INTRODUCTION

Since the 1980s osteoporosis has been viewed as a public health crisis in North America. The concern over osteoporosis has intensified in recent decades due to an aging population, which has created a greater focus on osteoporosis prevention and management approaches carried out by public health organizations. Public health in North America is grounded in risk-based epidemiological models that are used to identify what populations or groups are in need of prevention. Risk-based approaches have been common since the emergence of the “new” public health after the first world war. A reimagining of public health was driven by the constant threat of risk posed by environmental hazards and the growing awareness of lifestyle risks in the health literature. In order to be effective public health had to fundamentally reorganise itself around risk prevention and communication. This included the translation and dissemination of expert knowledge on health risk into lay language that could then be used by the public to adopt healthier behaviours. This risk communication is now termed health promotion, an education-based method of translating health knowledge through engagement with communities and individuals.

As public health has expanded its mandate, the consequences of a public health approach to population health have grown. While there is no question that increased efforts toward health are beneficial to populations, there are inherent problems in the framework on which the public health approach is based. The main problems with using a risk-based system is that risk is actually a statistical method designed for populations, not individuals. Risk as synonymous with danger or harm is how risk is used in a public health context and has come to be understood as the potential for disease or ill health. Individuals are concerned about their own personal risk of disease and so public health attempts to translate population level data into individual risk. As a result, public health has taken on the role of risk translators and communicators for the public.

While risk-based models are generally accepted as the norm for public health because they lead to positive reductions in disease, they also have recognized negative effects on individuals and populations. Discourses within public health often uncritically promotes the use of risk-based models, without due recognition of their limitations. This is not to suggest that these models do not work, as many have proven effective in reducing overall disease rates. However, the unexamined acceptance of these models within the literature creates a space in which the negative effects of these models are not addressed by those implementing them, which in turn raises the possibility that some people may be harmed by their use. This issue can be seen in osteoporosis health promotion, where the World Health Organization serves as the guide in prevention and management that is designed within this epidemiological, risk-based approach. Osteoporosis is currently viewed as an entrenched public health crisis, brought on by an aging population that this living longer. The need for osteoporosis prevention is growing, leading to widespread dissemination of risk-based prevention models for which the negative effects have only been cursorily examined. The purpose of this paper is therefore to use a critical medical anthropology lens to assess the application of a risk-based public health model to osteoporosis in order to gain a more nuanced understanding of the effects of risk-based models within osteoporosis promotion.

Public health and osteoporosis: A case study

Osteoporosis prevention initiatives in Ontario

Osteoporosis health promotion occurs at the national, provincial and local levels in Canada. At the national level, osteoporosis promotion and prevention is carried out primarily by Osteoporosis Canada (a non-governmental organization), which often collaborates with the Public Health Agency of Canada and Health Canada on the development of osteoporosis information. Osteoporosis surveillance is managed by the Public Health Agency of Canada’s (PHAC) Center for Chronic Disease Prevention and Control and Health Canada. Osteoporosis Canada, which is associated with the International Osteoporosis Foundation (IOF), is active in public health promotion throughout Canada at the national, provincial and local levels through specific provincial and locally-based initiatives.

In Ontario, osteoporosis prevention is shared by Osteoporosis Canada and the Ontario Osteoporosis Strategy. The Ontario Osteoporosis
Strategy is a joint venture of the Ministry of Health and Long-Term Care (MOHLTC), the Ontario Women’s Health Council, the Ministry of Education, the Ministry of Health Promotion, Osteoporosis Canada, the Dairy Farmers of Canada and a number of hospitals throughout Ontario. The Ontario Osteoporosis Strategy is an active initiative that provides education and support to specific target groups that include men and women over 40 and grade five students in Ontario schools. At the local level, Osteoporosis Canada has a number of chapters which follow the national mandate but operate essentially independently. These chapters deliver the national health promotion programs including: the ‘speaking of bones’ community outreach speakers program; the ‘BoneFit’ exercise initiative; participation in the Canadian Osteoporosis Patients Network (COPN), a national support network for osteoporosis patients; and the “Break Through” educational program. However the chapters tend to tailor their prevention programs to the community, with the goal being to provide the type of education and activities desired by the community. As a result there is considerable variability between programs. While these are the main organizations that deal specifically with osteoporosis health promotion, osteoporosis is also covered under other initiatives that deal broadly with chronic disease.

Canadian osteoporosis health promotion initiatives are based on the standards established by the WHO and the IOF. In keeping with the changes in the new public health, osteoporosis health promotion is centered around empowerment of individuals to take control of their own health. Osteoporosis education is risk-centered, with a focus on identifying individuals who are at high risk of fractures and delivering preventative education and support to change individuals’ health behaviours and prevent fractures. The large number of risk factors that are outside the control of the individual results in osteoporosis education being focused narrowly on the few factors that individuals can control, generally diet and exercise. Vigilance and self-surveillance are common themes and individuals are encouraged to communicate with their physicians about their bone density, monitor their calcium and vitamin D intake, and exercise regularly in order to build bone and maintain muscles for balance. These themes are seen on the information webpages for Osteoporosis Canada, PHAC and Health Canada. The underlying theme in osteoporosis promotion is that individuals must actively seek out education in order to manage their risk factors and the responsibility for osteoporosis management is on the individual.

The Ontario Osteoporosis Strategy is concerned with access to bone mineral density testing and education on osteoporosis. Screening for potential osteoporotic conditions and management of existing conditions require the use of bone mineral density tests to track changes in bone. One component of this strategy focuses on treatment, which provides access for all Ontarians at specific fracture clinics that are trained in the treatment of osteoporosis. Other components involve education programs for 5th graders, the widespread dissemination of osteoporosis education information to the general public through commercials and to specific high risk groups through targeted education.

Socioeconomic status and prevention

What emerges from this strategy is an attempt to provide equitable access to treatment options and education for those at risk, however, the major focus of prevention is on lifestyle factors. This becomes problematic as it operates on the assumption that all people have the same capacity to engage in prevention. In doing so it does not address the broader social determinants of health. Similarly, Osteoporosis Canada, beyond providing osteoporosis education and support through its chapters, does not offer tailored prevention programs to people of low SES or differential access. This means that, while these initiatives might recognize the role that larger social processes play in placing people at risk—a theme which comes across in osteoporosis literature—they are not providing promotional programs that address or include sources of risk beyond lifestyle.

Considering the current aim of public health promotion is on addressing the social determinants of health, these osteoporosis programs fall short of their mark. While they create spaces for specialised treatment and establish routes of referral that narrow the care gap in osteoporosis, they are not focussing on bringing accessible prevention information to those at risk of osteoporosis. The issue of access to prevention education is especially concerning in rural areas where people must rely on family practitioners and community health teams to disseminate this information. Previous research on the osteoporosis knowledge of rural primary care physicians has shown a lack of confidence in osteoporosis diagnosis and management.

These issues suggest that osteoporosis prevention programs need to be examined with a critical eye to assess how well they are meeting the intended goals of health promotion. Most of the information on program efficacy has been gathered from treatment of fragility fractures and involves delivery of follow up care, changes to BMD, and recurrent fragility fractures. While important in building treatment models, these measures do not accurately measure the effectiveness of prevention programs in preventing fragility fractures or decreases in BMD.

Risk factors, modelling risk, and blame

In an epidemiological model the risk factors for osteoporosis include: being female, over age 65, history of previous fracture, family history of fracture, smoking, excessive consumption of alcohol (three or more drinks per day), early menopause, low body weight (under 132 lbs), a history of falls, infrequent exercise and a diet low in calcium and vitamin D. Under a risk-based model these factors can be divided into three types: extrinsic/environmental, intrinsic/lifestyle and embodied. Extrinsic/environmental risks are those that are judged to be external and beyond the control of individuals. Intrinsic/lifestyle risks are internal risks, over which individuals do have control. In the health literature, ‘lifestyle’ risks are the result of lifestyle decisions made by individuals. The final type, embodied risks, which are internal to the individual. Embodied risks represent the body posing a physical or psychological threat to itself. Using this model, osteoporosis
falls within multiple risk categories. Many of the risks posed by osteoporosis are outside the control of individuals, but others, such as physical activity and diet, are lifestyle risks. Osteoporosis could also be considered an example of embodied risk, as defined by Kavanagh and Broom (1997), because the threat to the individual comes from the body itself. How osteoporosis is conceptualised is important because internal risks are perceived as within a person’s control and are associated with a greater amount of blame. This becomes important in health promotion where the internal risks are viewed as most easily modifiable and are given the most attention. By placing the emphasis on risks that are controllable, this creates a situation where individuals who cannot or will not modify their diet or exercise become perceived as partially to blame for their disease.

The risk that lifestyle behaviours truly pose to osteoporosis is a complex issue. While lifestyle is known to affect bone health, it represents a small fraction of the number of factors that contribute to osteoporosis52. Since the other factors remain outside the control of the individual, osteoporosis prevention centers around diet and exercise7,33,34. The importance of risk-reduction through these lifestyle changes is heavily emphasized, which places individuals who do not make changes in a potentially untenable role, but also offers a measure of perceived control over an embodied threat34,35. Through lifestyle changes, individuals are provided with a mechanism to assert control over and minimize their perceived risk of osteoporosis37. This implied control confers a moral responsibility on individuals to engage in behaviours that are beneficial to their health and to make efforts to minimize unhealthy activities38. Health is understood to be one of the most important values in society and attaining it is seen as a moral duty10,36,37. Good citizens are healthy citizens, so to reject a healthy lifestyle is to reject the ideals of Western society.

Placing lifestyle risk in the context of health access

The focus on lifestyle that is taken in public health fails to take into account the role of barriers to health access and so unintentionally labels individuals as unwilling to engage in health behaviours, rather than unable7. These are often not conscious labels, but are found inherently in how public health promotes health prevention. While the new health promotion recognises the existence of social, political and economic barriers, there are no exemptions offered for those who are limited by access37. Women who are unable to make the lifestyle choices they have been educated about due to barriers have the potential to feel guilty and depressed. Dietary changes involve access to leafy green vegetables, increased dairy intake, and regular meals. Following these suggestions means having access to grocery stores, both geographically and being able to physically access them, as well as having the resources to purchase these foods and the time needed to prepare them. Dairy-based foods and vegetables are costly to purchase and have a limited shelf life. Supplements are also raised as a possibility but these are also expensive and often out of reach for older adults on a limited income, which also represents the most at risk population.

Physical activity represents a similar problem. Access to a gym or to home exercise equipment requires economic means as well as time to dedicate to physical activity. Specialised osteoporosis exercise programs such as Osteo-circuit38 and Bonefit39 exist in Ontario, but come with a cost. Some programs are offered at a lower cost at the YMCA, but this still requires a financial output that is not accessible to all. This puts a strain on individuals who have access to prevention education and want to participate in risk-modifying behaviours but have limited access to them. The urge to engage in risk reduction is culturally embedded as part of the healthism and wellness culture in the west40. The inability to participate not only makes people feel bad that they are actively choosing to be risky, but also draws their attention to their lack of participation, which can increase their sense of their own risk and lead to new stress41. Overarching all of the problems affecting access to these modifiable risk factors is the controversy surrounding these recommendations in the first place, as there is no concrete evidence that shows that increased physical activity or calcium and vitamin D intake have a measurable impact on fracture risk42,44. The conflicting information provided to individuals, combined with the pressure to make good health decisions, leads to difficulty in deciding which initiatives they should be following.

Negative effects of constructed targeted prevention

How and where prevention education is presented has important implications for how the public comes to perceive their risk. Most official support for osteoporosis concerns the curative treatment of fractures, with individuals being responsible for the bulk of their prevention activities10,63. Prevention is overwhelmingly based on targeted education to prevent additional fractures in adults with one or more fractures, to older adults who are identified as at risk due to age and/or sex, and to young children in critical growth periods5,46. By targeting these individuals as at-risk, it serves to reinforce the fear of osteoporosis in the target groups, while causing other individuals to underestimate their own risk47. While targeted osteoporosis prevention provides useful information to older adults, such as information on fall prevention, it also reinforces the role of the self in preventing osteoporosis48. Placing the responsibility for risk prevention on individuals can be overwhelming for some women and act as a barrier to the adoption of health behaviours48.

Targeted education also reinforces the cultural models associated with osteoporosis, which has further implications for how individuals come to perceive their osteoporosis risk. The association between osteoporosis and aging results in younger individuals underestimating their risk of osteoporosis because they do not believe it poses a risk until they are older7,49. The reality, that osteoporosis is a lifecourse disease that is affected by risk factors established throughout life, exists in opposition to a dominant discourse on osteoporosis that places it as a natural part of aging.40,50,52. This dominant discourse is reinforced by education programs that target older persons47,48. At the same time, constructing osteoporosis as a natural process also serves to minimize the sense of risk experienced by older persons.5,50. While osteoporosis is
a serious condition, individuals do not perceive it as such because it is seen as natural and expected. A similar problem is seen in men who do not perceive themselves at risk of osteoporosis because osteoporosis is understood to be a women’s disease. Due to cultural construction of osteoporosis risk as dominated by women, a construction that is reinforced through the media, men who develop osteoporosis must contend with the psychological reality of having a ‘women’s’ disease. Public awareness campaigns generally feature older women, rather than men, which can be seen in a series of public videos from Osteoporosis Canada. Similarly, osteoporosis literature shows mostly women, though there is a concerted effort within Osteoporosis Canada to change this view. Male-specific images, literature, and even events are being proposed in order to highlight the risk to men. Still, the majority of attendees at Osteoporosis Canada events are women. Men who are diagnosed tend to have more severe disease and a greater number of fractures at the time of diagnosis. This has been suggested to reflect the effects of cultural constructions of osteoporosis on the medical community, as health care providers are slower to suspect osteoporosis in men.

Medicalization and control of healthy bodies through screening

In order to control the economic problems posed by osteoporosis, the Ontario Osteoporosis Strategy introduced a screening program for osteoporosis available as a prevention method for individuals that have a large number of risk factors. Screening programs as prevention have created a large amount of debate because they bring healthy individuals into the system of medical surveillance and have the potential to increase worries about health by categorizing them into a pre-disease or disease state. Because public health approaches used risk-based models to understand disease, risk becomes a medicalizing force that can transform pre-disease states into illness. At-risk bodies require constant monitoring and management by medical institutions, which creates a system of increasing medical surveillance. This is seen in the case of low bone mass (previously osteopenia), which is a pre-osteoporotic condition and is considered to indicate a high risk of developing osteoporosis. While the individual with low bone mass does not actually have osteoporosis and might never develop it, low bone mass has come to be recognised as a disease state and confers the same threat and fear associated with a disease. The result is that more and more bodily states are seen as representing disease and health itself becomes more difficult to attain as pre-disease states become labelled as diseases. This concern can be seen with osteoporosis screening where the process of being sent for the BMD test and having their risk assessed revealed an embodied risk and not only increased their worry about future illness and caused them to seek out further surveillance, but created a sense of alienation of the self and body.

Other concerns about screening programs have revolved around the idea of government control of bodies. Screening is seen as a mechanism to draw individuals into the web of expert knowledge created by public health in order to encourage particular behaviours. Labelling individuals at-risk because of screening, serves to instill a deeper need to comply with health information in order to avoid further ill health. Those who are screened as high risk are strongly encouraged to adopt risk-minimizing lifestyle behaviours and are occasionally prescribed medication to treat their low bone mass. As a result, women with low bone mass are treated as though they already have a disease and require intervention by the medical system. This represents a cost not only to individuals in terms of time, but also to the health system for long term monitoring. Recent shifts in BMD monitoring reflect an easing off of surveillance as the monitoring intervals for low and moderate risk women have been increased from three to five years. It is unclear what the long term effects of this change will be, but it does suggest a reassessment of the benefit of surveillance of those at low and moderate risk.

Reconsidering risk models

While risk-based models present a useful way of conceptualizing the harm caused by disease, they also have the potential for negative outcomes in osteoporosis. The goal of the new public health was good in theory, but it focuses heavily on how individuals can manage their own health instead of looking at systemic social determinants of health. In risk-based models the social determinants of health are treated as factors that contribute to risk, rather than recognizing their role as barriers to effective prevention or management. This approach raises the potential for victim-blaming of those who cannot participate, and increases the stress placed on high risk individuals who are being told they must change their lifestyles in order to avoid becoming sick. All the while there is little focus in public health on how individuals with decreased access to resources can make these changes.

Since the goal of risk-based health promotion is to identify places in which risk can be reduced, there is a focus on modifiable factors as compared to non-modifiable factors. While this needs to be a careful balance, as providing people with options gives them a sense of control, by not officially recognizing that some risks are inherent and therefore unmodifiable again raises issues surrounding victim-blaming. Focussing on modifiable factors holds the potential for real psychological harm to those who interpret the numerus lifestyle suggestions associated with osteoporosis prevention as an indication that they caused their own disease. Similarly, there are problems with introducing models that medicalize normal, inevitable body-states, such as aging. Assigning risk categories to individuals who might simply be experiencing normal bone loss promotes increased surveillance of the population, which then blurs the lines between what is and is not a disease state. For every recorded positive outcome, there is an unknown potential for suffering of those placed in these liminal spaces of low risk, who become both sick and not sick at the same time.

What emerges from this exploration of the intersection between risk-based approaches and osteoporosis prevention is the potential for harm that is inherent in attempting to delineate risk within a population. The new public health has taken on the role of risk communicator, where it attempts to identify, define, and provide
avenues for risk mediation to individuals within a population. The goal was to contribute to public safety by reducing instances of disease, but the increased surveillance that came with this approach has had unintended and often infrequently discussed consequences. In the case of osteoporosis public health promotion is responsible for a great deal of education around prevention activities, but has also created unintended spaces for suffering in surveilled populations. Going forward, public health organizations and partners that participate in osteoporosis prevention would benefit from considering the possible negative outcomes of their approaches, rather than just the positive benefits in disease reduction, and tailor their messages and programs in ways that help to reduce these potential harmful outcomes.

References