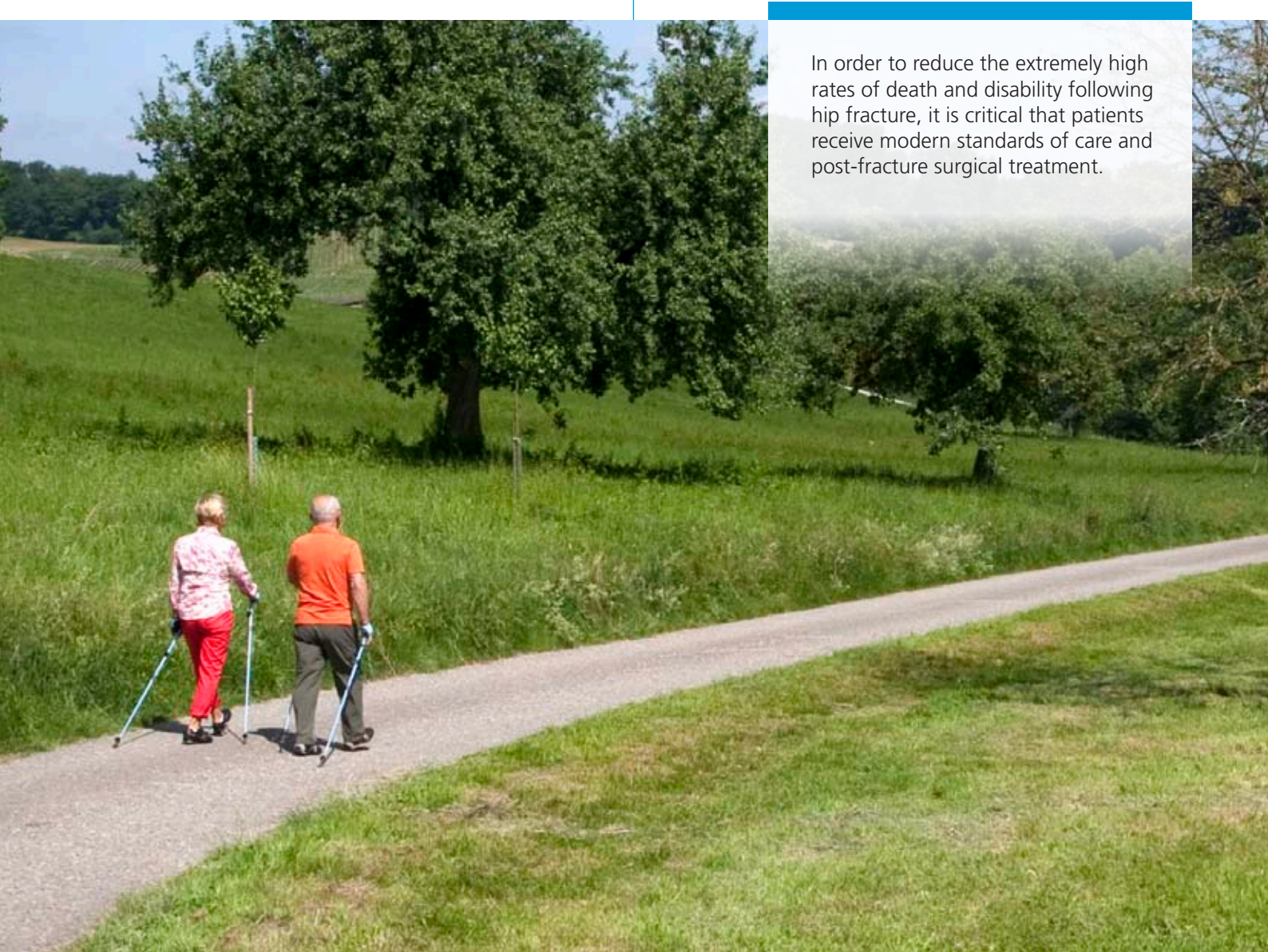
National guidelines have been published regarding optimum daily intake of calcium and vitamin D but there is no national public health programme.

## Prevention, education, government policy

Osteoporosis is not considered a national health priority in Estonia but the Estonian government has supported some campaigns for osteoporosis, especially for patients with rheumatic disorders and glucocorticoid users. Data regarding fractures are based on hospital invoices as there is no national fragility fracture registry.

## References

1. Source: U.S. Census Bureau, International Data Base.



In order to reduce the extremely high rates of death and disability following hip fracture, it is critical that patients receive modern standards of care and post-fracture surgical treatment.



# Georgia

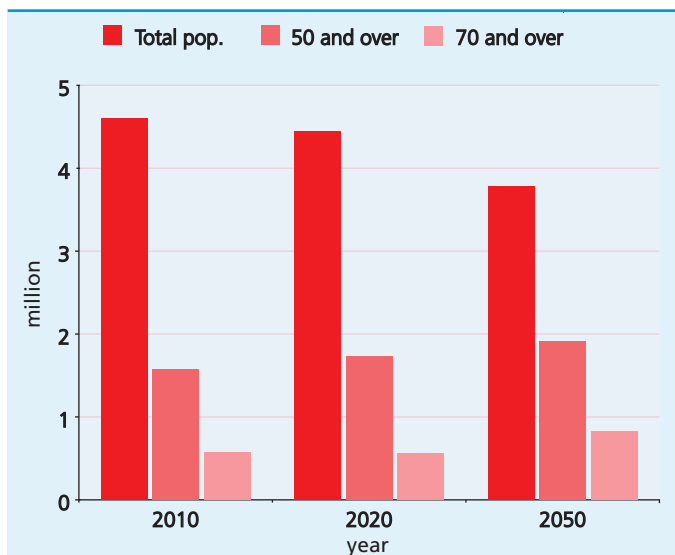
## Overview

The National Osteoporosis Association of Georgia has found that approximately 38% of all fractures in Georgia are osteoporotic. Nevertheless, not all of them are treated appropriately, as only 25% of hip fracture patients are hospitalized. The disease is not a health priority. But efforts are made by members of the National Osteoporosis Association to facilitate diagnosis of osteoporosis by establishing free consultations, as well as by improve awareness among health care practitioners and patients.

## Key findings

The present population in Georgia is estimated to be 4.5 million; of this 34% (1.6 million) is aged 50 and over and 13% (580,000) is 70 and over. By 2050, it is estimated that 51% (2 million) of the population will be 50 and over and 22% (820,000) will be 70 and over, while the total population will decrease to 3.8 million<sup>1</sup> (fig 1).

**Figure 1** Population projection for Georgia until 2050



## Fragility fractures

According to the National Osteoporosis Association, around 38% of all fractures registered in Georgia are osteoporotic fractures: 20% are vertebral fractures, and 18% are other fractures due to osteoporosis. Only 25% of the patients with hip fracture are hospitalized.

## Diagnosis

In Georgia there are 2 DXA scanners (0.4 DXA scan per million population), both located in the capital city Tbilisi, and 15 QUS instruments. Patients pay for the examination; the cost is about 70 USD. Twice a year the National Osteoporosis Association conducts a screening programme to diagnose osteoporosis which includes free densitometry and a doctor's consultation.

## Reimbursement

Most anti-osteoporotic medications are available in Georgia, however, the state does not cover expenses for treatment and patients have to pay for it themselves.

National Guidelines have been developed on the optimum daily intake of calcium and vitamin D but currently there are no national public health programmes. Information is provided through activities among physicians (CSMSD) and public education (CNFO).

## Prevention, education, government policy

Osteoporosis is not accepted as a major health problem at the state level. However, the National Osteoporosis Association, a member of IOF, has been created and is actively working to improve education and awareness. An interest in the problem of osteoporosis is also displayed by the Georgian Rheumatology Society. National clinical recommendations on osteoporosis treatment have been developed and there is a telephone hot-line for patients with osteoporosis.

## References

1. Source: U.S. Census Bureau, International Data Base.

# Hungary

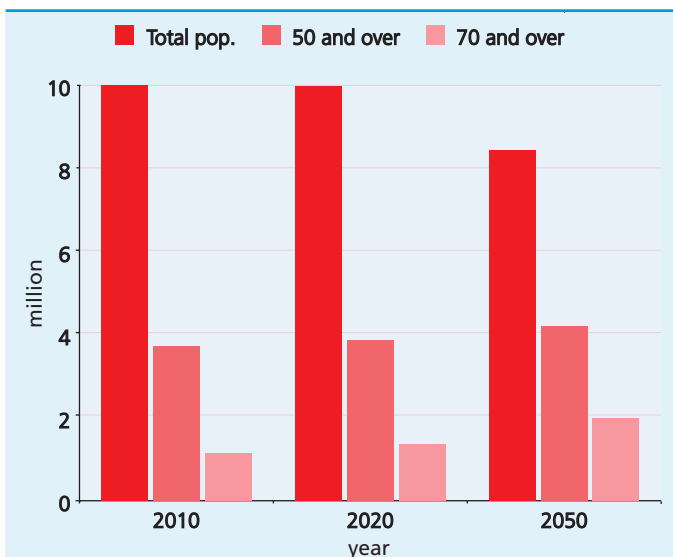
## Overview

Hungary is one of only several European countries, where despite the increasing number of elderly, the hip fracture incidence has fallen in the over 60s during the last two years. It has been suggested this is the outcome of the twenty years of educational and lobbying activity initiated by the professional society and patient association. Free DXA scanning and reimbursement for high risk and affected patients appears to have resulted in a statistically significant improvement.

Osteoporosis was a health care priority during the initial years; now it is treated as any other disabling health problem.

Yearly multidisciplinary congresses and regular post-graduate courses with attendance of over 500 physicians form a solid professional background supported by motivated allied health professionals (X-ray technicians, physiotherapists etc.). World Osteoporosis Day always gets special media attention, and main-

**Figure 1** Population projection for Hungary until 2050



tains public awareness. Vitamin D and Calcium supplementation as well as dietary and life style advice is distributed with varied success.

## Key findings

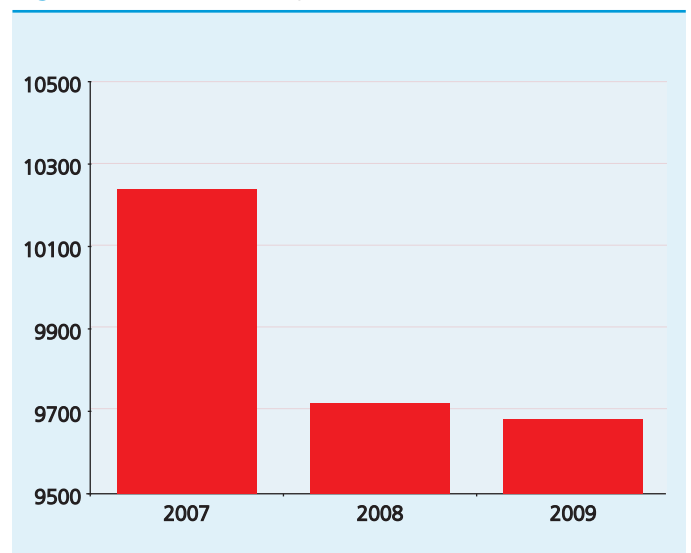
The present population in Hungary is estimated to be 10 million, of this 37% (3.7 million) is aged 50 and over and 11% (1.1 million) is 70 and over. By 2050, it is estimated that 49% (4.2 million) of the population will be 50 and over and 23% (1.9 million) will be 70 and over, while the total population will decrease to 8.9 million<sup>1</sup> (fig 1).

## Hip fractures

The estimated number of hip fractures was 9,680 cases in 2009. The number of hip fractures in Hungary since 2007 is presented in figure 2. The incidence of hip fracture was 43 for women and 22.3 for men per 10'000 population over 60 in 2007.

The average number of hospital days is 10 days (12 in 2007) in acute care and 26 days in rehabilitation or long-term care. The total direct hospital costs of hip fractures were between €5,000 and €10,000 in 2010.

**Figure 2** Number of hip fractures from 2007 to 2009



## Vertebral fractures

The prevalence rate of vertebral fractures in women aged over 50 years is 18.5 per 10,000 population and 15.8 in men aged over 50 years.

## Wrist fractures

The prevalence rate of wrist fractures in women aged over 50 years is 142 per 10,000 population and 60 in men aged over 50 years.

## Diagnosis

In Hungary, there are 13 DXA machines per million population. Their distribution is nearly homogenous with only a few regions underserved. The waiting time for a DXA scan is 4 to 6 weeks in the public health system. The cost of a DXA scan is €30 in the public system (20-40 in the private) but free for patients diagnosed with osteoporosis. Axial DXA is reimbursed for up to 1 scan (hip or spine) every 2 years while peripheral DXA and quantitative ultrasound (QUS) are not reimbursed, affected patients are 100% reimbursed. Technicians and physicians benefit from standardized training and a quality assurance protocol for DXA machines has been developed by the Hungarian Society of Osteoporosis and Osteoarthritis (HSOO).

## Reimbursement

In patients with a T-score  $\leq -2.5$  who have risk factors or previous fracture, 70% of the treatment is reimbursed. Patients at high risk can receive preventive treatment before the first fracture. Bisphosphonates, raloxifene, strontium ranelate, and teriparide are reimbursed drugs.

## Calcium and vitamin D

There is a national public health programme for calcium and vitamin D; national guidelines are prepared by the HSOO and reviewed yearly. Recommendations are a daily intake of 800IU for vitamin D and 1,000-1,500 mg for calcium.

The Euronut SENECA study investigated the diet and health of elderly people from 19 towns in 12 European countries. Between December 1988 and March 1989, the 25(OH)D concentration from 16 towns in 11 European countries<sup>2</sup> was studied. In Monor, a Hungarian city, it was observed that 33% of men and 52% of women had a 25(OH) D concentration below 30 nmol/L. Levels of 25(OH)D below 30 nmol/L are associated with secondary hyperparathyroidism, increased bone turnover, and decreased bone-mass density at the hip<sup>3</sup>.

## Prevention, education, government policy

Since 2007, due to general medical restrictions, osteoporosis has no longer been considered a national health priority in Hungary.

Training programmes are developed by the HSOO and partly by the medical universities but without government support. The Hungarian Patient Society, pharmaceutical companies, some foundations and media are supportive partners in the fight against osteoporosis.

University-based general scientific and medical research funds exist. There is no funding programme directly nominated for bone research.

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# Republic of Kazakhstan

## Overview

The Doctors' Osteoporosis Association was established in 2007 in Kazakhstan and in the same year joined the Russian Osteoporosis Association. Since the establishment of the Association, scientific conferences 'Modern aspects of diagnosis and treatment of osteoporosis' have been organized and conducted in eight regional centres in the Republic of Kazakhstan (Taldy-Korgan, Semipalatinsk, Kostanai, Karaganda, Pavlodar, Taraz, Shymkent, Actyubinsk) as well as in the cities of Almaty and Astana.

In April 2007 the conference was dedicated to urgent problems of osteoporosis and with the participation of leading Russian scientists was held in conjunction with the First Congress of Rheumatology in Central Asia and Kazakhstan. In October 2007 and November 2008 there were national conferences in Almaty with participant doctors from Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan. On October 20<sup>th</sup>, 2009, World Osteoporosis Day was marked for the first time; all densitometry examinations were free for patients in Almaty and members of the Association conducted a press-conference for mass media.

The Kazakh Doctors' Osteoporosis Association has initiated research on the incidence of hip and wrist fractures in Almaty. They have also been carrying out epidemiological research on osteoporosis in the population of Almaty using ultrasound.

As a result of these activities, the number of densitometers in the country has significantly increased from 1 to 9 QUS ultrasound and 5 DXA machines.

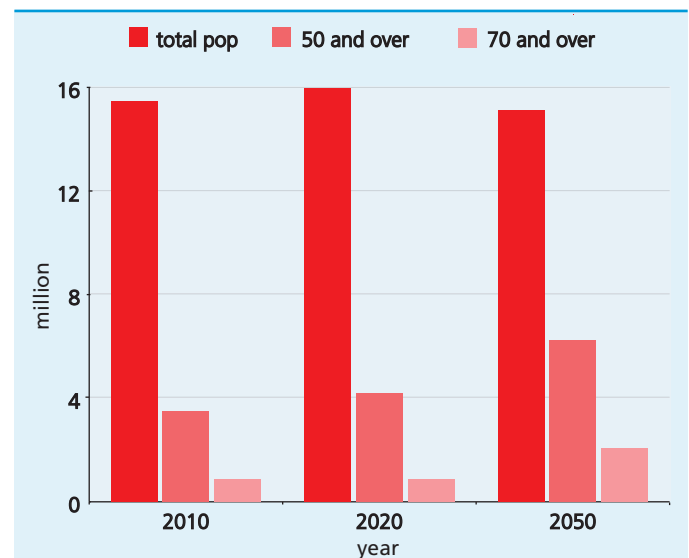
## Key findings

The present population in the Republic of Kazakhstan is estimated to be 16 million, 7.7 million men and 8.3

million women. 23% (3.5 million) of the population is 50 years of age and over and 6% (850,000) is 70 and over. The average life expectancy in the republic comprises 61.9 years in men and 72.4 years in women<sup>1,2</sup>.

By 2050, it is estimated that 41% (6.2 million) of the population will be 50 and over and 14% (2 million) will be 70 and over while the total population will be 15 million<sup>3</sup> (fig. 1).

**Figure 1** Population projection for the Republic of Kazakhstan until 2050



The population over 50 years is growing slowly, however among women the number of elderly people has been increasing slightly faster<sup>4</sup>.

There is no epidemiological data about the number of people suffering from osteopenia and osteoporosis. A study of BMD in the 50-59 age group revealed osteopenia in 33.3% (in 27.3% of men and 37.6% of women) and osteoporosis in 12.5% of women and 9.1% of men<sup>5</sup>.

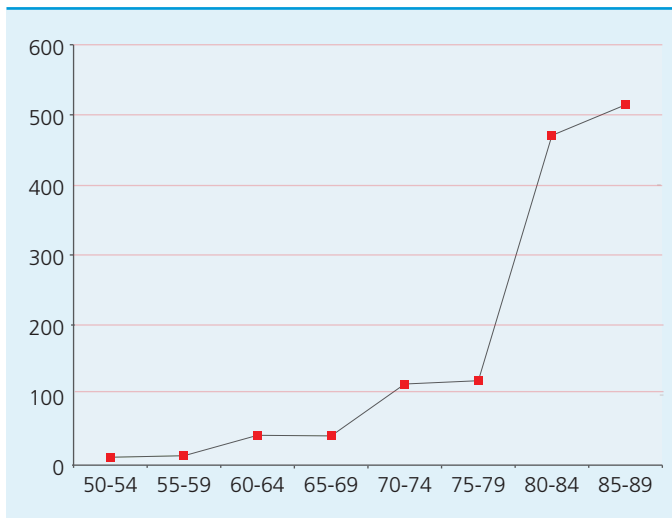
## Hip fractures

According to the official statistics, 2,238 hip fractures were registered in 2009: 1,328 concerned men and 910 women. Low energy hip fractures were registered

in 1,395 people: 748 men and 647 women<sup>6</sup>. The incidence of hip fracture varies from 1.03 to 562.09 per 100,000 population depending on gender and age: from 2.2 to 352.5/100,000 among men and from 0.1 to 651.1/100,000 among women<sup>7</sup>.

In Almaty a study of the incidence of low energy hip fractures in men and women over 50 years of age showed that the incidence made up 11.2 per 100,000 population aged over 50 years, increasing with age and reaching up to 514.3 per 100,000 population over 85 years (fig. 2). There are reasons to assume that not all elderly patients with hip fracture seek special-

**Figure 2** Incidence of hip fracture per 100,000 population



ized medical attention and are hospitalized, therefore, real figures could be considerably higher.

In the Republic of Kazakhstan there is extremely low surgical activity following hip fractures. Fewer than 50% of patients with hip fracture are hospitalized, and only 30% undergo hip replacement. Patients with hip fracture are usually not operated on because of financial difficulties, as patients often have to buy endoprotheses themselves. The mean number of days spent in hospital for a hip fracture is 16.5 days and the average treatment cost including hip replacement is 4,700 USD.

## Vertebral fractures

From 2002 to 2008 vertebral fractures were officially registered in 947 people (461 men and 486 women)<sup>8</sup>. The vast majority of patients with vertebral fractures associated with osteoporosis are not diagnosed.

## Diagnosis

There are 5 DXA machines in the Republic of Kazakhstan (0.3 per million population): 2 are located in the capital city Astana and 3 others in Almaty, Karaganda and Pavlodar. There are also 9 QUS instruments. The average cost of this examination is 17 USD. The state does not reimburse the patient's expenses on densitometry. Therefore, not all patients can afford to undergo a densitometric examination. There is no waiting time for densitometry.



There is an urgent need to establish more professional training programs and to include osteoporosis education in the medical curriculum.

## Calcium and vitamin D

In August 2008, the Kazakh Academy of Nutrition studied the average consumption of dairy products (g/day) in men and women of Kazakhstan. A very low consumption of milk and dairy products was observed, a fact that can lead to a lack of calcium intake, a significant risk factor for osteoporosis and osteoporotic fractures.

## Prevention, education, government policy

The Doctors' Osteoporosis Association conducts scientific conferences, interactive training schools for doctors, and schools on osteoporosis for patients. Every year on October 20 it holds an open day with information and densitometry testing for the public and press-conferences on the problem of osteoporosis for mass media.

The State Project called 'Healthy Kazakhstan' has been developed with the purpose of improving the health of the citizens of Kazakhstan and setting up a competitive health care system to ensure steady socio-demographic development of the country.

One of the main focuses of the project is strengthening preventive measures – ie. screening tests, improvement of diagnosis, treatment and rehabilitation of the main socially-significant diseases. The population will have free access to complete prophylactic check-ups of the National Screening Programme (diabetes mellitus, anaemia, cancer, etc.). The Health Centres for Postmenopausal Women have opened and perform screening examinations and treat osteoporosis in women over 50.

The problem of osteoporosis and osteoporotic fractures is relevant to the Republic of Kazakhstan. There is an urgent necessity for multicentre epidemiological studies that should be supported by the government authorities. The results of these studies have to form the basis of the state programme on diagnosis, prevention and treatment of osteoporosis and osteoporotic fractures.

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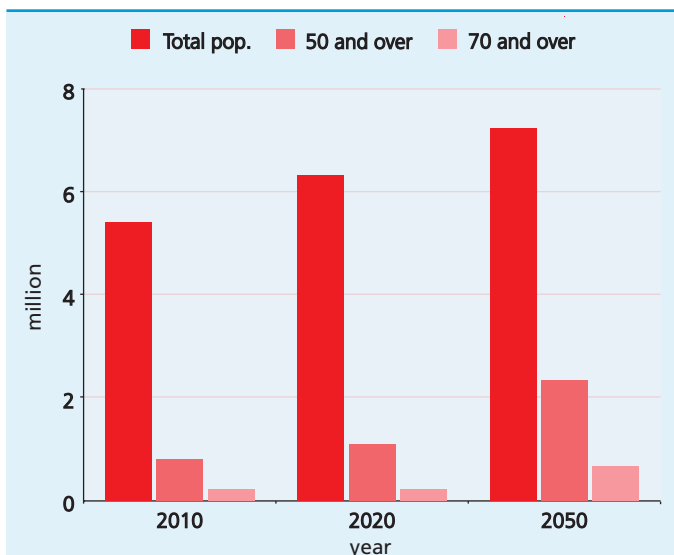
# Kyrgyz Republic

## Overview

Although the Kyrgyz population is young, it is estimated that the percentage of people aged 50 years and older will increase in the coming years. That means that osteoporosis will become a growing concern. Currently, there is only one DXA machine located in the capital. Patients need to pay for the test. There is a lot to do in the field in terms of education of patients and medical professionals and an urgent need for epidemiological studies of fragility fractures. Additionally, standards of care for hip fracture surgery need to be introduced.

The Kyrgyz Association on Osteoporosis was established in 2010. Twice a month it organizes free densitometry for those who cannot pay for the investigation. Members of the Association work closely with the media and health care authorities.

**Figure 1** Population projection for the Republic of Kyrgyzstan until 2050



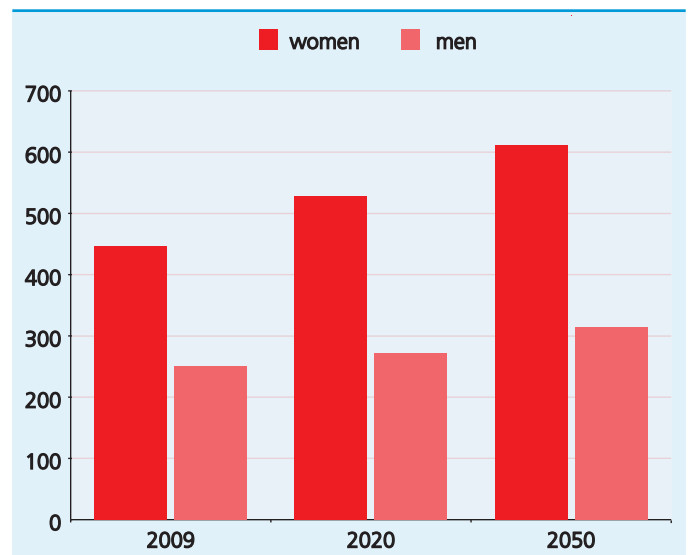
## Key findings

The present population of Kyrgyzstan is 5.4 million people, with 15% (776,000) aged 50 and over. The population is rapidly growing and getting older and by 2020 the expected number of people over 50 years of age will be close to 1 million, a 32% increase compared to 2008. In 2050 the predicted population size will be more than 7 million people and 32% of the population will be aged 50 and over<sup>1</sup> (fig. 1).

Accordingly, osteoporosis morbidity might increase by a third.

There are no statistical data about osteoporosis incidence in the Kyrgyz Republic. According to preliminary data from a public enquiry that investigated the risk factors for osteoporosis and screened using densitometric testing, 34% of women and 27% of men over 50 years of age might suffer from osteoporosis and the prevalence of osteopenia is probably even higher (fig 2). Thus, in the general population approximately 446,000 women and 250,000 men are susceptible to osteoporosis and are at high risk of low energy fractures. 25% of these patients could become disabled and every fourth case can lead to death. At least a quarter of all fractures is caused by osteoporosis.

**Figure 2** The predicted prevalence of osteoporosis in Kyrgyz men and women until 2050



## Hip fractures

According to the Bishkek Centre of Traumatology and Orthopaedics, the frequency of hip fractures is around 2,300 cases per year.

In Kyrgyzstan not all patients with hip fractures benefit from qualified medical aid, with only 50% of patients hospitalized and only about 20% of them receiving operative treatment. This particularly applies to remote regions. The majority of patients do not seek medical attention and prefer to be treated at home. Many patients refuse hospitalization because of their old age, serious concurrent diseases, contraindications to operation, inability to pay and other reasons.

The average hospital stay of a patient with a fracture is 15 days. Mortality within a year after hip fracture is about 20% (data from the report of the Bishkek Centre of Traumatology and Orthopaedics). The average cost of a hip fracture osteosynthesis is 220-660 USD and 500-2,000 USD for an endoprosthesis. There are no accurate data about average costs of rehabilitation after hip fracture.

## Vertebral fractures

According to the same Centre, every year approximately 2,300 cases of vertebral fractures and 1,770 cases of osteoporotic fractures at other sites occur in the country. Osteoporotic vertebral fractures are less likely to be diagnosed, and are often incidental findings.

## Diagnosis

In Kyrgyzstan there is one DXA scanner and one QUS, and both are located in the capital city Bishkek. Densitometry examination in Kyrgyzstan is paid by the patients themselves and is not included in the programme of state guarantees.

Patients' compliance to anti-osteoporotic medication intake is very low because of the relatively high cost of the medications, the patient's low ability to pay and the long-term nature of the treatment. Treatment of osteoporosis is not reimbursed by the state.

## Calcium and vitamin D

In Kyrgyzstan the consumption of dairy products is decreasing and the average annual consumption of milk has fallen from 264 to 88 litres per person per year. Fortified products with calcium and vitamin D3 are absent.

## Prevention, education, government policy

In March 2010, an order of the Ministry of Public Health provided for the development of a national programme to fight against osteoporosis. An Os-

teoporosis Association has been registered and has begun its work. The Centre of Osteoarticular Pathology has organized a school for patients with osteoporosis and the 10th day of every month has been declared as an open day when densitometry is performed for all patients free of charge. A telephone hotline for patients has been established. Educational programmes have been developed and introduced for patients with osteoporosis and those who have risk factors for osteoporosis.

According to surveys questioning doctors in city and district centres of family medicine, the level of doctors' knowledge of osteoporosis has significantly improved over the last two years. Nevertheless, it was noted that there is still low activity in terms of doctors referring their patients for densitometry. Based on sample interviews, awareness of osteoporosis among the rural population is extremely low: only about 1% of the respondents answered the questions correctly. City residents were better informed about osteoporosis: the right answers were given by 5% of the respondents. The best knowledge was revealed in people from 40 to 60 years old with specialized secondary or higher education.

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# Latvia

## Overview

The Latvian Osteoporosis Society (LOB) was founded in 2001 and was renamed Latvian Osteoporosis and Bone Metabolism Diseases Association (LOKMSA) in 2008.

LOKMSA unites physicians of various specialties: general practitioners, endocrinologists, rheumatologists, radiologists-diagnosticians, internists, traumatologists, podiatrists and other specialists. The number of LOKMSA members has rapidly increased during the last 2 years. At present, there are more than 100 Association members. In May 2010, LOKMSA became an independent legal, professional NGO organization.

LOKMSA develops guidelines, health care standards, recommendations for diagnosis and treatment of osteoporosis and bone metabolic diseases, and participates in scientific studies.

The main tasks of LOKMSA are the education of physicians by organizing association meetings, interdisciplinary association meetings, and starting from 2009, meetings on clinical cases, annual meetings of osteoporosis diagnostics experts and other activities. Every year, LOKMSA members take part in various international activities: congresses, conferences, symposia.

From September 3 to 4 2010, LOKMSA organized the 3<sup>rd</sup> Baltic Osteoporosis Congress in Riga and every year, on October 20, during World Osteoporosis Day, LOKMSA organizes events, conferences and seminars for physicians.

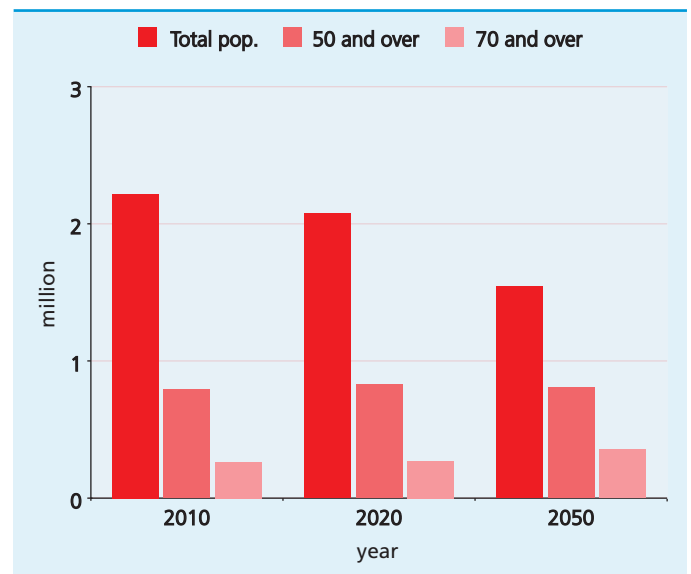
The aim of LOKMSA is not only to increase access and reimbursement for diagnostic applications, but also osteoporosis medications. Since the end of 2008, a continual fight to increase the reimbursement level for osteoporosis medications on the List of Reimbursable Medicinal Products has been on-going.

The goal of osteoporosis therapy is to reduce the frequency or prevent osteoporosis-related fractures (bone fragility) and, when the fracture is already present, to reduce the risk of subsequent fractures. In Latvia, since March 1, 2009, just 50% of the cost of osteoporosis agents are reimbursed, while in many other EU member countries the reimbursement reaches 100%. There are still no osteoporosis agents reimbursed by the State for the treatment of osteoporosis in men.

## Key findings

The present population in Latvia is 2.2 million; 36% (606,700) is aged 50 (494,300 women and 312,400 men) and over and 8.2% (268,893) is 70 and over. By 2050, it is estimated that 52% (805,060) of the population will be 50 and over and 23% (354,000) will be 70 and over while the total population will decrease to 1.5 million<sup>1</sup> (fig 1).

Figure 1 Population projection for Latvia until 2050



The total number of fractures in 2007 was 7565; the figures for 2008 and 2009 were 9687 and 6738 respectively.

## Hip fractures

Due to the lack of recording protocols regarding hip fractures, the number of cases can be estimated only based on the number of hip replacements performed in the country. However, hip replacement can be offered not only for hip fracture but also for osteoarthritis or other problems. The number of cases (the percentage of hip fractures) treated surgically in Latvia is not available.

Number of hip replacements in Latvia	
Years	Hip replacements
1999	1582
2006	2407
2007	2252
2008	2434
2009	2168

Average number of hospital days (hip replacement)	
Years	Hospital days
2006	14.3
2007	14.3
2008	13.4
2009	11.9

The average cost for hip replacement	
Years	Cost (€)
2007	2571.9
2008	2743.9
2009	2433.3

## Vertebral fractures

No available information

## Diagnosis

In 2001, there was just one DXA instrument in Latvia, but now 17 DXA instruments are available. According to the IOF criteria, Latvia has reached 70% 'saturation' in terms of diagnostic equipment, with DXA available for patient examination in Liepaja, Rzekne, Daugavpils, Valmiera, Jekabpils and Jelgava; the number of DXA scanners has increased in Riga.

The waiting time for a DXA scan is an average of 6 days in the public health system. The cost of a DXA scan is €4.5 in the public system (with referral) and €20 in the private. The state applies no specific criteria to access to DXA examination.

## Reimbursement

There is an ongoing effort to increase the reimbursement level of osteoporosis medication on the List of Reimbursable Medicinal Products. In Latvia, since March 1, 2009, osteoporosis agents (bisphosphonates, Strontium ranelate, PTH analog, Vit D) are reimbursed just by 50%. People at high risk for fractures are not eligible for treatment reimbursement before the first fracture.

## Calcium and vitamin D

Latvia has developed National Guidelines on optimum daily intake of vitamins and minerals (including vitamin D and calcium), adopted by the Minister of Health in 2001. Dietary guidelines for the elderly have also been accepted. An optimum daily intake of vitamin D and calcium is also included in National Guidelines for Osteoporosis Diagnostics, Prevention and Treatment (2005).

## Prevention, education, government policy

Osteoporosis is not a national health priority in Latvia. The following documents have been developed and published in Latvian:

- National Guidelines for Osteoporosis Diagnostics, Prevention and Treatment in 2005
- National Guidelines for Osteodensitometry Measurements in Latvia in 2007
- Recommendations of the European Society for Osteoporosis and Osteoarthritis Clinical and Economic Aspects Evaluation (ESCEO) for osteoporosis diagnostics and treatment in postmenopausal women in 2009

## References

1. Source: U.S. Census Bureau, International Data Base.

# Lithuania

## Overview

Lithuania currently has no national register for the collection of data on fragility fractures and osteoporosis is not yet a government priority, however the problem is always being raised.

Data on hip fracture patients admitted to hospital for surgical and nonsurgical treatment have been collected in some regions of Lithuania only. There is no information on the incidence rates for wrist or vertebral fractures.

There is currently no food supplementation with calcium or vitamin D, except for some milk products. From September 2004, the Ministry of Education and Science together with the Ministry of Agriculture have carried out a programme to achieve adequate calcium and vitamin D intake in children: every pupil at elementary school gets a daily glass of milk free of charge.

Lithuania has good DXA facilities available, with short waiting times for DXA scans. Unfortunately, many patients with osteoporotic fractures are currently being discharged without measurement of BMD. There is no reimbursement for screening by bone densitometry, not even for persons at high risk of osteoporosis-related fractures.

The Lithuanian Guidelines for the Prevention, Detection and Management of Osteoporosis were developed in 2003. The reimbursement for therapies is provided by a State Patient Fund only on an individual basis for patients after DXA scanning with a T-score < -2.5. Proven therapies for treatment of osteoporosis are reimbursed to a varying extent. Calcium is not reimbursed. Only a small percentage of patients suffering from osteoporosis receive evidence-based treatments, both because of strict budgets and the generally low incomes which make treatment unaffordable for the majority. These conditions also determine the insufficient duration of treatment.

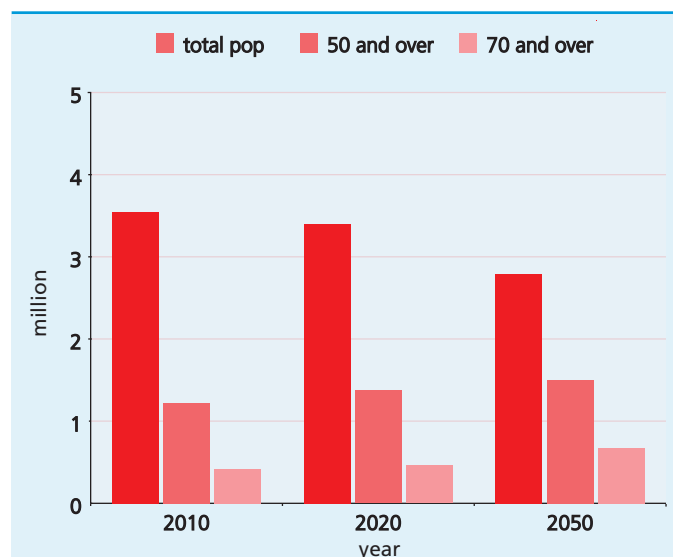
The Lithuanian Osteoporosis Foundation and Lithuanian Association of Metabolic Bone Diseases (incorporated in the Lithuanian Endocrine Society) are non-profit organizations. They organize annual conferences, meetings and training courses for healthcare professionals on osteoporosis and also issue press releases, leaflets, questionnaires and media events for the general public.

Research is being carried out through epidemiological studies on hip and wrist fractures, quality of life in persons with vertebral fractures, vitamin D and bone markers. Research programmes in osteoporosis should be set up, including studies to investigate a cost-effectiveness model of osteoporosis treatment.

## Key findings

The present population of Lithuania is estimated at 3.5 million, of this 34% (1.2 million) is 50 years old and over and 12% (417,000) is 70 and over. By 2050, it is estimated that 54% (1.5 million) of the population will be 50 and over and 24% (675,000) will be 70 and over while the total population will decrease to 2.8 million<sup>1</sup> (fig 1).

**Figure 1** Population projection for Lithuania until 2050



## Hip fractures

Data are available only for Vilnius, the main city. In 2009, the number of hip fractures in the population aged over 50 years was 433 (320 cases in women and 113 in men). The hip fracture rate in Vilnius is 24.7 cases per 10,000 population over 50 years and 29.5 hip fractures per 10,000 women over 50 years old and 17 hip fractures per 10,000 men over 50<sup>2</sup>.

The average number of hospital days is 5.7 days in acute care, 22 days in rehabilitation and 120 days in long term care. The total direct hospital costs per hip fractures were estimated to be €2,084 in 2009. The table below presents the costs breakdown depending on the type of clinical care for hip fractures treatment.

Hospitalization cost per day		
Type of clinical care	Type of treatment	Cost (€)
Acute	conservative	94
	osteosynthesis	228
	hip replacement	304
Rehabilitation		34
Long term care		24

In 2009, the total direct cost of hip fractures for the population over 50 years old was €902,400 in Vilnius.

## Vertebral fractures

No available information

## Wrist fractures

The incidence of wrist fractures in Vilnius in 2003 was 42.7 cases per 10,000 population aged 50 – 64 (62.7 wrist fractures per 10,000 women and 15.2 wrist fractures per 10,000 men) and 68.8 cases per 10,000 population over 65 years old (93.8 wrist fractures per 10,000 women and 21.6 wrist fractures per 10,000 men)<sup>3</sup>.

## Diagnosis

In Lithuania, there are 4.2 DXA scanners per million population and their distribution is homogeneous throughout the country. The waiting time for a DXA scan is 10 days in the public health system and 1 to 3 days in the private system. The cost of a DXA scan varies between €15 and €28. DXA scans are not reimbursed. There is now a standardized training for DXA technologists.

## Reimbursement

The reimbursement for therapies is provided by the State Patient Fund on an individual basis only for patients with T-score  $\leq -2.5$ . Proven therapies for

treatment of osteoporosis are reimbursed to varying extents: reimbursement of up to 50% is applied for all patients with osteoporosis and reimbursement up to 80% is given for 12 months only after a fragility fracture. Patients at high risk for fractures (T-score  $\leq -2.5$ ) are eligible for a partial treatment reimbursement (50%) before the first fracture. Calcium prescription is not reimbursed.

## Calcium and vitamin D

National guidelines have been published regarding optimum daily intake of calcium and vitamin D but there is no national public health programme.

## Prevention, education, government policy

Evidence-based guidelines exist on prevention, diagnosis and treatment of osteoporosis but they are not endorsed by the Lithuanian government<sup>4</sup>. Osteoporosis is not a national health priority in Lithuania.

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# The Republic of Moldova

## Overview

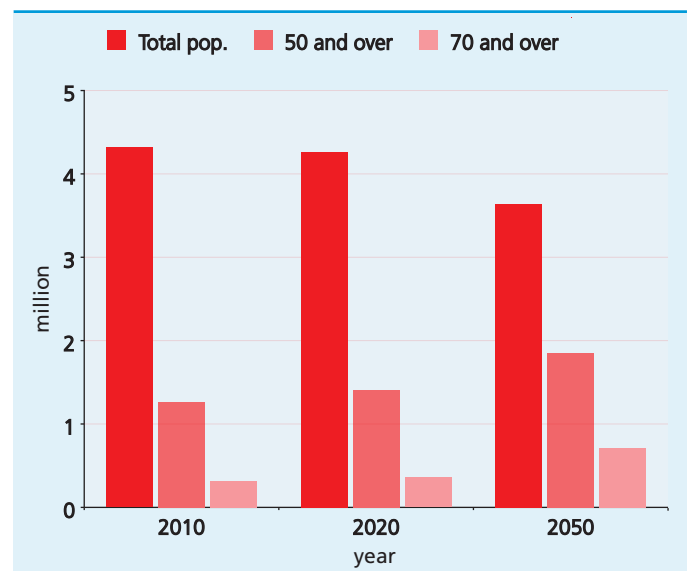
The Association Against Osteoporosis of the Republic of Moldova was founded in 2005 during the conference conducted together with the Osteoporosis Association of the Republic of Ukraine. It consists of 29 doctors and 6 patients. The major tasks of the Association are to direct the attention of medical specialists and patients to the problem of osteoporosis; study the evolution and specificities of osteoporosis in the population; assess risk factor prevalence in Moldova and seek methods to effectively correct these risk factors; provide information about osteoporosis for patients and medical personnel at all stages of medical care; and to provide consultations and advice on an out-patient basis and on-line. The Association's website [www.osteoporosis-md.com](http://www.osteoporosis-md.com) provides information for doctors and patients. The members of the Association Against Osteoporosis carry out educational programmes for patients and doctors and free consultations in different cities of Moldova.

## Key findings

Moldova is a South-Eastern European country with a small but multinational population. In 2010 the population of Moldova is 3.6 million people: 1.8 million men and 1.9 million women. Projections indicate that by 2030 the population will decrease to 3.1 million people; this is mainly associated with a high migration of the population and a low birth rate. The negative tendency will continue and by 2050 it is estimated that the population will be 2.6 million people while the proportion of ageing population will grow; more than 35% of the population will be older than 50. Thus, this population decline combined

with an increase of the total elderly and middle-aged population will consequently lead to an increase in the number of patients with osteoporosis.

**Figure 1** Population projection for Moldova until 2050



According to official statistics it is almost impossible to judge the incidence of osteoporosis and associated fractures in the Republic of Moldova. Population studies on the prevalence and morbidity of osteoporosis and osteopenia have never been conducted.

## Hip fractures

The State Department of Medical Statistics has no data on the number of hip fractures per year. Medical care of patients with hip fracture is not a subject of national protocol and is not standardized at a state level. General information about hospitalization of patients with hip fracture is absent. However it is clear that the number of patients having had surgical treatment is too low. A large proportion of patients are not hospitalized, especially those over 75 years old. The most common reasons for surgical refusal are concurrent diseases and the patient's inability to pay for the operation. Currently there are only four clinics

in the country with specialists (orthopedists-traumatologists) qualified to perform such operations. Derotational boot and skeletal traction are widespread conservative methods of hip fracture treatment even at hospital. Many patients with hip fracture, especially elderly patients, do not appear in the statistics at all, as they seek medical attention from their family doctor only and are not hospitalized.

In Moldova there is a system of compulsory state health insurance that provides the minimum of medical care guaranteed by the state. According to the national company of medical insurance the average cost of a hip fracture case as per contracts with specialized medical institutions is: osteosynthesis 574 USD; hip replacement 2,305 USD; and rehabilitation after hip fracture 225 USD.

The official funds dedicated to covering the cost of surgical treatment of fractures and rehabilitation is not enough and patients are forced to pay for the prosthesis, some medications and rehabilitation themselves. This significantly limits accessibility to qualified surgical treatment.

## Vertebral fractures

No available information

## Diagnosis

In Moldova there are 2 DXA scanners. Both of them are in the capital city Kishinev and belong to private clinics. Densitometry costs approximately 23 USD and patients must pay themselves. The country has 3 QUS instruments.

## Reimbursement

In Moldova there is no reimbursement for osteoporosis treatment by the state so people must pay for pharmaceutical preparations and calcium and vitamin D supplements. However, that is quite often financially impossible. In 2009 the average monthly income per person was approximately 100 USD: 125 USD for the urban population and approximately 85 USD for the rural population.

## Calcium and vitamin D

There are no data on vitamin D levels among adults. As for vitamin D deficiency in children under 2 years old, the incidence of diagnosed rickets makes up around 10% depending on the district of the country. Research conducted by the Association Against Osteoporosis of the Republic of Moldova calculated the quantity of calcium in the average diet (until now 1,025 people were examined) revealing that the average daily calcium intake was  $383.5 \pm 22.4$  mg.

Currently vitamin D and calcium supplements are rec-

ommended according to several documents approved by the Ministry of Public Health. Vitamin D intake by young children is regulated by the Programme of Integrated Management of Children's Diseases up to 5 years. The Ministry of Public Health and the National Protocol for Osteoporosis in Adults recommended prophylactic doses of calcium and vitamin D for adults of different age groups. The recommended dosage of calcium is 1,300 mg per day for adolescents, 1,000 mg per day for adults and 1,200 mg per day after 50 years. The recommended dose of vitamin D3 varies from 400 to 800 IU (International Unit).

## Prevention, education, government policy

At the moment osteoporosis is not recognized in the country as a socially important problem. Doctors' awareness of osteoporosis is low. To address this problem, the State Medical and Pharmaceutical University 'Nicolae Testemitanu' of the Republic of Moldova organizes a two-week educational course 'Problems of diagnosis and treatment of osteoporosis' in collaboration with the Association Against Osteoporosis of the Republic of Moldova.

There has been increased awareness of the problem of osteoporosis in the general population due to the activity of the Association Against Osteoporosis of the Republic of Moldova, the activity of companies among doctors and patients, and international funds supporting the development and validation of normative documents on this issue.

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# Poland

## Overview

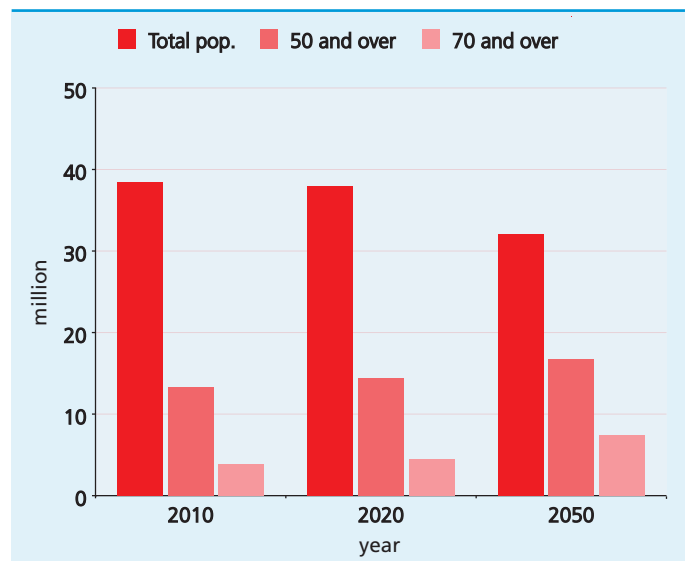
The hip fracture incidence in Poland in women over 50 is estimated at 280/100,000. The prevalence of clinical fracture in this group is estimated at 27-29%, including 20% forearm and 4.6% clinical spinal fracture. Osteoporosis is not a national health priority in Poland and there is no national registry to collect data and monitor fragility fractures. The government is not supporting any patient or scientific societies nor training programmes for health professionals. The most important problem for patients is that there is only one medication (generic bisphosphonate) reimbursed for osteoporosis. Currently, the most pressing issue is to prepare a FRAX<sup>®</sup> model based on the Polish data. The main scientific organizations working in the field of osteoporosis are the Polish Foundation of Osteoporosis, the Polish Osteoarthritis Society and the Multidisciplinary Osteoporotic Forum. National guidelines on osteoporosis treatment have been developed. In 2011 we will be celebrating the 25<sup>th</sup> anniversary of the Polish Osteoarthritis Society which has been active since 1986.

## Key findings

The present population in Poland is estimated to be 38.4 million, of this 35% (13.4 million) is 50 years of age and over and 10% (3.8 million) is 70 and over. By 2050, it is estimated that 52% (16.7million) of the population will be 50 and over and 23% (7.4 million) will be 70 and over while the total population will decrease to 32 million<sup>1</sup> (fig. 1).

In Poland, it has been estimated that the prevalence of osteoporosis in women older than 55 years is 18.5%, and osteopenia in 40.7%, both irrespective of place of residence (urban or rural area)<sup>2</sup>.

**Figure 1** Population projection for Poland until 2050



## Hip fractures

In a 2007 study, data provided by the Mazowsze Division of the National Health Fund were used to evaluate the number of hip fractures in Poland<sup>3</sup>. The number of hip fractures in the Mazowsze Province was calculated per 100,000 inhabitants and then extrapolated for the whole of Poland according to age and sex. Based on this, 28,000 cases of hip fractures per year were estimated to occur in Poland.

In 2005, there were 17,625 hip fractures diagnosed in Poland<sup>4</sup>. In the over-50-year-old population, hip fracture incidence was found to be 1.85 times greater in women than in men (89/100,000 for men and 165/100,000 for women). In the 50–65-year band, hip fracture incidence was higher in men than in women. The remaining lifetime probability of hip fracture at the age of 50 years was 2.0% for men and 4.5% for women which are among the lowest in Europe.

The estimated direct hospital cost of hip fracture is €870-1,300, and the average number of hospital days varies from 14 to 21 days.

Among women under 40 years of age, the annual risk of hip fracture is 0.01%<sup>3</sup>. As regards men, this risk is slightly higher and comes to 0.04%. Among women this risk slowly rises until 70 years of age and then

suddenly increases, reaching 1.55% at ages over 80. A slowly rising risk is also found among men until 70 years of age, while the further increase is not as sudden as among women. The risk of hip fracture among men over 80 years of age comes to 0.89%.

## Vertebral fractures

No available information

## Diagnosis

In Poland, it is estimated that there are 3.9 DXA scanners per million population. Most DXA scanners are only available in large cities and in the private sector. The waiting time for a DXA exam is 1-3 months in the public health system (2-3 days in the private system) and the cost for a DXA scan of hip or spine is €9 (€30 to €40 in the private). In the public system, DXA scans are reimbursed if the patient is sent to the specialist by a general practitioner.

## Reimbursement

Only bisphosphonates are reimbursed up to 30% and patients at high risk are eligible for treatment reimbursement before the first fracture.

## Calcium and vitamin D

National guidelines have been developed on optimum daily intake of calcium and vitamin D but currently there is no national public health programme regarding calcium and vitamin D supplementation.

In a cross-sectional observational study conducted in a standardized way during February–March 2004 in Denmark, Finland, Ireland, and Poland, it has been observed that Polish women (average age 71.6) had a significantly lower concentration of serum 25OH-vitamin D compared to the other women ( $p=0.0001$ ); 25% of Polish women had a serum 25OH-vitamin D  $<25$  nmol/L and 92% were  $<50$  nmol/l<sup>5</sup>.

## Prevention, education, government policy

Osteoporosis is not a national health priority in Poland, there is no national registry to collect data and monitor fragility fractures. The government is neither supporting patient or scientific societies, nor training programmes for health professionals.

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# Romania

## Overview

In Romania there are more than 3 million women older than 50 years of age and based on our epidemiological data around 1 million would be osteoporotic or osteopenic. The estimated number of hip fractures was 18,400 cases in 2009<sup>1</sup>. Osteoporosis is not a health priority but a national treatment programme, financed by the government, has been implemented to provide free treatment to severely osteoporotic patients. The osteoporotic patients also benefit from treatment reimbursement (50%) before the first fracture. Guidelines on prevention, diagnosis and treatment are available.

A national strategy based on more accurate epidemiological data (hip, vertebral, wrist fractures) should be developed and implemented. The Romanian Society of Osteoporosis (SROBMS) is currently working on a national FRAX<sup>®</sup> model, which will allow better fracture prediction at the individual level and cost-efficiency analysis of the national treatment program. National guidelines have been developed on optimum daily intake of calcium and vitamin D but currently there is no national public health programme regarding calcium and vitamin D supplementation.

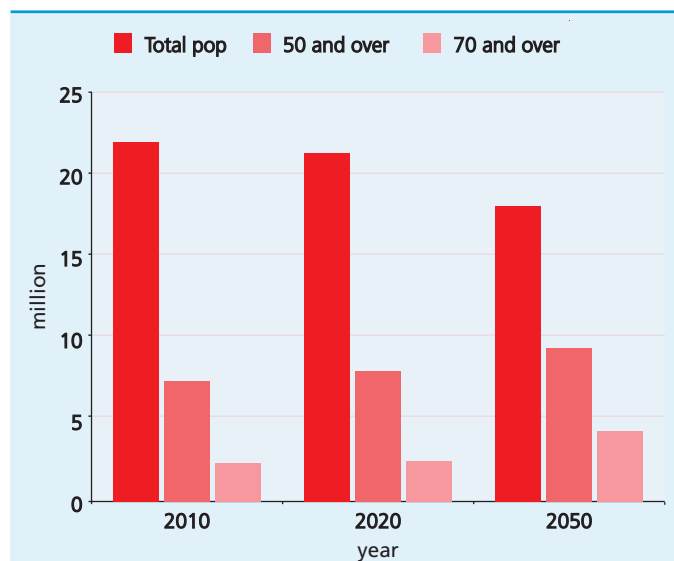
## Key findings

The present population in Romania is estimated to be 22 million<sup>2</sup>, of this 34% (7.3 million) is 50 years of age and over and 11% (2.3 million) is 70 and over. By 2050, it is estimated that 52% (9.3 million) of the population will be 50 and over and 24% (4.3 million) will be 70 and over while the total population will decrease to 18 million<sup>3</sup> (fig. 1).

## Epidemiology

An epidemiological study performed two years ago in the Romanian capital, Bucharest, estimated the

**Figure 1** Population projection for Romania until 2050



prevalence of postmenopausal osteoporosis at 11.5%, osteoporosis with fractures at 5%, and osteopenia at 16.8%, in a representative population of women over 55 years. Therefore one in three women would be osteopenic or osteoporotic after the age of 55 in Romania.

## Hip fractures

The estimated number of hip fractures was 18,400 cases in 2009<sup>1</sup>.

The estimated total direct hospital costs of a hip fracture was around €3500 in 2010.

## Vertebral fractures

No available information

## Diagnosis

In Romania, it is estimated that there are 4 diagnostic scanners (DXA) per million population. This number has doubled compared to 2007 but is still below the European recommendation. Most DXA scanners are only available in large cities and in the private sector.

The waiting time for a DXA exam is a few days in the public health system and the cost for a DXA scan of

hip or spine varies between €10 to €40 and between €20 to €60 for both. In the public system, reimbursement is €10 per scan.

Physicians benefited from standardized training through IOF and ISCD courses with certification (three IOF courses in the last few years). The Romanian Society of Osteoporosis (SROBMS) is planning to carry out training courses for physicians and technicians every year, on a national basis, starting in 2011 and to develop a quality assurance protocol for DXA machines.

## Reimbursement

Proven therapies are reimbursed up to 50%, the main criteria for reimbursement is T-score  $< -2.5$  SD. Diagnosed osteoporotic patients are eligible for treatment reimbursement before the first fracture. Reimbursed drugs are: bisphosphonates (alendronate, risedronate, ibandronate, zoledronate), raloxifene, strontium ranelate, tibolone and estrogens. Teriparatide treatment is provided for free to severe osteoporotic patients through the national treatment programme, financed by the government.

## Calcium and vitamin D

National guidelines have been developed on the optimum daily intake of calcium and vitamin D but currently there is no national public health programme regarding calcium and vitamin D supplementation.

A study published in 2008 investigated the vitamin D status in 1,048 postmenopausal Romanian women with osteoporosis<sup>4</sup>. Most patients were untreated with osteoporosis drugs and did not receive vitamin D supplementation. A high prevalence of both vitamin D deficiency (25OH-vitamin D  $< 10$  ng/mL in 22.2% and insufficiency (25OH-vitamin D = 10-30 ng/mL in 61.3%) has been found. This study also revealed a high prevalence of low vitamin D when using other cut-offs as reported in the literature. Values lower than 30 ng/mL were observed in 83.5% of studied women and 61.0% had values lower than 20 ng/mL. Oral vitamin D3 supplementation with 1000 IU/day is adequate to achieve (time-dependent 3-18 months) and maintain optimal serum 25OH-vitamin D concentration for only half of the postmenopausal osteoporosis patients.<sup>5</sup>

## Prevention, education, government policy

Guidelines on prevention, diagnosis and treatment are available on the website: *www.ms.ro*

A national treatment programme which is financed by the government has been implemented to provide free

treatment for severely osteoporotic patients. These patients also benefit from treatment reimbursement before the first fracture.

In Romania, some scientific and patient societies organize training programmes for health professionals, alone and in collaboration with IOF.

The Ministry of Education provides some funding through grant applications but this is not specific for bone research.

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# Russian Federation

## Overview

In the Russian Federation (RF) 24% (34 million) citizens are (potentially) at high risk of experiencing an osteoporotic fracture. It is estimated that every minute in RF, 7 vertebral fractures occur in people older than 50 years, while a hip fracture occurs every 5 minutes. Extremely low rates of surgical treatment of hip fractures are observed throughout the country: following a hip fracture only 33-40% of people are hospitalized and only 13% receive operative treatment. As a result, an extremely high mortality rate (up to 45-52%) after hip fracture is observed in some Russian cities. Furthermore, many of those who sustain fractures and survive are not subsequently administered osteoporosis therapy to prevent further fractures.

There are many possible explanations for this high incidence of osteoporosis, including the latitude of the country; studies have shown that there is widespread vitamin D deficiency in the population at risk of fractures, however official recommendations on vitamin D have been designed for young populations only.

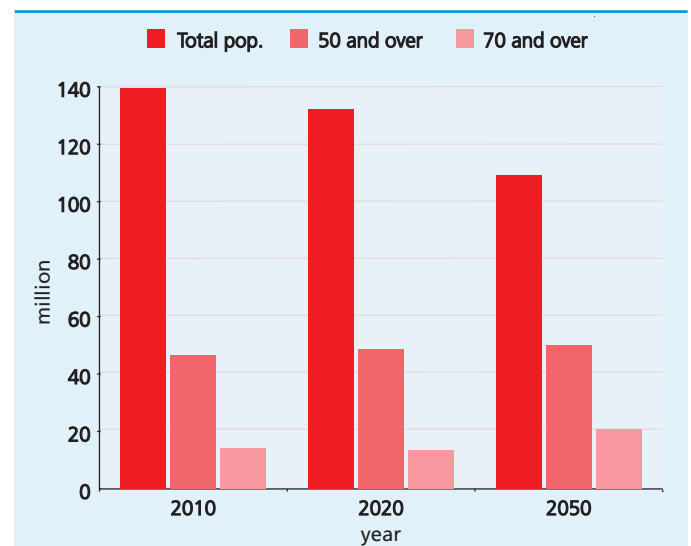
Problems with diagnosis also exist; medical institutions in the RF are underequipped with densitometers and densitometry is not reimbursed. However, over the last few years the government has paid more attention to the prevention of chronic non-infectious diseases, Russian citizens have been motivated to maintain healthy lifestyles, and Health Centres equipped with modern apparatus are currently being opened throughout the country. Unfortunately, at the present time osteoporosis is not in the sphere of interests of these centres.

## Key findings

In 2010 the Russian population is estimated to be 142 million people, with 32% (45.5 million) aged 50 years

or older. The average life expectancy in women (72 years) is significantly higher than in men (59 years). The Russian population is rapidly ageing and the number of people aged over 50 years will increase up to 48 million by 2020. It is predicted that the population of Russia will decrease to 110 million people by 2050 and as a result 56% of the population will be 50 or over and 20% will be over 70 years.

Figure 1 Population projection for Russia until 2050

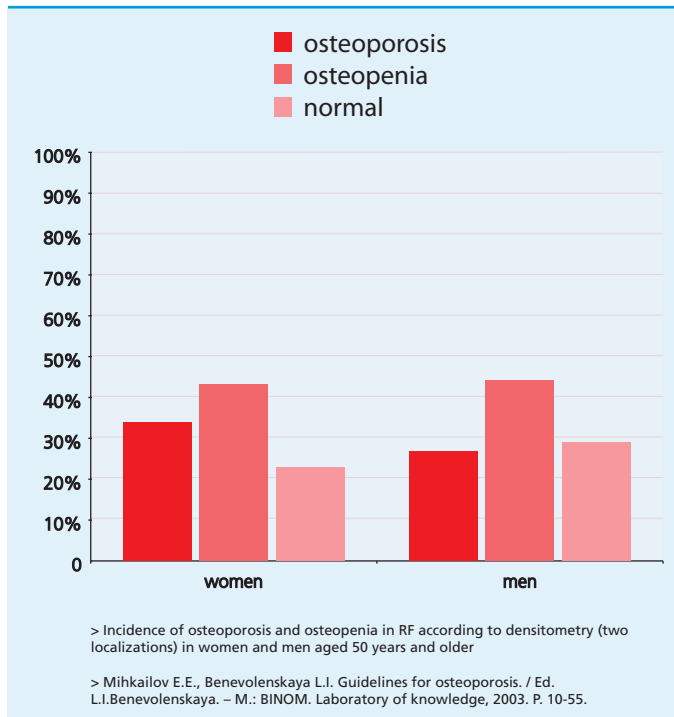


Owing to the ageing of the population, the number of people with osteoporosis is expected to increase by a third.

## Epidemiology

Due to lack of official statistics, it is very difficult to determine the exact incidence of osteoporosis and associated fractures. Population-based studies carried out at the Institute of Rheumatology of the Russian Academy of Medical Sciences indicated that 33.8% of women and 26.9% of men over 50 had osteoporosis, while 43.3% of women and 44.1% of men had signs of osteopenia (fig 2). Thus, it can be estimated that currently, 14 million people in Russia (10% of the population) suffer from osteoporosis and 20 million have

**Figure 2** Incidence of osteoporosis and osteopenia in men and women over 50 years old



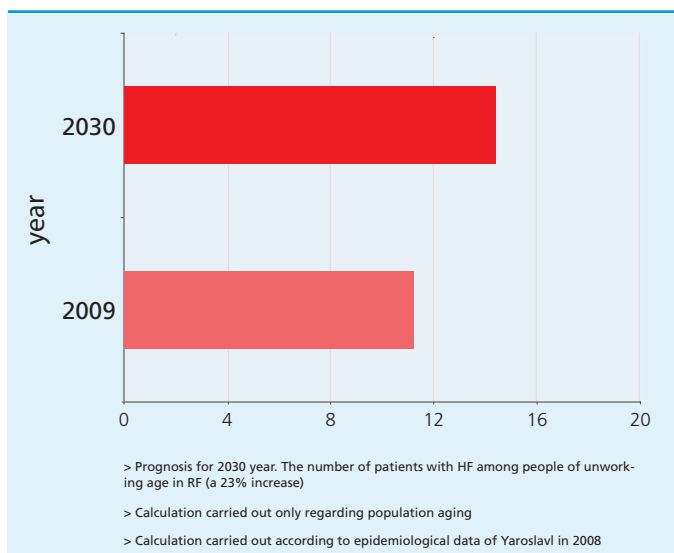
osteopenia. This means that 34 million people are at high risk of fragility (osteoporotic) fractures.

According to the Federal Centre of Osteoporosis Prevention, among the urban population of the RF, 24% of women and 13% of men aged 50 years and over had a previous fracture. Based on the Russian Osteoporosis Association's estimations, 3.8 million vertebral fractures occur annually due to osteoporosis. As a result, 7 vertebral fractures occur in people older than 50 years every minute, while a hip fracture occurs every 5 minutes in this population.

## Hip fractures

An epidemiological study in Yaroslavl reported a hip fracture incidence of 29.5 per 10,000 popula-

**Figure 3** Hip fractures projection in retired people by 2030

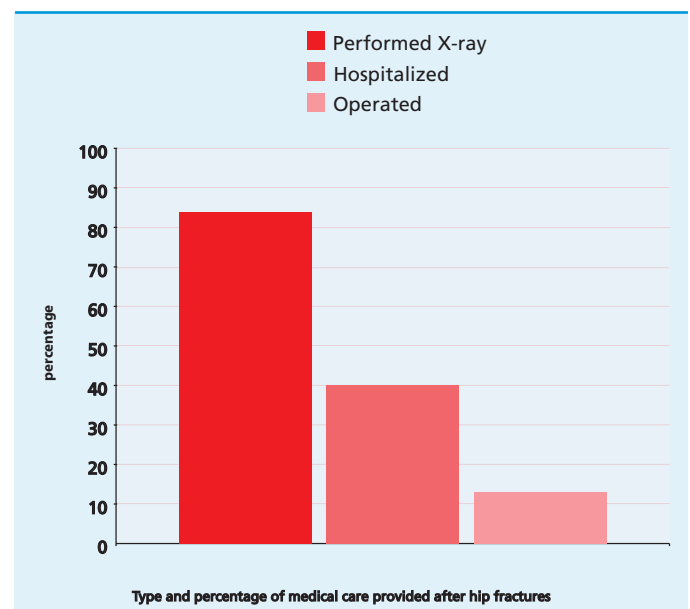


tion aged 50 years and over, rising to 676 per 10,000 population among women aged 95 and older. Extrapolating these data to the entire Russian population gives 134,225 cases of hip fracture annually. In retired people alone, 112,000 hip fractures occur annually. Thus by 2030, owing to the ageing of the population, it can be estimated that the number of hip fractures in this group will increase by 23% and reach 144,000 cases annually.

In Russia there is no unified standard of care for patients with hip fracture and an extremely low rate of surgical treatment of hip fracture is reported in the entire country; according to some studies, only 33-40% of people with hip fracture are hospitalized and only 13% receive surgical treatment. The reasons given for not admitting patients to hospital are the absence of surgical indications and the presence of contraindications (fig 4). Until now the conservative methods of hip fracture treatment, such as de-rotational boot and skeletal traction have remained widespread, even in hospitals. Approximately 24% of patients with hip fracture are not registered in the official statistics as they do not seek medical attention and are treated and managed by general practitioners (GP) only. A Total Hip Replacement operation is rarely performed on these patients. One of the main reasons for this is the limited funding as patients have to buy prostheses themselves. Hip replacement surgery is usually performed on arthritis patients as elective surgery.

Consequently, there is an extremely high mortality rate after hip fracture, reaching up to 45-52% during the first year after fracture in some Russian cities<sup>1</sup> (fig 5). The lowest mortality is registered in Yaroslavl where it is mandatory to hospitalize all patients with hip fracture and 80% of these patients receive surgical treatment. Of the surviving hip fracture patients in

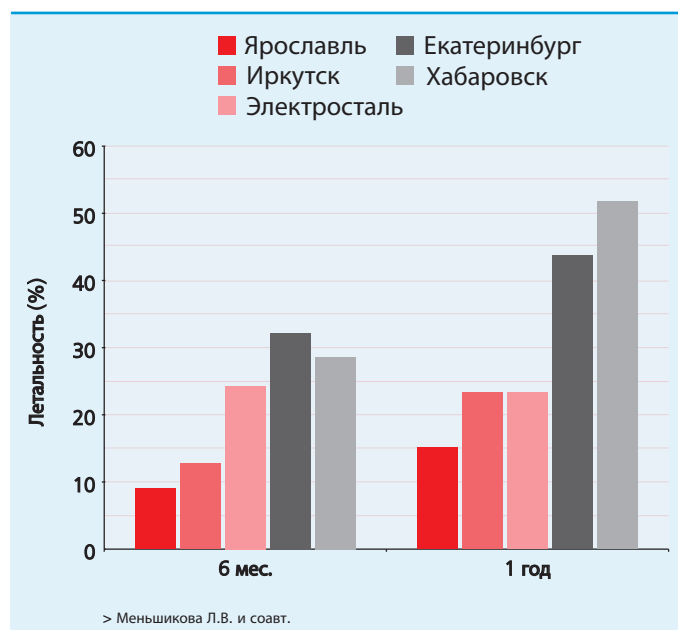
**Figure 4** Type and percentage of medical care provided after hip fractures



the Russian Federation, 33% remain bed-ridden and 42% are capable of only very limited physical activity. Only 15% are able to ambulate outside and only 9% return to their previous level of daily activities and physical ability (fig 6). Thus the quality of life and the mortality rates observed post hip fracture in the RF are clearly dependent on the type of treatment the patient received<sup>2</sup>.

In 2008, the cost of in-patient treatment for a hip

**Figure 5** Mortality rate (%) after hip fractures in Yaroslavl, Irkutsk, Electrostal, Yekaterinburg, Khabarovsk at 6 months and 1 year



**Figure 6** Percentage of possible activities at 1 year after a hip fracture in the surviving population



fracture with a hip endoprosthesis was 4,000 USD (120,000 rubles). If surgery was performed on all the Russian people who suffered a hip fracture, the total cost would be at least 458 million USD (13.8 billion rubles) per year.

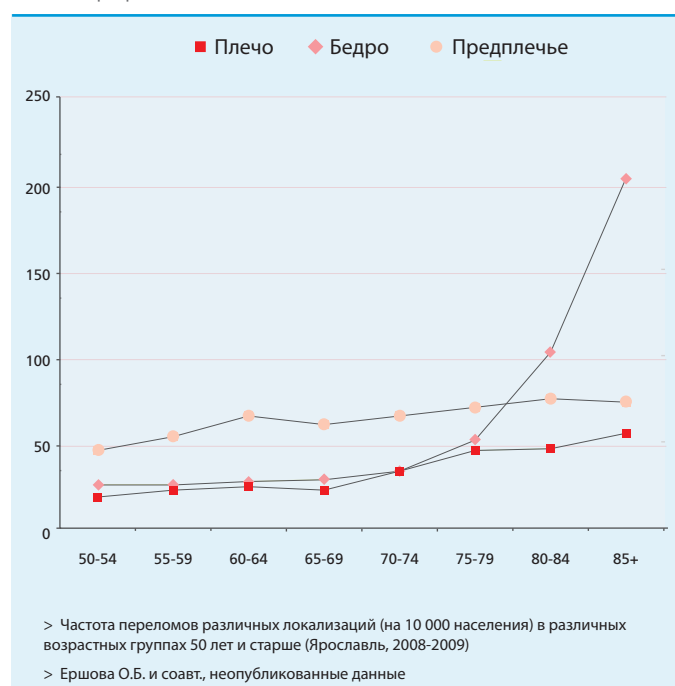
## Vertebral fractures

The Multicentre European Vertebral Osteoporosis Study (EVOS) indicated that vertebral fracture incidence in Russia is 10.3% in men and 12.7% in women 50 years or older. A study of a group of elderly people in Moscow showed an incidence of new vertebral fractures of 5.9% in men and 9.9% in women aged 50 years or older while the highest incidence rate occurred in the group of 75 years or older<sup>3</sup>. Extrapolation of these data to the Russian population permits us to estimate that there might be 1 million new vertebral fractures per year in men and 2.8 million in women of 50 years or older in the RF. Only those with the most severe vertebral fractures are hospitalized, and modern methods of surgical treatment for pain relief, such as vertebroplasty or balloon-kyphoplasty are rarely used.

## Wrist fractures

In a multicentre study covering 14 major cities of Russia, the incidence of wrist fracture was 200 per 100,000 in men and 563 per 100,000 in women aged 50 years or older. In cities such as Moscow, Tyumen, Khabarovsk and Yekaterinburg the wrist fracture incidence in women reached over 1,200 fractures per 100,000. In Russia, this type of fracture occurs twice as often as hip fractures and its incidence far exceeds that in other nearby countries owing to the effect of

**Figure 7** Incidence of hip, wrist and shoulder fractures per 10,000 population

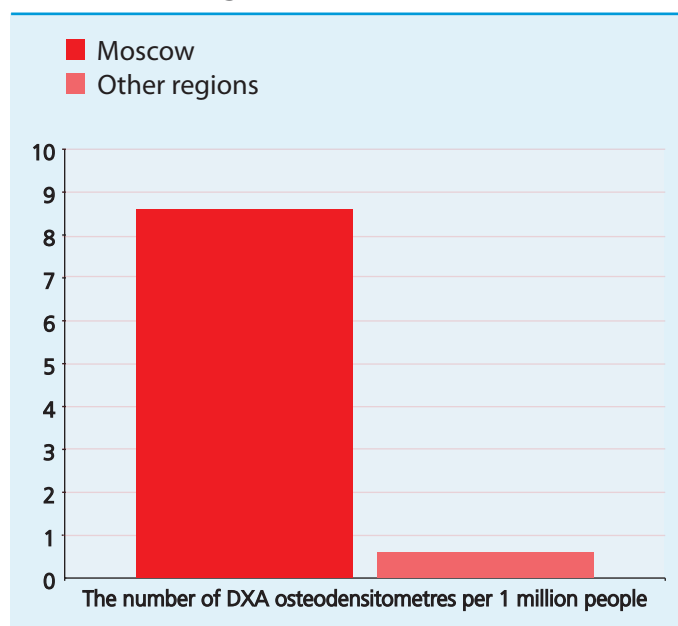


bad weather. The incidence of wrist fractures is substantially affected by weather conditions; slippery pavements from rain, snow and ice during the period from October to April increases wrist fracture occurrence almost three-fold.

## Diagnosis

In the RF there are 167 DXA scanners. However, they are unevenly distributed throughout the country: half of them (52%) are placed in Moscow and the others are located in major hospitals of regional centres (fig 8). Even in the Moscow region only 63% of doctors have the option to refer their patients for densitometry<sup>3</sup>. In the cities of Siberia and the Far East there are only 16 DXA machines. In general, DXA availability is 8.6 in Moscow and 0.6 scanners per million citizens in the rest of the country. A DXA examination is not included in the programme of state guarantees which means that patients have to

**Figure 8** Number of DXA per 1 million population in Moscow and in other regions



pay for the test themselves.

## Reimbursement

In the RF, medications for osteoporosis treatment are free of charge for disabled patients with severe osteoporosis only. The list of appropriate medications includes only Calcitonin salmon. Patient compliance with osteoporosis treatment is very low: 14% do not start the recommended treatment, and 16% discontinue it after 3 to 6 months. Among those who continue the treatment only 40% adhere regularly<sup>4</sup>.

A study conducted by scientists at the Moscow Clinical and Research Institute (MONIKI) found that people with less severe osteoporosis and fractures were not

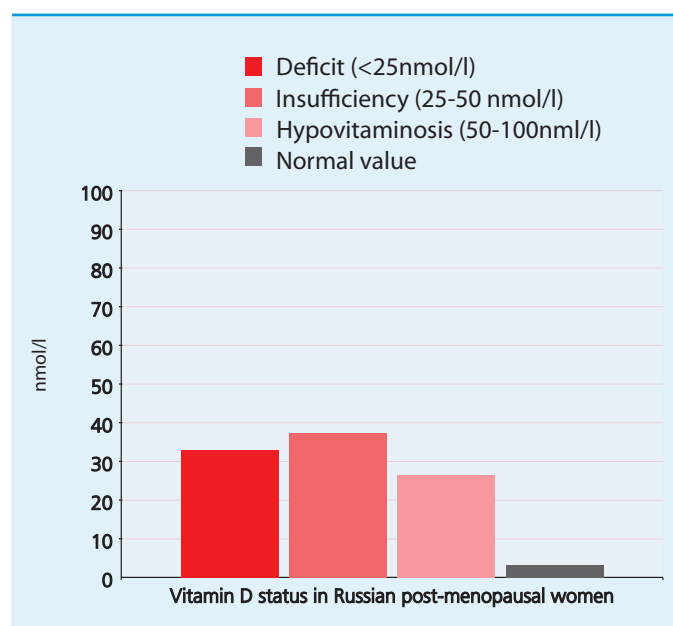
administered anti-osteoporotic therapy for recurrent fracture prevention<sup>5</sup>.

## Calcium and vitamin D

The territory of the RF is located mostly north of the 55° northern latitude; this is a substantial risk factor for vitamin D deficiency in the population due to insufficient sunlight in the winter months. Thus, in recent years the incidence of rickets among Russian infants has ranged from 54% to 66% in some regions. In Yakutia, the average level of circulating 25OH-vitamin D in healthy children and adolescents was 14 ng/ml in winter. In winter, vitamin D deficiency is observed in 60% of healthy children and in 10% during summer time. In wintertime 32.5% of healthy children suffer from secondary hyperthyroidism<sup>6</sup>.

Vitamin D deficiency has been investigated in postmenopausal women in Moscow (fig 9). The level of 25OH-vitamin D was >50 nmol/L in only 30% of this group. The lowest level of vitamin D was measured during the period from January to April<sup>7</sup>. In Yekaterinburg among the elderly population, none had a normal vitamin D level by the end of the winter while the lowest level was observed in those with a history

**Figure 9** Vitamin D status in Russian postmenopausal women



of hip fracture<sup>8</sup>. As previously noted, the official recommendations on vitamin D deficiency refer only to children under two years old.

It has been demonstrated in studies in different population groups in the RF that dietary calcium intake is generally low. Thus, children 10-15 years old consume on average less than a glass of milk or other dairy products per day<sup>9</sup>. In the Moscow population the calcium intake was within normal limits in only 6% of male adolescents, and in none of the females. The

level of calcium consumption influences bone mineralization<sup>10</sup>. A significant decrease of dietary calcium intake was observed in students<sup>11</sup>, female doctors of reproductive age<sup>12</sup>, and postmenopausal women<sup>13</sup>. Interestingly, the lowest level was noted in the days of Orthodox Lent.

The Institute of Nutrition of the Russian Academy of Medical Sciences of the Russian Federation has also analyzed diet in different age groups of the Russian population, according to the Russian monitoring of economic status and health of the population for 8 years (1994-2003), in a sample of more than 9,000 people. The lowest level of dietary calcium intake was found in men and women older than 55 years and in the group of 18-30 years. Consumption of dairy products was lowest in the urban populations<sup>14</sup>.

Research examining general awareness of osteoporosis showed that half of the people understand that dairy products are the main source of calcium; informed people drink more milk; 36% of people believe that dairy products are harmful for elderly people. Only 69% of people with osteoporosis take calcium and vitamin D supplementation<sup>15</sup>.

There are products fortified with calcium available in the RF, but no fortification with vitamin D.

### Prevention, education, government policy


In recent years the RF government has paid more attention to the problems of chronic non-infectious disease prevention, and many programmes have been developed around exercise, nutrition and adopting

a healthy lifestyle. However, as mentioned in the overview, osteoporosis is not a priority for the recently opened Health Centres in the RF.

Although osteoporosis is not considered to be a socially important problem in the country, as far back as 1997 the Ministry of Public Health of the RF declared that Centres of Osteoporosis Prevention should be opened on the premises of major multi-field hospitals. To date, 29 centres of osteoporosis prevention are officially registered and operating in Russia. There are at least 50 Public Health Units providing specialized care for osteoporosis patients in the RF. Two or three new Osteoporosis Centres are opened every year with the principal tasks of these centres to provide specialized care to people with osteoporosis, education programmes for doctors, and self-management programmes for patients and carers.

There is a lack of specialized doctors in the field of bone and osteoporosis in the RF. In one study, 19% of certified doctors could not state any method of examination for osteoporosis. Only 19% of doctors recommended densitometry to patients taking corticosteroids and 34% did not refer such patients for further examination.

The Russian Osteoporosis Association (RAOP) was established in 1995 and is a member of the International Osteoporosis Foundation (IOF). It unites efforts of doctors of various specialties involved in the process of medical care of patients with osteoporosis. A society of patients with osteoporosis, 'Towards a life without osteoporosis' (RPA) is also a member of IOF. Over the past 15 years, three Russian Symposia on Osteoporosis and three Congresses on Osteoporosis



Levels of daily calcium intake far below the FAO/WHO recommendations and vitamin D deficiency/insufficiency are prevalent throughout the region.

sis have been held. In 2009 the Russian Osteoporosis Association issued the 2nd edition of Clinical Guidelines on Diagnosis, Prevention and Treatment of Osteoporosis; unfortunately this is not used by the Ministry of Public Health and Social Development of the RF and other health authorities in taking administrative and political decisions.

The Russian Association on Osteoporosis has developed a unified education programme for patients with osteoporosis (Health school 'Osteoporosis'), recommended by the Training and Methodical Association of Russian Universities on Medical and Pharmaceutical Education as a manual for the system of advanced professional education of doctors<sup>16</sup>.

## Recommendations

Clearly there is a great need in the RF for improvements in epidemiological study of osteoporotic fractures and the education of health care professionals. The following measures are thus recommended:

- The collection of official statistics on fragility fractures, especially hip, vertebral and wrist and consideration of the establishment of a Fracture Registry in the RF
- Support for epidemiological research on osteoporosis and fractures
- The provision of surgical care after hip fracture; this will have a dramatic effect on morbidity and mortality rates in the RF
- Reimbursement of DXA in high-risk individuals and wider accessibility and availability of DXA testing
- Wider availability of anti-osteoporosis medications
- Official guidelines are needed for the prevention, treatment and management of osteoporosis, in particular for post-hip fracture care
- Official recommendations are needed for calcium and vitamin D in all population groups
- Improved continuing education for all health and medical professionals involved in the care of people with osteoporosis and fractures
- Support for widespread education and prevention programmes (including lifestyle management) for the general public

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# Slovakia

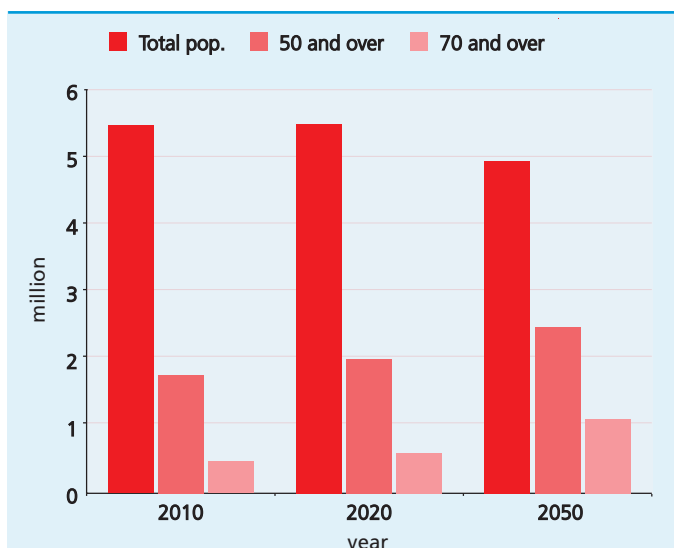
## Overview

The Slovak Association for Osteoporosis and Metabolic Bone Diseases (SOMOK) was established in 1998. Roughly 300 physicians are currently members of SOMOK. The major tasks are: studying the evolution and specificities of osteoporosis in Slovakia; assessment of risk factors; providing information and guidance about osteoporosis for patients and medical personnel at all stages of medical care; scientific and educational activities; and attracting attention to the problem of osteoporosis. The Patient's Association is an integral and active part of SOMOK. The Association's website [www.osteoporoza.sk](http://www.osteoporoza.sk) provides information for health care specialists as well as patients.

## Key findings

The present population of Slovakia is estimated to be 5.5 million, of this 32% (1.8 million) is 50 years of age and over and 9% (476,000) is 70 and over. By

**Figure 1** Population projection for Slovakia until 2050



2050, it is estimated that 50% (2.5 million) of the population will be 50 and over and 22% (1.1 million) will be 70 and over while the total population will decrease to 4.9 million<sup>1</sup> (fig. 1).

## Hip fractures

In 2006, the number of patients hospitalized with hip fracture in Slovakia was 6,913 in total, 5,462 cases (79%) amongst patients over 50 years of age, with an incidence rate of 12.6 per 10,000 population and approximately 2 times more fractures in women than in men. The average number of hospital days spent in acute care was 8 days and 10 to 13 days in rehabilitation or long-term care. The total direct hospital costs for hip fractures are estimated to be more than €60 million per year. The National Health Statistic Centre is responsible for collecting statistical data from the health care providers but there is no national hip fracture registry, only the National Arthroplasty Register (NAR).

## Vertebral fractures

No information available

## Diagnosis

In Slovakia, there are 13.1 DXA scanners per million population. The waiting time for a DXA scan in the public health system is 2 to 3 weeks. The cost of a DXA scan is €30. The exam is fully reimbursed.

The Health Insurance Companies are responsible for purchasing health care services for their clients. The purchasing of services is related to the increasing demand of the population. The number of specific examinations and DXA scans are growing from year to year.

## Reimbursement

In general, all treatments are reimbursed up to more than 90%. Main criteria are a T-score  $\leq -2.5$  and/or a presence of low energy trauma fracture. PTH analogues are reimbursed only for patients with severe

osteoporosis (T-score  $\leq -2,5$ ) and multiple vertebral fractures treated in selected osteo-centres.

## Calcium and vitamin D

There are no national public health programmes. Guidelines for health care professionals recommend optimum daily intake of calcium and vitamin D in Slovakia.


## Prevention, education, government policy

Osteoporosis is not a national health priority in Slovakia, however thanks to the collaboration of the Slovak Osteoporosis Society and the Health Care Department of the Ministry of Health, guidelines for the diagnosis and treatment of osteoporosis were issued in 2006 and guidelines for diagnosis and therapy of glucocorticoid induced osteoporosis were issued in 2009.

Educational activities and training of health professionals are offered by the Slovak Health University and the Slovak Osteoporosis Society.

## References

1. Source: U.S. Census Bureau, International Data Base.



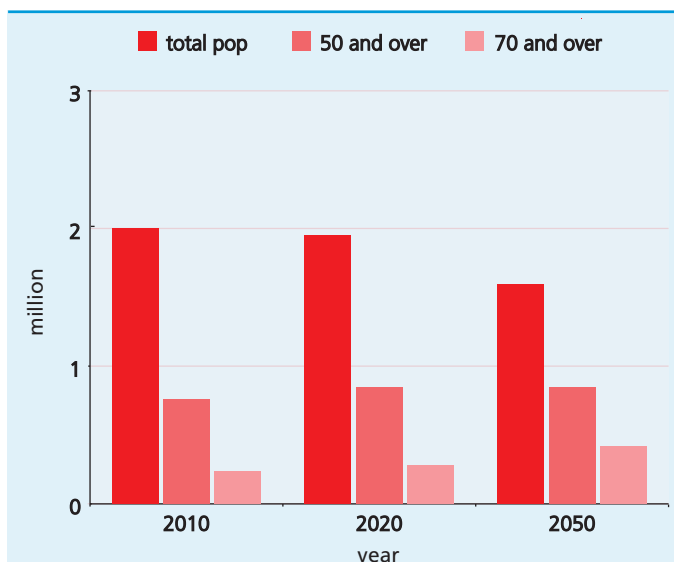
In many countries of Eastern Europe and Central Asia the number of elderly people will rise dramatically over the next few decades. Strategies for cost effective prevention, early detection and treatment of high risk patients are critical if the region is to reduce the projected burden of fragility fractures.

# Slovenia

## Overview

The detection, prevention and treatment of osteoporosis in Slovenia is not lagging significantly behind the most developed EU countries. The main obstacle remains that DXA is reimbursed only for secondary osteoporosis, while for everybody else it is carried out on a self-payment basis. Potential patients are well aware of the disease, at least in the urban areas, and are organized in a very active Slovene Osteoporosis Patient Society. All the internationally accessible medications against osteoporosis are also available in Slovenia, generally via health insurance with some limitations for certain medications (strontium ranelate and teriparatide). In recent years, a number of seminars and courses on osteoporosis have been conducted by the Slovene Bone Society. The last one in 2010 was endorsed by IOF and focused on bone densitometry. It has been recently estimated that around one third of patients with osteoporosis are receiving

**Figure 1** Population projection for Slovenia until 2050



adequate treatment, which is far from perfect, but still above average.

## Key findings

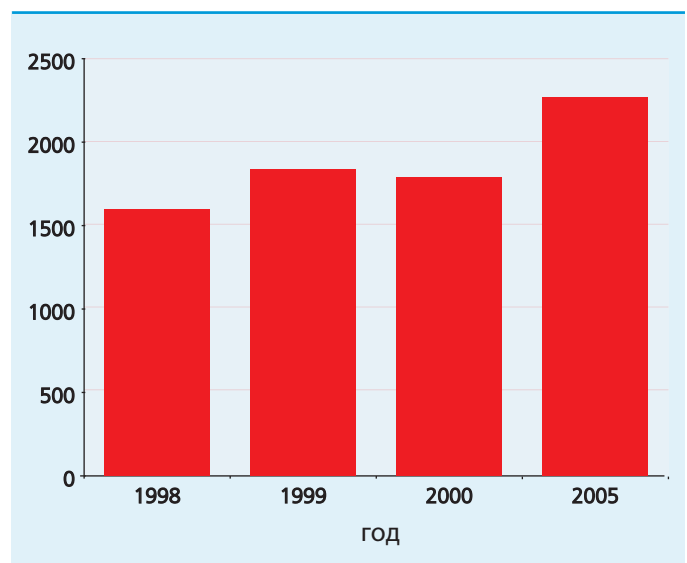
The present population in Slovenia is estimated at 2 million, 38% (760,000) is aged 50 and over and 12% (235,600) is 70 and over. By 2050, it is estimated that 53% (846,500) of the population will be 50 and over and 26% (421,000) will be 70 and over while the total population will decrease to 1.6 million<sup>1</sup> (fig. 1).

The prevalence rate of osteoporosis for women over 50 years is 27.5% and 14.6% for men over 60 years old.

## Hip fractures

In 2005, the total number of hip fractures was 2,267 (women 1,656, men 611), a 40% increase since 1998. The incidence rate is 11.2 per 10,000 population.

**Figure 2** Total number of hip fractures between 1998 and 2005



The average number of hospital days is 16.1 days in acute care and 16.7 days in rehabilitation or long-term care. The cost per day in acute care is €280 and the total direct hospital costs of hip fractures were estimated at over €11 million in 2005.

## Vertebral fractures

No information available

### Diagnosis

In Slovenia, there are 20 DXA scanners per million population, 7 DXA are in the public system and 33 scanners are in the private; their distribution is homogenous throughout the country. The waiting time for a DXA scan is 10 days in the public and private health system. The cost of a DXA scan varies between €25 and €50. DXA is not reimbursed for primary osteoporosis and the exam has to be paid by the patients. There are some limited discounts available for the members of the Osteoporosis Patients Societies and DXA is fully reimbursed for secondary osteoporosis. A standardized national training course for DXA technologists and physicians was introduced in 2010.

### Reimbursement

Reimbursement for osteoporotic treatment is generally provided for patients treated according to National Guidelines. There are limitations for strontium ranelate which is reimbursed only for patients older than 74 and those who are not able to take bisphosphonates. Teriparatide is reimbursed only for patients with severe osteoporosis who do not respond to other treatment (defined as a new hip or vertebral fracture after at least one year of appropriate treatment with other drugs).

### Calcium and vitamin D

There is no national public health programme. Public awareness about vitamin D was increased with the help of some articles on vitamin D in the leading national newspapers and seminars on this topic by the Slovene Bone Society in collaboration with pharmaceutical companies. The role of calcium in the prevention and treatment of osteoporosis is well known.

### Prevention, education, government policy

Osteoporosis is not a national health priority in Slovenia, however some national and regional campaigns have been supported by the government. Evidence based guidelines exist on prevention, diagnosis and treatment of postmenopausal osteoporosis and they have been published on the Slovenian Endocrine Society's website: [www.endodiab.si](http://www.endodiab.si)

Research is conducted on the genetics of osteoporosis, modifiable determinants of peak bone mass (such as exercise and calcium intake) and identification of risk factors for falling and the effects of fall prevention strategies on fracture.

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1. Source: U.S. Census Bureau, International Data Base.

# Republic of Tajikistan

## Overview

Despite the interest in osteoporosis in the global literature, many aspects of this serious problem are under-investigated in Tajikistan and countries with a similar socio-economic level. The risk factors for osteoporosis together with the regional features (like frequent child-birth, elevated number of children, alimentary factors, etc.), and the lack of studies due to inaccessibility to modern diagnostic and treatment methods are likely contributors to this situation<sup>1</sup>. As studies on this problem are absent, the Tajik Public Health Department currently has no evidence-based data on diagnosis and treatment of osteoporosis in the country. There are few data from other regions which reflect conditions present within Tajikistan. Specific local considerations are the high birth rate, the large percentage of multiparous women, dietary deficits, as well as the high incidence of iodine deficiency diseases, diabetes mellitus, and kidney diseases. Risk factors for osteoporosis are present in different combinations in 55.8% of patients, including 18.3% - anemia, 9.8% - goiter, 5.8% - diabetes mellitus, 32.3% - low weight, 53.3% - lack of exercise. The latter risk factors significantly influence osteoporosis development and outcomes.

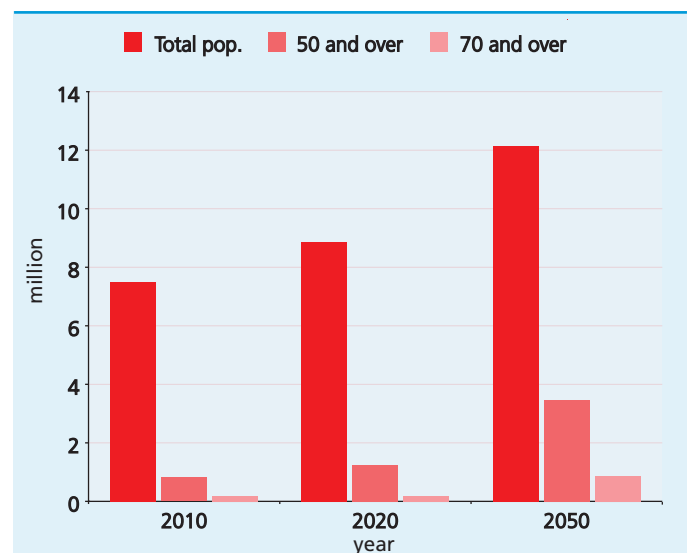
There are no official statistics about the incidence of osteoporosis and associated fractures in the country. In spite of the estimated high frequency of osteoporosis in Tajikistan, extensive research on this problem has not yet been carried out. However, according to the Abualy ibn Sino Trauma Clinic of Tajik State Medical University the incidence of osteoporosis and associated pathological fractures is likely higher than in other regions.

## Key findings

The characteristics of the demographic situation in Tajikistan reflect the global political socio-economic

changes after the civil war: the deterioration of living conditions, the emergence of an open market economy, the partial misbalance in demographic structure, the loss of the social protection of large families and the changes in the population's structure. On January 1st 2010, the Tajik population was estimated to be 7.5 million<sup>2</sup> people; more than 73.5% of the population

**Figure 1** Population projection for Tajikistan until 2050



live in the countryside.

## Hip fractures

There are no official statistics showing the incidence of fractures in different age groups or regions in the country. According to the Trauma Clinic, metaphyseal radial fractures are predominant amongst those fractures associated with osteoporosis; hip fractures are the second most common type of fracture.

Due to the unavailability of modern technologies for the treatment of hip fractures (hip replacement, osteosynthesis) in the country, most hip fractures associated with osteoporosis are treated conservatively<sup>3</sup>. Up to 30% of patients refuse surgery and 25-30% have contraindications to an operation. These patients

with various complications are treated in out-patient departments by traumatologists, surgeons and family doctors and because of the severe osteoporosis in most women, radial and hip fractures lead to different complications including Sudeck syndrome and pseudoarthrosis<sup>4</sup>. Hip replacement has been actively introduced in the country over the last two years. This operation has been done only in a small group of patients for hip fracture but there is a trend towards widespread implementation.

The cost of an extraarticular osteosynthesis for hip fracture is on average 200 USD and hip replacement costs 3,500 USD.

## Vertebral fractures

Evidence of vertebral fractures are seen in a large percentage of elderly patients, however more accurate statistics are not available.

## Diagnosis

In Tajikistan, there is only one DXA machine at the Institute of Maternity and Childhood in Dushanbe. This examination is on a fee basis except for the privileged categories of patients. As the majority of the population has no access to densitometry, Tajikistan is introducing a *scale of screening-diagnosis of osteoporosis*<sup>5</sup>. Recently, thanks to the efforts of various organizations, Tajikistan has had a practice of carrying out this examination free of charge. Tajikistan has serious problems diagnosing osteoporosis as only 5% of the population at risk can access densitometry, the majority of practitioners are not familiar with osteoporosis diagnosis and treatment and there is an important lack of awareness within the Tajik population.

## Reimbursement

Osteoporosis medications are free of charge for a privileged category of patients only.

Systematic pharmacological treatment of osteoporosis has been widely used in the country for the last five years only. According to unconfirmed data, the availability of the pharmacological treatment in the country covers only 5-10% of the needs and only 30% of patients receive systematic treatment.

## Calcium and vitamin D

There are no official data on the incidence of vitamin D deficiency and calcium intake with food. The diet of the majority of the population does not meet the required standards.

## Prevention, education, government policy

The Ministry of Public Health, functioning Health Centres and other associations are very active in promoting healthy lifestyles and chronic noninfectious diseases prevention. However, this work is still at the initial stage, and therefore, results are far from desirable. Unfortunately, there is no osteoporosis association in the country, but there is some focus on osteoporosis by the relevant professional associations. This problem is being investigated within the traumatology and endocrinology department of the Abuali ibn Sino Tajik State Medical University.

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# Ukraine

## Overview

In recent decades the problem of osteoporosis has become particularly significant for Ukraine because of two closely related demographical processes: a sharp increase in the number of frail elderly people and an increase in the number of postmenopausal women — the two groups most at risk of osteoporotic fracture.

Currently, 23.1% (of which, men 18.1%, women 27.3%) of the Ukrainian population is aged 60 years or over. The number of people with osteoporosis and its complications is increasing. The predicted number of postmenopausal women having osteoporosis or osteopenia in Ukraine comprises 7 million (28% of the total number of women). The Ukrainian population has a marked deficit of calcium and vitamin D consumption. However, at the present time there are no developed programmes to correct the above-mentioned deficit.

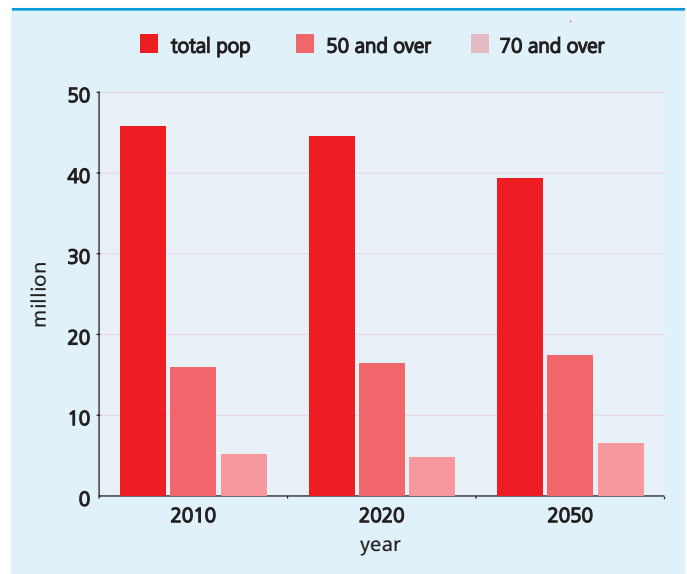
An analysis of the Ukraine population revealed a high frequency of risk factors for osteoporosis in different age groups. These include deficits in calcium and vitamin D consumption, smoking, sedentary lifestyle, and early menopause. At present the general population's awareness of the problems of prevention and effective treatment of osteoporosis remains low.

In addition, the Medical Society has lately increased its attention to the problems of osteoporosis prevention and treatment. Regional centres for the diagnosis and treatment of osteoporosis have been established and equipped with modern apparatus. However, the access to qualified treatment of osteoporosis is still insufficient, especially in remote regions of the country. Currently, medical institutions in the Ukraine are under-equipped with densitometers, and rehabilitation programmes after hip and vertebral fractures are not widely introduced.

## Key findings

The population of the country is 46 million people (21 million men and 25 million women) and the numbers of people aged 50 years and older is 16 million (35% of the total population). It is predicted that the population of Ukraine will be 39 million people by 2050 and thus 44% of the population will be 50 and over and 16% will be 70 and over<sup>1</sup> (fig. 1).

**Figure 1** Population projection for Ukraine until 2050



In Ukraine the estimated number of postmenopausal women with osteoporosis risk and osteopenia is 7 million (28% of total number of women). According to research carried out in 2007-2008 by the Ukrainian Scientific Medical Centre using DXA, it is estimated that 2 million postmenopausal women suffer from osteoporosis. Osteopenia was estimated in 4.6 million men and 5.8 million women<sup>2</sup>.

## Hip fractures

The incidence of osteoporotic hip fractures from 1997 to 2002 in Vinnitsa (Ukraine) is presented in the table shown<sup>3,4</sup>. During this period the frequency of hip fractures varied from 117.1 to 171.1 per 100,000 population of 50 years and older and was almost twice

as high in women as in men. These data are slightly lower than might be expected from comparison with other European countries, which may indicate lack of diagnosis of these fractures.

Incidence of hip fractures in citizens of Vinnitsa at the age of 50 and over, per 100,000 population		
Year	Women	Men
1997	118	115.9
1998	161.4	106.3
1999	171.4	123.1
2000	217.4	109.4
2001	209.1	97
2002	169.2	123.1

## Vertebral fractures

No available information

## Wrist fractures

The incidence of osteoporotic fractures of the wrist was significantly higher<sup>2,3</sup>. The highest figures were found in 60-64 year age group (women 1940.0; men 403.1 per 100,000 population), 70-74 years (women 1987.0; men 399.3 per 100,000) and 75-79 years (women 1986.2; men 422.7 per 100,000). This type of fracture also predominated among women.

The incidence of wrist fractures in women increases from 55-59 years to its maximal level at the age of 75-79 years with a following decline at the age of 80 years and older. These rates reliably exceed the incidence of fractures in men of all age groups.

## Diagnosis

In Ukraine there are 14 DXA machines located in Kiev, Kharkov, Dnepropetrovsk, Donetsk, Ivanovo-Frankovsk, Ternopol, Odessa and other cities, as well as over 30 QUS scanners. The cost of one examination with a DXA scan varies from 10 to 30 USD. At present densitometry is not paid for by the government; however in the Ukrainian Scientific Medical Centre some categories of citizens (disabled, victims of Chernobyl's nuclear power plant accident, etc.) have free access to examination.

## Reimbursement

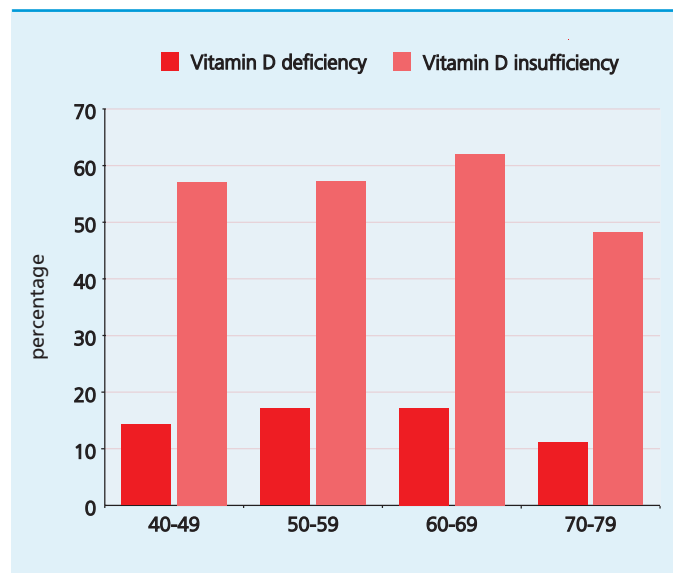
At the present time no treatment of osteoporosis is supported by the state.

## Calcium and vitamin D

According to V. Povoroznyuk et al. (2010)<sup>5</sup>, most of the Ukrainian population has vitamin D insufficiency or deficiency. A low level of vitamin D has

been observed in more than half the population of the older age groups (at 40-49 years 57.1%, 50-59 years 57.2%, 60-69 years 62.1%. 70-79 years 48.2%) (Fig. 2).

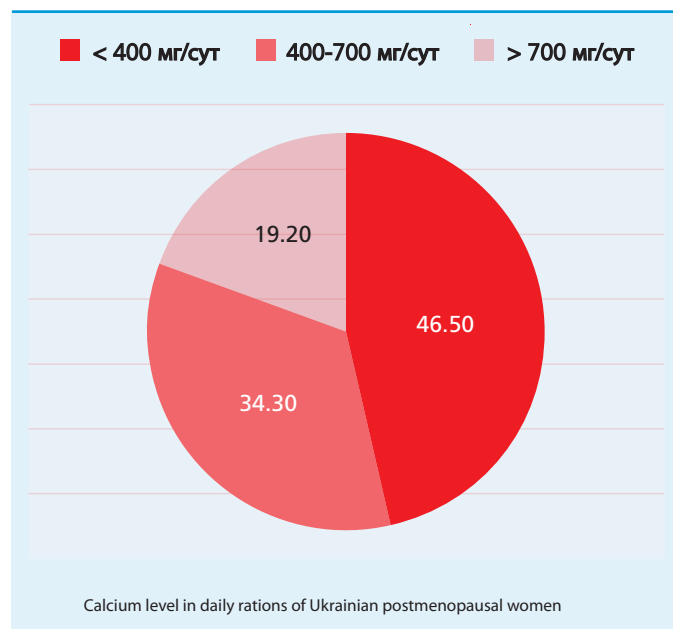
**Figure 2** Incidence of vitamin D insufficiency and deficiency among the Ukrainian population depending on age



2).

The analysis of children's, adolescents' and postmenopausal women's diets reveals a low calcium intake with food: the average level of calcium consumption is only 450 to 600 mg/day. Fewer than 5% of postmenopausal women obtain more than 1000 mg calcium a day in their diets<sup>6</sup>. Currently, enriched food with calcium and vitamin D is not used in Ukraine (fig. 3).

**Figure 3** Calcium level in daily rations of Ukrainian postmenopausal women





## Prevention, education, government policy

In 2009 National Clinical Recommendations on Osteoporosis were published, which are the national standards of medical care.

Ukrainian public organizations with interests in the field of osteoporosis are the following:

- The Ukrainian Osteoporosis Association, which is a member of the International Osteoporosis Foundation, and regularly conducts scientific conferences for Ukrainian doctors;
- The Ukrainian Association of Menopause, Andropause and Musculoskeletal Diseases which is a member of European Menopause & Andropause Society;
- Patients' Association 'Ukraine without Osteoporosis and Fractures' that works within the Ukrainian Osteoporosis Association.

Since 2007 in the city of Yaremche, seminars on 'Musculoskeletal system and age' have been carried out annually with the support of the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis. In these courses, local and international scientists give lessons on modern methods of diagnosis and treatment of osteoporosis to doctors from different regions of Ukraine.

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# Republic of Uzbekistan

## Overview

Osteoporosis is an urgent health problem for the Republic of Uzbekistan, and it requires much more attention from the government health authorities and research institutes. Further research is needed to determine the incidence of the disease and its consequences. It is essential to study the level of medical care for patients with osteoporotic fractures, including patients with hip fractures. Medical care for patients with osteoporosis, including diagnosis and treatment of the disease, requires the support of the state.

## Key findings

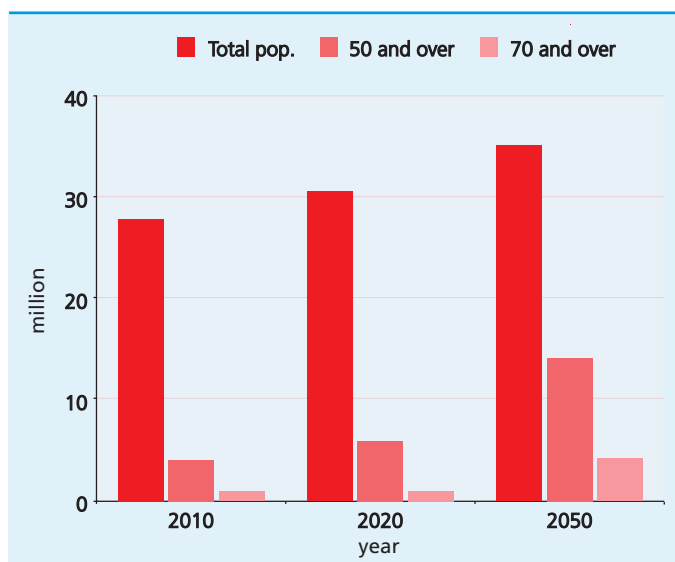
The present population in Uzbekistan is estimated at 28 million, 15% (4.1 million) of the population is aged 50 years and over and 4% (980,000) is 70 years or over. By 2050, it is estimated that 40% (14 million) of the population will be 50 years and over and 12% (4.2 million) will be 70 years and over while the total population will increase to 35 million<sup>1</sup> (fig. 1).

Studies dedicated to the epidemiology of osteoporosis and osteoporotic fractures have not been carried out in Uzbekistan. However, according to the Research Institute of Traumatology and Orthopedics of the Ministry of Public Health there are at least 30,000 people with osteoporosis and 150,000 with osteopenia in Uzbekistan. The number of patients with osteoporosis and osteopenia is predicted to increase up to 250,000 by 2020.

National medical and patient societies throughout the region are playing an important role in health professional education, patient care, public awareness and advocacy.



**Figure 1** Population projection for Uzbekistan until 2050



## Hip fractures

According to the same institute the average cost of hip fracture treatment at hospital is 800,000 UZS (ca. 500 USD).

## Vertebral fractures

No available information

## Diagnosis

In Uzbekistan there are 3 DXA scanners; all of them are in the capital city Tashkent. Additionally there are 3 quantitative ultrasound scanners. The cost of one DXA examination is 4.5 USD. Densitometry is not paid by the government and only done for a fee.

## Treatment

All pharmaceutical agents are over-the-counter, but the patient pays for them personally.

## Calcium and vitamin D

There are no official calcium and vitamin D intake recommendations.

## Prevention, education, government policy

Osteoporosis is not considered as one of the most significant health problems at the state level. There are no national clinical recommendations on osteoporosis.

In Uzbekistan there are no public organizations interested in the problem of osteoporosis. Currently, the greatest interest is shown by the Republican Scientific and Practical Centre of Endocrinology and Research Institute of Traumatology and Orthopaedics of the Republic of Uzbekistan.

## References

1. Source: U.S. Census Bureau, International Data Base.

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## Conclusions and recommendations

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Throughout all the presented countries it is apparent that osteoporosis is a major health problem and that the resulting burden will increase in the coming years as the proportion of elderly people and people at risk of fractures increases. There is a general lack of epidemiological fracture data throughout the region and in many countries there is no information available on vertebral fractures.

Hip fracture has enormous personal and socio-economic consequences for millions of people. International studies have shown that loss of function and independence among survivors of hip fracture is profound. Forty percent are unable to walk independently and 60% still require assistance a year later. Because of these losses, 33% are totally dependent on care in the year following the hip fracture.

In older patients, mortality after hip fracture can increase up to 36% in the year following the fracture and surgical delay independently affects mortality. Thus, patients for whom surgery is delayed for 2 days or more have a 17% higher mortality rate at 1 month than those for whom surgery occurs within 48 hours. This can be explained by factors related to immobilization including the development of deep vein thrombosis, pulmonary embolism, pneumonia, and muscular de-conditioning. As a matter of urgency, systems and policies should be instigated to ensure that all hip fractures are managed with the appropriate surgical care. To achieve this, different actions should be implemented:

- Improve medical education for physicians and orthopaedic surgeons about osteoporosis and its management and promote osteoporosis awareness in the public
- Governments should develop clear guidelines about osteoporosis treatment and prevention

- Adequate medical and surgical infrastructures should be developed, particularly for post hip fracture care
- Support for large scale epidemiological studies on prevalence and incidence of osteoporotic fractures, in particular, hip and vertebral fractures
- Reimbursement for treatment and diagnosis of osteoporosis must be improved
- Calcium and Vitamin D supplementation and food fortification should be considered by regulatory authorities in the region



**International  
Osteoporosis  
Foundation**

This report, the first audit report of its kind for Eastern Europe and Central Asia, reveals a crucial need for action to combat the enormous problem of fragility fractures in the individual 21 countries included in the audit as well as the region as a whole. It clearly shows high fracture rates throughout the region, with major increases in the number of fracture patients expected in the coming decades. Tragically, it also exposes the poor state of post-fracture care in some areas - many hip fracture sufferers, particularly in disadvantaged rural areas, remain disabled or die unnecessarily due to lack of proper surgical care. Among other related issues, such as poor vitamin D status and limited access to diagnostic tools and medications, the report highlights that, overall, osteoporosis and the burden of fragility fractures are vastly underestimated and suffer from lack of attention within healthcare systems.

On behalf of IOF I urge all those dedicated to improving public health and the welfare of osteoporosis patients to make use of this landmark report. If effectively implemented, it can be a valuable tool for patient and medical osteoporosis societies in the region, helping to direct media and public attention to key issues. Finally, we hope that the report findings will serve as a 'call for action' among government health authorities - clearly, more research and fracture data as well as improved prevention and treatment strategies are required to fight this growing epidemic of fractures.

**Professor Cyrus Cooper**, Chair of the Committee of Scientific Advisors  
International Osteoporosis Foundation

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