

Gendered dimensions of environmental health, contaminants and global change in Nunavik, Canada

Les dimensions sexuées de la santé environnementale, des contaminants et du changement global au Nunavik, Canada

Joanna Kafarowski

Volume 30, numéro 1, 2006

Problématiques des sexes
Gender issues

URI : <https://id.erudit.org/iderudit/016148ar>

DOI : <https://doi.org/10.7202/016148ar>

[Aller au sommaire du numéro](#)

Éditeur(s)

Association Inuksiitiit Katimajit Inc.
Centre interuniversitaire d'études et de recherches autochtones (CIÉRA)

ISSN

0701-1008 (imprimé)
1708-5268 (numérique)

[Découvrir la revue](#)

Citer cet article

Kafarowski, J. (2006). Gendered dimensions of environmental health, contaminants and global change in Nunavik, Canada. *Études/Inuit/Studies*, 30(1), 31–49. <https://doi.org/10.7202/016148ar>

Résumé de l'article

Ainsi que l'a démontré la littérature universitaire au cours des deux dernières décennies, la pollution est une importante menace potentielle à la santé à court et à long terme des êtres humains et de l'environnement naturel de l'Arctique, de même qu'elle soulève des questions de justice sociale et environnementale. Certaines études ont établi un lien entre des polluants tels que les métaux lourds, les polluants organiques de longue durée et les radionucléides, et l'usage traditionnel des nourritures locales par les peuples autochtones, y compris les Inuit. Ayant, d'une multitude de manières, un impact nuisible sur les communautés inuit, ces polluants représentent l'une des manifestations du changement global à travers le Grand Nord circumpolaire. En prenant pour point d'investigation la communauté d'Inukjuak, Nunavik (nord du Québec), Canada, cet article examine les rôles des femmes et des hommes inuit dans leur participation aux activités de chasse et à l'identification des polluants-contaminants; il démontre comment les hommes et les femmes construisent différemment cette question cruciale des contaminants. L'article examine de plus pourquoi le fait d'inclure les perspectives des deux sexes est essentiel au développement de politiques, de stratégies et de programmes environnementaux efficaces en réponse à ces contaminants.

Gendered dimensions of environmental health, contaminants and global change in Nunavik, Canada

Joanna Kafarowski*

Résumé: Les dimensions sexuées de la santé environnementale, des contaminants et du changement global au Nunavik, Canada

Ainsi que l'a démontré la littérature universitaire au cours des deux dernières décennies, la pollution est une importante menace potentielle à la santé à court et à long terme des êtres humains et de l'environnement naturel de l'Arctique, de même qu'elle soulève des questions de justice sociale et environnementale. Certaines études ont établi un lien entre des polluants tels que les métaux lourds, les polluants organiques de longue durée et les radionucléides, et l'usage traditionnel des nourritures locales par les peuples autochtones, y compris les Inuit. Ayant, d'une multitude de manières, un impact nuisible sur les communautés inuit, ces polluants représentent l'une des manifestations du changement global à travers le Grand Nord circumpolaire. En prenant pour point d'investigation la communauté d'Inukjuak, Nunavik (nord du Québec), Canada, cet article examine les rôles des femmes et des hommes inuit dans leur participation aux activités de chasse et à l'identification des polluants-contaminants; il démontre comment les hommes et les femmes construisent différemment cette question cruciale des contaminants. L'article examine de plus pourquoi le fait d'inclure les perspectives des deux sexes est essentiel au développement de politiques, de stratégies et de programmes environnementaux efficaces en réponse à ces contaminants.

Abstract: Gendered dimensions of environmental health, contaminants and global change in Nunavik, Canada

As has been well-documented in the scholarly literature over the last two decades, contaminants pose a potentially significant threat to the short and long-term health of Arctic human and natural environments and raise questions of social and environmental justice. Studies link contaminants such as heavy metals, persistent organic pollutants and radionuclides with the use of traditional country foods by Indigenous peoples including the Inuit. Adversely impacting Inuit communities in a myriad of ways, contaminants represent one manifestation of global change across the circumpolar North. Focusing on the community of Inukjuak, Nunavik (Northern Québec), Canada, this paper investigates the roles of Inuit women and men *vis-à-vis* participation in hunting activities and the identification of contaminants, and demonstrates how women and men construct the lead contaminant issue differently. Additionally, the paper explores why including the perspectives of both is critical to the development of effective environmental health policies, programs and strategies in response to these contaminants.

* Natural Resources and Environmental Studies Program, University of Northern British Columbia and Research Associate, Canadian Circumpolar Institute, University of Alberta. Mailing address: 429 Berg Road, Gabriola, British Columbia VOR 1X2, Canada. gypsy_four@shaw.ca

Introduction

Human activity has significantly altered the environment on a global scale driving climate change, ozone depletion, biodiversity loss and the long-range transport of contaminants. Influencing human-environment interactions at local, regional and global levels, signs of global change are pronounced in the Arctic. Inuit in northern Canada have little control over activities in the south that are primarily responsible for instigating and maintaining global change, but they are susceptible to the effects. Local communities face shifting social, cultural and economic systems as traditional and modern Western ways continue to collide. Wildlife experience increased pollutant burdens and ecosystems that may no longer adequately support life. Human health may be at risk due to exposure to contaminants and food insecurity (Duhaime 2002; Indian and Northern Affairs Canada 2003b; Muckle *et al.* 2001).

According to the case study outlined in this paper, lead shot is shipped into northern communities by southern-based companies. These companies ignore the fact that, in Canada, lead shot has been banned for the hunting of migratory gamefowl since 1999 and that lead shot use in Indigenous communities has been linked to high blood lead levels in local residents and pernicious effects on wildlife (Lévesque *et al.* 1999; Sanborn *et al.* 2002; Scheuhammer *et al.* 1998; Scheuhammer *et al.* 2003). Due to their reliance on a traditional diet, Nunavik communities are already susceptible to the effects of other contaminants that exist in the ecosystem as a result of global change (Dallaire *et al.* 2003; Després *et al.* 2005; Dewailly *et al.* 2001). This vulnerability is intensified by the presence of lead shot which is brought into the community and sold locally. Although these stores are responding to the laws of supply and demand, I would argue that the availability of a banned product; the failure of the manufacturer and/or store to provide literature (in Inuktitut and English) to local residents that explains the hazards of product use in plain language; the limited product choices available to northern residents; and the inability of the Canadian Wildlife Service (Environment Canada) to monitor the imposition of the ban in an equitable manner adversely affect the well-being of the Inuit. The environmental health of Nunavik communities—both human and natural—is further compromised.

Uncertainty about how global change and related activities such as the use of lead shot will impact Arctic environmental health in the future imposes additional stress on the region. Despite the potential vulnerability of Arctic residents to the effects of global change, Indigenous peoples have had to lobby this position vigorously in international fora in order to be heard¹. In identifying and formulating an effective response to global change and its effect on environmental health, decision and policy-makers must be aware of and responsive to the needs and perspectives of all residents: women, men and youth.

The discourse on global change suggests that contaminants, climate change, ozone depletion and biodiversity loss are gender-neutral. As Seager (1993) indicates,

¹ The Inuit Circumpolar Conference and the leadership of Sheila Watt-Cloutier at the Stockholm Convention on Persistent Organic Pollutants were instrumental in raising global awareness about how contaminants affect the peoples of the Arctic (see Downie and Fenge 2003; Fenge 2000; Watt-Cloutier 2000, 2001).

environmental crises are primarily represented as problems of physical systems under stress. In recent years, the global change discourse has broadened to include human and community systems but analysis has been limited from a gender perspective (Denton 2002; Nelson *et al.* 2002; Sass 2002). When addressing contaminants in particular, the relevant literature is dominated by the physical and natural sciences while most research in the social sciences explores the intersection between contaminants, traditional foods and human health (Kuhnlein 1995; Kuhnlein and Chan 2000; Milburn 2004). There is mounting evidence that women and men are affected differently by contaminants. Contaminants are transferred by women to their babies across the placental barrier and through breast-feeding (Dallaire *et al.* 2003; Dewailly *et al.* 1996; Klopov *et al.* 1998)². Additionally, both women and men identify contaminants at various stages during hunting. Women are responsible for making food-choice decisions in households and so are critical players in influencing the health of the family and community. As outlined in this paper, women and men construct the issue of contaminants in diverse ways based on their respective roles within the community and within Inuit culture. These gendered differences are of seminal importance in the development of robust environmental health and contaminant policies, programs and strategies.

Lead as an Arctic contaminant

Heavy metals represent a potentially significant source of contamination in Arctic communities throughout the circumpolar North. Heavy metals occur naturally in all ecosystems in the Arctic but with variations in concentration (Dallaire *et al.* 2003; Indian and Northern Affairs Canada 2003a). Scientists have identified mercury, lead and cadmium as the major heavy metals currently adversely affecting the Arctic and this is reflected in the quantity of research focusing on these elements (Arctic Monitoring and Assessment Programme 2002; Kwan 1999; Indian and Northern Affairs 2003b). Lead is a widespread environmental contaminant that originates due to natural or anthropogenic sources (Dallaire *et al.* 2003; Dewailly *et al.* 2001; Substance Selection Task Force 2003). Naturally occurring processes such as precipitation, weathering, and erosion transfer lead between the air, the soil and the water in a continuous cycle of exchange. As with other contaminants such as persistent organic pollutants (POPs), lead reaches the Arctic primarily through atmospheric, oceanic and riverine transport. Point-source pollutants within the Arctic include aging Dew Line military infrastructure and industrial emissions from the Kola Peninsula, Russia. Lead and other heavy metals are absorbed by living and dead organic matter which may be ingested by wildlife or remain in the soil or water. Once it has been consumed, lead bioaccumulates in organisms.

Although the use of lead has declined in North America in recent decades, it can still be found in paint, leaded gasoline, old plumbing, contaminated soil and drinking water (Sanborn *et al.* 2002; Koller *et al.* 2004). In the Arctic, elevated levels of lead

² However, work conducted by LaKind *et al.* (2005) highlights the fact that the traditional risk assessment approach cannot definitively link levels of most environmental chemicals in mother's milk to a particular health outcome.

exposure have also been linked to the use of lead shot (Lévesque *et al.* 1999; Tsuji *et al.* 1999; Dewailly *et al.* 2001; Johansen *et al.* 2004).

Linking lead exposure and traditional foods

Studies conducted since the late 1980s across Canada indicate that many Indigenous communities are potentially at risk particularly because of a reliance upon a traditional diet (Indian and Northern Affairs 2003b; Kuhnlein and Chan 2000; Tsuji *et al.* 2001). Data from the Santé Quebec Health Survey (reported in Lévesque *et al.* 1999; Schell *et al.* 2003), cord blood studies conducted between 1993-1996 (Lévesque *et al.* 2003; Rhainds *et al.* 1999) and data from the lead investigation done by Dewailly *et al.* (2001) provide evidence of exposure to lead for the population of Nunavik. As outlined in Table 1, levels of lead concentrations in maternal blood from 1990-2000 were among the highest in circumpolar nations.

Research on the connection between contaminants and traditional foods published between the late 1970s-late 1980s focused on the potential ramifications for human health. Somewhat alarmist in nature, the results of these studies were often communicated poorly to community residents. One negative consequence of these studies during this period was the decision of many Inuit mothers to relinquish breastfeeding (a beneficial practice even despite the possible presence of contaminants in breast-milk). Work published since that time has shifted to include the considerable advantages of consuming these foods³. According to Blanchet *et al.* (2002), traditional foods such as marine mammals and fish fat provides an adequate supply of essential nutrients such as vitamins A, D, iron and zinc. Omega-3 type fatty acids found in oil and meat may offer some protection against some conditions including arteriosclerosis, diabetes, high blood pressure and breast, colon and prostate cancers (Dewailly *et al.* 2001; Arctic Monitoring and Assessment Programme 2003). Further work is being conducted on how traditional foods may counteract the effects of certain contaminants.

Recent literature emphasizes that traditional foods feature significantly in the cultural and spiritual life of the community (Kuhnlein and Chan 2000; Kuhnlein *et al.* 2001; Indian and Northern Affairs 2003b; Milburn 2004). Work conducted in the Western Arctic⁴ reveals that women identify the cost and availability of food (both store-bought and traditional) as the primary factors underlying food choice decisions (Kuhnlein *et al.* 2001). According to preliminary results, contaminants are rarely mentioned as an important factor in food choice. However, results from the case study examined in this paper show that decisions based on the presence of contaminants in traditional foods are made *earlier* in the process, for example, when an animal is being

³ See Kuhnlein (1995); Kuhnlein *et al.* (2001); Milburn (2004); Wein and Freeman (1995); Wein *et al.* (1996) for a further discussion of the benefits of a traditional diet.

⁴ Communities located in the Western Arctic are less reliant upon a traditional diet than are those located in Nunavik and Nunavut.

Table 1. Lead concentrations in maternal blood from circumpolar nations. They are expressed in geometric mean ($\mu\text{g/L}$ whole blood) followed by the range when available.

Country / Ethnic Group / Region	N	Lead
Canada		
Caucasian (1994-1999)	134	21 (2.1-58)
Metis/Dene	92	31 (5.0-112)
Other	13	22 (5.0-44)
Inuit		
Baffin (1996)	31	42 (5.0-120)
Inuvik (1998-1999)	31	19 (2.1-102)
Kitikmeot (1994-1995)	63	36 (6.2-178)
Kivalliq (1996-1997)	17	29 (12-64)
Nunavik (1995-2000)	162	50 (5.2-259)
Greenland		
Ilullissat (1999-2000)	29	50
Nuuk (1999)	34	37
Alaska		
Bethel (2000)	23	33 (nd-91)
Barrow (2000)	23	11 (7.0-27)
Siberian Russia		
Non-indigenous		
Norilsk (1995-1996)	49	32 (12-44)
Salekhard (1996-1998)	31	24 (12-40)
Dudinka (1995-9196)	27	21 (14-42)
Indigenous		
Taymir (1995-96)	18	29 (12-48)
Yamal (1996-98)	12	24 (12-40)
Finland (1996-1998)	130	11(5-58)
Faroe Islands (2000-2001)	124	21 (13-100)

Adapted from AMAP (2002: 47).

butchered as well as *later* in the process (prior to and/or after cooking), when lead shot fragments are being removed. Further investigation into the various stages of the food choice decision-making process and the gendered context in which this process takes place would yield fruitful results.

Health effects of lead on women and children

Ubiquitous to the natural environment, lead is a toxic metal with no proven biological function in living organisms (Sanborn *et al.* 2002; Schell *et al.* 2003; Scheuhammer *et al.* 1998). According to Sanborn *et al.* (2002: 1287): “Studies indicate that, overall, there is no evidence for a threshold below which lead has been proven to have no adverse health effects. Blood lead levels previously considered safe are now known to cause subtle yet chronic health effects”⁵.

Identified as “sensitive sub-populations,” Northern Indigenous communities, pregnant women and children are particularly vulnerable to the effects of lead exposure (Substance Selection Task Force 2003: 11). Most literature on the health effects of lead focuses on children, with women and industrial workers also represented to a lesser extent (Koller *et al.* 2004; Lidsky and Schneider 2003; Substance Selection Task Force 2003).

Lead exposure among women of childbearing age is an important source of exposure during fetal development. In adults, 20-70% of ingested lead and nearly 100% of inhaled lead enters the blood. Reproductive effects associated with lead include a disruption of the onset of menstruation, an increased chance of miscarriage, spontaneous abortion or stillbirth, pre-term labour and having newborns with lower birth weight (Denham *et al.* 2005; Substance Selection Task Force 2003; Takser *et al.* 2005). Prenatal lead exposure is associated with adverse effects on cognitive function during infancy although some studies show that these effects generally diminish during childhood (Muckle *et al.* 2001; Rhoads *et al.* 1999). Low levels of postnatal lead exposure have been linked to poor childhood cognitive performance including distractibility, attention deficit, memory problems and other disorders (Després *et al.* 2005; Lévesque *et al.* 1999; Muckle *et al.* 2001). However, Sayre and Ernhart (1992), Minder *et al.* (1998) and others challenge these findings.

Children aged 9 months to 3 years are more vulnerable because they absorb lead 5-10 times more effectively than adults and have greater exposure because of their involvement in frequent hand-to-mouth activities (Sanborn *et al.* 2002: 1289). Lidsky and Schneider contend that children are particularly sensitive to the effects of lead:

A greater proportion of ingested lead is absorbed from the gastrointestinal tract of children than of adults. In addition, a greater proportion of systematically circulating lead gains access to the brain of children, especially those 5 years of age or younger, than of adults. Finally, the developing nervous system is far more vulnerable to lead’s toxic effects than the mature brain (Lidsky and Schneider 2003: 14).

There is general agreement regarding the effects of exposure to higher levels of lead but no consensus regarding effects of exposure to lower levels of lead. Lead exposure is also linked to low attention span, a lower than average IQ, aggression and antisocial or delinquent activities (Committee on Environmental Health 1998; Needleman 2001; Sanborn *et al.* 2002).

⁵ See Committee for Environmental Health (1998); Koller *et al.* (2004); Lévesque *et al.* (1999); Sanborn *et al.* (2002); Substance Selection Task Force (2003).

It is evident that medical conditions in children caused or aggravated by lead exposure at low levels are difficult to detect (Lévesque *et al.* 1999; Sanborn *et al.* 2002). Lidsky and Schneider state:

Lead poisoning from these lower levels of exposure is far more common and is particularly insidious because of its lack of diagnostically definitive physical signs. Some children complain of stomach pains and loss of appetite and may or may not have anaemia. However, such symptoms are not present in all poisoned children, or even the majority, and in any case do not point unequivocally to lead as the culprit. Such poisoning, often termed 'asymptomatic' because of the lack of clear physical symptoms, is unfortunately not 'asymptomatic' with respect to its effects on brain functioning (Lidsky and Schneider 2003: 15).

The challenges of definitively linking exposure to low levels of lead to medical conditions, the costs involved in testing for lead exposure and the lack of medical training in detecting symptoms of lead (and other heavy metals) exposure may result in a failure to accurately diagnose lead poisoning.

Case study: Inukjuak, Nunavik

Comprised of 55.63 km², Inukjuak is located on the east coast of Hudson Bay on the 58th parallel (Figure 1). Inukjuak lies 180 km south of Puvirnituq and 240 km north of Umiujaq. The population is 1,294 (2001). Of the 300 families, 38% are headed by single parents. The birth rate in Nunavik is twice as high as in the rest of Quebec and the population is growing at a rate six times higher than the rate for Quebec. Adults support a higher number of dependents than elsewhere in the province. Seventy-four percent of adults in Inukjuak have not completed high school. Life expectancy in Inukjuak and other communities in Nunavik is 65.4 years (1996) which is the lowest rate in Canada.

Residents in Inukjuak regularly engage in traditional activities such as hunting, fishing, trapping, gathering berries and wild plants. As outlined in Table 2, in 2001, 75% of adults hunted in the past 12 months and 96% of those who hunted, did so for food. One hundred percent of those adults surveyed indicated that they fished for food. With some minor differences, this high level of participation in traditional activities is consistent with the other 13 communities in Nunavik. As with other Hudson Bay communities, Inukjuak residents are heavily reliant on a traditional diet which is comprised mainly of goose and ptarmigan—gamefowl hunted with lead or steel shot⁶. In Inukjuak, local residents have been exposed to low levels of lead over generations due to the use of lead shot in hunting. In this case, the presence of lead as a contaminant is due to its availability in the two local stores. Its adverse effect on human and natural environmental health is aggravated by the presence of other contaminants transported through other pathways.

⁶ Communities located on Ungava Bay are more reliant upon caribou rather than gamefowl and so are not as susceptible to the risks posed by lead shot.



Figure 1. Map of Canada.

Table 2. Involvement of Inukjuak residents in traditional activities.

Characteristics	Inukjuak	Nunavik
% of adults who hunted in the past 12 months	75	70
% of those who hunted for food	96	98
% of adults who fished in the past 12 months	75	74
% of those who fished for food	100	98
% of adults who gathered wild plants (berries, sweet grass, etc.)	63	64
% of those who gathered wild plants for food	93	96
% of adults who trapped in the past 12 months	19	26

Source: Statistics Canada (2001)

Fieldwork was conducted in Inukjuak between October-November 2004 and January-March 2005. Survey questionnaires were administered by the primary investigator and a local Inuktitut-speaking woman to 139 male and female residents in total. This represented 46.3% of all Inukjuak households. Consisting of both closed and open-ended questions, the survey instrument focused on the participation of residents in hunting and fishing, the use of lead shot and the awareness of health risks associated with lead. In-depth, follow-up interviews were conducted with 14 women who either hunted themselves or who went hunting with others.

Involvement in hunting activities

An examination of the gendered dimensions of lead shot as a contaminant in Inukjuak must necessarily be prefaced by a discussion of hunting roles. According to Bodenhorn (1990: 56-57): “Gendered relations among hunters/gatherers have primarily been examined in relation to the presence or absence of egalitarian relations in societies with a sexual division of labour and a relative lack of private property.” Bodenhorn contends that anthropological models applied to hunter/gatherer societies may result in an inaccurate view of gender relations in the Arctic. In the Inuit community of Inukjuak, as in the Iñupiaq North Slope communities of Alaska studied by Bodenhorn, men are *primarily* although not *exclusively* responsible for preparing firearms, loading the kamotik, shooting/killing the animal and butchering it. Women and men jointly identify the need to hunt and which species will be targeted. Women help plan the expedition, prepare the food, bedding and shelter that is required when away from home. Women care for the family, assist in setting up the shelter and prepare meals. Women may share in preparing the animal for transport and then will dry and cook it. Bodenhorn states:

A couple could operate virtually as a self-sufficient dyad for much of the year—and indeed, several couples recounted to me with relish how they did exactly that. An adult should be able to do the gender-appropriate work and should be attached to a spouse who would reliably do the rest. It should be emphasized that this is a gendered not a sexual division of labor, for there is nothing in this model that assigns a ‘natural’ meaning to the task that men and women perform. Men and women are not thought to be somehow congenitally

incapable of doing something generally assigned to a member of the opposite sex (Bodenhorn 1990: 60).

In Inukjuak, most male respondents hunted at least once or twice a month with approximately 30% of them hunting once a week. Over 65% of married men said that their wives would “come along” with them hunting but few explicitly identified their wives as “hunters.” This was consistent with the response of women who rarely declared themselves to be “hunters” but who stated they often accompanied their husband. It became apparent that, in Inukjuak, the term “hunter” is equated with tasks related to firearms—namely, loading the gun and shooting the animal. This is rarely carried out by women. However, it was clear that hunting *as an activity* is understood by women and men to be a process in which both are involved in complementary tasks.

Identifying contaminants and making dietary choices

As outlined in Poirier and Brooke (2000), hunters (and their hunting companions) possess a vast store of traditional knowledge that guides them in detecting contaminants in wildlife. Poirier and Brooke wrote:

These hunters reiterate trust in their own ability to detect a sick animal, one that might be unfit for consumption [...]. In order to produce a diagnostic, hunters rely on a whole range of perceptible signs, such as the behaviour of the animal, the colour and texture of its organs, its fur, or fatty tissues. It is often during the evisceration and butchering process that the hunter or his wife notices that the animal is unfit for consumption. When in doubt or unsure of the quality of the meat, the hunters may discuss the case between themselves (Poirier and Brooke 2000: 86).

In Nunavik, the ability of hunters to observe aberrant behaviour and/or unusual characteristics in caribou and other terrestrial mammals is of particular importance in Ungava Bay communities which are more reliant on these species. Women’s observational skills and traditional knowledge may be of greater significance in Inukjuak and other Hudson Bay communities in which gamefowl comprises a greater percentage of the traditional diet. Both men, and to a lesser degree, women are involved in hunting geese and ptarmigan but women are almost exclusively in charge of plucking and dressing the goose either on site or at home. Therefore, women are the first to identify an abnormality in a bird and to discard it as a potential food item on this basis.

In being primarily responsible for the preparation and cooking of meat, women also determine if lead shot has become lodged in the meat or has splintered against bone and so remove it before or after cooking. A poster released by the Nunavik Nutrition and Health Committee in 1999, at the time of the ban on using lead shot, demonstrated what lead shot in meat looked like and provided instructions for removing the lead shot and cutting away the meat around it.

Women are primarily responsible for determining if the family will eat store-bought or country foods. The reliance of Inukjuak and other Nunavik residents on a

traditional diet means that women's ability to identify and remove (if possible) contaminants such as lead shot and their awareness of why they should do so, is critical in maintaining environmental health in the community. This role is particularly important in Inuit culture as women promote the health of their respective (extended) family's health but also that of the whole community.

Women also share in making other food choice decisions including who needs food in the community, how food is distributed, what food will be chosen, what quantities are provided and if the food to be distributed is store-bought or traditional. Women clearly have sole responsibility for this in many households. Poirier and Brooke state:

For an Inuk, sharing is not a duty; sharing is not performed for prestige or out of generosity either. It is even more than a responsibility toward others, it is an embodied value and practice. As such, it is vital to the management and the continuation of local inter-personal relationships within contemporary Inuit communities (Poirier and Brooke 2000: 82).

The ability of women and men to recognize lead shot as a contaminant and the knowledge about why and how it should be removed is paramount in promoting environmental health. Emphasis placed on the sharing of food in Inuit culture means that the failure to recognize lead shot may result in contaminants being unwittingly distributed throughout the community.

Gendered perceptions of the lead shot issue

As outlined in Table 3, the majority of Inukjuak residents surveyed report using steel shot regularly and thus think that it poses no threat to the environmental health of the community. However, despite the imposition of a ban on the use of lead shot in 1999 and a promotional campaign launched shortly thereafter by the Nunavik Nutrition and Health Committee⁷ stressing potential health risks associated with lead shot use, over 33% of hunters currently use either lead shot exclusively or use both lead and steel. Also, over 90% of those interviewed stated that they fished extensively and used lead sinkers—thus potentially further exposing themselves and others.⁸

Table 3. Lead shot usage in Inukjuak, Nunavik (2004-2005).

Type of shot used	Percentage of users
Steel shot	43.2%
Lead shot	15.8%
Both	17.3%
Don't know/no response	23.7%

⁷ It is important to note that the Nunavik Nutrition and Health Committee can only act in an advisory capacity and has no power to implement or enforce the ban.

⁸ Lead sinkers are currently in common use and have not been banned by the Canadian Wildlife Service although there have been recent studies to determine to what extent lead sinkers threaten the environment (see Scheuhammer *et al.* 2003).

Only 31% of respondents were aware that the use of lead shot was banned in the community. This could be due to the lack of enforcement of such regulations; the low profile of the conservation officer in Inukjuak; minimal monitoring by local organizations; and the failure of the Canadian Wildlife Service to provide ongoing information and support to hunters organizations in Nunavik. Although 50% of respondents had some awareness of the negative effects of lead shot, no one could provide specific information about how lead shot affected environmental health. However, even a general awareness of the potential health effects of lead is not always sufficient to impact on lead shot use. Slightly under 20% of respondents knew about the ban and possible health effects and used lead shot anyway, stating that they either did not believe this information or did not care. However, as Poirier and Brooke (2000: 85) assert, hunters are more reliant upon their own experiential knowledge and may mistrust scientific studies. "As they are confident in their own knowledge, they feel quite sceptical toward any warnings that have been issued from the South stating that their food might be poisoned or unfit for consumption." This may be particularly so in the case of lead shot as it is challenging for physicians to prove a causal link between lead exposure and various illnesses.

In indicating a preference for using one type of shot or another, hunters evinced an understanding of the differences between steel and lead shot. For male hunters, the choice of shot is a *hunting* issue. As individuals, they make a choice about how to hunt gamefowl and focus on ballistical qualities including speed, timing, accuracy and overall effectiveness. However, personal preference and the *perception* of ballistical properties are of significance as some hunters state that lead shot kills faster and other hunters state the same about steel shot. Other factors including the age and experience of the hunter, the influence of friends and family, the type of shot gun used influence the perception of hunters. In stating their preference for one form of shot or another, men assert their right as hunters to choose how to harvest wildlife and provide food for their family in the best way they know how. In this way, they are also asserting their roles as males in Inuit society and their rights as hunters and providers.

As identified in interviews with both men and women, Inukjuak is still a traditional community in many ways. Although a small percentage of men no longer hunt or pursue a traditional lifestyle and most women are employed full-time outside the home, traditional hunters are still accorded respect and status in Inukjuak. The fact that over 90% of residents taking part in the study still eat traditional food on a regular basis (and recognize its significance in Inuit culture) despite the availability of store-bought food, affirms the role of the hunter who obtains this food.

Women respondents were not aware of the ballistical properties of shot but were somewhat more likely than men to be aware of the health effects. While many men who had heard about the health effects indicated that they did not believe them, few such comments were heard from women. During in-depth discussions with women, women situated lead shot and its effects within the realm of environmental health with emphasis placed on the health of children. In this way, women stressed their own traditional role in Inuit culture as nurturers and caretakers of their own families and their community. According to Pauktuutit:

Inuit society is vibrant, changing yet deeply rooted in traditions and values of earlier times. Change has permeated every area of life, yet the culture and language remain strong. The role of women in Inuit society has also undergone many changes. Women are actively involved in community life and many are employed outside of the home, yet women continue to maintain the primary responsibility of caring for children and for passing the language, culture and values to the next generation (Pauktuutit 1991: 6).

During in-depth interviews, women asserted that the community and, in particular, women would mobilize to address the issue of lead shot if they were made more fully aware of the hazards.

Several women stated that the community did not have any information about lead shot and that although they recalled hearing about the issue in 1999 at the time of the ban, this information was no longer circulating. This was corroborated by the fact that during fieldwork in Inukjuak, no community organization including the health clinic had or displayed any information on lead shot.

Of the 14 women interviewed in-depth for this study, 12 worked with at least three organizations and stipulated that they would get involved in other issues if they were important to them. These women were active in organizations considered to be stereotypically female; *i.e.* education, healing and culture. Women's roles were recognized and valued but a delineation of women's and men's spheres still exists. Few women were involved in non-traditional organizations. For example, only one woman had ever sat on the board of the local Hunters and Trappers Organization and the majority of those interviewed stated that this organization held little attraction for women. This may be due in part to the fact that the board is dominated by traditional older hunters, but also because the organization was poorly funded and described as ineffective as a result.

Conclusion

Currently, environmental health policies, programs and strategies are developed on the basis that contaminants are gender-neutral. This study reveals that gendered dimensions of contaminant issues must be identified and addressed before dynamic strategies can be implemented. In Inukjuak, Nunavik, males identify lead shot as a hunting issue and an area of primary concern for men. Male respondents state this explicitly in interviews and also express the belief that traditional hunters (*i.e.* themselves) are best-suited to answer questions about lead shot and that it is not an effective use of time to speak about lead shot with non-hunters (who are in most cases women). Hunters and trappers organizations must be involved in future dialogue about contaminants and the role of hunters in the community validated. Conversely, women construct this as an environmental health issue. Although women are not knowledgeable about how lead shot impacts on health, they are keen to understand and assume an active role in resolving the issue. Contaminant policies, programs and strategies linking female and male perspectives that recognize environmental health *and* traditional hunting aspects of the lead shot issue will be most effective and culturally relevant in Inuit communities in Nunavik.

Acknowledgements

This study was supported by funding through a SSHRC Doctoral Fellowship, the CFUW Alice E. Wilson Award, the Arctic Institute of North America Grant-in-Aid Program and the Northern Scientific Training Program. The author gratefully acknowledges this funding as well as support provided by Pauktuutit Inuit Women's Association, the Nunavik Nutrition and Health Committee and the community of Inukjuak, Quebec. The author would also like to thank the two anonymous referees and the editor for their insightful comments and suggestions.

References

ARCTIC MONITORING AND ASSESSMENT PROGRAMME

2002 *Arctic Pollution 2002*, Oslo, AMAP Secretariat.

BLANCHET, Carole, Éric DEWAILLY, Pascale CHAUMETTE, Elizabeth NOBMANN, Peter BJERREGAARD, Tine PARS, Judith LAWN, Christopher FURGAL and Jean-Francois PROULX

2002 Diet Profile of Circumpolar Inuit, in Gérard Duhaime (ed.), *Sustainable Food Security in the Arctic*, Edmonton, Canadian Circumpolar Institute: 47-60.

BODENHORN, Barbara

1990 "I'm not the great hunter, my wife is." Iñupiat and Anthropological Models of Gender, *Études/Inuit/Studies*, 14(1-2): 55-74.

COMMITTEE ON ENVIRONMENTAL HEALTH

1998 Screening for elevated blood lead levels, *Pediatrics*, 101(6): 1072-1078.

DALLAIRE, Frédéric, Éric DEWAILLY, Gina MUCKLE and Pierre AYOTTE

2003 Time trends of persistent organic pollutants and heavy metals in umbilical cord blood of Inuit infants born in Nunavik (Quebec, Canada) between 1994 and 2001, *Environmental Health Perspectives*, 111(13): 1660-1664.

DENHAM, Melinda, Lawrence SCHELL, Glenn DEANE, Mia GALLO, Julia RAVENSCROFT and Anthony DeCAPRIO

2005 Relationship of lead, Mercury, mirex, dichlorodiphenyldichloroethylene, hexachlorobenzene and polychlorinated biphenyls to timing of menarche among Akwesasne Mohawk girls, *Pediatrics*, 115(2): 127-134.

DENTON, Fatma

2002 Climate change vulnerability, impacts and adaptation. Why does gender matter?, *Gender and Development*, 10(2): 10-20.

DESPRÉS, Christine, Anne BEUTER, François RICHER, Karine POITRAS, Annie VEILLEUX, Pierre AYOTTE, Éric DEWAILLY, Dave SAINT-AMOUR and Gina MUCKLE

2005 Neuromotor functions in Inuit preschool children exposed to Pb, PCBs and Hg, *Neurotoxicology and Teratology*, 27(2): 245-257.

DEWAILLY, Éric, Pierre AYOTTE and Suzanne GINGRAS

1996 Polychlorinated biphenyls and dichlorodiphenyl dichloroethylene in the breast milk of women living in the province of Quebec, Canada, *American Journal of Public Health*, 86: 1241-1246.

DEWAILLY, Éric, Pierre AYOTTE, Suzanne BRUNEAU, Germain LEBEL, Patrick LEVALLOIS and Jean Philippe WEBER

2001 Exposure of the Inuit population of Nunavik (Arctic Quebec) to lead and mercury, *Archives of Environmental Health*, 56(4): 350-357.

DOWNIE, David and Terry FENGE

2003 *Northern Lights Against POPs: Combatting Toxic Threats in the Arctic*, Montreal and Kingston, Inuit Circumpolar Conference and McGill-Queen's University Press.

DUHAIME, Gérard

2002 Tradition, modernity and food among northern peoples, in Gérard Duhaime (ed.), *Sustainable Food Security in the Arctic*, Edmonton, University of Alberta, Canadian Circumpolar Institute, CCI Press, Occasional Publication Series, 52: 1-12.

FENGE, Terry

2000 Indigenous peoples and global POPs, *Northern Perspectives*, 26 (1): 9-14.

INDIAN AND NORTHERN AFFAIRS CANADA

2003a *Canadian Arctic Contaminants Assessment Report II. Contaminant levels, trends and effects in the biological environment*, Ottawa, DIAND.

2003b *Canadian Arctic Contaminants Assessment Report II. Human Health*, Ottawa, DIAND.

JOHANSEN, Poul

2004 High human exposure to lead through consumption of birds hunted with lead shot, *Environmental Pollution*, 127(1): 125-129.

KOLLER, Karin, Terry BROWN, Anne SPURGEON and Len LEVY

2004 Recent developments in low-level lead exposure and intellectual impairment in children, *Environmental Health Perspectives*, 112(9): 987-994.

- KLOPOV, Valeri, Jon Øyvind ODLAND and Ivan BURKOW
 1998 Persistent organic pollutants in maternal blood plasma and breast milk from Russian Arctic populations, *International Journal of Circumpolar Health*, 57(4): 239-248.
- KUHNLEIN, Harriet
 1995 Benefits and risks of traditional food for Indigenous Peoples focus on dietary intakes of Arctic men, *Canadian Journal of Physiology and Pharmacology*, 73(6): 765- 771.
- KUHNLEIN, Harriet and Hing Man CHAN
 2000 Environment and contaminants in traditional food systems of northern indigenous peoples, *Annual Review of Nutrition*, 20: 595-626.
- KUHNLEIN, Harriet, Cindy DICKSON and Anne ARMSTRONG
 2001 Food choice decisions by Western Arctic Aboriginal women and children, in Sarah Kalhok (ed.), *Synopsis of Research conducted under the 2000-2001 Northern Contaminants Program*, Ottawa, Ministry of Indian Affairs and Northern Development: 14-15.
- KWAN, Michael
 1999 Heavy metal research at the Nunavik Research Centre, *Makivik Magazine*, 52: 4-9.
- LaKIND, Judy, Robert BRENT, Michael DOURSON, Sam KACEW, Gideon KOREN, Babasaheb SONAWANE, Anita TARZIAN and Kathleen UHL
 2005 Human Milk Biomonitoring Data: Interpretation and Risk Assessment Issues, *Journal of Toxicology and Environmental Health: Part A*, 68(20): 1713-1769.
- LÉVESQUE, Benoit, Marc RHAINDS, Henri PRUD'HOMME in collaboration with Serge DÉRY, Pierre GAUDRAULT, Robert PLANTE and Jean-François PROULX
 1999 *Lead exposure investigation and follow-up protocol for Nunavik*, Department of Public Health, Nunavik.
- LÉVESQUE, Benoit, Jean- François DUCHESNE, Clément GARIÉPY, Marc RHAINDS, Pierre DUMAS, Anton SCHEUHAMMER, Jean-François PROULX, Serge DÉRY, Gina MUCKLE, Frédéric DALLAIRE and Éric DEWAILLY
 2003 Monitoring of umbilical cord blood lead levels and sources assessment among the Inuit, *Journal of Occupational and Environmental Medicine*, 60: 693-695.
- LIDSKY, Theodore and Jay SCHNEIDER
 2003 Lead neurotoxicity in children: basic mechanisms and clinical correlates, *Brain*, 126(1): 5-19.

- MILBURN, Michael
 2004 Indigenous nutrition: Using traditional food knowledge to solve contemporary health problems, *American Indian Quarterly*, 28(3-4): 411-436.
- MINDER, Barbara, Edith DAS-SMAAL and Jacob ORLEBEKE
 1998 Cognition in children does not suffer from very low lead exposure, *Journal of Learning Disabilities*, 31(5): 494-502.
- MUCKLE, Gina, Pierre AYOTTE, Éric DEWAILLY, Sandra JACOBSON and Joseph JACOBSON
 2001 Prenatal exposure of the Northern Quebec Inuit infants to environmental contaminants, *Environmental Health Perspectives*, 109(12): 1291-1299.
- NEEDLEMAN, Herbert and David BELLINGER
 2001 Studies of lead exposure and the developing central nervous system, *Archives of Clinical Neuropsychology*, 16: 359-374.
- NELSON, Valerie, Kate MEADOWS, Terry CANNON, John MORTON and Adrienne MARTIN
 2002 Uncertain predictions, invisible impacts and the need to mainstream gender in climate change adaptations, *Gender and Development*, 10(2): 51-59.
- PAUKTUUTIT INUIT WOMEN'S ASSOCIATION
 1991 *Arnait. The views of Inuit women on contemporary issues*, Ottawa, Pauktuutit Inuit Women's Association.
- POIRIER, Sylvie and Lorraine BROOKE
 2000 Inuit perceptions of contaminants and environmental knowledge in Salluit, Nunavik, *Arctic Anthropology*, 37(2): 78-91.
- RHAINDS, Marc, Patrick LEVALLOIS, Éric DEWAILLY and Pierre AYOTTE
 1999 Lead, mercury and organochlorine compound levels in cord blood in Quebec, Canada, *Archives of Environmental Health*, 54(1): 40-47.
- SANBORN, Margaret, Alan ABELSON, Monica CAMPBELL and Erica WEIR
 2002 Identifying and managing adverse environmental health effects: Lead exposure, *Canadian Medical Association Journal*, 166(10): 1287-1297.
- SASS, Justine
 2002 *Women, men and environmental change: The gender dimensions of environmental policies and programs*, Policy brief prepared for the Population Reference Bureau under the MEASURE Communication Project, Washington D.C.

SAYRE, James and Claire ERNHART

1992 Control of lead exposure in childhood. Are we doing it correctly? *American Journal of Disease Control*, 146: 1275-1278.

SCHELL, Lawrence, Lech HUBICKI, Anthony DeCAPRIO, Mia GALLO, Julia RAVENSCROFT, Alice TARBELL, Agnes JACQUES, Dawn DAVID, Priscilla WORSWICK and the AKWESASNE TASK FORCE ON THE ENVIRONMENT

2003 Organochlorines, lead and mercury in Akwesasne youth, *Environmental Health Perspectives*, 111(7): 954-961.

SCHEUHAMMER, Anton, Julie PERRAULT, Edward ROUTHIER, Birgid BRAUNE and Gordon CAMPBELL

1998 Elevated lead concentrations in edible portions of game birds harvested with lead shot, *Environmental Pollution*, 102: 251-257.

SCHEUHAMMER, Anton, David KIRK and Garry DONALDSON

2003 *Lead fishing sinkers and jigs in Canada: Review of their use patterns and toxic impacts on wildlife*, Ottawa, Canadian Wildlife Service, Environment Canada, Occasional Paper, 108.

SEAGER, Joni

1993 *Earth follies. Coming to feminist terms with the global environmental crisis*, New York, Routledge.

STATISTICS CANADA

2001 Aboriginal Peoples Survey. (<http://www12.statcan.ca/english/profil01aps/statistics.cfm>).

SUBSTANCE SELECTION TASK FORCE

2003 *Decision document on lead under the process for identifying candidate substance for regional action under the Sound Management of Chemicals Initiative*, Unpublished report prepared for the North American Sound Management of Chemicals Working Group, Montreal.

TAKSER, Larissa, Donna MERGLER and Julie LAFOND

2005 Very low level environmental exposure to lead and prolactin levels during pregnancy, *Neurotoxicology and Teratology*, 27(3): 505-508.

TSUJI, Leonard, Evert NIEBOHR, Jim KARAGATZIDES, Rhona HANNING and Billy KATAPATUK

1999 Lead shot contamination in edible portions of game birds and its dietary implications, *Ecosystem Health*, 5(3): 183-192.

TSUJI, Leonard, Jim KARAGATZIDES, Billy KATAPATUK, Joshua YOUNG, Daniel KOZLOVIC, Rhona HANNING and Evert NIEBOHR

2001 Elevated dentine-lead levels in deciduous teeth collected from remote First Nation communities located in the western James bay region of northern Ontario, Canada, *Journal of Environmental Monitoring*, 3: 702-705.

WATT-CLOUTIER, Sheila

2000 A global POPs convention achieved, *Silarjualiriniq*, 6(10): 1-3.

2001 Speech delivered at the briefing on Persistent Organic Pollutants at the United Nations, January 25, 2001, Inuit Circumpolar Conference (Canada) website www.inuitcircumpolar.com, Accessed November 17, 2002.

WEIN, Eleanor and Milton FREEMAN

1995 Frequency of traditional food use by three Yukon First Nations living in four communities, *Arctic*, 48(2): 161-171.

WEIN, Eleanor, Milton FREEMAN and Jeanette MAKUS

1996 Use of and preference for traditional foods among the Belcher Island Inuit, *Arctic*, 49(3): 256-264.