

# BROKEN BONES, BROKEN LIVES:

A roadmap to solve the fragility  
fracture crisis in France



## FOREWORD

With fragility fractures affecting one in three women and one in five men aged 50 or above, nearly everyone has a family member or friend who has been affected by a fragility fracture. Yet how many of us stop to question the true cause of fragility fractures and simply assume them to be a 'normal' sign of aging rather than the result of weakened bone? How many of us understand that an initial fracture may be a gateway to further fractures and should be treated as a warning sign and prompt us to seek out preventative treatment?

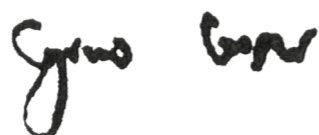
As France's population ages as a result of increasing life expectancy, the incidence and contribution of fragility fractures to the overall healthcare spend continue to increase. In 2017, 380,000 fractures occurred in France with an associated healthcare cost of €5.4 billion. This annual expenditure is predicted to increase by more than one-quarter (26%), to €6.8 billion, by 2030.

Beyond the immediate distress, healing time, and recovery associated with a fracture, an initial fracture significantly increases the risk of subsequent fractures and can trigger a negative spiral of healthcare dependence, escalating expense, and impaired quality of life, despite the existence of treatments and programs for secondary prevention of fragility fractures.

This report, **Broken bones, broken lives: A roadmap to solve the fragility fracture crisis in France**, explores the clinical, societal, and cost burdens associated with fragility fractures in France. The findings provide evidence that, despite the availability of effective preventative therapies and management approaches for fragility fractures, only 15% of women aged 50 or above receive osteoporosis treatment after an initial fragility fracture and only 10% have an osteodensitometry assessment.

Secondary prevention of fragility fractures has been neglected for too long. There is an urgent need to recognize fragility fractures as a public health priority and to establish secondary fracture prevention and management as an integral component of healthy aging.

In addition to providing the latest state of play of fragility fracture care, the report serves as a roadmap, which includes policy recommendations that can assist policymakers in offering the best possible care for French citizens in order to reduce the number of fractures and their impact on patients and the French healthcare system.



Cyrus Cooper, IOF President

The International Osteoporosis Foundation (IOF) is a registered not-for-profit, non-governmental foundation based in Switzerland that has been granted Roster Consultative Status with the Economic and Social Council of the United Nations. IOF functions as a global alliance of patient societies, research organizations, healthcare professionals, and international companies working to prevent osteoporosis and fragility fractures worldwide. Striving for a world without fragility fractures, in which healthy mobility is a reality for all, IOF is dedicated to advancing research and education, promoting policy change, increasing awareness of bone health, and improving patient care.



The French Association of Anti-Rheumatic League (AFLAR) was created in 1928 as the League Against Rheumatism and transformed into AFLAR in 1972. The objective of AFLAR is clear: to preserve the quality of life of patients with osteoarticular diseases, with equal access to care, in a secure and economically viable health system. AFLAR is a French umbrella organization bringing together numerous affiliated associations, healthcare professionals, and patients. AFLAR is an established and trusted source of information for the public, the French government, and all relevant health stakeholders. AFLAR played a key role in establishing rheumatic diseases as public health priorities, as evidenced by the United Nations and World Health Organization's (WHO) recognition of 2000–2010 as the decade of 'diseases of the bones and joints'. It is further involved in a large number of missions, ranging from raising awareness to patient empowerment, and from the training of healthcare professionals to targeted advocacy.

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The French Society of Rheumatology (SFR) was founded in 1969 by a community of scholars occupied with the study of the musculoskeletal system, covering diseases as diverse as rheumatoid arthritis, osteoporosis, osteoarthritis, 'back pain', as well as rarer disorders. With over 1,000 members, the Society represents nearly half of all rheumatologists in France. As a scientific society, SFR's primary objective is the promotion of scientific progress in the area of musculoskeletal diseases, as well as to facilitate French rheumatologists' and other physicians' access to information and training. It does so through various fora, such as the French Congress of Rheumatology, National Rheumatology Day and the Journal of Rheumatology. SFR has a strong record of providing information towards national and international agencies, and is an advocate for patients' rights and disease awareness among the general public.



The Research and Information Group on Osteoporosis (GRIO) was created over 30 years ago by healthcare professionals as a multidisciplinary and uniform approach to tackle all forms of osteoporosis and now forms the rheumatology section of the SFR. GRIO has more than 1,500 members with various specializations and engaged in different areas of research. GRIO's work is built around two pillars: 1) the general public – informing the public and authorities about the burden of osteoporosis and how to prevent it; and 2) the medical profession – sharing knowledge, and promoting current and future progress in both diagnosis and treatment. The GRIO is central to the dissemination of ethical, consensual, objective, and independent information in order to fight against this pathology.

## GLOSSARY

<b>AFLAR</b>	French Association of Anti-Rheumatic League
<b>BMD</b>	Bone Mineral Density
<b>CI</b>	Confidence interval
<b>CNAM</b>	National Health Insurance Fund
<b>COPD</b>	Chronic obstructive pulmonary disease
<b>CTF®</b>	Capture The Fracture®
<b>DALY</b>	Disability-adjusted life year
<b>EU6</b>	France, Germany, Italy, Spain, Sweden, and the UK
<b>FLS</b>	Fracture Liaison Service
<b>GDP</b>	Gross domestic product
<b>GP</b>	General practitioner
<b>GRIO</b>	Research and Information Group on Osteoporosis
<b>HAS</b>	French National Authority for Health
<b>ICER</b>	Incremental cost-effectiveness ratio
<b>ICUROS</b>	International Costs and Utilities Related to Osteoporotic Fractures Study
<b>IOF</b>	International Osteoporosis Foundation
<b>LTC</b>	Long-term care
<b>MOF</b>	Major osteoporotic fracture (hip, spine, humerus, or forearm fractures)
<b>PRADO</b>	French national health insurance outpatient services
<b>QALY</b>	Quality-adjusted life year
<b>SFR</b>	French Society of Rheumatology
<b>SNIIRAM</b>	Système national d'information inter-régimes de l'assurance maladie
<b>WHO</b>	World Health Organization



## EXECUTIVE SUMMARY

This report provides an overview of the burden and management of fragility fractures in France and compares the national reality to that of the EU6 nations (France, Germany, Italy, Spain, Sweden, and the UK). The report not only aims to highlight the burden and challenges posed by fragility fractures, but also to signpost opportunities for increased efficiencies in fragility fracture management and to realize improvements in patient care.

As France's population ages, the challenge of preserving the independence and active lifestyles of the aging population has become a multifaceted challenge that technology, social initiatives, and healthcare policy can help tackle.

With **approximately 380,000 new broken bones** occurring in France in 2017, fragility fractures are a major obstacle to healthy aging, impacting the independence and quality of life of **3.8 million women and men** living with osteoporosis in France.

Fragility fractures can be prevented, but their prevention and management have long been neglected despite the massive associated costs for the French healthcare system (**€5.4 billion in 2017**) and these are set to increase to €6.8 billion by 2030.

The burden of fragility fractures in France exceeds that for chronic obstructive pulmonary disease (COPD) and ischemic stroke.

After a fragility fracture, patients are **five times** more likely to experience a second fracture within the next 2 years. Despite this, an estimated **85%** of French women aged 50 years and above do not receive preventative treatment after an initial fragility fracture. Not unique to France, the treatment gap has increased markedly since 2010 reflecting the low importance that continues to be given to the escalating issue of fragility fractures in our aging society.

With life expectancy continuing to increase, fragility fracture incidence in France is predicted to increase by almost 24.4% by 2030; **now** is the time to **break** the cost spiral, and take action to put an end to the dire consequences of fractures on patients.

Policies have a significant role to play in promoting, funding, and implementing care solutions, such as coordinated care models for patients following a fracture (known as '*Filières Fractures*' in France). The most common coordinated care model for post-fracture patients is a 'Fracture Liaison Service', or FLS. The FLS model has been proven to be both clinically effective and cost-effective: reducing further fractures, and lessening the burden on both healthcare and individuals at a reasonable level of investment.

While coordinated care models appear as a universal solution to improve patients' diagnosis, treatment, and follow-up, local policy solutions adapted to the specificities of healthcare systems and policies – within and across countries – should also be considered.

In recognition of the growing fragility fracture burden, the French national roadmap reiterates the seven proposals of the 2017 Estates General for osteoporosis to improve the care of the many patients who have undergone at least one fragility fracture, e.g. developing and implementing secondary prevention strategies, introducing incentives to target osteoporosis in primary care, and creation of a fragility fracture registry.

## DID YOU KNOW THAT...

- Osteoporosis (which means 'porous bone') is a disease that weakens the density and quality of the bone, thus increasing the risk of fracture. The loss of bone is symptomatically silent and progressive, until the first fragility fracture occurs due to a low-trauma event, such as a fall from standing height or even a minor bump<sup>1</sup>
- One in five men and one in three women aged 50 and above will experience a fragility fracture in their remaining lifetime<sup>2</sup>
- A fragility fracture is a warning sign that has to be taken seriously: a fracture increases the risk of a subsequent fracture, which can occur at a different site<sup>3</sup>
- It is not only important to treat the existing fragility fracture but also to prevent subsequent breaks, i.e. secondary fracture prevention<sup>4</sup>
- "By missing the opportunity to respond to the first fracture, healthcare systems around the world are failing to prevent the second and subsequent fractures" (Professor Kristina Åkesson)<sup>5</sup>

“ I continue to suffer and I am always leaning forward. I cannot straighten myself anymore. ”  
 Monique, France



## THE SILENT BURDEN OF FRAGILITY FRACTURES FOR INDIVIDUALS AND HEALTHCARE SYSTEMS



“ Something else that affects my everyday life is fatigue. Pain results in incredible fatigue, which I think is difficult for others to be able to understand. ”

Anita, Sweden



### Fragility fractures affect men and women across France

#### Prevalence of osteoporosis in France

Approximately...

3 million

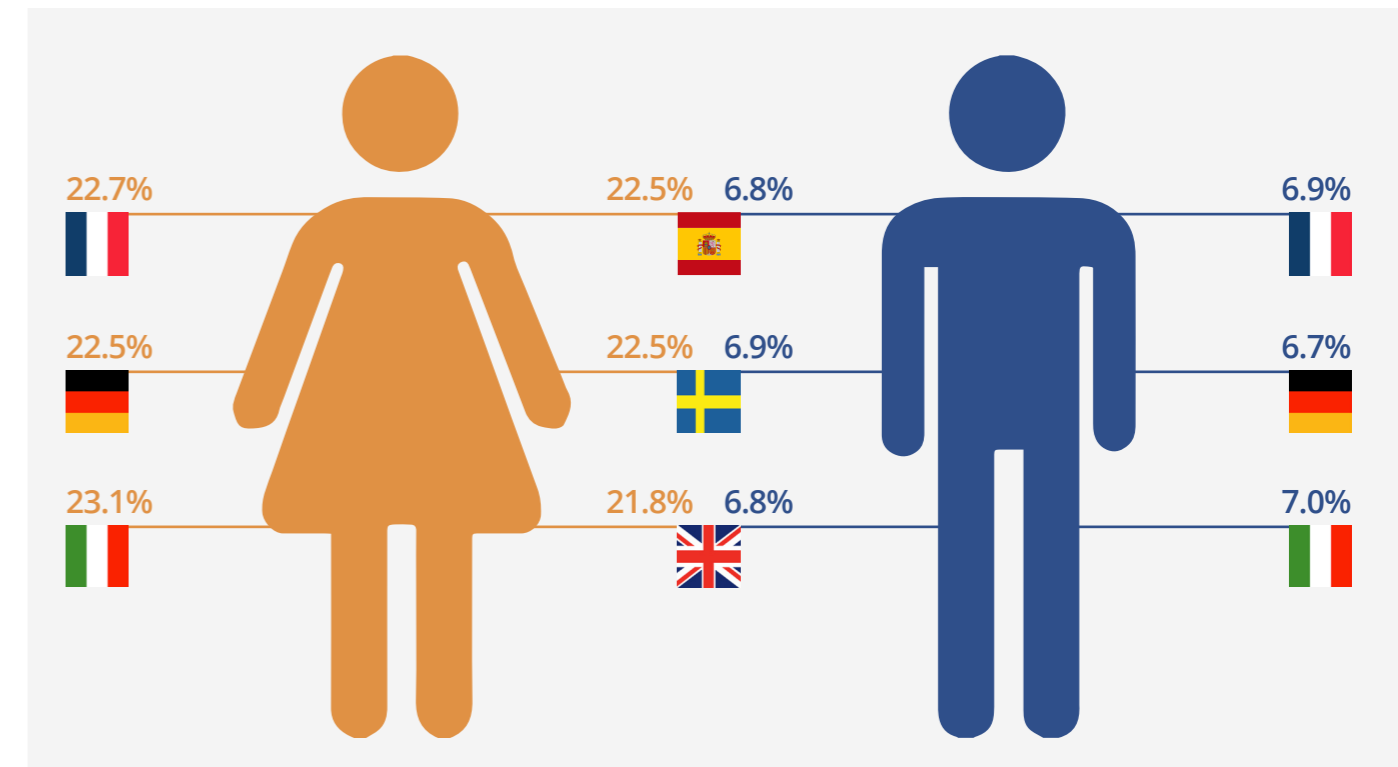


0.8 million



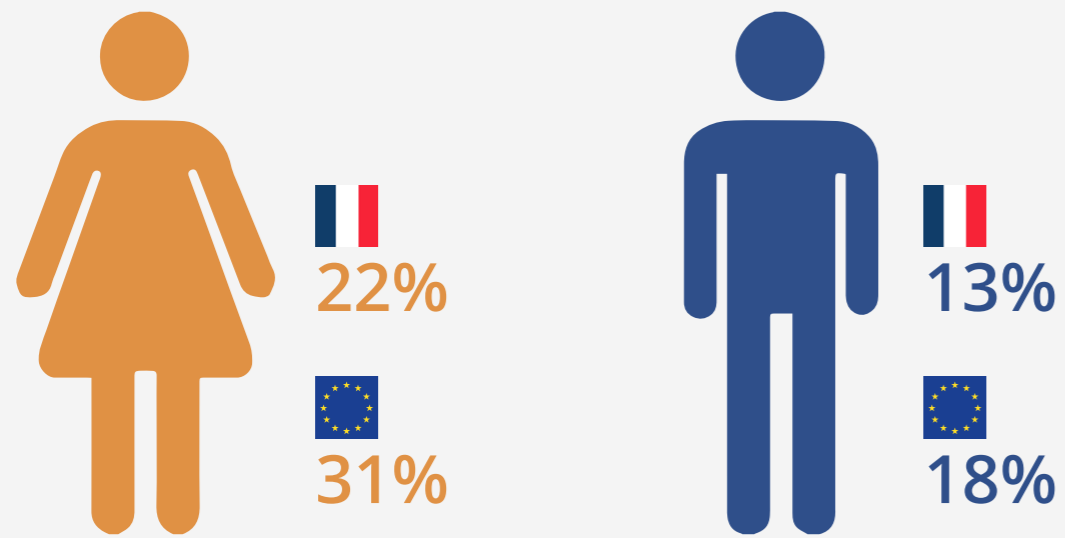
...3.8 million people in France have osteoporosis (assessed 2015).<sup>6</sup>

Prevalence of osteoporosis in France (22.7% for women; 6.9% for men) over the age of 50 years is comparable to that of Germany, Italy, Spain, Sweden, and the UK, which together with France are hereafter referred to as the EU6 nations.<sup>7-11</sup>



## Lifetime risk of fragility fractures

At the age of 50 years, the remaining lifetime risk for a major osteoporotic fracture (MOF) is relatively high, yet lower for French citizens than for the collective EU6 population:<sup>7</sup>



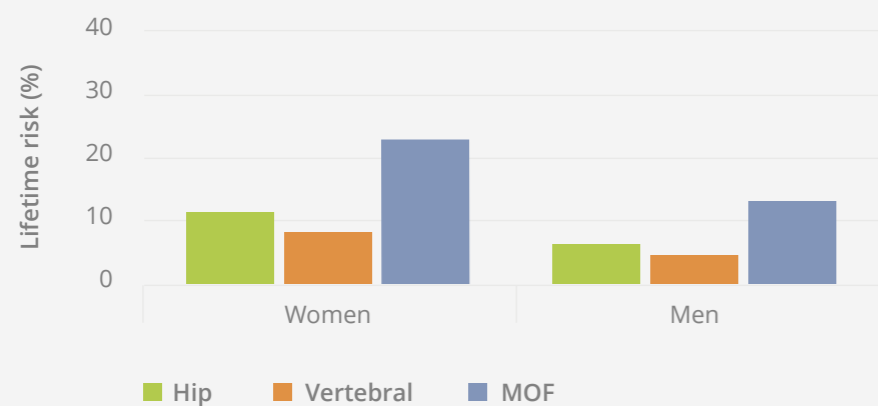
The lifetime risk of sustaining a fragility fracture varies for women and men and by fracture site.

There is a marked difference in the risk of fracture between the EU6 countries, with Northern European countries having the highest fracture rates observed worldwide.

The reasons for the difference in fracture risk between countries are unknown and cannot be explained by differences in bone density. However, plausible factors include differences in body mass index, low calcium intake, reduced sunlight exposure and, perhaps the most crucial factor, socio-economic prosperity, which in turn may be related to low levels of physical activity.<sup>12,13</sup>

Regardless of differences in fracture risk, the number of fractures in all countries is expected to increase due to an increasingly elderly population.

### Lifetime risk of fragility fracture from the age of 50 years, in France<sup>2,7,12,14-20</sup>

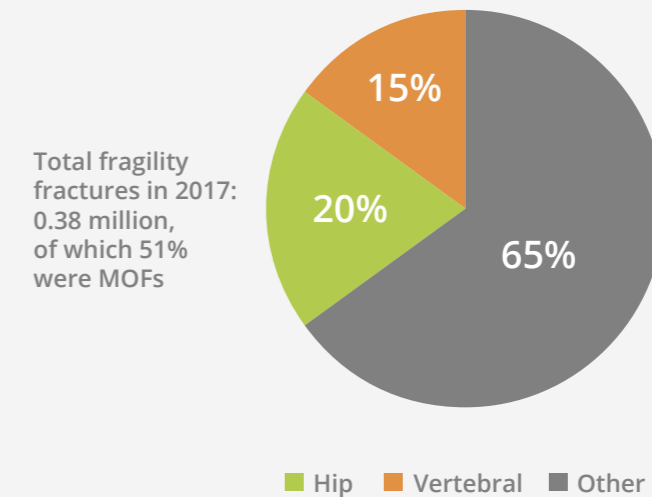


## Fragility fracture incidence

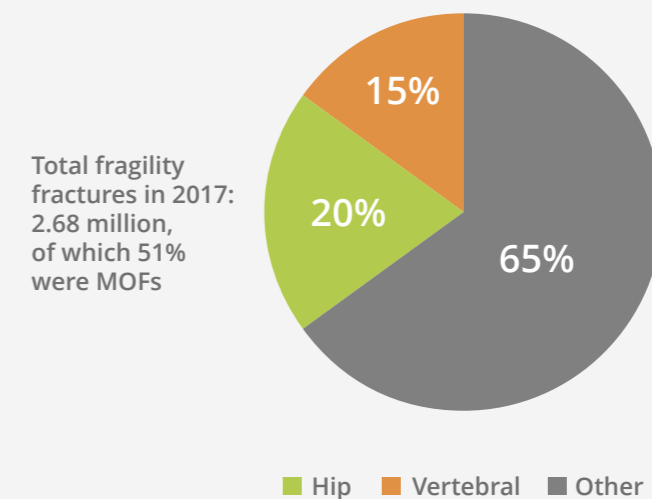
An estimated 380,000 fragility fractures occurred in France in 2017.<sup>6</sup>

### Estimated number of fragility fractures in France and the EU6 in 2017, by fracture category

France: distribution of fracture type



EU6: distribution of fracture type

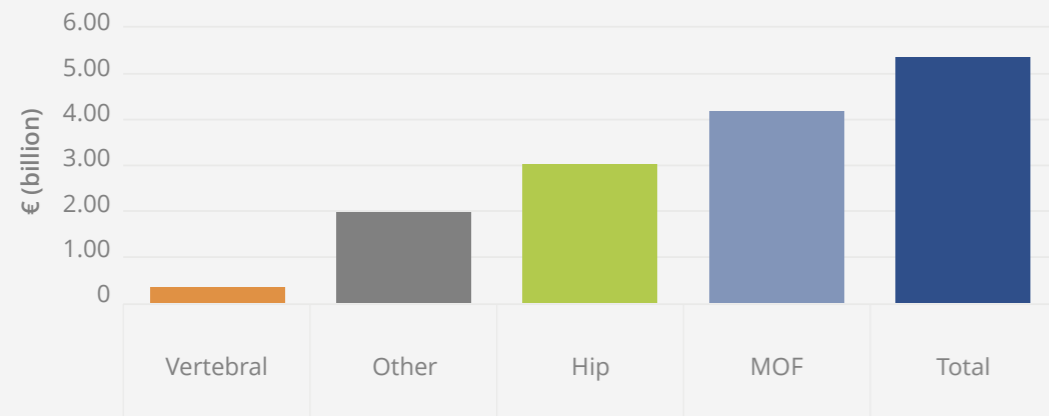


## Fragility fractures incur substantial healthcare costs

### Fragility fractures are associated with significant healthcare costs

In 2017, fracture-related costs totaled approximately **€5.4 billion** in France, even though France has one of the lowest proportional healthcare spends on fracture of any of the EU6 nations.<sup>6</sup> Hospital admission and length of stay in secondary care following a fracture are important drivers of fracture-related costs.

#### Estimated annual fracture-related costs in France in 2017



Fracture-related costs:<sup>21,22</sup>



happen during the first year following a fracture



differ between fracture sites and, to some extent, reflect the severity of fracture



are highest with hip fractures, as this is the most severe fracture site

## Fragility fractures place a high burden on patients and healthcare systems

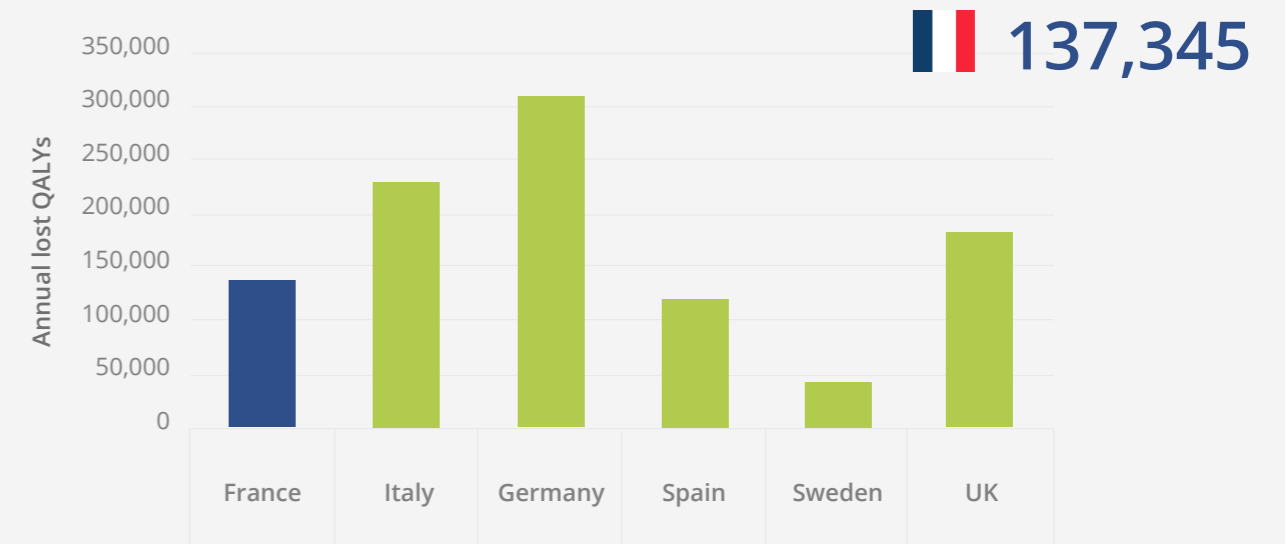
The burden of fragility fractures on individuals is demonstrated here with the annual loss of quality-adjusted life years (QALYs).

QALYs are a measure of the state of health of a person or group in which the benefits, in terms of length of life, are adjusted to reflect the quality of life. One QALY is equal to 1 year of life in perfect health. QALYs are calculated by estimating the years of life remaining for a patient following a particular treatment or intervention and weighting each year with a quality-of-life score (on a 0 to 1 scale). It is often measured in terms of the patient's ability to carry out the activities of daily life, and freedom from pain and mental disturbance.<sup>23</sup>

The loss of QALYs as a result of fragility fractures varies across the EU6 countries. These differences are largely driven by variations in the risk of fractures and age distribution between countries.<sup>6</sup>

The total health burden in 2017 due to fragility fractures in France is estimated to be 137,345 QALYs; 67% of which is attributable to fractures occurring among women.

#### Total annual loss of QALYs across the EU6 nations in 2017



## Fragility fractures have a multifaceted impact on the individual and society

### Reduced independence and lifestyle impairment

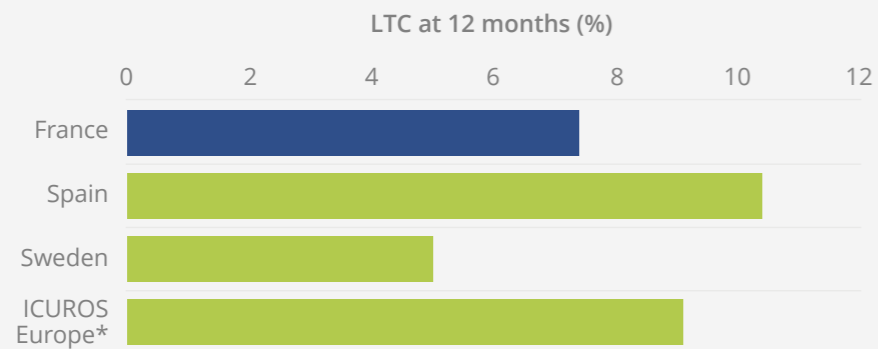
Reduced independence can be one of the most distressing outcomes for fracture patients. The disability associated with hip fractures can be severe. One year after hip fracture, 40% of patients are still unable to walk independently, and 80% are restricted in other activities, such as driving and grocery shopping.<sup>24</sup>

A fracture not only affects people physically, but also emotionally. Knowledge of their increased fracture risk can negatively affect patients' outlook, causing them to change their levels of social interaction and to avoid certain activities: impairing their overall quality of life.<sup>25</sup>

The long-term loss of independence and mobility can put physical, emotional, and financial strain on patients, as well as their relatives and friends, potentially leading to the need for institutional care, particularly in older age groups.<sup>26</sup>

Across Europe, the proportion of patients that move into long-term care (LTC) within a year of sustaining a hip fracture increases with age, from 2.1% at age 50–60 years to **35.3%** above 90 years.<sup>6</sup> Although France appears to have a lower rate of rapid transitions to LTC following a hip fracture than some other European countries,<sup>25</sup> the potential impact of an initial fragility fracture should not be underestimated: in France, in the year immediately following hospitalization for an initial fracture, there is a 12.5% re-hospitalization and a 23.5% mortality rate.<sup>27</sup>

### Proportion of patients (%) in LTC at 12 months after a hip fracture, by country<sup>6</sup>



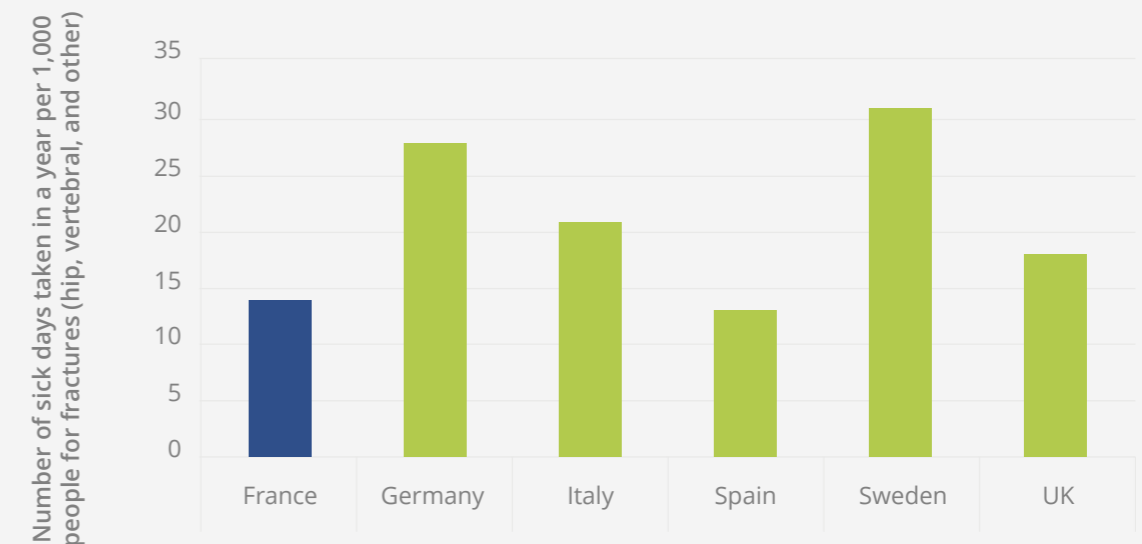
\*International Costs and Utilities Related to Osteoporotic Fractures Study (ICUROS) Europe: Austria, Estonia, Spain, France, Italy, and Sweden

## Fragility fractures can significantly impact the working population

Although fragility fractures mostly affect people in later life, an estimated 20% of fractures occur at pre-retirement age.<sup>2</sup> In 2017, a total of 1,461,444 sick days were taken in France among individuals of pre-retirement age affected by fragility fractures.<sup>28</sup>

An average number of 14 sick days are taken per 1,000 people following a fragility fracture in France; one of the lowest estimates for any EU6 nation.<sup>6</sup>

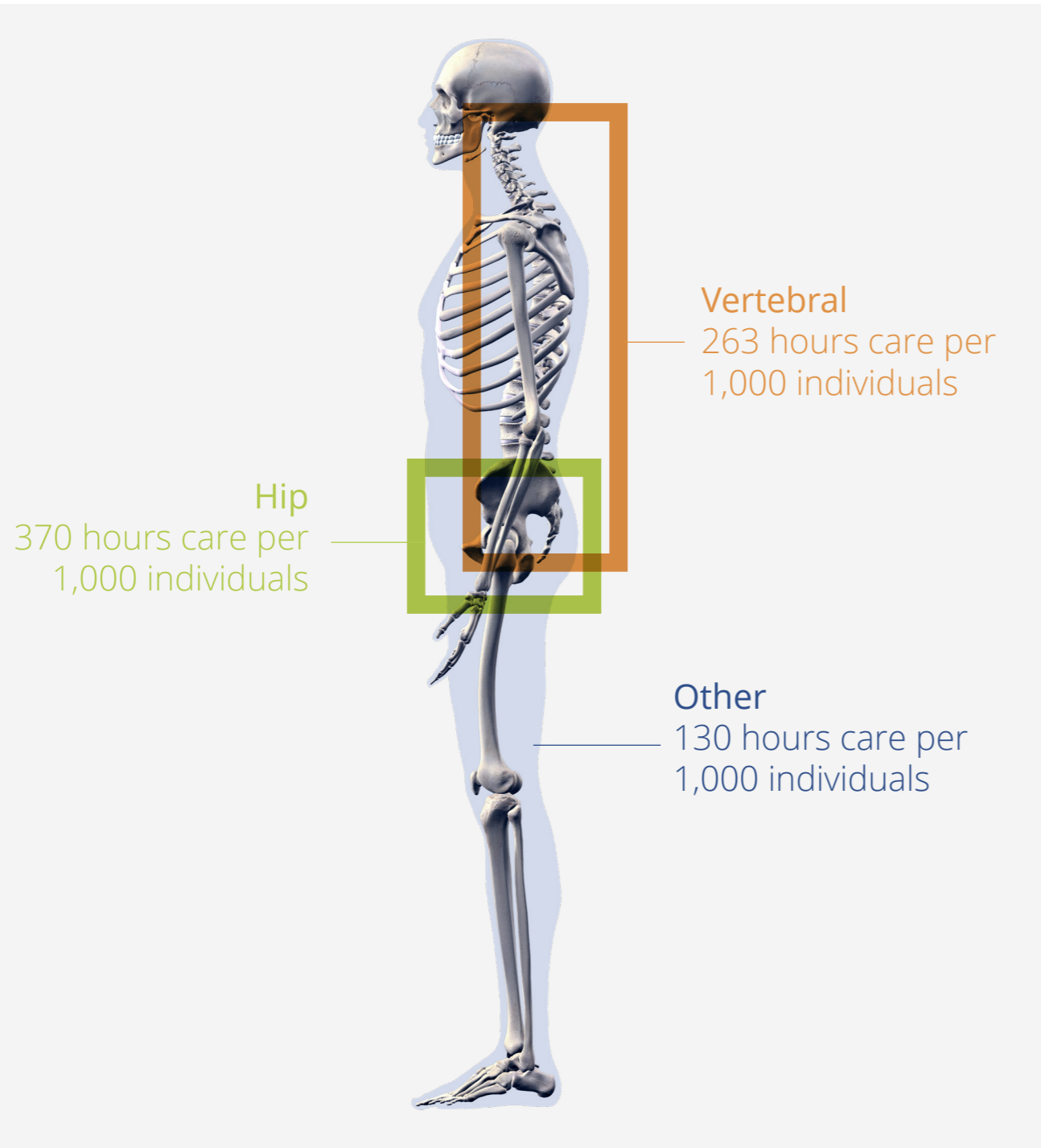
### Average sick days taken after fragility fracture per 1,000 people, by EU6 country



## Patients suffering fragility fractures depend on care from family and friends

As a result of reduced mobility and ability to complete activities of daily living, individuals who have suffered a fragility fracture may rely on informal caregivers, such as family members or friends.

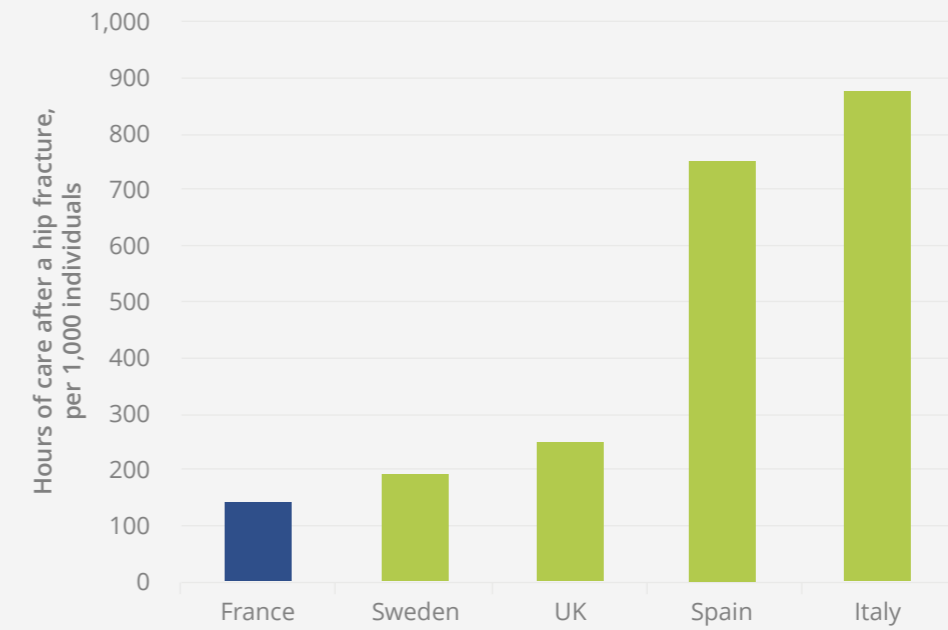
During the first year after a fracture, the hours of care provided by relatives vary greatly by fracture type and country.\*<sup>6</sup> **The more serious the fracture, the more support is needed.**



\*To measure the average burden placed on informal caregivers per year, survey responses from ICUROS<sup>29-31</sup> were also used to determine the caregiver burden due to osteoporotic fracture. It was measured in terms of hours of care per year provided by relatives in ICUROS Europe (a substitute measure for the EU6), as well as selected countries.

In countries where cross-generational support is more established, the impact of fragility fractures on caregivers is generally higher.<sup>32</sup> France has the lowest caregiver burden of all the EU6 nations, with an average of 138 hours a year, per 1,000 individuals, spent caring for patients with osteoporotic hip fractures.<sup>28</sup>

Relative care hours related to hip fractures per 1,000 people, by country



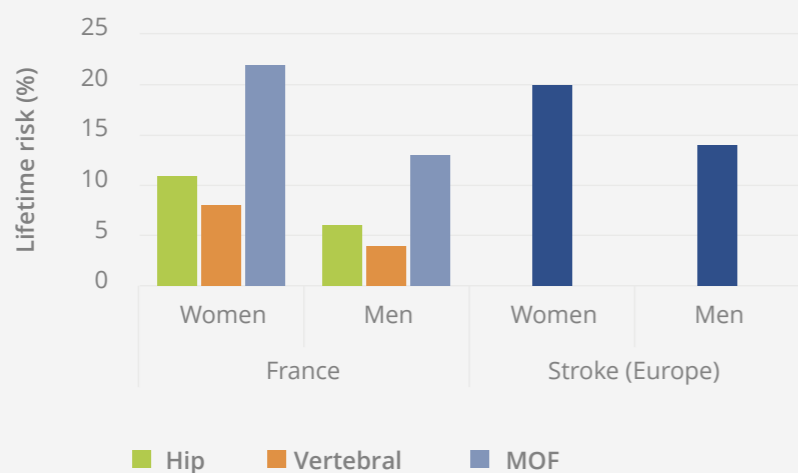


# FRAGILITY FRACTURES IN THE CONTEXT OF PUBLIC HEALTH PRIORITIES

“ I can no longer run to catch a bus. I no longer feel young. *Maryvonne, France* ”

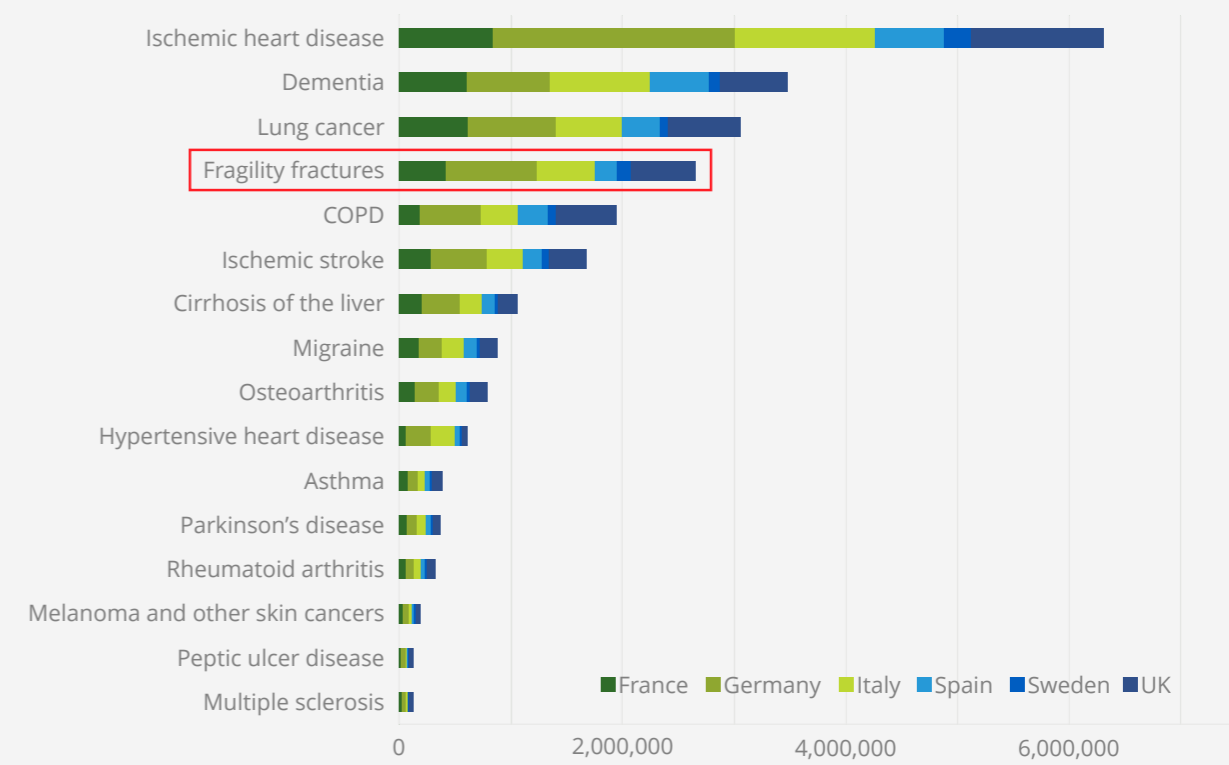
Fragility fractures represent a health risk for individuals aged 50 or above. In France, **the lifetime risk of suffering a MOF at age 50 years** (22% for women; 13% for men<sup>7</sup>) **is similar to the lifetime risk of a stroke** for women (20%) and men (14%) across Europe.<sup>33,34</sup> Overall, the remaining lifetime risk of sustaining a fracture in France is lower than for the other EU6 nations.

**Lifetime risk of fragility fracture from the age of 50 years in France and the equivalent risk for stroke in Europe<sup>2,7,12,14-20</sup>**



The fragility fracture burden in the EU6 is greater than that of many other chronic diseases (including COPD). It is surpassed only by ischemic heart disease, dementia, and lung cancer.<sup>35</sup>

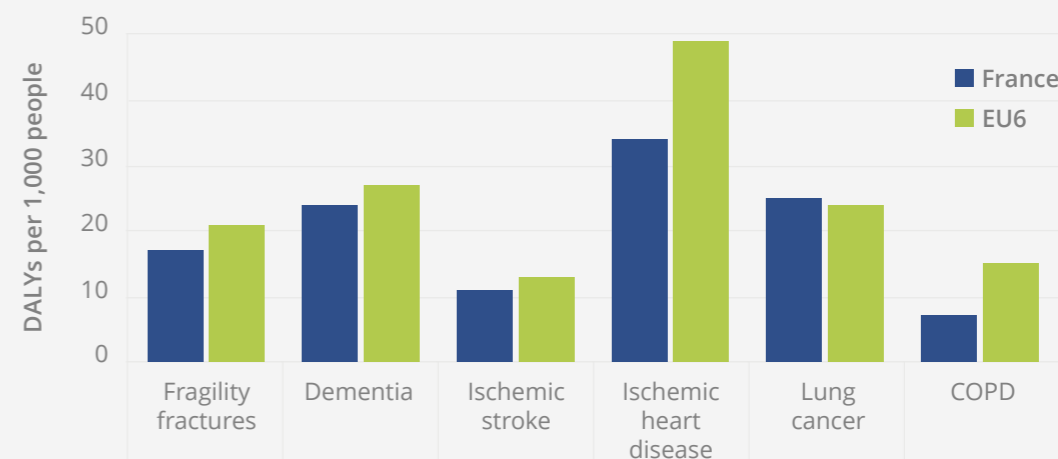
**Country contribution to total disability-adjusted life years (DALYs) by disease in the EU6 in 17 selected diseases**



Fragility fractures are the fourth leading cause of chronic disease morbidity, rising from a ranking of sixth in 2009. Across the EU6, fragility fractures now account for 2.6 million DALYs (a measure of the impact of a disease or injury in terms of healthy years lost<sup>23</sup>) annually, more than for hypertensive heart disease or rheumatoid arthritis.<sup>7</sup>

In France, an estimated 17 DALYs are lost per 1,000 individuals aged over 50 years due to fragility fractures. The French burden is slightly lower than the average for the EU6 (21 DALYs per 1,000 people) and higher than the national burden associated with other major chronic diseases of aging (ischemic stroke and COPD).<sup>35</sup>

**DALYs per 1,000 people (aged over 50 years) by disease in France and the EU6<sup>35</sup>**

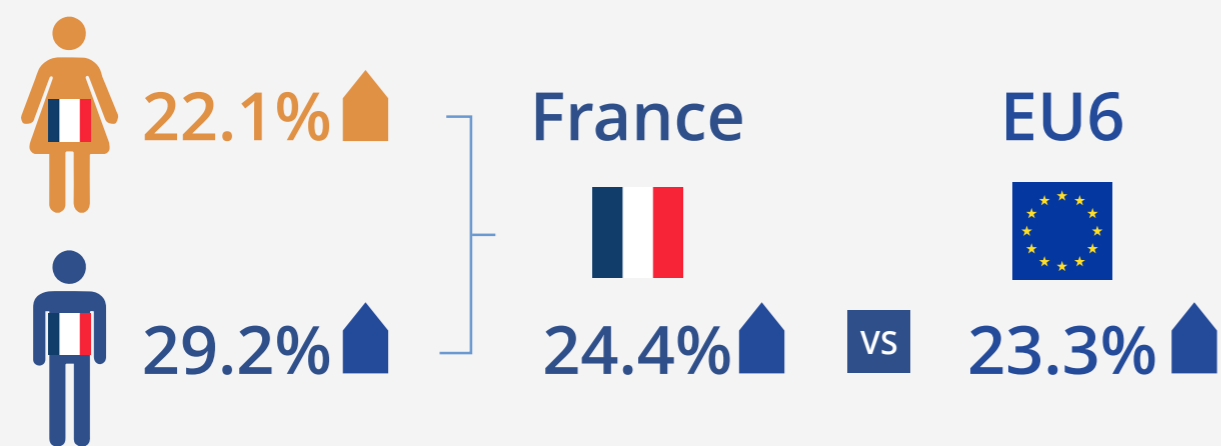


# FRAGILITY FRACTURES ARE A GROWING CHALLENGE IN THE PUBLIC HEALTH LANDSCAPE

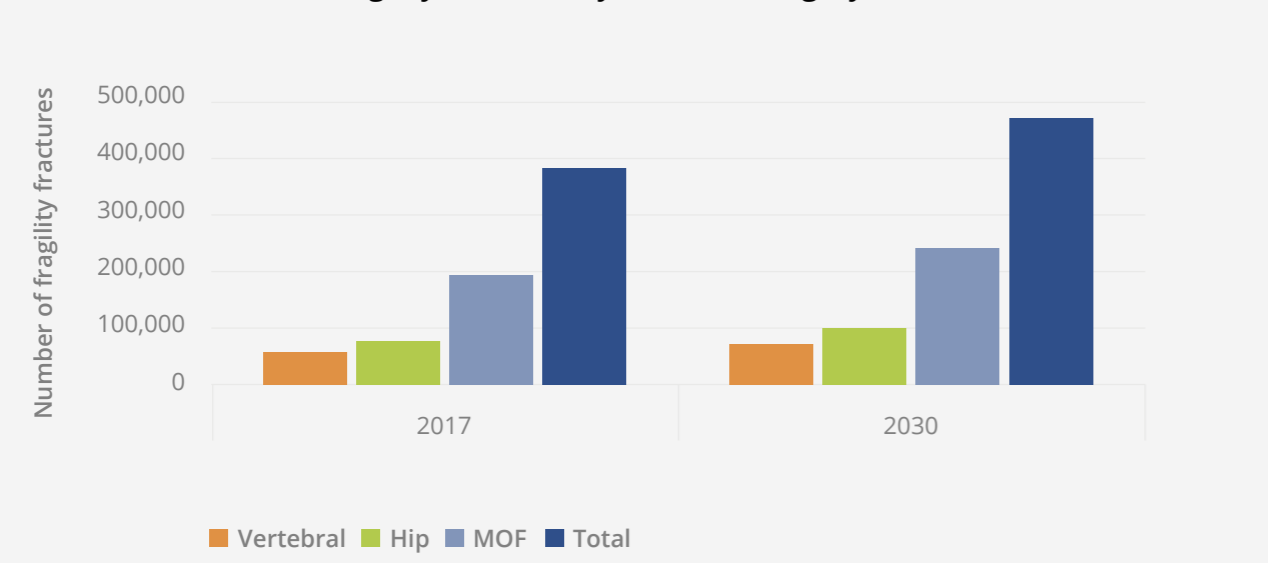
“ My daily life has changed completely. I now walk with two canes. I can't bend down and I'm constantly in pain. I cannot carry things and therefore cannot go shopping. I miss my active life, very, very much. *Inger, Sweden* ”

An ever-growing public health challenge is emerging: approximately 380,000 fragility fractures occurred in France in 2017, and the annual incidence is estimated to increase to 470,000 by 2030.<sup>6</sup>

This projected increase in fracture incidence in France (24.4%) is slightly higher than the EU6 average of 23.3% over the same period:<sup>6</sup>

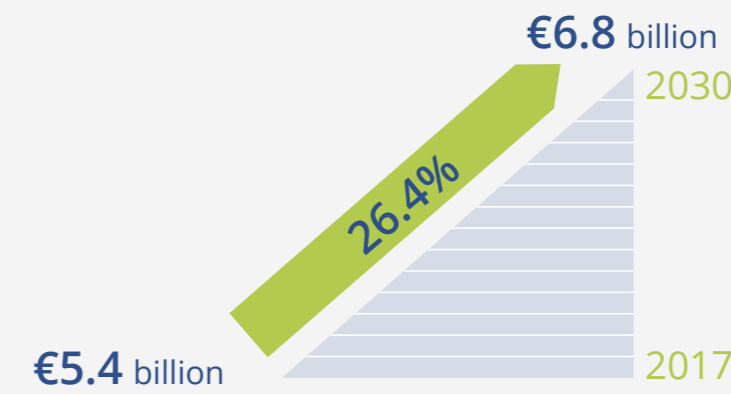


Estimated number of fragility fractures by fracture category for France in 2017 and 2030

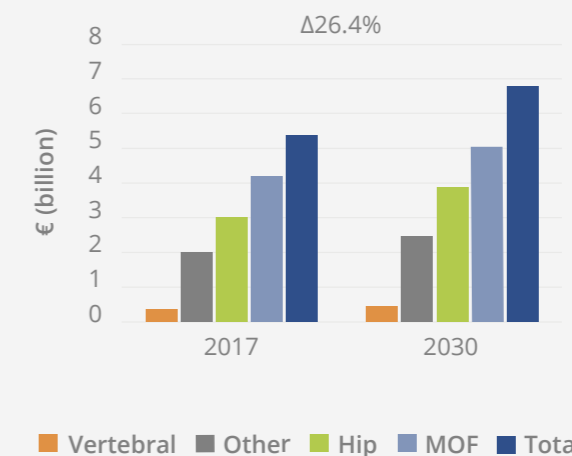


## Fracture-related costs are set to rise

With life expectancy in France increasing, so too is the fragility fracture incidence and related use of healthcare services. Hospitalizations for fragility fractures, one of the key drivers of healthcare costs, increased by 10% between 2011 and 2013.<sup>36</sup> With fragility fracture incidence predicted to increase by a further 24.4% between 2017 and 2030, the associated care costs are projected to increase by 26.4% over the same period, comparable to the overall rate for the EU6 of 27.7%.<sup>6</sup>



Estimated annual fracture-related costs in 2017 and 2030, and percentage change for France



Δ percentage change for all fragility fractures

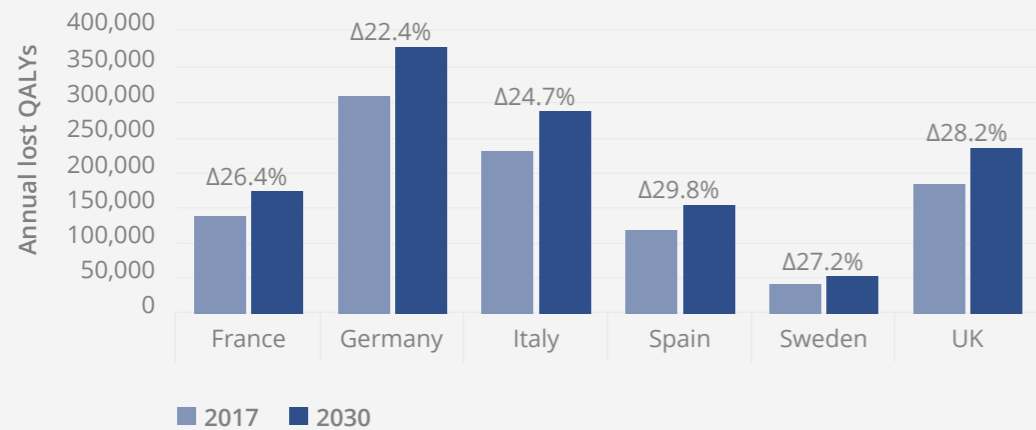


Although hip fractures make up **1/5** of total fractures, they are estimated to incur an estimated **57%** of total fracture-related costs

## Fracture-related patient burden is set to increase

Based on population projections, the QALY losses associated with fragility fractures will increase between 2017 and 2030, with France facing an increase of 26.4% over the period; slightly higher than the EU6 average of 25.6%.<sup>6</sup>

Total annual loss of QALYs by country in 2017 and 2030 and percentage change



Δ percentage change for all fragility fractures



## EFFECTIVE MANAGEMENT CAN IMPROVE OUTCOMES AND REDUCE COSTS

“



If the fracture I suffered in my spine had been spotted earlier than it was, I would have been spared a great deal of pain and suffering.

*Christine, UK*

”

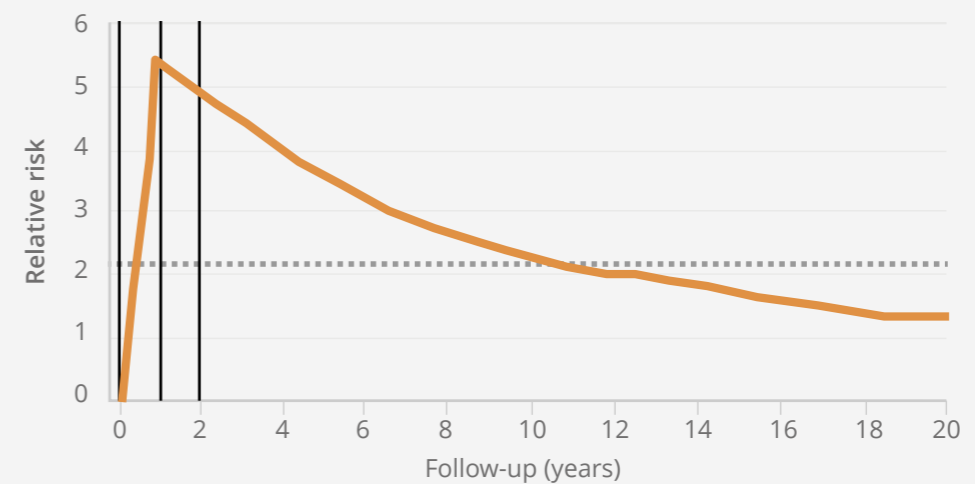
### One fragility fracture leads to another

For women aged 50 to 80, after their first fragility fracture, their risk of a subsequent fracture within the first year after a fracture is **five times greater** than women who have not had a prior fracture.<sup>37</sup>

Subsequent fracture risk is highest in the first 2 years following an initial fracture, when there is an **imminent risk** of another fracture at the same, or other, sites.<sup>38</sup> This is why it is critically important to identify patients as soon as possible after fracture to optimize fracture prevention treatments and keep the patient from having another fracture.

Similar patterns of imminent fracture risk have been observed in most countries evaluated,<sup>21,22</sup> but between-country comparisons are limited by data availability.

Relative risk of all subsequent fractures calculated as a mean from the first fracture (grey line) and per separate year of follow-up (orange line)



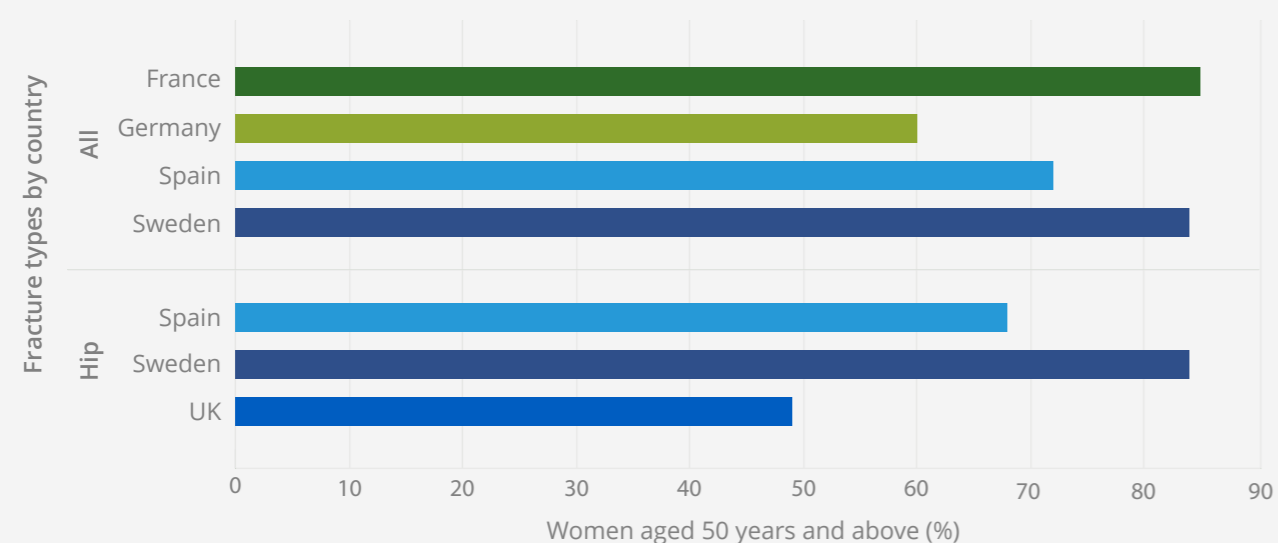
Adapted from van Geel *et al.*<sup>37</sup>

## Most eligible patients do not receive treatment to prevent fragility fractures following their first fracture

With appropriate medical treatment, many fragility fractures can be avoided.

Guidance from the GRIQ recommends that patients of all ages in France should be treated with specific anti-osteoporosis treatment after a severe osteoporotic fracture – unfortunately this is not always the case.<sup>39</sup> In France, **no more than 15% of women aged 50 and above who have sustained a fragility fracture receive treatment for fracture prevention** and only 10% receive osteodensitometry assessment.<sup>36,37</sup>

### Proportion (%) of female patients (50 years and above) untreated within a year of osteoporotic fracture<sup>6,36,40</sup>



## Multidisciplinary models for secondary fracture prevention can contribute to closing the treatment gap

Post-fracture coordinated care models, such as a Fracture Liaison Service (FLS) internationally or *Filière Fracture* in France, are multidisciplinary healthcare delivery models for secondary fracture prevention. Systematically, they aim to identify, diagnose, and treat (by referral) all eligible patients within a local population who have suffered a fragility fracture, with the intention of reducing risk of subsequent fractures. In the FLS model, care is usually coordinated by a dedicated, specialist nurse who helps patients navigate the way through the various departments of relevance (e.g. orthopedic surgery, radiology, and primary care).

Post-fracture coordinated care models, like FLSs, offer the potential for a **cost-effective care delivery model** that reduces the risk of re-fracture and mortality by increasing the number of patients being treated and improving adherence to treatment.<sup>5,41-46</sup> Data published from the FLS in Glasgow, Scotland, showed that FLSs are cost-effective for the prevention of further fractures in fragility fracture patients, resulting in fewer fractures and cost savings for healthcare systems.<sup>5,43</sup>

A recently published systematic literature review and meta-analysis based on 159 scientific publications highlighted the benefits of FLSs:<sup>47</sup>

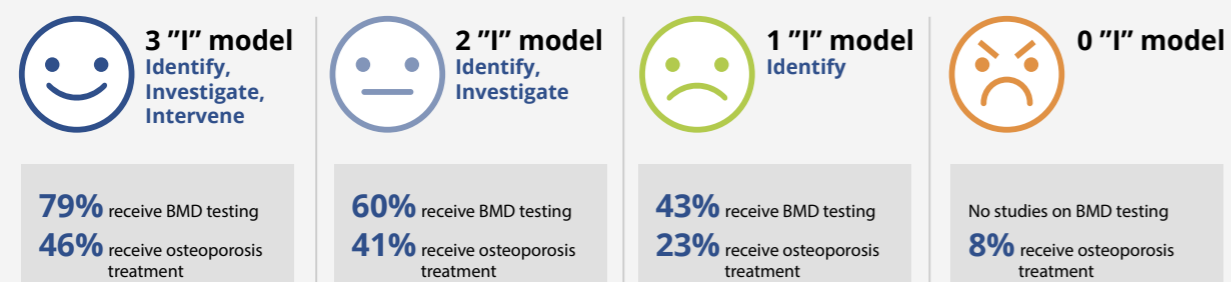
Outcome measure <sup>47</sup>	Effect of FLS (absolute change)	95% CI	Duration of follow-up (months)	Number of studies included
BMD testing	+24%	0.18 to 0.29	3–26	37
Treatment initiation	+20%	0.16 to 0.25	3–72	46
Treatment adherence	+22%	0.13 to 0.31	3–48	9
Re-fracture rate	-5%	-0.08 to -0.03	6–72	11
Mortality	-3%	-0.05 to -0.01	6–72	15

BMD, Bone Mineral Density

Despite their potential benefits, the IOF estimates there to be only 15 FLSs currently operating in France.<sup>48</sup> Furthermore, the FLSs available are likely to vary within France and to differ with those available in other EU6 countries. FLSs vary in the services they offer, from identifying and informing patients without taking further action to more comprehensive models that include investigating, treating, and monitoring patients. This variation in structure affects the level of impact on health outcomes.<sup>46</sup>

The effect of different models of care on osteoporosis treatment and frequency of BMD testing were evaluated in a meta-analysis by Ganda *et al.*<sup>49</sup>

A meta-analysis demonstrated that adoption of the 3 "I" model, with core priorities of Identify, Investigate and Intervene, offered greater effectiveness in patient assessment and treatment than 0-2 "I" models



Adapted from Ganda *et al.*<sup>49</sup>

The analyses by both Ganda *et al.* and Wu *et al.* showed **dramatic increases in BMD testing and osteoporosis treatment initiation**, which further supports the value of post-fracture care coordination to prevent fragility fractures and reduce the overall cost of care for these patients.<sup>47,49</sup>

### Capture The Fracture® (CTF®): A global initiative of IOF

CTF® aims to 'facilitate the implementation of coordinated, multidisciplinary models of care for secondary fracture prevention'. CTF® has created a set of internationally endorsed standards and guides for best practice to bridge the gap between FLS providers and to help in the development and implementation of new FLSs. CTF® includes the largest network of individual FLS providers in the world. Providers undergo a CTF® audit to determine service quality, with a gold, silver, or bronze star awarded.

There are huge variations between and within countries in terms of the availability of coordinated care models. A CTF® survey reported that such models only existed for 2.8% of responders in Italy and up to 37.5% of responders in Sweden for hospital referrals, reducing to 1-10% for general practitioner (GP) referrals. In contrast, in the UK, the National Osteoporosis Society estimated that 55% of the UK population has access to an FLS.

### FLSs are a cost-effective option for patient management

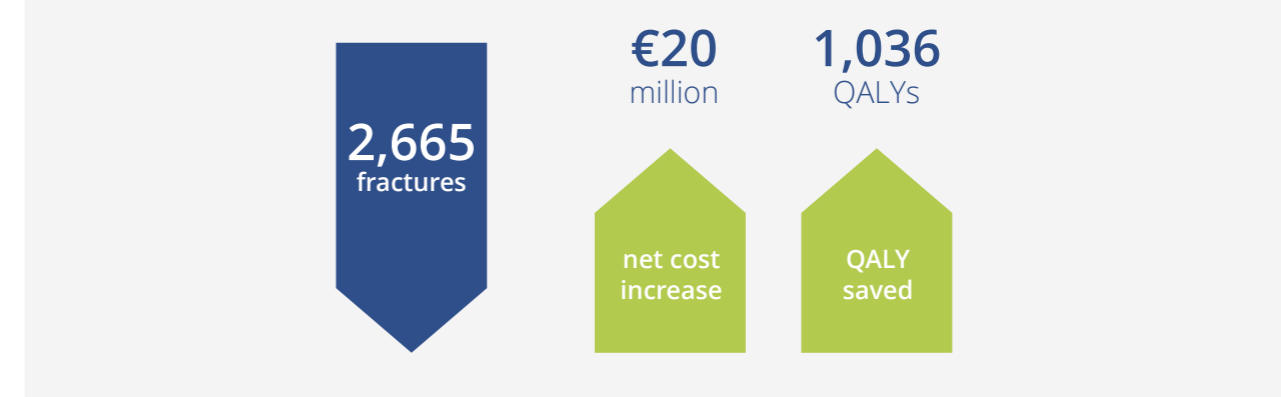
Several studies have showed FLS to be a cost-effective healthcare delivery form in European countries. Although not specifically evaluated for France, in Sweden and the UK the cost of improving patient outcomes through an FLS has been estimated to be.<sup>50,51</sup>



Based on a survey sent to a number of FLSs in the EU6 enrolled in IOF's CTF® network, it is estimated that 10-25% of French hospitals and 1-10% of GPs report having a referral system for fracture patients. This is significantly less than seen in the UK, where the National Osteoporosis Society estimates that 55% of the UK population has access to an FLS.

A recent health economic analysis suggested that the introduction of FLSs for all individuals aged over 50 years could prevent an estimated 2,665 subsequent fragility fractures in France every year. Extension of FLSs in this way would result in a net increase of costs (€20 million), but also a gain of 1,036 QALYs.<sup>6</sup>

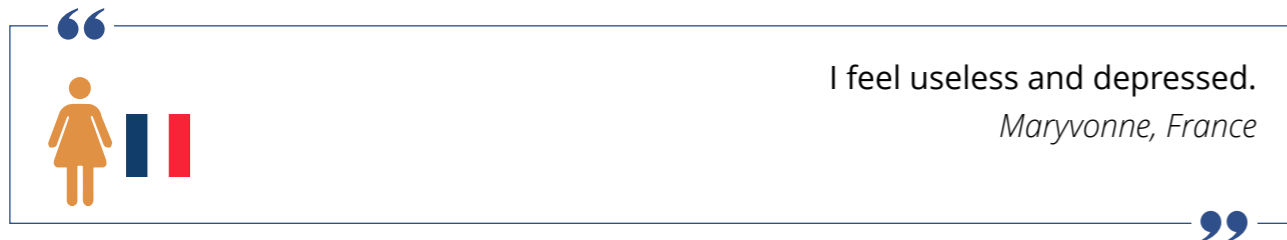
### Cost implications of extending an FLS to all individuals over 50 years in France



The WHO<sup>52</sup> provides guidance on how an intervention with a benefit expressed in QALY value equivalent to 1 year's gross domestic product (GDP) per capita or less is considered to be reasonable expenditure, representing the likelihood of achieving at least 1 additional year of healthy life per capita.

Although an FLS extension would result in a net increase in healthcare costs, with the French GDP estimated to be €44,930,<sup>53</sup> FLSs still offer **clear cost-effectiveness**, as well as the possibility of improved care for the French population.

# A ROADMAP TO SOLVE THE FRAGILITY FRACTURE CRISIS IN FRANCE



As part of a multidisciplinary consultation across France, the Estates General for osteoporosis (*États Généraux de l'Ostéoporose*) established seven key priorities to enable better management of fragility fractures in 2017. A year on, the Estates General's recommendations remain more relevant than ever. In fact, the Government's Health System Transformation Strategy, released in February 2018, confirms the importance of “putting quality and relevance of care at the heart of organizations and practices” and measuring the quality of care pathways. In order to contribute to this government's priority workstream, it is important to reiterate the proposals of the Estates General for osteoporosis to improve the care of the many patients who have experienced at least one fragility fracture.

## 1. Change the paradigm from osteoporosis to fracture: Awareness campaigns

- Promote information campaigns targeted at patients at risk of fracture with regard to:
  - First fracture management: “the first fracture must be the last!”; “The complications of osteoporosis are serious, crippling, and deadly”; “Lose more than 4 cm in size or have a fracture after a simple fall from standing height: it is not normal! It is because your bones have become too fragile! Take action!”
  - Misconceptions: “osteoporosis is not a real disease”; “the hormonal treatments of the menopause are dangerous”; “osteoporosis treatments are not effective”; “calcium and vitamin D are enough”; “losing height is normal”
- Promote the training of local healthcare professionals: train GPs, pharmacists, and dentists
- Make World Osteoporosis Day a popular day, with free BMD tests for all women over 65 (or all postmenopausal women)

## 2. Develop primary prevention strategies for fragility fractures

- Screen for walking abnormalities from a young age
- Carry out prevention campaigns at school: how to build strong bones (bone capital); why it is important to take in 1 g of calcium per day (one dairy product), to do physical activity, to get sufficient levels of protein
- Conduct annual, systematic height measurements (at least annually) by a GP or pharmacist and during thermal treatments
- Reimburse bone densitometry testing for women over 65 in order to identify patients at risk of fracture
- Incorporate osteoporosis screening into established health checks (e.g. retirement check)

- Systematically screen patients suffering from chronic diseases, such as diabetes, chronic respiratory diseases, hyperthyroidism, and Parkinson's disease
- Improve recognition and prescription of menopausal hormone treatments as tools for the primary prevention of osteoporosis
- Make bone marrow osteodensitometry screening a routine examination for women over 65, regardless of their osteoporosis risk factors
- Conduct impact assessment studies looking at medico-economic evidence supporting the broadening of the conditions for reimbursement of osteodensitometry

## 3. Develop secondary prevention strategies so that the first fracture is the last

- In accordance with osteoporosis management recommendations from the French National Authority for Health (HAS) and GRIO:
  - Secure equal access to proper care pathways for patients having experienced a first fragility fracture
  - Upgrade the post-fracture care pathway, especially for vertebral fractures, wrist fractures, and hip fractures, building on the existing *Filières Fracture*. Such pathways should involve the relevant healthcare professionals and rely on a care coordinator (e.g. nurse)
  - Adapt the remuneration model for these post-fracture care pathways
  - Put in place incentives linked to the detection of osteoporosis and fragility fractures in emergency and orthopedic surgery services
  - Enable osteoporosis detection and management in cases where patients have been hospitalized (usually following a surgery)
  - Improve the management of chronic pain linked to fragility fractures (in particular vertebral fractures)

## 4. Promote incentive measures for GPs in the management of osteoporosis

- Systematically screen height loss at least once a year
- Systematically screen patients at risk of fall for osteoporosis (having fallen in the last year, antecedent of fall in the last year)
- Systematically perform osteoporosis screening for patients suffering from chronic diseases (e.g. diabetes, chronic respiratory diseases, hyperthyroidism, and Parkinson's disease)
- Incorporate osteoporosis into GPs' business software
- Create a tool to support GPs with decision making around treatment options
- Offer a specific remuneration model for osteoporosis-focused consultations (key explanations on the disease, its risks and its management), in alignment with the '*Rémunération sur Objectifs de Santé Publique*' program

## 5. Promote and support a public–private medico–economic research plan to address the costs of the ‘fracture cascade’ and the benefits of innovative multidisciplinary care pathways

- Leverage the *Système National d’Information Inter-régimes de l’Assurance Maladie* (SNIIRAM) data (i.e. national electronic healthcare records) to measure the level of expenses associated with initial fragility fractures and in the 12 and 24 months following its occurrence
- Compare the expenses reimbursed by the health insurance in the 12 months preceding the fracture with those in the 12 months following the occurrence of the fracture
- Based on these findings and demographic projections, calculate the cost of osteoporosis and fragility fractures in France for 2020–2025
- Demonstrate that the increasing costs could be countered by the implementation of innovative organizational set-ups, such as coordinated care models, FLSs, and specific medications for osteoporosis (factoring in issues of medication compliance)

## 6. Promote fall prevention and support the independent living of patients at risk of fragility fracture

- Engage local communities in the detection and prevention of falls risk factors, either related to individuals’ health condition (e.g. vision, walking disorders) or environmental factors (e.g. home improvement)
- Set up programs adapted to seniors’ physical capacities, in order to support their physical activities and autonomy. Such programs should be coordinated by physiotherapists or ‘*Activité Physique Adaptée*’ specialists
- Create therapeutic education programs to inform and educate patients after a fracture (e.g. on issues of compliance, adapted physical activity and prevention of falls), especially during rehabilitation/ thermal treatment
- Create a questionnaire to assess the risk of fracture in patients over 75 years old after a fracture
- Support the autonomy of patients having experienced a MOF and their return home (home and care support, meal delivery)
- Create a ‘return to home’ step in the post-fracture hospitalization process
- Support the two initiatives by the National Health Insurance Fund (CNAM): outpatient services (PRADO) ‘bone fragility’ and PRADO ‘post-fracture’, which promote patients’ return to home after a hip fracture. Consider extending the post-fracture PRADO to patients in geriatric wards
- Systematically reimburse podiatrist consultations for patients who have experienced a fragility fracture, since this can help assess the risk of falling and to put in place preventive measures, as well as physiotherapist help to resume physical activity

## 7. Create a fragility fracture registry, potentially starting with pilots in one or two regions

## ACKNOWLEDGMENTS

### IOF Steering Committee

Professor John Kanis, Emeritus Professor in Human Metabolism and the Director of the WHO Collaborating Centre for Metabolic Bone Diseases, University of Sheffield, UK

Professor Eugene McCloskey, Professor in Adult Bone Diseases, Department of Oncology and Metabolism, University of Sheffield, UK

Professor Nicholas Harvey, Professor of Rheumatology and Clinical Epidemiology, MRC Lifecourse Epidemiology Unit, University of Southampton, UK

Dr. Kassim Javaid, Associate Professor in Metabolic Bone Disease, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, UK

Fredrik Borgström (PhD), Associate Researcher, Medical Management Centre, Department of Learning, Informatics, Management and Ethics, Karolinska Institutet, Sweden and Partner at Quantify Research, Sweden

### IOF Consultation Panel

#### France

Professor Bernard Cortet (GRIO), Professor in Rheumatology, University Hospital Lille, France

Professor Thierry Thomas (SFR), Professor of Medicine and Head of the Rheumatology Department, University Hospital St. Etienne, France

Professor Laurent Grange (AFLAR), Professor in Rheumatology, University Hospital Grenoble, France

#### Germany

Professor Claus Glüer (DGO), Professor of Medical Physics, Department of Radiology and Neuroradiology, University Medical Center Schleswig-Holstein, Kiel University, Germany

Professor Andreas Kurth (DVO), Chief Orthopedic Specialist, Department of Traumatology, Orthopedics and Hand Surgery, Community Hospital Mittelrhein gGmbH, Germany

Professor Peyman Hadji (DVO), Head of the Department of Bone Oncology, Endocrinology and Reproductive Medicine Krankenhaus Nordwest, Steinbacher Hohl, Germany

Thorsten Freikamp (BfO), Managing Director, Federal Self-help Association for Osteoporosis (BfO), Germany

#### Italy

Professor Maria Luisa Brandi (FIRMO), Professor of Endocrinology and Metabolic Diseases and Director of the Operative Unit of Diseases of Mineral and Bone Metabolism, Medical School, University of Florence, Italy

Professor Stefano Gonnelli (SIOMMMS), Associate Professor of Internal Medicine and Director of the School of Specialization in Emergency Medicine and Urgency, University of Siena, Italy

Professor Giuseppe Sessa (SIOT), Professor of Orthopedics and Traumatology and Director of the Orthopedic Clinic of the Vittorio Emanuele Polyclinic, University of Catania, Italy

## Spain

Dr. Josep Blanch Rubio (SEIOMM), Clinical Director of the Institut Blanch de Reumatologia, Spain

Professor Adolfo Diez-Perez, Head Emeritus of Internal Medicine at the Hospital del Mar, Autonomous University of Barcelona, Spain

Maria Antonia Robles Palacios, President of AECOSAR, Spain

Dr. Santiago Palacios (FHOEMO), Director of Instituto Palacios, Salud y Medicina de la Mujer, Spain

## Sweden

Professor Mattias Lorentzon (SVOS), Professor in Geriatric Medicine, Institute of Medicine, University of Gothenburg, and Chief Physician, Osteoporosis Clinic at the Sahlgrenska University Hospital, Sweden

Lisa Keisu Lennerlöf (Osteoporosförbundet), Chair of Osteoporosförbundet, Swedish Osteoporosis Association, Sweden

## UK

Professor Cyrus Cooper, Professor of Rheumatology and Director of the MRC Lifecourse Epidemiology Unit, University of Southampton, UK, and Professor of Musculoskeletal Science at the NIHR Musculoskeletal Biomedical Research Unit, University of Oxford, UK

Fizz Thompson (NOS), Clinical and Operations Director at National Osteoporosis Society, UK

Dr. Celia L Gregson, Consultant Senior Lecturer and Arthritis Research UK Clinician Scientist, Musculoskeletal Research Unit, Bristol Medical School, University of Bristol, UK



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Our vision is a world without fragility fractures,  
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9 rue Juste-Olivier • CH-1260 Nyon  
T +41 22 994 01 00 • F +41 22 994 01 01

[info@iofbonehealth.org](mailto:info@iofbonehealth.org) • [www.iofbonehealth.org](http://www.iofbonehealth.org)



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