ARGENTINA

OVERVIEW

Argentina is a large country with many different climate regions ranging from a considerably cold climate in the south to a subtropical climate in the north. This geography may be a factor in the varying prevalence rates of osteoporosis among different regions. Therefore, it is important to perform epidemiological studies throughout the country to determine each region’s individual status.

In 2011, the total population of Argentina was estimated at close to 42 million, with 10 million inhabitants aged ≥50 years. The population is expected to increase 28% by 2050 and will reach 53 million, with the over 50’s population reaching 19.5 million1.

Local bone mineral density (BMD) studies reveal that two out of four postmenopausal women have osteopenia, one has osteoporosis, and one has a normal bone mineral density2. By 2025 over three million women are expected to have osteopenia, rising to over five million in 2050. Although the rate of fragility fractures is higher in patients with osteoporosis, the absolute number of fractures is higher in osteopenic patients. In Argentina, the mean annual rate of hip fractures is 298 per 100 000 women >50 years, and 118 per 100 000 men, with a 2.5:1 F/M ratio3,4. Thus, over 34 000 hip fractures occur every year among the aged population with an average 90 such fractures per day.

The Latin American Vertebral Osteoporosis Study (LAVOS) found an overall 16.2% prevalence of vertebral fractures in Argentinean women aged 50 years or over5. Hospitalization costs of hip and vertebral fractures in Argentina exceed 190 million USD per year. Consequently, the costs of osteoporosis for the public health system are staggering; however, the federal or the provincial governments of Argentina do not give the disease a high priority.

Efforts for the prevention of osteoporosis and fractures are urgently needed and include improved access to diagnostic tools. There is a particular need for improved education and awareness among individuals, health-care providers, policy makers and governments around prevention prior to the first fracture, timely diagnosis and improved management.

KEY FINDINGS

Population growth statistics

The present population in Argentina is estimated to be 42 million. Of this, 25% (10 million) is 50 years of age and over and 7.6% (3 million) is 70 years and over. By 2050, it is estimated that 37% (19.5 million) of the population will be over 50 years, and 14% (7.4 million) will be 70 years and over while the total population will increase to 53 million1 (fig 1).

The Argentinean population is expected to grow 28% by 2050, but the population aged 50 years and older, that is, the susceptible population, will grow by 86%1. Furthermore, fertility rates are falling. The present average number of children per woman is 2.3, and is likely to fall to 2.0 within 20 years and to 1.8 within 50 years (source: La Nación. Buenos Aires, April 6th, 2008). This decline means that by 2050 the number of economically

FIGURE 1 Population projection for Argentina until 2050

SOURCE US Census Bureau
active persons will not be enough to subsidize the health and retirement systems. Consequently it is reasonable to assume that osteoporosis will pose a significant burden in Argentina in the coming years.

Epidemiology

Although neighbouring countries in Latin America have a diverse ethnic composition, composed of a variable mixture of Native American, white Caucasian and black African descents, Argentina is an exception with a predominantly white Caucasian population. Of the 10.5 million people 50 years and over, the male/female ratio is 1:1.2 with 4.8 million men and 5.7 million women.

Age is an important risk factor for fragility fractures. The peak number of all fragility fractures occurs between 50 and 54 years of age and the peak number of hip fractures between the ages of 75 and 79. Today, life expectancy at birth in Argentina is 77 years and is expected to be 82 years in 2050.

Population-based studies of osteoporosis prevalence in Argentina, analyzing BMD at two axial sites (lumbar spine and femoral neck) with DXA reveal that one out of four women aged above 50 years has normal BMD, two have osteopenia, and one has osteoporosis. As the estimated population of women aged 50 years or more will be 7.3 million in 2025 and 11 million in 2050, it can be projected more than three million women will suffer from osteopenia in 2025 and more than five million in 2050 (fig. 2); the number of women with osteoporosis can be estimated as 1.82 and 2.75 million, respectively. Although the rate of fragility fractures is higher in people with osteoporosis, the absolute number of fractures is higher in osteopenic patients.

Hip fracture

In Argentina, the mean annual rate of hip fractures, according to five published studies, is 488/100 000 inhabitants (SD=86/100 000) aged above 50 years, with a 2.6:1 female to male ratio. Thus, over 34 000 hip fractures occur every year among the aged population, with an average 90 such fractures per day. Estimates indicate that during the year 2050 there will be more than 63 000 hip fractures in women, and more than 13 000 in men.

One prospective study compared the fracture incidence rates in distinct geographical regions within Argentina. The study found that hip fracture incidence rates varied among some regions (table 1).

<table>
<thead>
<tr>
<th>AGE</th>
<th>LA PLATA</th>
<th>ROSARIO</th>
<th>MAR DEL PLATA</th>
<th>TUCUMAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 - 59</td>
<td>11.3</td>
<td>13.1</td>
<td>18.5</td>
<td>24.5</td>
</tr>
<tr>
<td>60 - 69</td>
<td>102.6</td>
<td>97.0</td>
<td>94.0</td>
<td>176.5</td>
</tr>
<tr>
<td>70 - 79</td>
<td>621.1</td>
<td>527.0</td>
<td>946.2</td>
<td>554.3</td>
</tr>
<tr>
<td>≥ 80</td>
<td>2807.3</td>
<td>2954.0</td>
<td>946.2</td>
<td>1598.8</td>
</tr>
<tr>
<td>≥ 50</td>
<td>379.4</td>
<td>405.0</td>
<td>259.6</td>
<td>334.9</td>
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</table>

In the largest published Argentinean study, the mean age of patients presenting with hip fracture was 82 years for women, and 79 years for men. Local experts estimate that 98% of hip fractures are surgically treated. Most fractures happened during the daytime and at home. More than 40% of patients had suffered previous fractures. In a nationwide survey of 5500 patients discharged from public hospitals during the year 2000, 1.1% had a diagnosis of hip fracture and patients who had surgery for this type of fracture had an in-hospital mortality rate of 5%. In another study, in-hospital mortality was 10%, while 33% of fracture patients died during the year following the event.
In yet another study reporting data gathered from a managed care system, the mortality rate in the first year post-fracture was a low 9.1%.

Direct costs of treating an acute episode of hip fracture (hospital admission, surgical intervention, price of an artificial prosthesis, and rehabilitation) were estimated at 5500 USD in 2004. Table 2 shows the cost of hip fractures considering all cases registered in one year.

### TABLE 2 Hospitalization cost of hip and vertebral fractures in Argentina (in USD per year)

<table>
<thead>
<tr>
<th></th>
<th>EXPECTED COST PER CASE</th>
<th>NUMBER OF CASES</th>
<th>TOTAL COST</th>
</tr>
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<tbody>
<tr>
<td>Hip</td>
<td>3800</td>
<td>34 000</td>
<td>129 200 000</td>
</tr>
<tr>
<td>Vertebral</td>
<td>163</td>
<td>382 100</td>
<td>62 282 300</td>
</tr>
</tbody>
</table>

Mean duration of hospital stay for a non-complicated hip fracture case is four to five days in the private sector, and six to seven days in public hospitals. The average number of hospital bed days for hip fractures is estimated at 240 000 annually. It has been established that the number of hospital days due to osteoporotic fractures is higher compared to many other diseases.

### Vertebral fracture, other fragility fractures

It is estimated that approximately 382 100 vertebral fractures occur each year in Argentina. The number of vertebral fractures is an estimate based on the prevalence of such fractures among women aged 60 years or more.

### TABLE 3 Prevalence of vertebral fractures in 420 Argentinean women, adapted with permission

<table>
<thead>
<tr>
<th>AGE</th>
<th>PREVALENCE % (95% CI*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 - 59</td>
<td>10.4 (4.5-16.4)</td>
</tr>
<tr>
<td>60 - 69</td>
<td>13.7 (6.9-20.5)</td>
</tr>
<tr>
<td>70 - 79</td>
<td>16.8 (9.9-23.6)</td>
</tr>
<tr>
<td>≥ 80</td>
<td>24.4 (15.6-33.3)</td>
</tr>
<tr>
<td>Overall ≤ 79</td>
<td>13.8 (10.03-17.56)</td>
</tr>
<tr>
<td>Overall ages</td>
<td>16.19 (12.65-19.72)</td>
</tr>
</tbody>
</table>

* CI: confidence interval

The presence of vertebral fractures indicates an important risk factor for future osteoporotic fractures at the vertebral level as well as other anatomical sites. The LAVOS Study, a radiological survey among Latin American women aged 50 years or older, found an overall 16.2% prevalence of vertebral fractures in Argentina. Vertebral fractures increased with old age and in the population aged above 80 years, as many as one in four women had a prevalent vertebral fracture (table 3).

The study highlighted two significant risk factors for vertebral fractures: history of fracture and height loss. Hormone replacement therapy was associated with 35% lower risk of having a vertebral fracture, and physical activity with 27% lower risk of having a vertebral fracture.

### Diagnosis

In Argentina, there are 268 DXA machines allowing for approximately 1 DXA machine per 150 000 inhabitants. There are many CT scanners in all large cities, but only 20 are used to perform central measurements of bone mineral density (QCT). This figure is an estimate based on information provided by commercial dealers of densitometers most frequently sold in Argentina. There are an undetermined number of quantitative ultrasound (QUS) devices in the country. There are four pQCT scanners and one high-resolution pQCT scanner, all of which are only used in research. The average length of wait for a DXA scan is 1 week.

### Reimbursement policy

In Argentina, DXA machines are concentrated in large urban centers. DXA examinations are now accepted by most health insurance companies, including many public social security institutions. Most public health facilities lack densitometry equipment and the national welfare system for retired citizens and pensioners (PAMI) does not routinely cover bone densitometry. Requests made by primary care physicians must be audited and approved on a case-by-case basis.

The practice of bone densitometry is covered by third-party payers and the social security system (usually, one anatomical region per year). The average cost of a bone densitometry (with DXA or QCT) is 22 USD per anatomical region. Quantitative Ultrasound (QUS) is not recognized as a reimbursable practice.
The price of radiological vertebral fracture assessment (lateral radiographs of the dorsal and lumbar spine) is 66 USD. A laboratory work-up to evaluate calcium/phosphate metabolism and bone turnover costs 60-70 USD. The cost of a medical office visit ranges from 7-15 USD and 30-50 USD, the former figures representing the medical fee within the managed care system, and the latter the fee in the private sector.

Medical prescriptions for osteoporosis represent only 1% of the Argentinean pharmaceutical market, which totals 37 million USD per year. Of all osteoporosis prescriptions, 41.6% correspond to calcium salts, and 55.8% to bisphosphonates. In recent years, the prescription of calcitonin, oestrogens, and other hormonal preparations has dropped 30%, while that of bisphosphonates has increased.

The average annual cost for the most frequently prescribed non-generic osteoporotic medications in Argentina (oral alendronate, risedronate, ibandronate, raloxifene and intravenous pamidronate and ibandronate) is 367 USD (range 289-1047 USD), including adequate calcium and vitamin D supplements. If generics are considered, the average annual cost decreases to 240 USD (range 190-945 USD). Finally, the most recent treatments (teriparatide, strontium ranelate, zoledronic acid), of which there are no generics in the market at this time, cost 10 300 USD, 961 USD and 722 USD respectively. Costs can be 40% lower for patients with medical coverage. Medications are provided free of charge within the public health system, and with sizable discounts (70%) or free for retired citizens and pensioners covered by PAMI. The eight most frequently prescribed anti-
Osteoporotic drugs are generics, representing 62% of the total monetary value, and 68% of total units sold annually (source: Intercontinental Marketing and Statistics; Pharmaceutical Market).18

**Calcium and vitamin D**

Several surveys have detected insufficient calcium intake (averaging 500 mg daily) in the adult population.21 Despite ample sunshine in most areas of the country, prevalence of deficient/insufficient levels of 25(OH)-Vitamin D (<20 ng/ml) in the elderly population is relatively high, not only in the south (87% of the population), but also in the mid (64%) and northern (52%) regions.22 The population living in Patagonia, the southernmost area of the country, is particularly at risk for hypovitaminosis D.23

The Argentinean Guidelines for the Prevention and Treatment of Osteoporosis recommend a daily calcium intake of 1.5 g, and a daily vitamin D intake of 800 IU.2 Thus, to help prevent osteoporosis through nutrition, calcium- and/or vitamin D- fortified milk, yoghurts and juices are available. Calcium-enriched milks contain 40% more calcium than standard milk. The addition of vitamin D is low in fortified milk or juices, containing only 40 IU/liter.24 Calcium and vitamin D supplements are also available in Argentina.

**PREVENTION, EDUCATION, LEVEL OF AWARENESS**

Argentinean physicians are aware of osteoporosis as a disease and the importance of both preventing and treating it. Consensus reveals that although gynecologists, rheumatologists and endocrinologists are well trained in osteoporosis treatment guidelines, general practitioners, geriatricians, and orthopaedists are not. The perception is that Argentinians in general are aware of osteoporosis as a health problem and that pharmaceutical companies actively participate in promoting patient awareness.

There are no government-sponsored programmes for prevention and/or treatment of osteoporosis. Scientific and patient societies are active in improving public awareness about the disease through regularly organized conferences, symposia and courses on osteoporosis.

Every year, coinciding with scientific meetings and on World Osteoporosis Day, articles are published in newspapers, and often bone specialists appear on radio and TV programmes to explain the problem and recommend preventive measures. Free peripheral densitometry tests are made available among men and women in order to identify people at high risk of osteoporotic fractures. The Argentine Society for Osteoporosis has helped organize an Association for Patients with Osteoporosis (SAPCO), which has become increasingly involved in spreading news about advances in prevention and treatment. Both the Argentine Association of Ostology and Mineral Metabolism (AAOMM) and the Argentine Society for Osteoporosis (SAO) organize annual training courses in densitometry for technicians and young physicians. Both associations jointly sponsored and published Guidelines for the Diagnosis, Prevention, and Treatment of Osteoporosis, which were updated in 2007.

**RECOMMENDATIONS**

It is apparent that in Argentina, the burden and costs of osteoporosis for the individual and for the public health system are staggering. However, the disease is not recognized as a major health problem by the federal or the provincial governments. Efforts towards the prevention of osteoporosis are urgently needed and should include the following:

- Education starting in primary school, and sustained in high school and the tertiary level around lifestyle factors for building strong bones.
- Improved nutrition for children, adolescents, pregnant women and the elderly including fortification of food with calcium and vitamin D. Priority should be given to these measures in geographic areas at high risk of hypovitaminosis D.
- Media campaigns to increase the awareness of prevention and treatment of osteoporosis.
- Encouragement of targeted exercise programmes for adults and the elderly.
- Physicians should be urged to identify patients at high risk for fragility fractures, confirm the diagnosis of osteoporosis, and promptly begin treatment as indicated.
- Doctors and medical institutions should establish programmes to ensure that patients adhere to indicated treatment plans.
Better practices should be implemented to produce practical, cost-effective strategies with measurable targets for reducing osteoporotic fractures.

DXA reimbursement for people at high risk of fragility fractures, especially before the fracture event.

Enhancing accessibility to diagnosis and proven therapies alone is not enough. Improved education of policy makers, healthcare professionals, and the general public is necessary to reduce the incidence and burden of osteoporotic fractures in Argentina.

REFERENCES

20. Kanis, J. data on file 2011