Trends in the study of Aboriginal health risks in Canada

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ABSTRACT

Objective. To identify trends in the study of health risk in peer-reviewed and grey literature in Canadian Aboriginal populations from 1960 to 2007.

Study design. Systematic literature review and analysis.

Methods. Peer-reviewed literature was searched using 5 electronic library databases. The grey literature was searched using 3 online search engines, 4 agency websites and 2 online compiled databases. The search terms used were “Canada,” synonyms for Canadian Aboriginal peoples and “risk.” Citations were screened for relevance to Aboriginal populations and risks to aspects of human health.

Results. Both literatures show an exponential growth in risk-focused study of Canadian Aboriginal health issues over time. There is a geographic foci in the North with the Prairies and the West under-represented. Risk is most commonly used in relation to general health, environmental, zoonotic infections and chronic diseases in the peer-reviewed literature, and general health or environment in the grey literature. Most publications in both literatures are on generalized Aboriginal populations. When specified, a larger proportion of the publications relate to First Nations people, followed by Inuit. Little literature exists on Métis health risks in Canada.

Conclusions. There has been an increase in publications about Aboriginal health risk in Canada over time. Trends reflect a research focus on the North and an increased interest in environment and health issues. Greater attention to mental health, addictions and Métis health is required. The increasing use of a risk-based analytical focus has potential implications for understanding the nature of Aboriginal health today and in the future.

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INTRODUCTION

In recent years, the concept of “risk” has gained significant attention among individuals, communities and government (1-3). This interest is evident when analysing and understanding the health issues and health status of Canada’s Aboriginal populations. Whereas risks to these peoples were formerly confined primarily to the general physical hazards associated with more traditional lifestyles, more recently these have been replaced with a multitude of other risks induced by changes in environment, lifestyle and society. Today, health risks include disease (e.g., tuberculosis and diabetes), adoption of adverse lifestyle habits (e.g., poor nutrition, smoking and inactivity) and threats from changes to the environment (e.g., loss of traditional lifestyles, increased reliance on “Western” foods, exposure to contaminants such as PCBs and climate change) (4,5).

Within Canada, the need to understand health risks facing Aboriginal peoples has become more compelling as the population continues to grow rapidly. Between 1996 and 2006, the Aboriginal population grew by 45%, compared to 8% for the non-Aboriginal population. In 2006, Canada’s Aboriginal population surpassed the 1 million mark, reaching 1,172,790, which includes 50,485 Inuit, 389,785 Métis and 698,025 First Nations people (6). Research has shown the increasing influence of a number of common risk factors on current health status among Aboriginal populations, including socio-economic status, geographic location of residence and differential access to health services. As a result, Aboriginal populations continue to report significantly lower health statuses than those of non-Aboriginal Canadians (4,7,8).

Recent theoretical developments in the general understandings of risk perception and communication provide useful insights for issues facing Aboriginal communities (9). For example, the concept of the duality of risk as analysis and risk as feeling (“the affect heuristic”) (10) aptly explains much about the response to risks experienced by Aboriginal communities. Similarly, the idea that risk is a cultural concept (11) has relevance by recognizing the unique history and traditions of these peoples. Power and trust (12) have special significance for Aboriginal communities, which have endured many years of contentious relationships with government agencies. However, while these concepts are useful in understanding some aspects of risk and risk response, it has become increasingly evident that studying and understanding risk in Aboriginal communities requires first understanding the people and their situational context (13,14). Skolbekken (15) argues that there is value in understanding the volume and nature of health research using a “risk” approach and terminology. He notes that there has been an “epidemic” of the use of the term in the past that carries with it potential dangers in such areas as health analysis, self-perception of health and the allocation of resources for treatment within the health care system. However, at the same time, when the term is used appropriately it is potentially valuable as it sheds light on key factors influencing future health by providing information that aids in the prediction of unwanted events or health outcomes.

While other papers have reviewed the considerable research that has been conducted on Canadian Aboriginal health (5), identified trends in peer-reviewed social science health literature (16) and reviewed specific risk issues
Canadian Aboriginal risk study trends

(17), the trends in the amount, location and focus of health risk investigations and their representation in the peer-reviewed and grey literature have not been specifically examined. The purpose of this paper is to examine trends in the study of health risks in Canadian Aboriginal populations from 1960 to 2007 (as represented in both the peer-reviewed and grey literature) to identify current patterns of understanding and possible research gaps.

For the purpose of this review, we have defined risk in accordance with the definition proposed by Kaplan and Garrick (18) in the inaugural issue of the journal Risk Analysis, which is based on the concepts of hazard, probability and consequences. The authors propose that risk be defined as the answer to three basic questions: (1) “What can go wrong?” representing the hazard or potential risk associated with a chemical/biological agent or activity; (2) “How likely is it to go wrong?” representing the probability that circumstances will arise that result in exposure to a contaminant or disease vector, or the existence of specific risk factors (such as genetic predisposition or compromised physical condition) that may contribute to a risk being manifested; and (3) “If it does happen, what are the consequences?” representing the adverse outcomes that may arise if a hazard is present and there is a probability the risk will be incurred. In addition, the element of human concern or worry about the risk (what is commonly referred to as risk perception or risk perspectives, and which may not be directly correlated to the quantitative prediction of the risk) and the time period over which the risk is incurred (i.e., immediate or long term) are considered (19). This definition is consistent with other common definitions such as that used by the World Health Organization (20) in their report Reducing Risks, Promoting Healthy Life: “a probability of an adverse outcome, or a factor that raises this probability” (p. 7).

By focusing specifically on “risk,” this review is an analysis of the growth in the use of the term and approach, as well as an assessment of the focus on predictive factors that may lead to unwanted health outcomes, and an identification of where future research might take place. Knowledge of these factors allows for the potential mitigation or prevention of the adverse consequences and differentiates this review from others that have specifically focused on Aboriginal health status or health conditions in the country (16).

METHODS

A systematic search of both the peer-reviewed (primary) and grey literature was conducted for the period January 1960 to August 2007. The peer-reviewed literature was searched using Academic Search Complete, Social Sciences Full Text, Humanities Full Text, Web of Science and Bibliography of Native North Americans. The search terms used were “Canada” and “Indian” or “Métis” or “Inuit” or “Eskimo” or “Native” or “Aboriginal” or “First Nation(s).” The specific delineating terms “risk” and “health” were not initially included in the peer-reviewed literature search in order to search as broadly as possible and to capture peer-reviewed literature whose content was health risk-related, yet did not explicitly use those terms in the title or abstract.

The grey literature was searched using 3 online search engines (Google, Google Scholar and Yahoo), 4 agency websites (Government of Canada, Health Canada, World Health Orga-
nization and United Nations) and 2 online databases (Circumpolar Health Bibliographic Database [University of Manitoba], and Arctic Science and Technology Information System [University of Calgary]). The search terms used were “Canada” and “risk” and “Indigenous” or “Aboriginal” or “First Nation(s)” or “Métis” or “Indian” or “Native” or “Inuit.” The search term “health” was not initially used in the grey literature in order to capture those sources both directly and indirectly related to health as might be defined by the source author. Where there were a large number of hits identified in the grey literature search using any combination of keywords, the search focused on the sources most specifically relevant to the topic. To achieve this, each of the first 200 hits was reviewed for inclusion in the study. After 200, each consecutive source was reviewed for relevance until 25 consecutive irrelevant hits were found. At this point, the search advanced 50 hits in the list and 5 sources were reviewed for relevance, and then the search was advanced by 50 more hits where another 5 sources were reviewed for relevance. This process continued until the 600th source in the list was reached, at which time the review of that list was stopped. The grey literature included government and international organization reports, books and book chapters, as well as a wide variety of non-peer-reviewed articles available online or via online databases.

A 3-stage exclusion and coding process was applied to both sets of literature. Stage 1 eliminated duplicate records, book reviews, books, review articles and articles using the terms “Native” and “risk” in the context of biology, ecology, archaeology, resource management, agriculture and basic natural sciences. During stage 2, every record was examined and the abstract was read carefully to ensure the article dealt with Aboriginal issues, risk and health. All other records were eliminated. In stage 3 the remaining records in the peer-reviewed literature were then preliminarily coded as “risk-related” (using the term “risk” in the title or abstract), “implied risk” (dealing with risk topics but not using the term “risk” per se; these records included statements such as “increased incidence,” “higher prevalence” or “more likely to”) or “not risk” (not related to risk at all). Only records identified as “risk-related” or “implied risk” are included in this analysis. In stage 3 for the grey literature, only those articles explicitly using the term “risk” were included. Articles that could be categorized as “implied risk,” as in the peer-reviewed literature search, were not captured. However, as many of the sources in the grey literature search did not contain an abstract and the full source content was reviewed, there was greater chance for the term “risk” to appear in the text scanned during the screening process and therefore a greater likelihood that risk-focused work was included.

RESULTS

In the peer-reviewed literature, 3,663 citations were generated by the original search, with 728 retained after stage 1 and 2 eliminations. Following stage 3 coding of “risk,” “not risk” and “implied risk,” a total of 234 peer-reviewed articles were retained for final analysis. In the grey literature, a total of 701 sources were generated, with 535 retained after stage 1, 2 and 3 eliminations. The process developed to manage the search and review of the large number of hits possible with general
online search engines (e.g., Google Scholar) in the grey literature described above likely resulted in a smaller number of total initial sources being found but a higher percentage of sources being retained, even when applying stage 1, 2 and 3 exclusion criteria. All sources retained in the search of primary and grey literature were then coded by cultural group specificity (Aboriginal, First Nations, Inuit, Métis and multiple groups where more than one group was identified), geographic focus (region/province) and health research focus (general health, environmental health, zoonotic diseases, chronic diseases, mental health and infectious diseases).

**Trends over time**
Figure 1 identifies an increase in the use of risk-based approaches and the terminology of “risk” in the Aboriginal health literature in Canada since 1960, with considerable growth apparent since 1990. For the grey literature, this growth appears exponential, and peaks in 2005. By comparison, the peer-reviewed literature has seen a more sustained growth over time, peaking in 2007 with approximately 35 publications that year.

**Geographic foci**
Figure 2a delineates the distribution of focus of publications by geographic region. In the grey literature, over 50% of the publications are classified as focusing on “Canada” with publications in the Territories and Arctic a distant second at just over 20% of publications. The peer-reviewed literature shows a similar pattern, however there is less emphasis on publications classified as focusing on “Canada” and a greater proportion focusing on the West and Quebec in particular.

Figure 2b presents the same data divided by Aboriginal population per region. When depicted this way, it is evident that there has been much greater attention paid to health risk

![Figure 1. Number of publications on Canadian Aboriginal health risk topics (1961–2007).](image-url)
issues among Aboriginal populations in the Territories and Arctic, despite their considerably smaller population base. While this overrepresentation is especially evident in the grey literature, it also exists in the peer-reviewed literature. Regions outside of the Territories and Arctic have only averaged between 1 and 2 publications in each of the grey and peer-reviewed sources per 10,000 Aboriginal population between 1960 and 2007.

**Health topics**

Figure 3 presents a breakdown of both literatures by health topic. The grey literature shows a very strong representation of health risk research on general health (33.6%) and

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**Figure 2a.** Proportion of publications by region (1961–2007).

**Figure 2b.** Publications by region (1961–2007) per 10,000 Aboriginal residents.

*Based on people reporting Aboriginal identity in the 2006 Canadian Census (6).*
Environmental health (27.5%), with a stepwise reduction in representation of zoonotic infections, chronic diseases, mental health and infectious diseases. By comparison, the peer-reviewed literature displays a fairly even distribution across general health (22.7%), environmental health (20.1%), zoonotic infections (20.1%) and chronic diseases (25.6%). As with the grey literature, there is a relatively small focus on risks associated with mental health and infectious diseases.

Aboriginal group
Most publications in both the grey and peer-reviewed literatures refer to the general term “Aboriginal” (45.8% and 41.5%, respectively) (Fig. 4). This is followed by references to First Nations people (24.9% and 28.6%) and then Inuit (20.4% and 22.2%). Subsequently, there is a small proportional representation of publications that identify multiple Aboriginal groups such as First Nations and Inuit, or Aboriginal and Inuit. There is a marked absence of literature on Métis health risks.

Figure 3. Proportion of publications (1960–2007) by health topic.
DISCUSSION

The systematic literature review of Canadian Aboriginal health risk sources reveals some very interesting trends and disparities in the distribution of research publications over the last 40 years. In general there has been a significant growth, predominantly since 1990, in the use of the term “risk” and a risk-focused approach in both sources of literature. This growth is likely influenced by at least two factors. First, the growth in the grey literature obtained using online databases and search engines likely reflects recent technological advances such as greater Internet accessibility and the explosion of online resources over the past decade. Second, the growth of the peer-reviewed literature reflects the coalescing of academic research on environment, health and Aboriginal issues in Canada over the past decade, as well as an increase in journals specifically targeting both risk issues and Aboriginal populations.

For example, the premier risk journals (Risk Analysis, Journal of Risk Research and Health, Risk and Society) were initiated in 1981, 1998 and 1999 (respectively), while the major Canadian Aboriginal journals (Canadian Journal of Native Studies, Pimatziwin and Journal of Aboriginal Health) were initiated in 1981, 2003 and 2004 (respectively).
These results are synonymous with the writings of Beck (1) and others in regards to the fascination with and apparent power seen in a “risk-based” approach to inquiry in society today, coupled with research funding agencies’ emphasis on Aboriginal, environmental and health research. The findings reflect what Skolbekken (15) reported back in 1995 among the medical literature. He argued that this “epidemic” of the use of the term and approach possibly originated in a number of things, including the growth of probability statistics and the technology used to support it; a shift in beliefs regarding factors influencing health from those outside the individual to those within and under control of the individual and a corresponding shift in belief away from a fatalistic attitude towards health and health care; an evolution in our understanding of health outcomes to recognize the reality of multiple and complex causes; and the growth of interest and belief in health promotion. This trend appears to exist within the Aboriginal health literature in Canada as well in the years we have reviewed. Further, this trend appears in the peer-reviewed as well as the grey literature sources which often include reports prepared and disseminated by Aboriginal organizations, governments and other non-academic institutions.

There are significant geographic disparities in risk-focused health research across Canada, with the risk-based analysis of health issues in the North more than four times greater in terms of the number of publications per 10,000 Aboriginal residents than elsewhere. Per capita, the Aboriginal populations in the Prairie region are the group “least studied” in this regard. Within the peer-reviewed literature, this northern focus may be reflective of specific targeting by Canadian research programs. While this distribution of focus does not represent the geographic distribution of Aboriginal peoples in the country, it does reflect a focus on the population reported to be facing some of the greatest health challenges and disparities in the country according to current data (northern Aboriginal residents) (21,22). However, this raises the question as to whether northern Aboriginal health status is truly worse than elsewhere in the country, or if there are other populations with similar health status that receive significantly less attention because they are currently under-represented in the research literature.

Research and writing on health risk issues has primarily a “general Aboriginal” focus as opposed to being more specific to particular cultural groups. What is most apparent in the distribution of risk investigations across cultural groups is the near absence of research and publications focused on the Métis, likely reflecting the current general lack of awareness and understanding of this population in Canada.

The patterns in foci of health subject area are reflective, at least in part, of the literature sources reviewed. The focus on “chronic diseases and health risks” seen in the peer-reviewed literature is likely due to the medical focus of many peer-reviewed sources. Similarly, the grey literature focus on “environment and health risks” is probably strongly influenced by the growing public interest and awareness of environmental conditions (e.g., contaminants and climate change) and how they influence health status, particularly in the North (e.g., 21,23). Further, the grey literature has been more focused on general effects than the more “analytical and academic focus” on
chronic and other disease categories yet has a similar growth in the use of a risk-based approach and terminology. Interestingly, there has been little attention given to mental health (which includes addictions) despite the level of concern about these issues within Aboriginal populations.

These results reflect those found by Wilson and Young (16) in their review of the social science literature on Aboriginal health in Canada over the past 10 years and Skolbekken (15) in his review of the use of a risk approach represented in literature available through MEDLINE databases from 1967 to 1991. We have complemented and furthered our understanding of the patterns in Canadian Aboriginal health research literature by combining these approaches and focusing here on health risk issues and by including all years accessible via online sources of both the grey and peer-reviewed literature.

The importance of examining trends in research cannot be overstated. An increased interest in Canadian Aboriginal health risks has clear benefits, particularly considering the current health disparities experienced by these populations. It can be argued that analytical examination of health risk factors supports the development of targeted treatment and intervention programs. However, at the same time, there may be a danger in focusing solely on the “risk factors” or the negative side of the Aboriginal health equation that supports program development and perhaps a philosophy of risk management and minimization being equated with health protection and promotion (24). Skolbekken (16) draws the connection between an overemphasis on risk and the impact on self-perceived health status and the potential manifestation of ill health.

An overemphasis on understanding risk alone may be negatively influencing the lens through which we view and understand Aboriginal health status and may be underestimating the value of a focus on better comprehending the factors that promote and protect positive health and well-being of Aboriginal peoples in Canada today.

Conclusions

The increase in number of health risk studies in recent years is likely beneficial in terms of addressing the underlying causes of health disparities, but also raises a caution that mitigation of risk factors needs to be balanced with a corresponding emphasis on positive health promotion and an understanding of the factors that influence good health. Geographic inequities suggest that greater attention should be paid to Aboriginal Canadians residing outside of the North, particularly among Métis populations. Finally, the focus of Canadian health risk research needs to reflect additional pressing issues facing these populations, such as addictions and mental health which are currently under-represented in the literature. Addressing these inequities and gaps in our understanding will support movement towards better awareness of the reality of Aboriginal health risk status in Canada.

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Conflict of interest statement

No conflicts to declare.
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