

# LEBANON

## OVERVIEW

Osteoporosis is prevalent in Lebanon as indicated by the population-based study of Lebanese elderly individuals from the greater Beirut area<sup>1</sup>. Indeed, in that cohort, the prevalence of morphometric vertebral fractures, taking into account fractures classified as grade 2 and above, was 12% in men and 19% in women. Similarly the prevalence of osteoporosis, using the WHO DXA-based operational definition, was 33.0% [27.5-38.8] at the total hip in women and 22.7% [16.2-30.2] in men<sup>1,2</sup>.

Annual hip fracture crude incidence rates for those over fifty years of age have been reported between 164 and 188/100 000 persons per year for females and between 88 and 107/100 000 persons per year for males, rates comparable to those from Southern Europe<sup>3</sup>. The annual age-standardized rates per 100 000 persons per year in the Lebanese are between 329 and 370 in females and 110 and 134 in males<sup>3</sup>.

Assuming current estimates of hip fractures prevail for the coming decades, the demographic transition alone will drive the overall crude rates among women to 179/100 000 persons per year in 2030 and 193/100 000 persons per year in 2050, and the overall crude rates among men to 124/100 000 persons per year in 2030 and 143/100 000 persons per year in 2050<sup>3</sup>.

Osteoporosis is not considered a national health priority in Lebanon yet, but ongoing efforts are being made to change this. The Ministry of Health (MOH) established a hip fracture registry in 2006 and has worked with lead investigators from academic centers on endorsing osteoporosis national guidelines<sup>4,5</sup> (initially in 2002 and 1st Update in 2007) as well as fragility fracture guidelines<sup>6</sup>. In addition, national data on hip fracture incidence was made available for the development of FRAX<sup>®</sup> Lebanon in 2008 which was subsequently launched in September 2009.

The MOH also established a National Task Force for Osteoporosis and Metabolic Bone Disorders in 2010, and strongly supported the designation of a WHO

Collaborating Center of Metabolic Bone Disorders at American University Beirut.

The Lebanese Osteoporosis Prevention Society (LOPS), the first osteoporosis patient society in the Middle East and Africa, is a non-governmental multidisciplinary organization, registered with the Ministry of Social Affairs. It was inaugurated in 1995 and has since made significant efforts to raise awareness of osteoporosis in the general community. It helped create the '206 Bone Fund' and the Pan Arab Osteoporosis Society. It opened a dispensary to offer bone density assessment at greatly reduced prices while providing patients with educational pamphlets; it organized a national symposium on osteoporosis as well as a *Fun Run* that was attended by 17 000 individuals to raise awareness. Regarding education, LOPS was given approval in 1998 to integrate osteoporosis into curricula in schools, targeting children aged between 8 and 16 years. They also launched the first Middle East Training Course on Osteoporosis in 2005 and have been publishing a quarterly magazine, *Osteonews*, to promote awareness. As of May 2011, a 6-month media campaign is planned to highlight awareness of musculoskeletal diseases.

The Lebanese Society for Osteoporosis and Metabolic Bone Disorders (OSTEOS), a scientific multidisciplinary society affiliated with the Lebanese Order of Physicians, was founded in 2006. It has tackled osteoporosis at three important levels: the patient, the health care professional, and the government. With regard to patients, the society has been involved in producing guides for fall prevention, clinical education pamphlets (endorsed by the MOH), Ministry of Social Affairs (MOSA), and the Lebanese Order of Physicians, and it has been active on World Osteoporosis Day, producing bone oriented educational place mats at the hospital cafeteria and offering free DXA scans for needy patients. In collaboration with the MOSA and OSTEOS representatives, a series of educational sessions were held in MOSA social and healthcare centres throughout the country. With respect to healthcare professionals, OSTEOS has been involved in producing a newsletter for physicians and handy office materials with the Lebanese guidelines and FRAX<sup>®</sup>, as well as sponsoring a BMD workshop and ISCD

courses. The government's involvement via the Ministry of Public Health is apparent through its endorsement of yearly OSTEOS meetings (also supported by the Lebanese Order of Physicians and the WHO) and its endorsement of the aforementioned guidelines.

Priorities for the coming years have been set by the Osteoporosis National Task Force and OSTEOS which will work closely with the MOH and the WHO Lebanon office. These include: revision and dissemination of the current Lebanese Osteoporosis Guidelines, development of national quality assurance measures for densitometry testing<sup>7</sup> and guidelines for the use of FRAX<sup>®</sup> Lebanon, vitamin D assays, collection of national data on non-hip fractures, and assessment of the social (morbidity and mortality) as well as economic burden of osteoporosis in Lebanon. Finally, collection of information on quality of life studies is also essential.

## KEY FINDINGS

The present population in Lebanon is estimated to be 4.3 million, of this 20% (850 000) is 50 years of age or over<sup>8</sup>. By 2050, it is estimated that 40% (2 million) of the population will be 50 or over while the total population will increase to 5 million (fig 1).

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



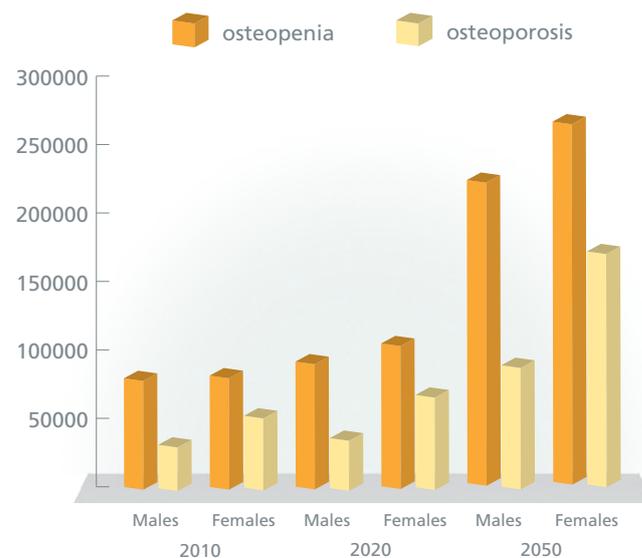
REF US Census Bureau

## EPIDEMIOLOGY

In a population-based study in which a random sample of 432 elderly subjects from the greater Beirut area aged 65-84 years was studied, osteopenia prevalence using

DXA at total hip was found to be 51% in women and 56.6% in men<sup>1</sup> (*unpublished data*). This would yield a total of 84 660 women and 82 636 men aged 65 and above with osteopenia, using the World Bank population data for 2010. In the same study of elderly subjects aged 65-84 years, osteoporosis prevalence using DXA at total hip was found to be 33.0% [27.5-38.8] in women and 22.7% [16.2-30.2] in men<sup>1,2</sup> (*published data*). This would yield a total of 54,780 women and 33 142 men aged 65 or above with osteoporosis, using the World Bank population data for 2010. Hip fractures occur at a younger age in Lebanon compared to Western populations, and 60% of patients with hip fractures have osteopenia rather than osteoporosis<sup>9</sup>.

**FIGURE 2** Number of osteopenic/osteoporotic individuals ≥ 65 years and projections



## Hip fracture

In a study using national registry data provided by the Ministry of Health<sup>3</sup>, crude incidence rates for those over the age of fifty varied across the years (2006-2008) between 164 and 188/100 000 per year for females and between 88 and 107/100 000 per year for male subjects. The calculated age standardized rates per 100 000 in the Lebanese ranged across the years between 329 and 370 per year in females and 110 and 134 per year in males. The study population was restricted to those individuals covered by the MOH, which represents around 50% of the Lebanese population<sup>3</sup>.

**NOTE** The corresponding age standardized rates (ASR's) for neighboring countries in the region and adjusted for the U.S. population were 330

and 224 for Kuwaiti women and men, respectively, and varied between 171 and 251 for women from Iran, and between 131 and 191 for Iranian men, depending on study site and year.

In a prospective study conducted in 1996, in which orthopedic surgeons completed a structured questionnaire, the estimated annual incidence rate of hip fracture in Lebanese subjects aged 30 or above was 129/100 000 person-years (women:153/100 000 person-years and men 100/100 000 person-years)<sup>10</sup>.

Projections to 2020 and projections to 2050: Assuming that current age-specific estimates of hip fractures prevail for the coming decades, the demographic transition, alone, will drive the overall crude rates among women to 179/100 000 persons per year in 2030 and 193/100 000 persons per year in 2050, and the overall crude rates among men to 124/100,000 persons per year in 2030 and 143/100 000 persons per year in 2050<sup>3</sup>.

In Lebanon, it is estimated that 98% of hip fractures are surgically treated.

### Hip fracture costs

In order to derive projected costs incurred from health care it is important to consider the sources of health care coverage of Lebanese citizens: 50% obtain their medical care through the Ministry of Health (MOH), 25% through the National Social Security Fund (NSSF), 12.5% through private insurance companies, and 12.5% through Co-ops, Army, Internal Security Forces. Some of this last group may be also covered by private insurers.

Direct (hospital) costs: In a 1999 Bulletin Report from the WHO, it was estimated that the cost per person varies, for example from USD 12 000 in Australia to USD 8700 in Lebanon<sup>11</sup>. It should also be kept in mind that these figures only represent the direct hospital costs; primary, outpatient and institutional care may multiply the real cost of hip fractures by 2.5. Therefore, the estimated total cost for Lebanon, direct and indirect, could be as high as USD 21 750 per person.

Using class II as a reference, the mean cost of surgical repair per hip fracture at AUB-Medical Center (a tertiary and academic care centre) is USD 12 126 (weighted average). The cost estimate provided by LOPS for average direct hospital cost for treating a hip fracture is USD 10 000. Using the Ministry of Health data,

the average cost for treating hip fracture is USD 2069 (weighted average).

Based on the above detailed breakdown for providers of health care in Lebanon, MOH, NSSF, and private insurers, the total cost for hip fractures per year is estimated to be USD 7 716 775. Projection to 2020: USD 10 186 143 total cost per year for all hip fractures; Projection to 2050: USD 17 902 918 total cost per year for all hip fractures.

The average hospital bed days for all hip fractures is 7-10 days.

According to a retrospective study, hip fracture patients admitted to the AUB-Medical Center from 1992-2002 with an age of >50 years had an average length of stay in hospital equal to 9.2 ± 7 days post hip fracture surgery<sup>12</sup>.

Using data from May 2010-2011 at AUB-Medical Center, average hospital bed days ranged between 2-10 days; averaging 6.5 days for femoral neck fractures, and 6.8 days for intertrochanteric or sub- trochanteric fractures.

**TABLE 1 Hospital bed days per year**

MEDICAL PROBLEM	BED DAYS PER YEAR
Hip fracture	7700 to 12 000
Breast cancer	8755
Ovarian cancer	855
Prostate cancer	3805

REF Lebanon Ministry of Health and National Cancer Registry of Lebanon 2003-4

Loss of productivity in the workplace is estimated to be around 6 months. In terms of social costs, according to a retrospective study of 100 cases from 1990-1994, 79% of hip fracture patients will regain the ability to walk normally while 18% will walk with help<sup>13</sup>.

### Vertebral fracture, other fragility fractures

In the same population-based sample, of subjects aged 65-84 years, the prevalence of vertebral fractures was estimated at 19.9% in women and 12.0% in men<sup>1</sup>. Furthermore, using the elderly population in a study assessing the effect of PTH and vitamin D on bone loss in addition to population growth data, the annual incidence of vertebral fractures in women was estimated at 1.5% [0.6-3.0]<sup>14</sup>. (manuscript is in preparation). This

would in turn translate to 2,490 [996-4980] women aged 65 and above sustaining a vertebral fracture per year.

## DIAGNOSIS

There are a total of 130 DXA machines in Lebanon, 8 of which are currently not in use, but only 82 machines are FDA approved (that is 0.19/10 000, or 19/million population). Distributors of the two major DXA companies in Lebanon estimate an increase of 4-5 machines per year from each company (i.e. around 10 total). Most equipment is located in urban centers.

The range of prices per DXA scan varies between LBP 30 000-255 000 / USD 20-170 depending on where in Lebanon the scan is done and how many sites it includes: 2, 3, or full body (Seventy densitometry centers provided updated information for the purposes of the audit). Many centers are no longer performing 2 site DXA scans and opt to do the 3 sites instead. Therefore, the mean cost for a DXA scan based on the 3 site DXA scan price is LBP 93 000 /USD 62 and the median cost is LBP 78 000 LBP/USD 52. The waiting time for a scan is usually less than 1 day but in some academic institutions the length of wait can be up to 1 week depending on the workload as well as availability of technicians.

## REIMBURSEMENT POLICY

Reimbursement for outpatient tests and care also depends on type/source of health coverage as detailed above. In terms of DXA, there are several government health plans that reimburse patients with anywhere between 80-100% of the price of the DXA scan. In terms of medication coverage, the MOH (government insurance) covers bisphosphonates, calcitonin and parathyroid hormone but not strontium ranelate or raloxifene. Preference of coverage will be given to the generic drug if one exists.

There are no conditions that must be met for an individual to be reimbursed by the NSSF. It covers all approved medications and reimburses the patient with 80% of the price of the medication as long as the patient has a BMD T-score < -2.5 or a report from their physician.

Most of the diagnostic tests are reimbursed by private health care insurance. Treatments can be reimbursed by private health care insurance plans but this is not the

general rule for outpatient insurance coverage, unless the patient has purchased specific premiums to do so.

## CALCIUM AND VITAMIN D

Calcium, Vitamin D supplements and fortified foods are available.

In a study addressing the risk factors for vitamin D deficiency, 251 postmenopausal women were asked about the consumption of calcium and vitamin D-rich foods and a mean milk intake of only half a cup daily was reported. This was attributed to the high prevalence of lactose intolerance in the Lebanese population<sup>15</sup>. Various studies conducted on Lebanese adults report a noteworthy prevalence of hypovitaminosis D<sup>16</sup> and have subsequently verified that this problem can be a significant contributor to bone loss<sup>14,17</sup>.

Lifestyle prevention programmes do not exist but several societies are working to promote awareness and therefore prevention of osteoporosis.

## PREVENTION, EDUCATION, LEVEL OF AWARENESS

Osteoporosis is not yet recognized as a major health problem in Lebanon but active efforts to raise its profile are underway: the National Task Force for Osteoporosis was appointed by the MOH in March 2010 and includes members from all relevant disciplines (endocrinology, rheumatology, orthopedics, radiology, and obstetrics and gynecology). The mission of such a task force is to establish a national programme for osteoporosis, generate protocols for the treatment of osteoporosis, and create a national registry to determine the prevalence of hip fracture and its causes. Other priorities include assessment of disease burden using measures of morbidity and mortality.

There is no adequate evidence assessing public awareness of osteoporosis in Lebanon. However, in a 1999 Bulletin Report of the WHO, awareness polls showed that around 75% of the Lebanese adult population had heard of osteoporosis<sup>10</sup>. This is most likely attributed to the efforts of LOPS, which specifically includes public information in its programme. However, few data exist from recent population based samples, and little is known about healthy behaviours regarding osteoporosis prevention.

## LEVEL OF AWARENESS AMONG HEALTH CARE PROFESSIONALS

Proportion of patients with osteoporosis that are treated with supplementation: In 1995, bone densitometry became available in Lebanon and awareness of osteoporosis increased. This is reflected in a retrospective study conducted by Hreybe et al. in which hip fracture patients admitted to AUB-MC between 1992 and 2002 were studied<sup>11</sup>. There was an increase in the proportion of hip fracture patients receiving calcium supplementation on admission between the period before 1995 and the period after 1995 increasing from 2.1% to 8.7%,  $p=0.013$ . Similarly, there was an increase in the proportion of hip fracture patients receiving calcium supplementation on discharge between the period before 1995 and the period after 1995, increasing from 3.4% to 11.4% ( $p=0.07$ ). This can be considered a reflection of the greater HCP awareness of osteoporosis due to increased diagnosis by densitometry.

Educational Materials for Health Care Professionals: OSTEOS has been involved in producing a newsletter four times a year to update Lebanese physicians on the most recent developments in osteoporosis research, diagnostic care, practice guidelines and upcoming bone programmes. Physician oriented osteoporosis office materials specific to the Lebanese osteoporosis guidelines and FRAX Lebanon have also been produced and distributed at major local and regional bone meetings. Moreover, a BMD workshop that was organized by the founders of OSTEOS was held in 2002, prior to the society foundation. Two densitometry courses have been held by OSTEOS in collaboration with the ISCD, were attended by over 200 registrants, and resulted in ISCD certification of around 95 individuals. As of 2009, yearly scientific meetings have been organized by OSTEOS and co-sponsored by the Ministry of Public Health, the Lebanese Order of Physicians, and the WHO. As of 2011, additional collaborative interdisciplinary symposia have been organized between OSTEOS and several other key scientific societies concerned with osteoporosis namely: the Lebanese Society of Radiology, the Lebanese Oncology Society, the Lebanese Society of Obstetrics and Gynecology and the Lebanese Society of Rheumatology. These have been a useful means by which updates on bone disease, diagnosis, and management were relayed to a large base of internists and specialists concerned with osteoporosis.

LOPS has also been involved in health care professional awareness through its national symposia, the launching of a Middle East Training Course on Osteoporosis in 2005, and most recently by producing guidelines for fragility fractures. Furthermore, their active collaboration with the Pan-Arab Osteoporosis Society has increased health care professional awareness in the Middle East.

### Guidelines

Lebanese guidelines for osteoporosis assessment and treatment were published in 2002 and have been most recently updated in 2007. The guidelines were reviewed and endorsed by the Lebanese scientific societies of endocrinology, orthopedics, obstetrics and gynecology, radiology, rheumatology, and subsequently by the Eastern Mediterranean Region Organization of the WHO. Currently, the updated guidelines have been endorsed by the 5 Lebanese scientific societies, the Lebanese Society for Osteoporosis and Metabolic Bone Disorders (OSTEOS), the WHO-Lebanon, and the MOH. The guidelines cover several important issues including whom to test, what measures to use, and when to treat<sup>4,5</sup>. In addition, the Lebanese Osteoporosis Prevention Society (LOPS) has most recently produced guidelines for fragility fractures that were approved by the Ministry of Public Health in addition to the Lebanese Orthopedics Association, the Lebanese Society of Physiotherapy and Rehabilitation, and the Faculty of Medicine at Saint Joseph University<sup>6</sup>. Furthermore, regional guidelines on osteoporosis for the Middle East and North Africa were also developed and endorsed by societies throughout the region including the LOPS<sup>19</sup>.

There are several important issues that need to be considered:

- Lack of national data on non-hip fractures (hip fracture data currently available are from the MOH)
- Lack of investigations about the social and economic impact of hip fractures and osteoporosis (i.e. morbidity, QALYs)
- All necessary medical specialties and allied health professionals need to be well equipped and well trained in the management of osteoporotic patients. This entails proper distribution of the Lebanese guidelines not only to health care professionals but to the allied professionals as well
- Lack of national quality assurance measures for densitometry testing to allow for better detection
- Lack of data on risk factors such as diet, physical activity, and other lifestyle patterns
- Gaps in fracture management

## RECOMMENDATIONS

At an individual level, programmes in lifestyle prevention that target both men and women at younger ages should be instituted. For example, just as the young are encouraged to engage in the necessary steps to prevent obesity, similar actions need to be taken for osteoporosis. Furthermore, awareness campaigns covering both urban and rural areas in Lebanon would not only prompt lifestyle changes among those previously ignorant of osteoporosis risk but would also encourage those that are at greatest risk of osteoporosis and hip fracture to make active decisions regarding their health. Furthermore, it is necessary to properly assess healthy behaviour with regards to osteoporosis and identify the barriers preventing individuals from engaging in appropriate lifestyles.

At a national level, the National Task Force for Osteoporosis and relevant societies must work together to revise and disseminate the current Lebanese Osteoporosis guidelines, develop national quality assurance measures for densitometry testing<sup>7</sup> and guidelines for the use of FRAX<sup>®</sup> Lebanon, perform vitamin D assays, collect national data on hip and non-hip fractures through creation of national registries, while promoting data collection through healthcare facilities, and assess the social (morbidity and mortality) as well as economic burden of osteoporosis in Lebanon. It is only through this joint effort that all relevant health providers can be reached and subsequently reinforce prevention and detection of osteoporotic fractures.

Health care professionals (HCPs) will continue to be involved in two significant stages. The first stage entails the endorsement of the national guidelines and of all recommendations issued by the National Task Force through their respective scientific societies. The second stage necessitates their participation in educational sessions to disseminate the guidelines and enhance osteoporosis and hip fracture care in the country.

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