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International Osteoporosis Foundation

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# Osteoporosis in the Workplace

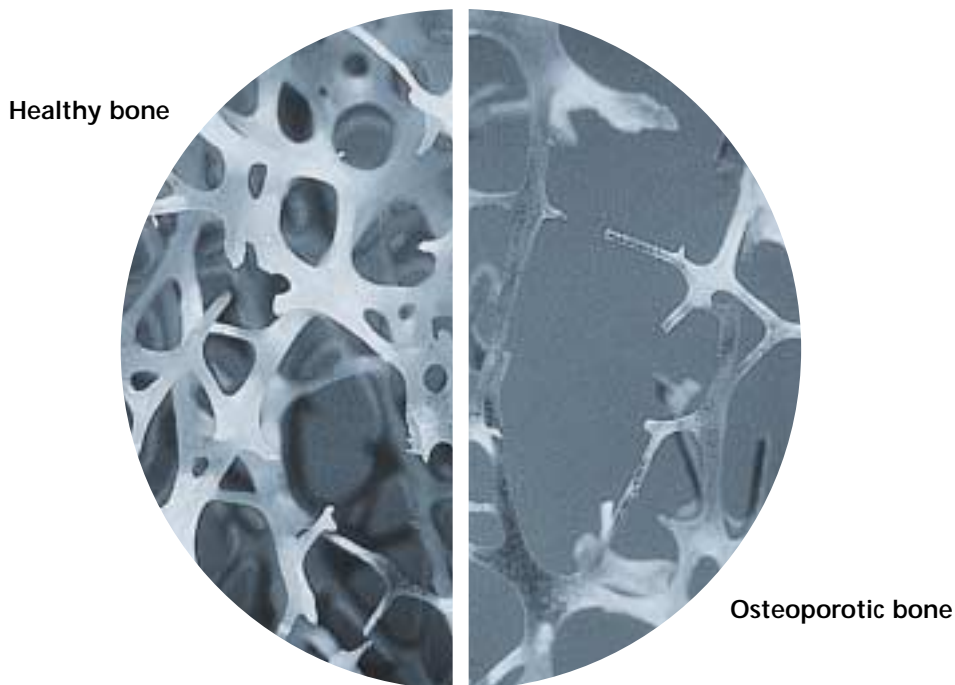
The social, economic and human costs of osteoporosis on employees, employers and governments

Prepared by the World Health Organization Collaborating Center, Liege, Belgium on behalf of the IOF Committee of Scientific Advisors



## 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 many affected people, bone loss is gradual and occurs without symptoms or warning signs until the disease is advanced. Osteoporosis is a global problem which is increasing in significance as the population of the world both grows and ages. For these reasons, osteoporosis is often referred to as the “silent epidemic”.

Invest in your bones

# Osteoporosis in the Workplace

The social, economic and human costs of osteoporosis on employees, employers and governments

## ■ Foreword

*It is time to recognise that osteoporosis does not only affect the elderly.*

*Osteoporosis affects people at various stages of life, including millions of people who are actively working.*

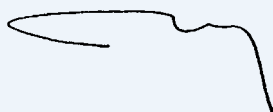
*These people have been ignored in most studies, but the preliminary calculations in this publication show that osteoporosis in the workplace results in huge economic and human costs.*

*This report estimates that the annual direct costs of treating osteoporosis fractures of people in the workplace in the USA, Canada and Europe alone is approximately \$48 billion. This cost, of course, does not include the indirect economic costs and the huge emotional price that has to be paid by someone who has broken a vertebra or hip – I urge you to read the stories of human suffering in this publication.*

*Women and men are staying longer in the workplace. In many parts of the world people have no health insurance or compensation for loss of income due to their disability. Also, many health insurance schemes will not cover diagnosis and treatment prior to the first fracture.*

*This report includes useful recommendations on what should be done to reduce the burden of osteoporosis in the workplace. It also stresses that additional research is required.*

*We urge everyone concerned to take immediate steps to reduce the impact of the “silent epidemic”.*



Pierre D. Delmas  
President, IOF-International Osteoporosis Foundation

# The problem of osteoporosis in the workplace

Why write a paper about osteoporosis in the workplace when osteoporosis is generally seen as a disease of the elderly?

Like so much discussion about this widespread disease, the concept that osteoporosis only affects old people is not correct.

Worldwide, osteoporosis is estimated to affect one in three women and one in eight men over the age of 50. (see pages 17 and 18 for more statistics about the impact of osteoporosis).

It is true that osteoporosis affects people later in life – more than two women out of three have osteoporosis by the age of 80, which represents a five-fold increase compared to women aged 50 to 59. Nevertheless, a significant number of younger people who are economically active suffer from the osteopenia (low bone density) or osteoporosis (significantly low bone density).

Many of these people will break bones – primarily at the hip or spine – and their lives will change dramatically for the worse.

In younger people, who are more likely to be economically active, vertebral fractures cause a much more significant impact than hip fractures. Some studies have shown that quality of life following vertebral fractures is reduced much more severely than following hip fractures.

Osteoporosis results in significant direct costs for medical care to treat fractures and pay for medication.

In addition, osteoporosis results in huge indirect costs that are rarely calculated. For example, a worker with osteoporosis might lose her or his job, incur medical expenses that are never calculated by economists, and suffer other economic losses.

If the osteoporosis results in a debilitating fracture, the worker is likely to suffer a severe loss of self-esteem, which of course has a huge emotional cost.

The employer is likely to face economic costs in terms of loss of efficiency and productivity and the costs of replacing the employee.

There are few data available to put a precise cost on the economic or social burden of osteoporosis on the workplace and more research is needed. One of the problems in calculating this cost is that people with osteoporotic fractures are seldom diagnosed with the disease.

## Just one in two osteoporotic vertebral fractures is diagnosed by a physician.

Consider the case of David Tomlinson in the United Kingdom, who was forced to quit his job as a travel agency manager because of severe back pains. His doctors did not suspect he had osteoporosis (although one of them frightened him by suggesting he might have a tumor on his spine) until nine months after the first fracture, by which time he had suffered 11 additional vertebral fractures. This “missed diagnosis” is unfortunately not uncommon, especially when you consider that just one in two osteoporotic vertebral fractures is diagnosed by a physician, and the frequency of correct diagnoses is even lower with more “mundane” fractures such as the fracture of the wrist [Kanis and McCloskey].

The result of this missed diagnosis is that less than 10%-20% of all osteoporosis patients receive timely treatment [Center, et al]. Tragically, about half of hip and vertebral fractures can be prevented, if osteoporosis is treated promptly and adequately.

Osteoporotic fractures can be fatal. The lifetime risk of women dying from hip fracture complications equals the risk of dying from breast cancer. Yet, although osteoporosis kills people, osteoporosis is rarely listed on the death certificate as the cause of death since people die from medical complications resulting from fractures rather than from the fractures themselves.



The challenge in preparing this paper has been to extrapolate from existing epidemiological studies in an attempt to begin to calculate the cost burden of osteoporosis. **The authors are aware that these calculations are preliminary and invite other researchers to continue research into the impact of osteoporosis in the workplace.**

In addition, the case histories in this publication will hopefully remind the reader that osteoporosis causes considerable human suffering and that this suffering can never, and should not, be calculated solely as a monetary loss.

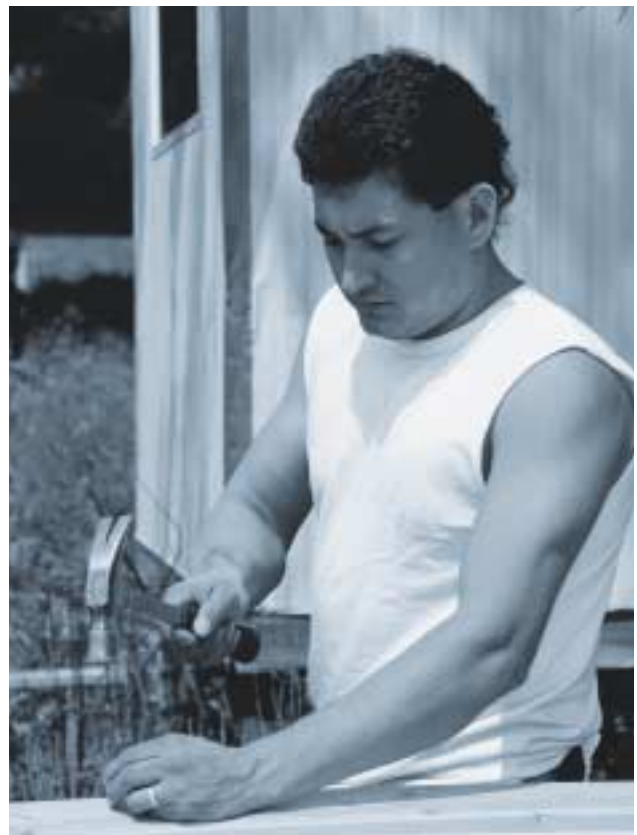
The troubling paradox is that osteoporosis can, to a certain extent, be prevented, it can be easily and painlessly diagnosed, and it can be effectively treated.

Everyone has a responsibility to take care of their bone health. One of the main obstacles is that most government and private health care systems only pay for osteoporosis and treatment after the first fracture. This should be changed to providing diagnosis and testing for people at risk before the first fracture.

Some of these preventive measures could also be supported by employers; few employers today recognise their powerful role in caring for the bone health of their employees.



**Osteoporotic fractures result in huge indirect costs that are rarely calculated.**



# Economic costs of osteoporosis in the workplace

We have relatively accurate data from several countries about the direct costs of treating hip fractures of all patients. We have relatively poor data relating to the costs of treating vertebral fractures, and related morbidity, mortality, loss of working days and pharmacological preventive strategies.

There are virtually no studies calculating indirect costs but an educated guess would place **indirect costs as at least 20% of the direct costs**. Because of the imprecision of this estimate we have not tried to calculate secondary costs in this paper but encourage other researchers to do so.

Younger people – those more likely to be working – recover faster than older people and therefore require fewer hospital days following a hip or vertebral fracture. Younger people also are less likely to require long-term hospital or nursing home care.

However osteoporotic fractures in patients younger than 60 lead to higher relative indirect costs: sick leave, loss of job days, unemployment payments, loss of productivity, community expenses, as well as psychological distress.

## Direct costs

Direct healthcare costs form the largest proportion of the economic cost burden of osteoporosis.

As stated earlier, many people suffering from osteoporosis are not diagnosed with the disease, so **the true cost**

**burden estimates for osteoporotic fractures are probably significantly higher than estimated.**

We have reliable statistics that indicate the direct costs of osteoporotic fractures in terms of hospital stay, and management of acute and chronic fractures, and continued medication.

We have broken the cost calculations into two groups – hip and vertebral fractures.

### Hip fracture

What does a hip fracture cost?

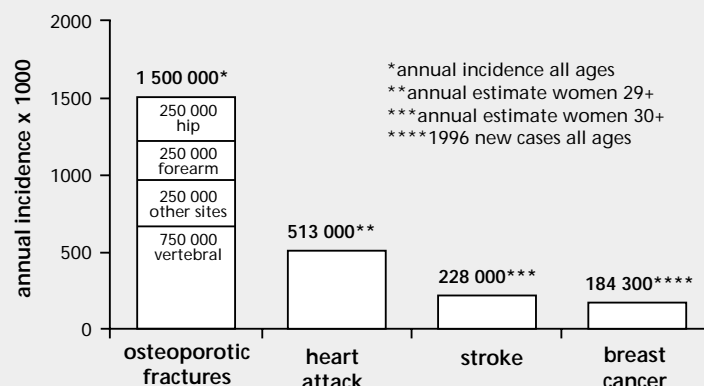
The average cost of care during initial hospitalisation for hip fracture is about \$7,000 per patient [Johnell]. By the end of the first four months, accrued costs increase to about \$12,000 [idem]. The costs reported by the end of the first year following a hip fracture are more difficult to calculate, because different costs are included in different studies. Without going into detail on these calculations, **we can estimate that the average cost of treating a hip fracture for the first year is \$20,000**. [idem] This may prove to be a low estimate, at least for North America and Europe – one study calculates the direct cost of each hip fracture in Switzerland as more than \$35,000 [Schurch, et al].

### Vertebral fracture

Costs for vertebral fractures are variable, because of the lack of standardisation between the available studies. A generally accepted estimate that we will use is that the **approximate direct cost of a vertebral fracture is \$1,200** [Johnell, et al]. The cost of treating a vertebral

## Osteoporotic fractures in women: comparison with other diseases

Riggs BL, Melton LJ. Bone. 1995  
Heart and Stroke Facts. 1996. American Heart Association.  
Cancer Facts & Figures. 1996. American Cancer Society.



fracture is lower than treating a hip fracture because there is usually no surgery involved.

### People in the workplace

While we have estimates of direct hospital costs for people with osteoporotic fractures, how can we determine how many of those patients are in the workplace and the respective costs of their fractures?

This is not a simple task.

Here is how we have developed our rough calculations. First, we do not have sufficient data to make a global calculation about the economic impact on the workplace. We have adequate data to determine **approximate** costs in the European Union, United States and Canada.

The percentage of people in various age groups who are working was considered similar for the European Union, United States and Canada. For the sake of this study we focus on people who are economically active aged 50 and above, shown below, statistics from 2000.

### Numbers of people economically active in EU, USA, Canada by age group

	55-59	60-64	65+
EU	15060	10339	9203
USA	9470	5343	5050
Canada	1080	618	562

Values are thousands (x1000)

We know that the incidence of hip and vertebral fractures are roughly equal in Europe, the United States and Canada.

We can estimate the percentage of those people who are working who will fracture a hip or a vertebra.

### Fracture rates according to age groups (includes both hip and vertebral fractures)

55-59	60-64	65+
0.8%	1.2%	13.2%

Direct costs were considered similar in the United States, Canada and European Union.

The direct cost of treating a hip fracture has been set as US\$20,000 for the first year.

The direct cost of treating a vertebral fracture has been set as US\$1,200 [Johnell, et al].

Therefore, the annual direct costs for USA, EU and Canada come to:

USA	Europe	Canada
\$30,938,502,384	\$17,099,356,080	\$1,913,456,880

With this calculation, our preliminary estimate of the annual direct costs of treating osteoporosis fractures of people in the workplace in the European Union, Canada and the United States is approximately \$48 billion per year. This amount is similar in scope to the estimated \$53.7 billion spent annually on global foreign development aid.

The annual direct costs of treating osteoporosis fractures of people in the workplace in the EU, Canada and the USA is approximately \$48 billion per year.



Statistics do not reflect the economic impact of "minor" osteoporotic fractures.

### ■ Indirect costs

Direct healthcare costs form only part of the economic cost of osteoporosis and associated fractures. The morbidity and mortality effects of osteoporosis also incur significant costs, described as "indirect costs".

Indirect costs also include loss of income to the employee, loss of productivity to the employer, costs to a country's social welfare system including unemployment and disability pay, health insurance payments and rises in insurance premiums.

These indirect costs are unlikely to ever be calculated to anyone's satisfaction, but they are likely to be huge, and must be taken into account when discussing the osteoporosis burden on the individual and society.

Vertebral fractures are more serious as a workplace problem than are hip fractures because they are more likely to afflict younger people, even around the age of 50 or earlier. Clinical symptoms of vertebral fractures include back pain, limited spinal mobility, height loss, deformity and disability - all of which can have a severe impact on a person's overall quality of life.

Studies show that following a hip fracture, 40% of individuals cannot walk independently, and 80% or more are unable to carry out at least one activity that they formerly did independently, such as shopping [Lips, et al].

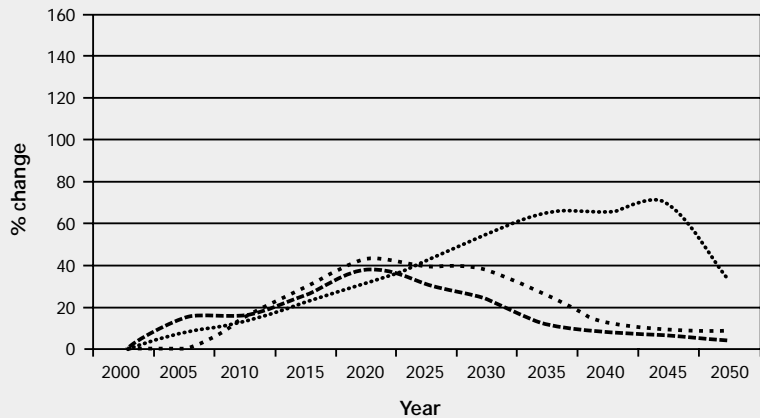
The patient is likely to lose working days for which she or he might not be compensated. There are also significant mental, emotional and social repercussions to osteoporosis as well.

And the employer is likely to have significant indirect costs in terms of loss of productivity, payment of workmen's compensation and health claims, need to hire and train new staff.

People die following a hip fracture – approximately 12-20% die within one year [Sernbo and Johnell]. This fact is obviously far more important than the loss of produc-

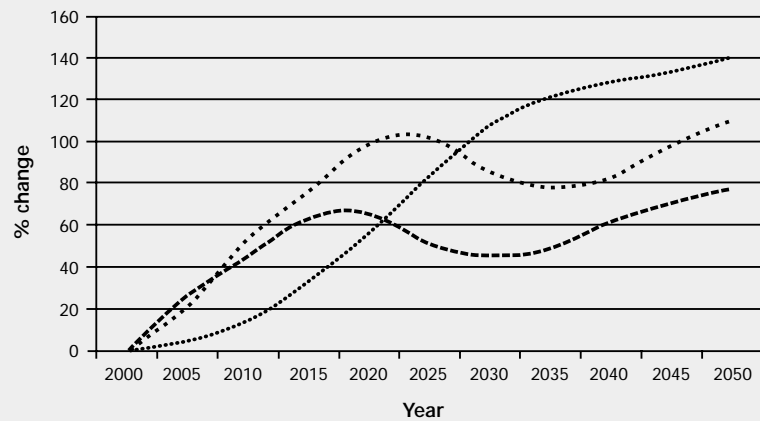
### Projections of vertebral fractures according to age groups: European Union

- ..... 65+ age group
- ..... 60-64 age group
- ..... 55-59 age group



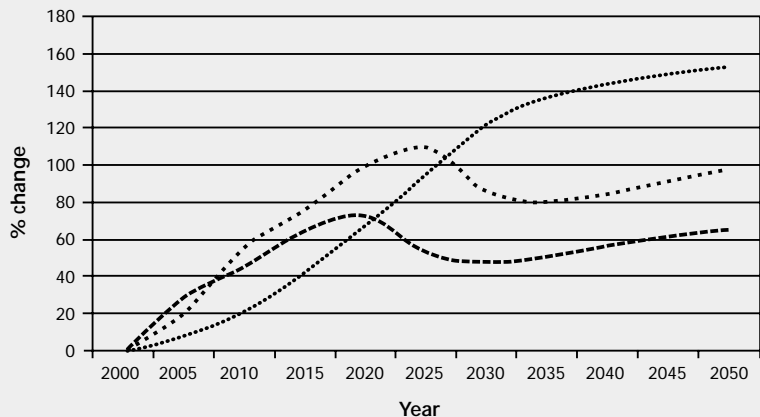
### Projections of vertebral fractures according to age groups: USA

- ..... 65+ age group
- ..... 60-64 age group
- ..... 55-59 age group



### Projections of vertebral fractures according to age groups: Canada

- ..... 65+ age group
- ..... 60-64 age group
- ..... 55-59 age group



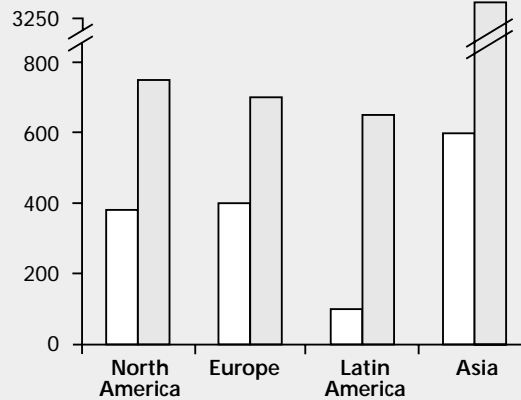
Compiled by Florent Richy based on UN demographic data and published studies on fracture rates



## Projected burden of osteoporotic hip fractures worldwide

Estimated n° of hip fractures (1000s)

□ 1990  
■ 2050



Total n° of hip fractures:  
1990 = 1.66 million;  
2050 = 6.26 million  
Adapted from Cooper C., Melton U.,  
*Osteoporosis Int.* 2:285-289, 1992

tivity. A study of osteoporosis in the United States estimates the value of lost productivity due to missed work at less than 1% of total economic costs whilst the value of premature death accounts for 35.3% [idem]. Together the indirect costs of lost productivity and premature mortality from fractures (mostly, but not all related to osteoporosis) amount to between \$4.5 billion and \$6.4 billion in the United States alone.

## ■ Projections

The economic costs of osteoporosis in the workplace are certain to increase since the incidence of osteoporosis is growing at a significant rate.

The worldwide cost burden of osteoporosis is forecast to increase to \$131.5 billion by 2050 [Johnell, et al].

### Hip fractures

By 2040, the number of hip fractures in the United States is predicted to increase three times. By 2016, hip fractures are projected to increase by 30% in the United Kingdom, and by 82% in Australia. In a worldwide perspective, hip fractures are expected to increase by 270% by 2050, with only 25% of the fractures occurring in Europe and North America [Kannus, et al].

On the basis of demographic projections and assuming a similar relative rate of hip and vertebral fractures, it can be estimated that, by 2050, the total economic burden for hip fractures for working people between 50 and 59 years old, will be increased by 70% for the USA with an increase in health care expenditures of \$1.1 billion over costs in 2000. Europe will reach a 70% increase even faster, by 2020, with an increase in health care expenditures of \$900 million over current costs.

The economic impact is even greater when considering people aged 65 and older. For this age group, by 2050, hip fractures in North America and Europe will more than double, with an expected increase in related costs of \$17 billion compared to 2000.

### Vertebral fractures

By 2050, the predicted vertebral fracture rates for people in the workplace could lead to a 140% increase in the USA and 150% in Canada, which have younger (median age 36.9 in 2000) populations. Because Europe has a slightly older population (median age 37.8 in 2000) the predicted vertebral fracture rates in Europe will also increase, but to a smaller degree. Projections for Europe indicate a smaller increase in the incidence of vertebral fracture (70%) than North America, with a peak in 2040, followed by a decrease.



**“We must act now.”**

Dr. Gro Harlem Brundtland, director general of WHO, said in an exclusive interview with IOF that

good bone health requires the empowerment of both women and men. “Twenty-five years ago, the world’s leading experts in cardiovascular diseases warned of an impending epidemic of heart disease in developing countries,” she said. “This warning was largely ignored and we are now seeing a dramatic increase in prevalence of cardiovascular diseases in the developing world. We must not allow the same thing to happen for osteoporosis. We must act now.”

Dr. Brundtland predicted a significant increase in osteoporosis in the developing world and urged policy makers to collaborate with different sectors of society.

# The human cost of osteoporosis



Gail Lemieux  
Canada

**“I’m not  
about to give  
up now”**

Gail Lemieux’s working life was ended prematurely by osteoporosis.

A home care coordinator for a medical laboratory in Barrie, Ontario, Gail enjoyed her job working with people who could not come to the lab for medical testing, just as she enjoyed playing golf and gardening in her free time.

In March 1980, at the age of 40 she slipped on ice in front of her home and fractured two vertebrae. She was hospitalised for two weeks and spent about six months recuperating. Gail eventually recovered, but she was not investigated for osteoporosis, in spite of the fact that her mother has the disease and is confined to a wheelchair.

In 1990 Gail slipped on the stairs at home and fractured another vertebra. Within a year she broke another vertebra and suffered a compression fracture of the spine, a common “cascade” effect among people with osteoporosis.

In almost constant pain, Gail would have to leave work early and lie flat on her back at home until heading off to work again in the morning. “I didn’t really have a life at that time, certainly not of any quality,” remembers Gail.

Gail was put on Long Term Disability (a combination of private, employer and government insurance coverage) because of her constant pain, inability to do her job, and the likelihood that some of her fractures may have happened at work. “It is difficult to pinpoint when and where the later fractures had occurred,” says Gail. “And employers need to be concerned about possible liability issues for on-the-job injuries.”

Still in pain, and frustrated by the lack of assistance from her physician, Gail changed doctors and began to get some answers. Eleven years after her first fracture, Gail was finally diagnosed with osteoporosis.

“I had a dual reaction when I was diagnosed,” Gail says. “One reaction was thank goodness I have a diagnosis. My other reaction was what do I do? You know, I really don’t know anything about osteoporosis.

I thought because my mother (*see photo*) had it that was just something that happened to her and it never crossed my mind it would happen to me.”

“I still get a lot of pain if I do things I shouldn’t do,” says Gail. She cannot vacuum or dust. “Well, who likes housework anyway, you might say.” But she can no longer garden or golf. “So it makes for a restricted life,” she says.

Equally frustrating is the fact that her physical limitations can mean depending on others for help with activities she used to do herself. “Your independence can certainly be jeopardised,” says Gail.

Today Gail spends a lot of her time spreading the word about osteoporosis prevention. She advises women to look at their risk factors and discuss them with their doctor.

“I often wake up in the middle of the night and think oh my goodness am I going to wind up like my mom in a wheelchair in a nursing home requiring 24 hour care? That’s really scary.”

Gail has not returned to work since 1991. Battling additional health concerns today, Gail does her best to stay busy, active and positive. “I’m not about to give up now,” she says.

*Gail Lemieux is a former member of the Board of the Osteoporosis Society of Canada and appeared in the WOD 2001 video.*



Renu Dhall  
India

**“They told me  
to take some  
painkillers and  
live with it.”**

Renu Dhall, 56, is a primary school teacher. Since the age of 40, Renu suffered extreme back pain. “I couldn’t stand, and I was in so much pain that I couldn’t even sit down without great discomfort” she recalls.

Renu consulted several doctors, but none of them diagnosed her problem as osteoporosis. “They told me ‘back pain is common in women after multiple pregnancies,’ or ‘it’s related to your periods’, or ‘get your kidneys

checked.’ The only common refrain I heard from the doctors was ‘take some pain killers and learn to live with it.’”

During the period that Renu suffered without a diagnosis, her mother suffered multiple fractures and was confined to bed. Still, no one spoke to Renu about osteoporosis.

Two years ago Renu read in the Hindustan Times about a bone densitometry camp being organised by the Osteoporosis Society of India. She got a bone densitometry test done and was diagnosed with osteoporosis and offered treatment. After spending years in agony, Renu got what she terms “a new lease on life”.

Since joining a local osteoporosis support group, she says “My outlook on life is much better.” Renu exercises regularly and has learned guidelines to reduce the risk of fracture. Renu feels so much better in fact, that she was able to return to teaching. Although unable to work her usual hours, she finds happiness in teaching shorter periods at a more leisurely pace.

Her message to others is simple – “Do not put up with pain. Insist that your doctor test you for osteoporosis”.



**Dan Mortell**  
USA

**“Every month I  
break a rib”**

What happens to a man who, at the age of 33, realizes that his life has been “irreversibly turned upside down”?

Dan Mortell was the maintenance supervisor for a brand new bottling plant for a major soft drink manufacturer in Washington State. He ran the entire maintenance operation – repairing broken equipment, greasing the machines, adjusting boilers and refrigeration systems. “It was very physical,” he recalls. “I walked all day and wore a 15 pound tool belt.”

Dan experienced chronic foot pain in the spring of 1988. None of the five specialists he consulted could accurately diagnose his osteoporosis – they suggested his problem might be due to arthritis, or possibly psychosomatic illness. “I couldn’t walk,” he says. “I got crutches, but even that was too difficult.”

“I told my boss I wanted to quit,” but he said ‘No way, you have to stay.’ By the end of June he got me a wheelchair. I used my eyes and brains, but someone

else’s hands to repair the equipment.”

In one way, Dan was lucky. “We were a non-union facility but we got great health benefits. They kept me on their medical plan for five years. I’m sure I wouldn’t have had that support at my previous job.”

In January of 1989 he fractured a vertebrae, and a bone densitometry test revealed that he had lost 70% of his bone mass. He worked another month but he couldn’t handle the pain and had to quit in February 1989.

Dan has had more operations than he can remember, including seven surgeries on his hips to implant various plates and screws. Steel rods have been inserted in both of his femurs.

Dan, now 47, has fractured every vertebra in his back, and fractures his ribs almost monthly. “My ribs or vertebrae can fracture from simply coughing or sneezing,” he says. In spite of his continuing fractures, Dan feels that “my fracture rate would be even higher without the medication that I’ve been prescribed.”

He has lost 23 cm in height, and is mostly confined to a wheelchair. “I can no longer play catch with my son, ride a bike with my daughter, or walk on the beach with my wife,” he explains.

“Osteoporosis is not just a disease of the elderly,” he says. “It can be very debilitating and extremely painful.” Dan recommends that people talk to their physicians about the risks of osteoporosis and insist on a bone density test when it is indicated. In spite of the fact that Dan and his mother had osteoporosis, both of his sisters had to insist that their physicians give them a bone density test. “Both were found to have low bone density,” he notes, “and are taking medication so they don’t wind up like me.”

*Dan Mortell is featured in the Oliviero Toscani photo exhibition “Osteoporosis: A Photographic Vision”, which is part of the IOF European Osteoporosis Tour.*



**Jamal Saleh**  
Bahrain

**“I developed a sudden fear of most physical activities”**

“Before I knew I had osteoporosis I was physically very active. In my medical practice I used to rush about unconcerned about falling. Once I knew I had osteoporosis I developed a sudden fear of most physical activities; maybe that was an over reaction but it was a true feeling. I now walk with care and with less confidence. I particularly avoid all slippery surfaces and polished hospital floors. When I walk up or down stairs I go slowly, watching where my feet go in every step. I was not like that before.

“Gone are the days when I would bend down to examine patients' legs. I now ask them to lie on the examination table so that I can examine them with my spine straight.

“I often look at my colleagues and compare if I have become shorter than them. My original height was 179 cm, now it is 176 cm.

“I used to help lift patients on to the operating table; it was a good way of sharing responsibility and boosting team spirit. One day I panicked when I got a sharp pain in my back after an easy patient lift. I went straight to have an X-ray taken of my spine and thankfully it was clear, no osteoporotic fracture of the vertebrae. I no longer help lift patients.

“I try to avoid doing major spine surgery; many of these operations take a minimum of three hours of continuous standing. I used to enjoy them; I still do, but suffer at the end of the day. My back, legs, and feet would hurt for a day or two afterwards. I know that long standing is not good for osteoporosis and I also feel my bones less strong than before, as they ache more.

“I am taking more time out of my huge stock of accumulated annual leave, basically taking it easier with more breaks from my busy practice. I believe I should stay very active and productive but I also believe I should pay more attention to my body's needs.

“I take my medications every morning, religiously, the calcium tabs and vitamin D and the once-weekly bisphosphonate tablet.

“I had a recent DEXA measurement of my bones and there was some improvement. I was encouraged, although I tell my patients with osteoporosis not to be disappointed if their DEXA doesn't show an immediate improvement while on treatment. I sometimes feel odd

in reassuring my patients whose conditions are not improving while I know that my bone density is improving. Osteoporosis has changed many aspects of my medical and surgical practice, but it has not forced me to change my career yet. I hope it won't come to that.

*Jamal Saleh, an orthopedic surgeon, is president of the Bahrain Osteoporosis Society*



**Norma Larrea**  
Mexico

**“I'm a very lucky woman”**

The “workplace” includes the home just as much as the office. Although not paid a salary, nor eligible for unemployment, many people who work in their homes suffer from osteoporosis disabilities with serious consequences for their families and personal well-being.

Norma Larrea was lucky.

“I was a soccer mom, always driving the kids to sports events and parties,” this energetic 55-year-old Mexico City woman explains. “Then I got pain throughout my body, in all my joints. I couldn't do my household chores, let alone think about continuing my sports.”

Norma Larrea had osteoporosis. But her gynecologist never considered that she might have the bone disease that has been called “the silent killer.” He simply gave her analgesics and anti-inflammatory drugs, and told her to take it easy.

Her husband, a specialist in nuclear medicine, attended a lecture on osteoporosis. He immediately recognised the symptoms and insisted that his wife consult with a specialist.

“That was in 1990, and at that time densitometry was very new in Mexico,” her husband, Dr. Eduardo Larrea, explains. Her new physician, who was an osteoporosis expert, prescribed medication that Norma had to go to San Antonio, Texas, to buy since it was not available in Mexico.

Her bone mass has increased to just below the mean for her age, and her physician expects her bone mass to stabilise above the mean within a year or two.

“I'm a very lucky woman,” Norma Larrea says. “My osteoporosis was detected early, before I had any fractures. My bones have recovered their strength. I now swim, and sleep the whole night without pain.”





**David Tomlinson**  
UK

**“The travel industry was my life ...I do miss it.”**

His professional career came to an end in May 1998 at the age of 44. As manager of a travel agency in Yorkshire, UK, David was invited with other agents to a familiarization trip to Dubai. One of the local hotels arranged a social get together on the beach. “We were playing volleyball”, he remembers. “I went to hit the ball, missed it completely and crashed on my back. The pain was excruciating, I couldn’t move.”

He was taken to a hospital in Dubai which showed a fracture of the lumbar area of the spine. After ten days in Dubai he was flown on a stretcher to England.

Then began a frustrating and painful eight months. He was in and out of hospital, seeing “a different consultant at each visit.” He was given pain killers, and a support corset. Nothing worked. “Even sitting caused great pain; it was better to lie flat or stand. It even hurt to breathe.”

David wanted to return to work but couldn’t drive the 25 miles to his office. He asked a friend to drive him, but nevertheless the pain was so great that he couldn’t continue.

“My employer was initially understanding,” David recalls. “He paid me a portion of my normal salary but as time went on he pressured me to let him know when I would return to work. I was totally distressed. My job was everything to me but I physically couldn’t do it.”

Fed up with the national health system, David sought out a private consultant. After several months of tests the consultant came up with a dramatic theory, telling David “you might have a tumor on your spine.” But the consultant suggested a second opinion.

David sought yet another opinion. By mid-December 1998 David was introduced to a professor who diagnosed severe osteoporosis.

The scans showed that since his initial accident David had suffered 11 additional vertebral fractures.

“I had never heard of osteoporosis,” David recalls. The doctor told me I had the spine of someone twice my age. But it didn’t make sense. I’ve always eaten milk, cheese, and yogurt. I’ve always played sports.”

David Tomlinson was forced to retire from his job. He still can’t sit for any length of time. He joined the

National Osteoporosis Society in the UK. “They’ve helped me tremendously” he says. “I’m secretary of the local osteoporosis support group and I see other people my age or younger with osteoporosis. Obviously there’s a huge lack of awareness among doctors – they think it only affects older people.”



**Jintana Bounsombat**  
Thailand

**“The pain was so strong that I could hardly stand.”**

For most of her working life, from the ages of 24 to 50, Jintana Bounsombat, of Bangkok, worked at a printing company.

She used a low-dose steroid to treat bronchial asthma, and she was able to work unhindered. However at the age of 49, she was admitted to hospital because of an acute jaundice attack. She was diagnosed with cholecystitis and had her gall bladder removed. Part of her post-operation treatment was a high-dose steroid. She returned to work, but after a year, at the age of 50, she suffered severe back pain.

“The pain was so strong that I could hardly stand,” she says. “It was impossible for me to continue working.”

She saw an orthopedic surgeon who took X-rays that revealed multiple compression fractures of her lumbar spine resulting from steroid-induced osteoporosis. The surgeon prescribed analgesic drugs and calcium tablets.

Jintana had to resign from her job and stay at home, as an invalid without any financial support from her employer. She lived with what she called “self sufficient economy”.

Her osteoporosis progressed and she suffered the classical “cascade” effect of additional spinal fractures in the thoracic vertebrae, which has led to a kyphosis and loss of height. Then her rib cage collapsed into her pelvis, causing her even more pain and discomfort.

Jintana is now 74, and rarely leaves her home.

She warned other women in similar situation to be aware of osteoporosis and visit the doctor more often for prevention and prompt treatment of osteoporosis.





**Valentina Ninova**  
Bulgaria

**“My professional life is finished.”**

Valja's face is candid, friendly – only the cane she leans on tells of the pain she suffers with every step.

Mrs Valentina Ninova, called Valja by her friends, was teaching kindergarden when she first felt the back pain. “I was standing in front of the class and I had to sit down. I almost collapsed. The pain was like a rocket going through my spine,” she says. She was just 38.

At the time Valja was treated for a slipped disc, given pain killers and underwent physiotherapy. Although her pain got worse, none of the numerous specialists she consulted could help her.

Like many women worldwide, Valja, who lives in a town in northern Bulgaria, was bounced from doctor to doctor before being diagnosed in 1997, at the age of 41, with osteoporosis. “It took five years for the doctors to discover that I had osteoporosis,” she says.

In retrospect, doctors should have recognized that her hysterectomy in 1992 at the age of 36, was a significant risk factor for osteoporosis.

According to Valja's physician, Dr. Delina Gueorguieva, her five-year frustrating odyssey from physician to physician is not untypical, since many otherwise qualified physicians are not trained to recognize the symptoms of osteoporosis. “First comes the visit to the neurologist,” Dr. Gueorguieva says, “then various clinical tests and X-rays of the vertebrae, when vertebral fractures may be diagnosed, and later the referral to a rheumatologist. Often, it is only then that a patient's bone density is measured and osteoporosis diagnosed”.

Valja's life has changed. A highly-trained teacher, she is now too disabled to work and lives with her mother and daughter who help care for her daily needs. She has begun to wear a corset this past year – uncomfortable, but necessary to relieve some of the pain of her vertebral fractures. “I cannot work at all, and my professional life is finished,” she says. “My social contacts are limited and I stay home alone.”

The health system in Bulgaria paid for the bone density test, but not for any medication. She is a widow, with no income except for a small disability pension, and cannot afford to buy the drugs that she needs to treat her osteoporosis.

In addition, Valja thinks that her 23 year old daughter Nadejda is in the early stages of osteoporosis, but Valja cannot afford the necessary examinations.

Valja hopes that other women in Bulgaria will not suffer as much as she has.



**Amalia Sorrentino**  
Argentina

**“The pain felt like a knife going into my body”**

Amalia Sorrentino worked as a medical secretary in a private medical clinic in Buenos Aires. At the age of 57 she fell and broke her wrist, but her doctor did not suggest that she might have osteoporosis.

Two years later she experienced a back pain that “felt like a knife going into my body.” She had trouble walking and for some time could not get out of bed. An X-ray showed that she had fractured a thoracic vertebra and a bone mineral density test showed that she had osteoporosis.

While she had returned to work following her wrist fracture the pain of the vertebral fracture was so great that she had to take a three-month leave of absence.

Her condition has improved somewhat with treatment, but she cannot perform the daily chores that most people take for granted. She has returned to work but her performance is greatly reduced. “If we need to do something as simple as moving a few files I have to ask someone else to lift them,” she says.

“I now see how important it is to get an early diagnosis of osteoporosis in order to prevent the first fracture,” she says.

# What can be done?

Individuals, health care professionals, government health services, private insurance companies and employers all have responsibilities and opportunities to reduce the impact of osteoporosis in the workplace.

Although not the focus of this paper, many of the lifestyle issues associated with building strong bones – healthy diet, exercise, stopping smoking and drinking, avoiding eating disorders such as anorexia, being aware of family medical history – can have a positive impact on a person's overall health.

## ■ The role of the individual

Each person should be responsible for his or her own bone health. Some suggestions:

- Learn about osteoporosis and discuss the disease with family, friends, co-workers.
- take the One Minute Risk Test (available on the IOF website: [www.osteofound.org](http://www.osteofound.org))
- maintain a bone-healthy diet, particularly sufficient in calcium and vitamin D
- exercise
- avoid smoking and drinking
- recognise the impact on your bones from eating disorders such as anorexia, and the impact from certain drugs such as corticosteroids.
- Encourage your employer to support osteoporosis prevention and diagnosis (see below).
- Lobby for political action to ensure that the national health care system provides diagnosis and treatment of osteoporosis prior to the first fracture (see below).
- Join a national osteoporosis patient society. Offer your skills, enthusiasm, support.

## ■ The role of the physician

The physician has a responsibility to recognise osteoporosis risk factors in patients, and where there is a likelihood of the disease to ask the patient to take a bone density test. If the test shows that the patient has osteopenia or osteoporosis, a number of approved medical treatments are available.

Physicians should be aware of diagnostic guidelines issued by the IOF or their national osteoporosis society.

## ■ The role of other health care professionals

Nurses, physiotherapists, dieticians, medical technicians and other health care professionals are often important and trusted contacts and have a key role in informing people about osteoporosis risks and treatment.

## ■ The role of researchers

There are few epidemiological research studies that focus on osteoporosis and the workplace. We need much more information.

## ■ The role of the public health sector and private health insurance companies

An immediate diagnosis followed by early treatment with effective pharmaceuticals would result in a 50% reduction in the rate of hip fractures and an even greater reduction in the rates of vertebral fractures. Also, randomized controlled trials report that it is never too late to administer supplementary calcium and vitamin D.

Numerous IOF initiatives, including the European Union "Call to Action" and the "Call to Action" issued by the international IOF Women Leaders' Roundtable, stress that public health authorities should "make diagnosis and treatment of osteoporosis prior to the first fracture a global health priority."

Regrettably, many countries do not provide diagnosis and treatment of osteoporosis until after the first fracture, if at all.

Also, in many parts of the world people have no health insurance or compensation for loss of income due to their disability (or their health insurance will not cover diagnosis and treatment prior to the first fracture).

## ■ The role of the employer

Employers should recognise that osteoporosis may affect their employees, with impact on productivity and morale. There may be significant costs in the form of health insurance payments, and workers' disability claims.

### Employers can:

- provide education programs about osteoporosis
- provide all employees with the One Minute Risk Test
- provide medical guidance
- ensure that company cafeterias serve calcium-rich, bone-friendly meals
- support sports programs
- support programs to help employees stop smoking or drinking
- give employees who are at risk time off to have a bone density test performed
- improve the physical workplace to reduce the risk of falls
- support national osteoporosis societies

## ■ Studies cited:

Center JR, Nguyen TV, Schneider D, Sambrook PN, Eisman JA. Mortality after all major types of osteoporotic fracture in men and women: an observational study. *Lancet* 1999, 353:878-82.

Cooper C. Epidemiology of osteoporosis. *Osteoporos Int* 1999, 9(Suppl 2):S2-8.

Cooper C, O'Neill T, Silman A. The epidemiology of vertebral fractures. European Vertebral Osteoporosis Study Group. *Bone* 1993, 14(Suppl 1):S89-97.

Dennison E, Cooper C. Epidemiology of osteoporotic fractures. *Horm Res* 2000, 54(Suppl 1):58-63.

Guralnik JM, LaCroix AZ, Abbott RD, Berkman LF, Satterfield S, Evans DA, Wallace RB. Maintaining mobility in late life. I. Demographic characteristics and chronic conditions. *Am J Epidemiol* 1993, 137:845-57.

Jensen JS, Tondevold E, Sorensen PH. Social rehabilitation following hip fractures. *Acta Orthop Scand* 1979, 50:777-85.

Johnell O. The socioeconomic burden of fractures: today and in the 21st century. *Am J Med* 1997, 103(2A):20S-25S.

Kanis JA, McCloskey EV. Epidemiology of vertebral osteoporosis. *Bone* 1992, 13(Suppl 2):S1-10.

Kannus P, Parkkari J, Sievanen H, Heinonen A, Vuori I, Jarvinen M. Epidemiology of hip fractures. *Bone* 1996, 18(Suppl 1):S57-63.

Lips P, Cooper C, Agnusdei D, Caulin F, Egger P, Johnell O, Kanis JA, Kellingray S, Lepage A, Liberman UA, McCloskey E, Minne H, Reeve J, Reginster JY, Scholz M, Todd C, de Vernejoul MC, Wiklund I. Quality of life in patients with vertebral fractures: validation of the Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO). Working Party for Quality of Life of the European Foundation for Osteoporosis. *Osteoporos Int* 1999, 10:150-60.

Magaziner J, Simonsick EM, Kashner TM, Hebel JR, Kenzora JE. Predictors of functional recovery one year following hospital discharge for hip fracture: a prospective study. *J Gerontol* 1990, 45:M101-7.

Schurch MA, Rizzoli R, Mermillod B, Vasey H, Michel JP, Bonjour JP. A prospective study on socioeconomic aspects of fracture of the proximal femur. *J Bone Miner Res* 1996, 11:1935-42.

Sernbo I, Johnell O. Consequences of a hip fracture: a prospective study over 1 year. *Osteoporos Int* 1993, 3:148-53.

The Burden of Brittle Bones: Costing Osteoporosis in Australia. Prepared for Osteoporosis Australia by Access Economics Pte Limited, Canberra, September 2001.

# Osteoporosis facts: The scope of the problem



## ■ Osteoporosis is common

Every thirty seconds someone in the European Union has an osteoporotic fracture. The incidence of osteoporosis will double in the next 25 years.

The lifetime risk of a hip fracture in women is greater than the sum of lifetime risks of having breast, endometrial and ovarian cancer.

The lifetime risk of hip fracture in men is greater than that of cancer of the prostate.

One out of five patients in the European Union with osteoporotic hip or spine fractures die annually, about 150,000 total.

In the UK one in three women over the age of 50 have osteoporosis. By comparison, in the UK one in 12 women have breast cancer.

Today, worldwide, some 50 million women suffer from osteoporosis. With the ageing of the population, in the next 5 years we can expect that some 55 to 60 million women will suffer from osteoporosis.

The incidence of osteoporosis in males, generally estimated at affecting one out of eight men, has probably been significantly under-estimated. In men, the lifetime risk of hip fracture is greater than that of prostate cancer.

Some 40% of middle-aged women and 15% middle-aged men will suffer one or more osteoporotic fractures during their remaining lifetime. And once a person has an osteoporotic fracture she or he is likely to have additional fractures in what is called a "cascade event".



## ■ Osteoporosis is fatal

In the Western world, the risk of dying following a hip fracture is greater than the risk of dying from gastric or pancreatic cancer. The lifetime risk for women of dying from hip fracture complications is similar to the risk of dying from breast cancer.

## ■ Osteoporosis is global and increasing

Currently, one out of four hip fractures in the world occur in Asia and Latin America. This number will increase to one in two by 2050. Asia is the region expecting the most dramatic increase in hip fractures during coming decades

In the Middle East, the number of hip fractures will triple in the next 20 years.

Worldwide, the estimated number of hip fractures from 1990 to 2050 will increase to 6.3 million from 1.7 million.

## ■ Osteoporosis is expensive

In terms of hospital days, osteoporosis puts a higher cost burden on health systems than many major diseases. For example, women with osteoporosis account for more hospital days than patients with chronic obstructive pulmonary disease, stroke, acute myocardial infarction and breast cancer.

The annual hospital healthcare costs paid by taxpayers to treat osteoporosis hip fractures in the European Union are estimated at approximately € 4.8 billion annually, a 33% increase over the past three years.

Osteoporosis patients currently occupy 500,000 hospital bed nights per year in the European Union, and this number is expected to double in the next 50 years. More beds are taken up by osteoporosis patients than by heart attacks, or other well-known diseases.

*References and further statistics are available on the IOF website: [www.osteofound.org](http://www.osteofound.org)*







**International Osteoporosis Foundation**

The International Osteoporosis Foundation (IOF) is an international non-governmental organisation created in response to the urgent need for action against a disease which is “silently” reaching epidemic proportions as the world’s population ages. Although osteoporosis affects millions of people everywhere, awareness about the disease is still low, doctors often fail to diagnose it, diagnostic equipment is often scarce, or not used to its full potential, and treatment is not always accessible to those who need it to prevent the first fracture. IOF’s growing membership which has expanded by over 70% within three years, reflects increasing international concern about this serious health problem.

For more information about IOF and to contact an IOF member society in your country please visit: [www.osteofound.org](http://www.osteofound.org)

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“Strong bones build  
strong lives,  
and strong lives  
build strong futures”



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