



Hepatitis C National Inuit Strategic Planning Session

Literature Review prepared for the
*Hepatitis C Gaining the Tools to Make
Informed Decisions Project*

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Introduction

The primary interest of this literature review is the hepatitis C virus (HCV) among Inuit. Given the paucity of material, however, it is inevitable that some elements of this review describe research involving First Nations populations. The effort is to identify relevant material and to describe in general terms the nature of the existing documentation about HCV among Inuit. It is beyond the scope and capacity of this project to offer epidemiological assessments of research finding. Some materials referenced in this review are complex and specialized. An attempt has been made to capture the main finds without getting too specific about the epidemiological, therapeutic, haematological, and/or clinical details. The author apologizes for any misinterpretations or misunderstandings of these latter details.

This review is organized according to subject matter headings. Inevitably, there is some degree of overlap and some resources are referenced under multiple headings.

Background

The hepatitis C virus (HCV) is an important cause of chronic liver disease. Despite the introduction of an effective screening policy for all blood donations, transmission continues to occur by other means. Researchers have discovered that HCV infections have features similar to those of other blood-borne infections, including possible vertical transmission, a well-established characteristic of both the hepatitis B virus (HBV) and (human immunodeficiency virus) HIV (Canadian Paediatric Society 2008).

HCV is thought to infect between 1% and 3% of the adult Canadian population, but the true incidence is difficult to establish because the majority of those infected are asymptomatic. HCV infection is more widespread among intravenous drug users. The Canadian Paediatric Society (2008) notes there has not been a decline in HCV infections despite efforts to inform intravenous drug users and the general public about the risks of sharing needles. Transmission through household contact is yet to be proven, but there are household contacts with unexplained HCV infection.

In general, there is limited literature available about hepatitis among Inuit, and even less about HCV. In early 2010, Pauktuutit Inuit Women of Canada completed a scan of published health-related research about Inuit. The review focussed primarily upon peer-reviewed research published over the previous 20 years. A total of 475 articles were identified and coded according to subject matter, gender, Inuit-specific focus, regional/geographic relevance, and a number of other subject-related sub-categories. Only 1.5% of the coded research (7 articles) explicitly addresses hepatitis infections.¹ For this project, a new Internet search using search such terms as

¹ The literature scan for Pauktuutit's *How are We Different? Inuit Women's Health Policy Research Priorities* project relied on keyword searches of the PubMed online database of medical literature and the Arctic Science and Technology Information System database.

‘Inuit’ ‘hepatitis’ and ‘HCV’ identified a few more recent as well as older articles. Not surprising, most of the PubMed listed research focuses on the epidemiology of HCV among Inuit.

Research suggests Inuit and First Nations people have higher HCV infection rates compared to other Canadians (Minuk and Uhanova 2003). Pauktuutit’s concern addresses the risk behaviours common among Inuit that may promote high HCV rates of infection. Sexually transmitted infection (STI) rates are among the highest in Canada and homemade tattoos, home body piercing, and a social stigma about testing — especially for HIV — can contribute to the spread of HCV and its undetected prevalence. Data on illicit drug use among Inuit is limited but there exists extensive data about other lifestyle choices that are consistent with illicit substance abuse and which place Inuit at risk for both HIV/AIDS and HCV. Pauktuutit’s research suggests public awareness about HCV within Inuit communities is limited.

Hepatitis Infections

Within the limited literature available on hepatitis infections among Inuit, most address the hepatitis A virus (HAV) and HBV. For example, Minuk et al. (1985) note that HBV is common among Inuit populations. In a study of 172 residents of Chesterfield Inlet, 78% had serologic markers of HBV and 22% showed evidence of the infection. The prevalence increased with age, being uncommon under the age of 20 (7%), yet present in the majority of inhabitants over the age of 40 (85%). The researchers conclude HBV infections have become relatively less common over the previous 20 to 30 years. They note the apparent decline in prevalence did not appear to be related to recent demographic or socioeconomic changes in the area.

In a study involving over 700 individuals from Baker Lake, Nunavut, researchers tested for markers of HAV and HBV infection. Evidence of HAV was present in 71% of the residents (75% among Inuit and 17% among non-Inuit residents). In houses with eight or more occupants, 86% of the individuals were anti-HAV positive compared to 64% in houses with only one to three persons.² Evidence of HBV infections was found in 27% of residents with its prevalence increasing with age, becoming almost universal over the age of 60 years (93%) (Minuk et al. 1982). Males are twice as likely to be anti-HBV positive. The study suggests Inuit tend to be HBV infected at birth or at an early age. However, the researchers note that no HBV carrier had elevated enzyme or abnormal liver function tests.

In a review article, Minuk and Uhanova (2003) identify poor health, poverty, low education, limited housing, high unemployment, and sanitation problems as factors leading to high HAV transmission. Early and more regular involvement in high-risk activities and the high number of Aboriginal prison inmates and injection drug users result in higher HBV and HCV transmissions. Specific to Inuit, the researchers identify the early and widespread practice of using non-disposable equipment as a potential source for HBV and HCV transmission.

² Anti-HAV, anti-HBV, and anti-HCV positivity refers to the presence of passively acquired antibodies that can be used to detect the presence of the respective hepatitis viruses. For hepatitis A, for example, the antibodies may be detected within 14 days after the first symptoms.

Minuk and Uhanova (2003) report that evidence of anti-HAV positivity in Inuit and First Nations populations is three times that for non-Aboriginal Canadians residing in the same communities. For HBV, the prevalence of the infection among Inuit is approximately 20 times that of non-Aboriginal Canadians and the risk of exposure is five times higher. In contrast, the HBV prevalence and risk of exposure among First Nations populations are similar to rates in non-Aboriginal populations residing in the same regions and participating in similar high-risk activities. The researchers present the following estimates about hepatitis infections:

TABLE 1: Estimated Hepatitis Infection Among Inuit and First Nations*

Hepatitis Infection		Inuit	First Nations
HAV	Prevalence of infection	75% to 82%	72% to 95%
HBV	Prevalence of infection	5%	0.3% to 3%
	Risk of exposure	11% to 27%	10% to 22%
HCV	Prevalence of infection	1% to 18%	2% to 19%
	HCV-RNA positivity	5%	—
* Data compiled from different community studies. Source: adapted from Minuk and Uhanova (2003: Table 1)			

With respect to HCV, the researchers note that serological evidence of HCV infection is higher among Inuit and First Nations (1% to 18%) compared to the Canadian population (0.5% to 2%). However, they state that the presence of HCV-Ribonucleic acid (RNA) levels³ among Inuit are less than 5%, compared to 75% among other anti-HCV positive individuals. The presence of HCV-RNA levels discloses chronic infection, so the implication is that HCV is less likely to advance to a chronic stage among Inuit.

The review article concludes that viral hepatitis is common in Inuit and First Nations populations and that in the absence of HIV co-infection and alcohol abuse, the outcomes of HBV and HCV appear to be more benign than in non-Aboriginal Canadians. These conclusions are widely cited in other studies concerning hepatitis infections in Canada's Aboriginal populations.

HCV Infection Rates

Riben, et al. (2000) note the epidemiology and disease burden for HCV among First Nations and Inuit is not known. However, they state:

The assumption that it will mirror the epidemiology in the non-Aboriginal population – as evidenced by the experience with tuberculosis, HIV/AIDS and pneumococcal disease – may be false. The distribution of disease and risk factors may differ from the Canadian population and this may impact on the opportunities for interventions (2000: S16).

The researchers canvassed the seven regions of Health Canada's Medical Service Branch (now First Nations Inuit Health Branch) and reviewed provincial reportable disease databases to

³ HCV-RNA is the genetic material for HCV.

determine the number of HCV cases among First Nations and Inuit in 1999. Using data from five of the seven regions, the reported cases of HCV for First Nations varied from less than 1% of all cases reported in a province to almost 30%. No information on hepatitis C for Inuit could be obtained.

Variation in the known rates between provinces may reflect “true variation in incidence, the difference in reporting, or an ascertainment bias resulting from special studies and surveillance projects” (Ribben et al. 2000: S17). Given the experience with tuberculosis and HIV/AIDS, the researchers reason it is necessary to collect standardized ethnic identifiers to ensure an accurate measure of the HCV disease burden among Aboriginal peoples. The researchers wonder what the role poverty and genetic make-up play in the transmission of HCV. Without information about the incidence and prevalence of HCV among First Nations and Inuit, it is difficult to determine and establishing appropriate public health interventions.

As discussed above, Minuk and Uhanova (2003) note the HCV infection rate among Inuit and First Nations ranges between 1% and 18% which is much higher than the rate for the rest of Canada (0.5% to 2%).

**TABLE 2: Incidence of Acute and Chronic HCV
in Selected Provinces and Territories (per 100,000 population)**

		NU	NT	QC	NL	Canada
2005	Total	23.1	48.4	31.6	16.3	40.5
	Male	12.7	66.5	43.7	20.9	53.6
	Female	34.2	28.8	19.1	11.9	27.4
2006	Total	9.7	44	28.8	19.6	37.2
	Male	18.9	48.9	38.9	25.9	48.7
	Female	0	38.6	18.1	13.5	25.7
2007	Total	6.4	36.8	24.1	17.8	36.8
	Male	6.2	44.2	31.9	23.3	46.9
	Female	6.6	28.7	15.8	12.4	26.4
2008	Total	6.3	32	24.6	19.5	36.1
	Male	12.2	48.6	33.7	26.6	46.1
	Female	0	14.2	14.4	12.8	25.8
2009	Total	15.5	27.6	22.2	17.7	33.7
	Male	17.9	35.6	30	24	43.2
	Female	13	19.1	12.3	11.6	23.6
Source: Adapted from Public Health Agency of Canada (2011).						

The Public Health Agency of Canada (PHAC) (2011) provides data on HCV and STI surveillance and epidemiology. Inuit-specific data is not listed. Table 2 summarizes the reported rates of acute and chronic HCV for the years 2005 to 2009 in Nunavut and in the provinces and territories where the other Inuit regions are located. These latter province-/territory-wide rates do not accurately reflect rates among Inuit given their disproportionately small populations.

Table 2 indicates that HCV rates in Nunavut in 2009 were the lowest in Canada, measuring well below the Canadian average. The rates dropped dramatically in 2006 but more than doubled between 2008 and 2009 to levels that are still below the 2005 level. The NWT consistently report higher rates of HCV but these rates declined in 2009 by over 40% from the 2005 level. In Québec, rates have declined by about 30% and in Newfoundland and Labrador, the rates have remained fairly constant.⁴

PHAC (2010) reports that between 2002 and 2008, HCV infection rates among Canada's Aboriginal people were 4.7 times higher than for non-Aboriginal people (4.34 per 100,000 and 0.90 per 100,000 respectively). Inuit-specific data is not reported. For Aboriginal people in general, the rate was as high as 203 cases per 100,000 population in 2002, but declined by 2008 to 79 cases per 100,000 population. Well established HCV risk factors more common to Aboriginal people include less frequent use of needle exchange programs and more frequent borrowing of injection equipment, injection drug use at a younger age, and less frequent use of condoms. The borrowing of needles, involvement in the sex trade, and male gay sex were not risk factors more common to Aboriginal people. HCV rates are reported to be higher among female aboriginal people, a trend which counters reports for the whole of Canada in 2008. The PHAC report concludes:

HCV vulnerability must be considered within the context of the broader mental, emotional, physical, spiritual and socio-economic factors. Disease prevalence is also impacted by factors such as access to adequate housing, education, income and experiences of childhood abuse and neglect. Socio-economic instability has been associated with initiating injection drug use and is a risk factor for drug-related infectious diseases.

The Northwest Territories *EpiNorth* newsletter (Beck and Santos 2007) presents an overview and epidemiological review of HCV in the territory. Intravenous drug use is considered the main source of HCV infection. Though there is now increased testing, the real incidence of HCV infection is likely under-reported. Overall, newly diagnosed cases are reported to have declined between 2001 and 2006, falling from 8.2 cases to 5.7 cases per 10,000 person-years, respectively). Rates among males are higher than among females (6.9 cases and 4.5 cases per 10,000 person-years respectively).⁵ Declines were measured in both Aboriginal and non-Aboriginal residents. More recent reports confirm that the decline in HCV infection rates continue (NWT Health and Social Services 2011).

Notably, Beck and Santos (2007: 16) report that the incidence of HCV is highest in the Beaufort-Delta region of the NWT, an area where most Inuit in the territory reside. This, however, is not consistent with the low HCV rates reported by PHAC (2010) for Nunavut. In terms of age groups, Beck and Santos report those between 45 and 49 have the highest incidence of HCV infection in the NWT. However, the researchers report significantly lower rates among those

⁴ The PHAC data indicates the Yukon has the highest rates of HCV infection, rates that are 2.5 to almost 3 times the national average. In the Yukon, HCV rates declined between 2005 and 2009 by only about 8% (Public Health Agency of Canada 2011).

⁵ The HCV incidence rates reported in the NWT *EpiNorth* newsletter are in terms of the incidence density rate or person-time incidence rate. This incidence measure is not directly comparable to other sources that report rates per 100,000 people.

over 60 years. In contrast, Minuk et al. (1982) and Minuk et al. (1985) report that HAV and HBV exposure is highest among older Inuit living in Baker Lake and Chesterfield Inlet, Nunavut.

A search of the Government of Nunavut's Internet sites failed to locate additional information about HCV infection rates among Inuit in the territory. The Québec government's ministère de la Santé et des Services sociaux provides HCV incidence rates for all health regions in the province (Government of Québec 2011). Table 3 compares the rate for the whole province with those for Nunavik.

TABLE 3:
Incidence of HCV Infection in Québec and Nunavik (2006 – 2010)

	2006	2007	2008	2009	2010
Québec - Total	28.8	24.2	24.2	22.1	18.6
Nunavik	9.1	0.0	8.8	8.7	8.5

Source: Adapted from Government of Québec (2011).

For the Nunavik region, the incidence rates are low compared to other areas of the province. Between 2006 and 2010, the average annual rate of infection was 6.9 per 100,000 compared to the provincial rate of 23.3 per 100,000 population. Compared to the HCV rates published by PHAC (2011), the infection rates for Nunavik are similar to those for Nunavut for 2006 and 2008, but are well below rates Nunavut's rates for 2007 and 2009 (see Table 2, above). The HCV infection rates for Québec and Nunavik are significantly lower than the rates reported for the NWT. In terms of age and gender, the Québec data is consistent with the NWT — those between 45 and 49 have the highest incidence of HCV and it is most common among males.

Limited data about sexually transmitted and blood-borne infections is available for Newfoundland and Labrador (Government of Newfoundland and Labrador 2011). For the entire province, the reported incidences of HCV infection peaked in 2006 and 2008 at 10.4 and 10.3 cases per 100,000, respectively. By 2010, the rate had declined to 6.9 cases per 100,000. These rates are not Inuit and/or Aboriginal-specific and refer to the entire province. Nonetheless, the rates are significantly lower than the rates reported for NWT. As well, the five-year trend for the province indicates the 25-29 and 40-44 year age groups are most likely to be infected (16.1% and 18.3% of all cases, respectively). These groups are younger than for the groups reported for the NWT. In Newfoundland and Labrador, males are more likely to be infected.

About 6% of the clients serviced by the Labrador-Grenfell Health Authority are Inuit living in the region of Nunatsiavut. In terms of HCV infections, the five-year average for the authority is the second lowest in the province, reporting an average rate of 3.8 cases per 100,000 or 3.1% of all cases in the province. No ethnic-specific identifiers are provided so it is not possible to estimate Inuit infection rates.

A clear picture of Inuit HCV incidence rates is not available. Reported rates appear to vary widely between years and between regions. Inuit-specific data is not recorded. In the Yukon and NWT where First Nations and Métis populations are proportionately high, the territorial infection rates are high. Researchers note that serological evidence of HCV infection is high for both Inuit and First Nations populations (Minuk and Uhanova 2003). Actual rates and reported rates may account for some of this variability and confusion.

HCV Treatment

Cooper et al (2008) note there is very little published information on the response of HCV treatment in Aboriginal populations. The researchers present the results of a study about a community-based HCV treatment program that compared the efficacy of peginterferon alpha-2a and ribavirin therapy among 40 Aboriginal and 2,458 non-Aboriginal patients. The specific ethnic make-up of the Aboriginal cohort was not defined. Though Aboriginal patients were underrepresented, the viral response to therapy was found to be similar to the non-Aboriginal cohort; there were no clinically significant differences in treatment outcomes or adverse events. The researchers note, however, that those seeking HCV treatment may be less burdened by medical, psychological, social, economic, and substance abuse issues that may limit access to and success in treatment. As well, the researchers caution that some research out of Alaska suggests that Alaskan natives with genotype 1 may not respond positively to the combined peginterferon alpha-2a and ribavirin therapy. There may be greater resistance to HCV therapy in Aboriginal patients versus Caucasians though further research is required.

Additional Literature

Inuvialuit

Between 2003 and 2006, the NWT Department of Health and Social Services published a series of reports about community wellness initiatives. In terms of HCV, the reports describe GNWT initiatives and those of other agencies such as the Status of Women Council of the NWT, the Inmates Advisory Council, and the Yellowknife Correctional Centre (see: NWT Health and Social Services 2003a, 2003b, 2005a, and 2006). The statements are general, outlining the goals and intent of the initiatives and the activities undertaken in a given year. None of the descriptions detail Inuit-specific programming.

As described earlier, Beck and Santos (2007) present an overview and epidemiological review of HCV in the Northwest Territories. The report also describes programs for HCV in the NWT. Primary prevention activities include screening and testing of blood, plasma, organ, tissue, and semen donors; virus inactivation of plasma-derived products; risk-reduction counselling and services; and implementation and maintenance of infection-control practices. Secondary prevention includes identification, counselling, and testing of persons at risk; the medical management of infected persons; professional and public education; surveillance and research to monitor disease trends and prevention activities; and to improve prevention methods.

In 2005, the NWT Department of Health and Social Services released a strategic directions document to address STIs. It makes reference to the fact that HCV shares many risk factors with STIs but presents no HCV-specific goals or objectives (NWT Department of Health and Social Services 2005b).

Nunavut

A search of the Government of Nunavut's Internet site did not identify any links to information about HCV infection rates or to health promotion material. An Internet search of Nunavut Tunngavik Inc. (www.tunngavik.com), Kitikmeot Inuit Association (www.polarnet.ca/polarnet/kia.htm), the National Inuit Youth Council (www.niyc.ca), the Nunavut Status of

Women Council (www.qnsw.ca), and the Qikiqtani Inuit Association (www.qia.ca) also did not result in any material. A single page factsheet on hepatitis B from the territory's Department of Health and Social Services was found.

Nunavik

In an effort to identify studies, reports, or information about the incidence of HCV within the Nunavik region, an internet search of a number of Nunavik-related sites was conducted. Searches of the Nunavik portal (www.nunavik.ca), the Avataq Cultural Institute (avataq.qc.ca), Makivik Corporation (www.makivik.org), ArcticNet (<http://www.arcticnet.ulaval.ca>), and Inuulitsivik Health Center (<http://www.inuulitsivik.ca>) failed to identify any relevant material. Similarly, a search of the Institut national de santé publique du Québec Internet site (www.inspq.qc.ca) did not locate any material.

Nunatsiavut

An Internet search of the entire Nunatsiavut government website (nunatsiavut.com) did not return any links or content relevant to HCV infections or in terms of health promotion. A similar search of the Department of Labrador and Aboriginal Affairs (www.laa.gov.nl.ca) and the Labrador-Grenfell Health Authority (www.lghealth.ca) also did not locate any provincial/regional references to HCV infection rates or health promotion.

Non-Regional Literature

Berngards, Kazulin, and Lawson (2011) offer a poster about developing HCV advocacy resources for Inuit. The poster describes a partnership with the University of British Columbia School of Nursing, the federal government, and the BC Centre for Disease Control to adapt a national package of educational material to meet the needs of Inuit living in Nunavut. The current package is designed to help people living with HCV to navigate health and social care systems in order to improve their self-care. It is currently tailored to English, French, and First Nations populations. The poster describes the effort to make the package culturally appropriate for Inuit. The poster describes the need to consider literacy levels among Inuit, to adopt an Inuit holistic learning model, and employ Inuit symbols in the package. No data about HCV infections among Inuit is offered and no information about when and where this material will be available is presented.

Pauktuutit Inuit Women of Canada explicitly addresses HCV as a component of its sexual health projects. The organization is dedicated to preventing the further spread of sexually transmitted infections among Inuit and is working to ensure that Inuit who are living with such diseases as HIV and/or HCV are able to access the services and support they need in the communities in which they live. Pauktuutit provides web-based resources as well as factsheets on HIV and HCV that focus on prevention. As well, Pauktuutit has organized and participated in a range of community and regional-based activities that address sexual health matters. Pauktuutit notes that reported rates of HCV among Inuit are unreliable. Concern is about the possible under-reporting of HCV infections, the asymptomatic nature of the infection, and the prospect that those unaware of their infection could be fostering widespread infection.⁶ Besides unprotected heterosexual sex,

⁶ See Pauktuutit's Internet site, URL: www.pauktuutit.ca/hiv/main.html.

common risk behaviours associated with the transmission of HCV among Inuit include tattooing, piercing, and other body art, all of which are common among youth.

This Internet-based review indicates that material related to HCV among Inuit is uneven. Some jurisdictions offer HCV resources geared for the general public but this is not always available in Inuktitut. National organizations are also involved in public awareness but Inuit-specific resources are not always available. As part of the *Hepatitis C: Gaining the Tools to Make Informed Decisions* project, Pauktuutit assembled various hepatitis C related factsheets and brochures were located and compared for their relevance to Inuit audiences. The selection included resources from national non-governmental organizations and federal departments.

Conclusions

Overall, a clear picture of hepatitis C among Inuit is not available. Reported rates appear to vary widely between years and between regions. There is a need to collect standardized Inuit-specific data to ensure an accurate measure of the disease burden. Housing, education, income, experiences of childhood abuse and neglect, and factors that contribute to injection drug use are considered important contributing factors that can help describe the unique distribution of the disease among Inuit.

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