

**English Summary of the original French  
Report submitted to the**

**Ministre délégué à la Recherche, à la Science  
et à la Technologie du Québec**  
*(Québec Minister Responsible for Research,  
Science and Technology)*

This assessment is an official report prepared and published by the *Agence d'évaluation des technologies et des modes d'intervention en santé (AÉTMIS)*. It is also available in PDF format on the Agency's Web site.

Information concerning this report or any other report prepared by *AÉTMIS* may be obtained by contacting it at:

Agence d'évaluation des technologies et  
des modes d'intervention en santé (*AÉTMIS*)  
2021, avenue Union, bureau 1040  
Montréal (Québec) H3A 2S9

Telephone: (514) 873-2563  
Fax: (514) 873-1369  
E-mail: [aetmis@aetmis.gouv.qc.ca](mailto:aetmis@aetmis.gouv.qc.ca)  
Web site: <http://www.aetmis.gouv.qc.ca>

How to cite this report as a reference (this document is the English summary of the following original *AÉTMIS* report):

Agence d'évaluation des technologies et des modes d'intervention en santé (*AÉTMIS*). L'ostéoporose et les fractures chez les personnes de 65 ans et plus : recommandations pour un cadre intégré d'intervention au Québec. Rapport préparé par Michel Rossignol et collaborateurs. (*AÉTMIS* 01-4 RF). Montréal: *AÉTMIS*, 2001, ix-68 p.

Legal deposit  
Bibliothèque nationale du Québec, 2001  
National Library of Canada, 2001  
ISBN 2-550-38067-3

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## MISSION

To support the *Ministre délégué à la Recherche, à la Science et à la Technologie* and Québec's public health system decision-makers, including the *Ministère de la Santé et des Services sociaux*, through the assessment of technologies and methods of intervention in health issues, notably the assessment of their efficacy, safety, cost and cost-effectiveness, as well as ethical, social and economic implications.

To support the *Ministre délégué à la Recherche, à la Science et à la Technologie* in the development and implementation of scientific policy.

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## OSTEOPOROSIS AND FRACTURES AMONG PEOPLE AGED 65 AND OVER: RECOMMENDATIONS FOR AN INTEGRATED FRAMEWORK FOR ACTION IN QUÉBEC

Osteoporosis is caused by gradual bone loss associated with age. According to estimates, half of Canadian women over the age of 75 suffer from low bone density and are at risk for fractures of the wrist, hip and spine. It is a major health problem that has numerous organizations around the world reviewing their screening, diagnosis and treatment strategies, as well as recommending structured action plans to deal with this illness.

As part of its involvement in reviewing national health-care priorities, the Direction de la santé publique de Montréal-Centre asked AÉTMIS to conduct a thorough study of the recommendations available. AÉTMIS's research provides a starting point for recommendations on an integrated framework for action to fight osteoporosis and fragility fractures in Québec.

The authors have based their review on the analysis of 11 reports prepared by national and international organizations. Conclusions emphasize the need for a framework that integrates and appropriately sets out population-related and clinical interventions. The implementation of this plan will require leadership at the ministerial level and the involvement of many stakeholders from different fields.

AÉTMIS also recommends the development and assessment of various ways to identify people at risk, promote good health care among the young and prevent falls among people aged 75 and over. Other recommendations highlight the need to develop and implement a guide to good clinical practices, and to assess its application. The guide must be updated to include any developments in the evidence available. A recommendation was also made regarding the priority to be given to research in this area.

With this assessment, *AÉTMIS* wishes to provide the best possible information to the policymakers at various levels of the Québec health services network concerned by the important public health problem that is osteoporosis.

Renaldo N. Battista  
President and CEO

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## SUMMARY

### Introduction and objective

Osteoporosis is caused partly by the gradual loss of bone mineral density associated with age. According to estimates, this condition strikes a third of Canadian women over the age of 65 and half over the age of 75. Low bone density is a major risk factor for fractures of the wrist, hip and spine. The mortality rate in the year following a hip fracture ranges from 12% to 20%, while the disability rate among survivors stands at 25%. However, the impact of these complications exceeds the aspects that are usually measured. For example, in a study, 80% of women aged 75 and over said that they would rather die than suffer a hip fracture. The impacts that physical disabilities have on quality of life have not been adequately studied and, as a result, are neglected in official assessments and recommendations.

The decrease in bone density that is characteristic of osteoporosis, combined with other factors, also increases the risk of fractures. The Québec population, for example, is systematically exposed to genetic, climatic and environmental risk factors that contribute to the prevalence of fractures.

The objective of this study is to summarize the various reports published worldwide on osteoporosis screening, in order to 1) describe the recommendations and supporting arguments; 2) understand the differences between the recommendations in order to prepare a coherent summary; 3) make recommendations for an integrated framework for action against osteoporosis and fragility fractures in Québec.

### Bone densitometry

Densitometry measures the mineral content of the skeleton, which gives an estimate of bone fragility and involves the use of various X-ray or

ultrasound techniques. At the international level, in spite of unanimous recommendations against the use of densitometry for population-wide screening, all industrialized countries have reported a sharp increase in the number of tests conducted. The number of tests conducted in Ontario grew sixfold between 1992 and 1998, to one in seven women aged 55 to 69. Since the geographic distribution of screening is determined solely by market laws, the highest number of tests was observed to be 200 times more than the lowest. There is no published information available on the use of densitometry or on the prevalence of osteoporosis in Québec.

Still at the international level, the recommendations fail to agree on a definition of people at risk who should be tested for osteoporosis. These differences stem from a lack of understanding of the paradigms used and the objectives sought. The clinical paradigm, on one hand, favours diagnosing and treating osteoporosis in consulting patients. The use of densitometry therefore depends on the reasons for the consultation and the prescribing of the test. In the Ontario survey, most of the cases were patients consulting their general practitioners about issues relating to menopause.

The public health paradigm, on the other hand, has a broader objective: fighting osteoporosis and fractures. In this context, densitometry is presented as the tool that could be useful to people between the ages of 65 and 75 who were already identified because of other risk factors. Three of these risk factors — a previous fragility fracture, physical inactivity and a low body mass index — are deemed especially interesting, as they are linked to both osteoporosis and fractures.

Lastly, cost-benefit considerations, the level of awareness among clinicians and the general

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public, as well as the organization of health-care services differ from country to country. We therefore need to base our arguments on data that correspond to our reality.

### **Conclusions of the review**

It is difficult to summarize the recommendations on osteoporosis screening and the prevention of fragility fractures, as they are indistinguishably based on two models: one favours clinical management and the second, a public-health-type prevention approach. As a means of preventing fragility fractures, the two models are not incompatible; however, the reports do not clearly demonstrate their complementarity. This is partly due to the fragmentation of disciplines and the fact that prevention and treatment objectives are not clearly defined.

Based on the evidence, none of the 11 reports studied recommends universal bone density screening, i.e. among individuals who present no symptoms of osteoporosis and do not request the test. They also do not recommend bone densitometry for risk-free patients seeking medical attention, whether or not they request the test. In spite of these recommendations against intervention, no alternative strategies are put forward for the general public. One aspect that is sometimes alluded to is population-wide screening for risk factors associated with fragility fractures.

The reports studied differ on the use of bone densitometry to screen people who, when consulting, present one or more risk factors for osteoporosis or fragility fractures. Although several of the reports agree that the practice could be recommended, they differ on the number and definition of the risk factors. None of the organizations used the prevalence of risk factors among their local populations as a basis for their recommendations. They seem to focus more on the clinicians' need to face the growing demand.

All the recommendations present osteoporosis as a major health-care issue. The research conducted has focused primarily on imagery techniques and pharmacology, rather than on integrated strategies to fight osteoporosis and fragility fractures, even though there is no direct evidence that these techniques are effective. Although it is virtually not addressed in the reports studied, the imbalance — in part caused by the differences in funding capabilities — sometimes reduces the scope of thought on the fight against fragility fractures to the single question of bone densitometry or hormone replacement therapy.

### **Recommendations**

The following recommendations are aimed at initiating a process that will help prevent fragility fractures by fighting against osteoporosis and risk factors associated with osteoporosis and fractures. Although the recommended approaches and interventions largely apply to women, they also extend to men who, to a lesser extent, may present several of the risk factors, as well as young people. These recommendations are formulated as objectives to be met.

The reports studied for this project clearly demonstrate the need for a framework that integrates and appropriately sets out population-related and clinical interventions. The implementation of this plan will require leadership at the ministerial level and the involvement of many stakeholders with different interests, especially institutions in the health-care and social services network, non-profit organizations that focus on promoting physical activity or healthy eating for example, seniors groups, as well as private pharmaceutical or biomedical engineering companies. Although the cost of implementing such a plan has yet to be determined, it would probably be modest compared with the costs incurred by the exponential increase in the availability and use of diagnostic and treatment methods for osteoporosis, which is driven by those having vested interests.

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***Recommendation 1***

*An integrated framework for action should be created to fight osteoporosis and fragility fractures in Québec.*

***Recommendation 2***

*Measures should be introduced, and assessed, to raise awareness among and to identify Québécois at risk for osteoporosis and fragility fractures.*

***Recommendation 3***

*Guidelines for good clinical practices should be developed, implemented and assessed. They must be updated to include evolving research developments on:*

- *The identification of patients seen in primary care at risk for fragility fractures as a result of low bone mass (previous or family history of fragility fractures, low body mass index, estrogen-related problems, etc.);*
- *The identification of people with a high risk for falls and, by extension, for fragility fractures (previous history of falls, social isolation, people on multiple medications, etc.);*
- *Diagnostic indications for bone densitometry and interpretation of results;*
- *Quality control criteria for all aspects of the installation, use and replacement of bone densitometry equipment as technology progresses;*
- *Management of previously identified people, including drug therapy for osteoporosis and referrals to health-care or social services depending on the type of risks identified.*

***Recommendation 4***

*Public health interventions should be introduced and assessed with a view to promoting the development of strong bones among adolescents and to preventing falls among people aged 75 and over.*

***Recommendation 5***

*Support for the research required to assess actions against osteoporosis and fragility fractures in Québec should be increased.*

