Vol. 10 No. 1, pp. 103–129 March 2023

Canadian Food Studies La Revue canadienne des études sur l'alimentation

Original Research Article

Characterizing the development and dissemination of dietary messaging in the Inuvialuit Settlement Region, Northwest Territories

Julia Gyapay,[a*] Sonja Ostertag,[b] Sonia Wesche,[c] Brian Laird,[d] Kelly Skinner [e]

[a] University of Waterloo; ORCID: 0000-0002-5543-7141; [b] University of Waterloo; ORCID: 0000-0002-7982-4920
[c] University of Ottawa; ORCID: 0000-0002-8300-954X ; [d] University of Waterloo; ORCID: 0000-0001-6127-1865 ;
[e] University of Waterloo; ORCID: 0000-0003-0989-8841

Abstract

Public health communication about diet in Inuit communities must balance the benefits and risks associated with both country and store-bought food choices and processes to support Inuit well-being. An understanding of how dietary messages—public health communication addressing the health and safety of country and store-bought food—are developed and disseminated in the Arctic is currently lacking.

As part of the Country Foods for Good Health study, this participatory research sought to characterize dietary messaging in the Inuvialuit Settlement Region (ISR), Northwest Territories (NWT), from the perspective of territorial, regional and local dietary message disseminators to further improve message communication in the region.

We conducted an in-person interview (n=1) (February 2020), telephone interviews (n=13) (May-June 2020), and follow-up telephone interviews (n=5) (June 2021) with key informants about their involvement in developing and/or disseminating dietary messages about the health benefits and risks of country foods and/or store-bought foods in/for the ISR. Key informants interviewed included health professionals (n=5), government employees (n=6) and community nutrition or food program coordinators (n=3) located in Inuvik, Tuktoyaktuk, Paulatuk and Yellowknife, NWT. We conducted a thematic analysis on the 19 interviews.

Our findings indicate that publicly disseminated dietary messages in the ISR are developed at all scales and communicated through a variety of methods. Dietary

*Corresponding author: jgyapay@uwaterloo.ca

DOI: 10.15353/cfs-rcea.v10i1.569
ISSN: 2292-3071

messages focus predominantly on encouraging healthy store-bought food choices and conveying nutritional advice about store-bought and country foods. As federal and territorial messaging is seldom tailored to the ISR, representation of the Inuvialuit food system and consideration of local food realities is generally lacking. There is a need to evaluate dietary messages and improve collaborations among Inuvialuit country food knowledge holders, researchers, and public health dietary message disseminators at all scales to develop more locally tailored and culturally relevant messaging in the ISR. We recommend utilizing a participatory, collaborative, culture-centered approach to dietary message development and dissemination in northern Indigenous contexts.

Keywords: Indigenous health communication; food communication; dietary messaging; country food; store-bought food; community-based research; Inuit; Northwest Territories; Canada

Résumé

En matière de santé publique, les communications liées à la diète dans les communautés inuites doivent refléter un équilibre entre les avantages et les risques associés autant à la nourriture traditionnelle qu'aux aliments achetés en magasin et les méthodes pour favoriser le bien-être des Inuits. Pour cela, il manque une compréhension de la manière dont les messages diététiques – les communications de la santé publique concernant la santé et la sécurité des aliments traditionnels et achetés en magasin – sont conçus et diffusés.

S'inscrivant dans une étude sur la nourriture traditionnelle favorable à la santé, cette recherche participative visait à relever les caractéristiques des messages diététiques transmis dans la région désignée des Inuvialuit (RDI), dans les Territoires du Nord-Ouest, selon la perspective des diffuseurs de ces messages aux niveaux territorial, régional et local, et ce, en vue de les améliorer.

Nous avons mené une entrevue en personne (n=1) (février 2020), des entrevues téléphoniques (n=13) (mai-juin 2020) et des entrevues téléphoniques de suivi (n=5) (juin 2021) avec des informateurs clés. Nous avons abordé avec eux leur implication dans la conception et/ou la diffusion de messages quant aux bienfaits sur la santé et aux risques reliés aux aliments traditionnels et achetés en magasin dans la RDI. Les personnes interrogées comptaient des professionnels de la santé (n=5), du personnel gouvernemental (n=6) et des coordonnateurs de programmes d'alimentation ou de nutrition communautaire (n=3), répartis à Inuvik, Tuktoyaktuk, Paulatuk et Yellowknife. Une analyse thématique des 19 entretiens a été réalisée.

Nous avons observé que les messages diététiques diffusés publiquement dans la RDI sont conçus à toutes les échelles et communiqués par diverses méthodes. Ces messages visent surtout à encourager l'achat d'aliments santé et à fournir des conseils nutritionnels sur les aliments achetés et traditionnels. Puisque les communications fédérales et territoriales sont rarement adaptées à la RDI, la représentation du système alimentaire des Inuvialuit et la prise en compte des réalités en matière d'alimentation locale y sont généralement déficientes. Il s'avère nécessaire d'évaluer

les messages diététiques et d'encourager la collaboration entre les porteurs du savoir sur l'alimentation traditionnelle des Inuvialuit, les chercheurs et les diffuseurs, à tous les niveaux, de messages diététiques de santé publique, et ce, afin de concevoir des communications plus adaptées et pertinentes pour la RDI. Nous recommandons d'utiliser une approche participative et collaborative axée sur la culture pour concevoir et diffuser ces messages dans les contextes autochtones nordiques.

Introduction

Contemporary Inuit diets are comprised of both country foods (animals, game birds, fish and plants harvested from the environment for consumption) and store-bought foods (food sold in grocery stores),[1] each of which present benefits and risks to Inuit food security and holistic health (Arctic Monitoring and Assessment Programme [AMAP], 2021; Guyot et al., 2006; Inuit Tapiriit Kanatami [ITK], 2019). Country food is central to Inuit food sovereignty, personal and cultural identity, local livelihoods and economies, and holistic health, including physical, mental, cultural, spiritual, and socio-economic dimensions (Beaumier et al., 2015; Council of Canadian Academies [CCA], 2014; Damman et al., 2008; Ford, 2009; ITK, 2021). Inuit food sovereignty is "the right of all Inuit to define their own hunting, gathering, fishing, land, and water policies; the right to define what is sustainably, socially, economically, and culturally appropriate for the distribution of food and to maintain ecological health; and the right to obtain and maintain practices that ensure access to tools needed to obtain, process, store, and consume traditional foods" (Inuit Circumpolar Council, 2020, p. 17). Federal colonial policies including relocation, settlement, and residential schooling have detrimentally impacted Inuit control of their food system (ITK, 2021). A movement toward Inuit food sovereignty asserts Inuit self-determination over and revitalization of the Inuit food system through both the practice and sharing of the requisite skills and knowledge for harvesting, gathering, and preparing country foods in a sustainable way (Settee & Shukla, 2020). Inuit Qaujimajatuqangit or IQ (often described as Inuit traditional knowledge but more accurately understood as Inuit ways of knowing and ways of being) includes Inuit cultural beliefs, knowledge, values and skills relating to the Inuit food system (Tagalik, 2009).

Climate change increasingly challenges Inuit food security by compromising the availability, accessibility, and quality of country foods for Inuit harvesters, accelerating the nutrition transition toward non-nutrient dense store-bought foods (Furgal & Seguin, 2006; Ford, 2009; Guyot et al., 2006; Kuhnlein & Chan, 2000; Wesche & Chan, 2010). Further, elevated concentrations of certain environmental contaminants (e.g., Persistent Organic Pollutants (POPs) and mercury) in Arctic environments represent a concerning source of dietary exposure to contaminants through country food consumption, creating an 'Arctic Dilemma' whereby the health risks and benefits associated with country food consumption must be weighed (AMAP, 2016, 2021;

[1] The terms 'store-bought foods' and 'market foods' were used interchangeably by study researchers and participants, referring to food sold in grocery stores.

Donaldson et al., 2010; Furgal et al., 2005; Krümmel & Gilman, 2016; Lemire et al., 2015). This 'Arctic Dilemma' is the central focus of Arctic environmental health risk communication research today (AMAP 2015; Boyd & Furgal, 2019; Furgal et al., 2005; Krümmel & Gilman, 2016; Lemire et al., 2015). Health risk communication comprises culturally appropriate messages and advice that aim to minimize harm and improve health (AMAP, 2015; Krümmel & Gilman, 2016). These studies have guided our transdisciplinary Country Foods for Good Health (CFGH) project by providing an understanding of effective country food risk communication strategies in Inuit communities. However, none have characterized how messages are developed and disseminated nor addressed best practices for developing regionally- and locally-tailored country food messaging; we seek to address these research gaps.

On a broader scale, health communication aims to improve health by informing, influencing, and motivating individual and community knowledge, awareness, attitudes, and behaviours through communication strategies (Center for Disease Control and Prevention, 2011; Schiavo, 2014; Thomas, 2006). In Canada, nested within health communication, nutrition communication—the transmission of nutritional information to influence knowledge, attitudes, or behaviours—is largely developed and disseminated federally by Health Canada (Gavaravarapu, 2019; Health Canada, 2016; Mayfield, 2020). The dominant discourse around food is primarily biomedical, reflecting ongoing colonial narratives of food and nutritional health, while largely excluding Indigenous food systems and worldviews (Dawson, 2020).

Store-bought foods are typically the predominant source of dietary calories consumed in remote Inuit communities (Kuhnlein et al., 2004). Of these, highly processed, non-nutrient dense foods are the most affordable, and thus oft-consumed; therefore, they pose significant risks to human health, including higher risk of chronic disease (Blanchet & Rochette, 2008; Egeland et al., 2010; Fillion et al., 2014; Kenny et al., 2018; Kuhnlein et al., 2004). Nonetheless, store-bought foods have been largely excluded from Arctic risk communication research; thus, there is a significant knowledge gap about store-bought food dietary messaging in Arctic Indigenous communities and even less is known at the national, territorial, and regional levels in Canada (Bjerregaard & Mulvad, 2012; Jeppesen et al., 2011). Of the studies addressing store-bought food messaging in Canadian Inuit communities, the Healthy Foods North program (Kolahdooz et al., 2014; Sharma et al., 2010) described and evaluated dietary intervention programs promoting healthy eating, but not dietary messages communicated via these programs. Very little research examining risk communication and risk perception of contaminants in country foods has been conducted in the Northwest Territories (NWT) or Inuvialuit Settlement Region (ISR), and no studies have explicitly addressed dietary messaging about both country and store-bought food choices and processes (Ratelle et al., 2018; Reinfort, 2015). Findings from existing studies support the need for balanced messaging about country foods and engagement of communities during message development and dissemination, which our study builds upon (Ratelle et al., 2018; Reinfort, 2015). However, preferences for collaborations and methods of incorporating and communicating Indigenous knowledge in messaging remains understudied (Gyapay et al., 2022). Further, given the exclusive focus on country food risk messaging, studies addressing dietary messaging broadly (including store-bought foods) are greatly needed across all regions of the NWT.

Inuit residing in Inuit Nunangat (the Inuit homeland in Arctic Canada) experience the highest prevalence of food insecurity among all Indigenous peoples living in

developed countries (ITK, 2021). Further, they are disproportionately impacted by climate change, given that the Arctic is warming at over twice the rate as elsewhere on Earth (Vincent et al., 2015). Recognizing that rapid environmental changes threaten the quality and safety of Arctic foods and consequently Inuit socio-cultural health, it is imperative that Inuit have access to evidence-informed and culturally relevant dietary information promoting healthy and safe diets and food processes (AMAP 2015; Boyd & Furgal, 2019; ITK, 2021; Krümmel & Gilman, 2016). Territorial and regional public health departments in the NWT currently communicate information and advice about food-related choices and processes involving country and/or store-bought foods to NWT communities in the form of dietary messaging about harvesting, buying, storing, preparing, preserving, cooking, and consuming food, with the aims of reducing harm and promoting good health. For example, the Government of the Northwest Territories (GNWT, n.d.) published the "NWT Traditional Food Fact Sheet Series", a resource promoting the nutritional benefits of consuming country foods found in the NWT and safe preparation practices; however, there has been no research to characterize how it was developed and disseminated or to evaluate its effectiveness in initiating dietary change. To date, limited attention has been paid to dietary messaging about country foods beyond the field of Arctic environmental health risk communication research, and even less so to dietary messaging about store-bought foods in the Arctic.

Building on long-term research relationships with the Inuvialuit communities of Tuktoyaktuk and Paulatuk, and their interests in positive dietary messaging about country foods, this community-based participatory study sought to characterize current public health dietary messaging that guides food choice and food-related processes in the ISR. Working with territorial, regional, and local public health dietary message disseminators, our objectives were to understand who develops and disseminates dietary messages in/for the ISR, how the messages are communicated, what topics the messages address, and which gaps exist in current messaging. This research improves understanding about the effective promotion of healthy, safe, and culturally appropriate food choices in ways that support Indigenous food sovereignty.

Methods

Research approach

This study employed a Community Based Participatory Research (CBPR) approach with the aim of conducting socially-just and culturally inclusive research in partnership with territorial, regional and community partners (Israel et al., 2012) in the NWT, with a focus on the ISR. By utilizing a CBPR approach, these partners were involved in a series of community meetings in 2018 to plan the larger CFGH project and

in February 2020 to review the plans for our study; this approach legitimizes Inuvialuit community knowledge, perspectives and preferences, which have historically been exploited and marginalized in the research process (Jull et al., 2017). Given our inability to collaboratively complete in-person research activities with community partners during the COVID-19 pandemic, we shifted to remote methods, drawing on our existing research relationships with territorial, regional and community partners. Research updates were shared via bi-annual newsletters and virtual group meetings in 2020 and 2021. Reflecting our participatory approach, both the Tuktoyaktuk and Paulatuk Hunters and Trappers Committees (THTC, PHTC) and Community Corporations (TCC, PCC) provided letters of support.

Participant sample and recruitment

Participant inclusion criteria were selected based on outcomes from focus groups, community meetings and consultation with Tuktoyaktuk and Paulatuk Community Corporations and Hunters and Trappers Committees during the CFGH project tour in February 2020. Using an internet search, we developed a list of health professionals, government employees and community nutrition or cooking program coordinators who appeared to be involved in developing and/or disseminating dietary messaging in or for the ISR. Three levels of dietary message disseminators were included: 1) *Territorial* - GNWT Department of Health and Social Services (HSS) in Yellowknife; 2) *Regional* - Inuvialuit Regional Corporation (IRC) and Northwest Territories Health and Social Services Authority (NTHSSA) Beaufort-Delta Region in Inuvik; and 3) *Local* – community members in Tuktoyaktuk and Paulatuk. Federal and national dietary message disseminators were excluded from this study given the scope of the CFGH project. We then employed a snowball sampling approach, where three representatives from the GNWT HSS and IRC identified additional relevant contacts. Potential participants were recruited and followed-up with by telephone and email.

Data sources and procedures

From February to June 2020, we conducted one in-person interview and thirteen telephone interviews with key informants to characterize how dietary messages are developed and disseminated in the ISR. We conducted follow-up telephone interviews with five participants in June 2021, building on the findings from the original interviews. Two key informants (Participants 8 and 9) chose to be interviewed together; all other interviews were done individually. Interviews lasted approximately one hour and were audio-recorded with permission. Consent forms were used, and participants provided either verbal or written consent.

All interviews were conducted using interview guides (Appendix). We primarily asked open-ended questions and used probes to elicit further information and clarify participant responses. The questions focused on the types of messages that are currently communicated to the public in the ISR, how and by whom these messages are developed and communicated, and barriers and facilitators to disseminating messaging. After the first interview, we transformed the original interview guide into three tailored guides for each participant category to promote clarity and included additional questions to further explore topics raised by the first participant.

The audio recordings were transcribed, reviewed, and analyzed utilizing Braun and Clarke's (2006) guide to thematic analysis and Saldaña's (2016) first and second cycle coding methods. An integrative approach was employed, beginning with provisional coding and

ending with descriptive coding using NVivo® version 12 qualitative analysis software (Bradley et al., 2007; Saldaña, 2016). We combined inductive and deductive coding approaches to identify and code transcripts, based on the aforementioned focal areas. Initially, we used an a priori list of research-generated codes based on findings from focus groups conducted in February 2020 as part of the larger CFGH project. We then applied an inductive approach by assigning additional codes and modifying existing codes. Peer briefings were conducted throughout coding to further support the rigor and trustworthiness of analysis (Nowell et al., 2017). We discussed interview findings with territorial and regional project partners in February 2021, and they were also involved in reviewing this manuscript. This process was key to further building trusting relationships with project partners. This study was granted ethical approval from the University of Waterloo (ORE#41577) and a Scientific Research License (No. 16690) from the Aurora Research Institute.

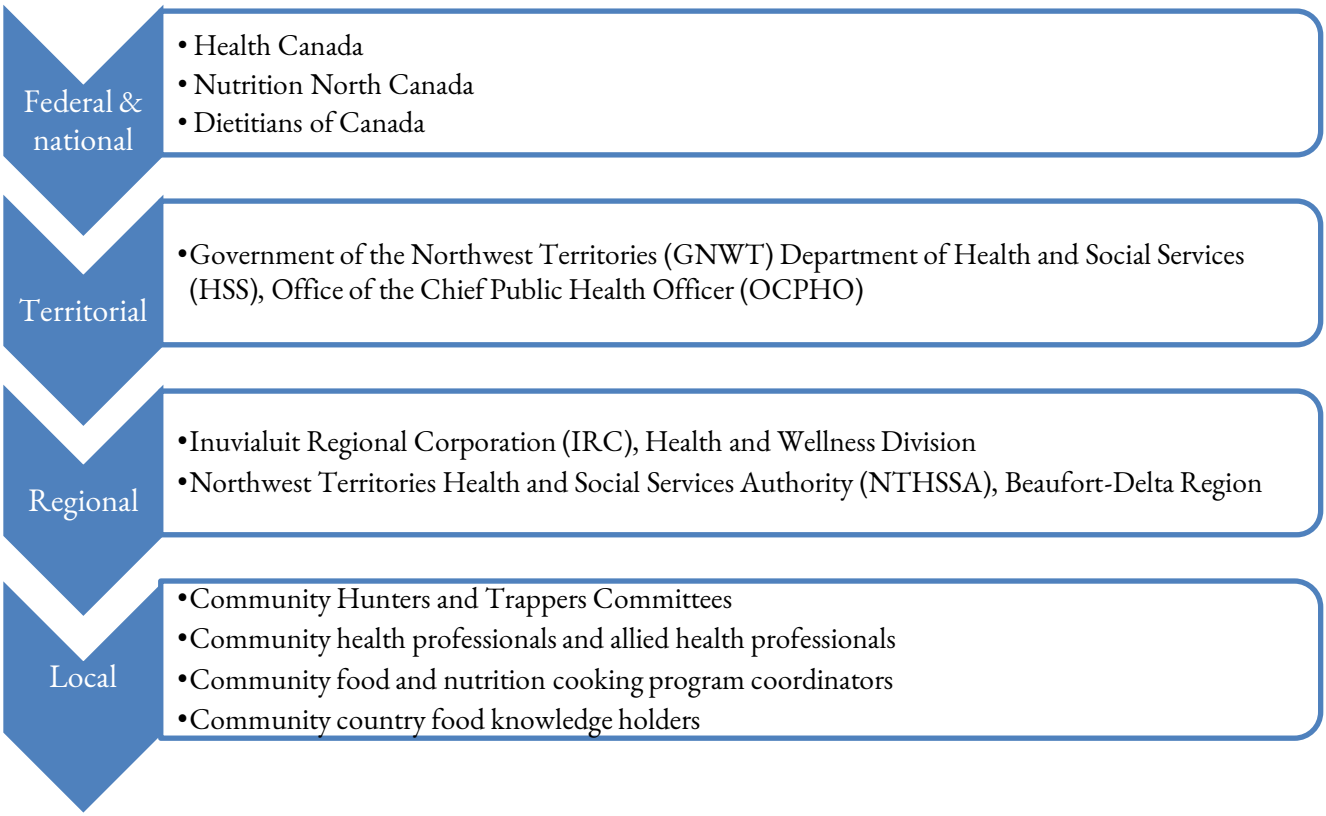
Results

Six key themes were identified during thematic analysis relating to the development and dissemination of dietary messaging in the ISR. These include: participant involvement in dietary messaging, types of messages being communicated, methods of dissemination, special considerations, barriers to message development and dissemination, and facilitators of message development and dissemination. In this section, we discuss each of the themes in turn, and include relevant quotations that reflect broader participant perspectives.

Involvement in the development of dietary messages for/in the ISR

Dietary messages for/in the ISR are developed federally and refined through three distinct mechanisms: territorially through the GNWT, regionally through both the Inuvialuit governance body and the regional health authority of the GNWT, and locally through various organizations and programs (see Figure 1). Methods for dietary message development vary based on the type of message being conveyed, and on both the organization(s) involved and roles of key public health stakeholders therein. Activities at each level are discussed below.

Figure 1: Current public health stakeholders involved in the development and/or dissemination of dietary messages in/for the Inuvialuit Settlement Region



Territorial level

The Government of the Northwest Territories (GNWT) Department of Health and Social Services (HSS), Office of the Chief Public Health Officer (OCPHO) develops and disseminates messaging about the safety of country food consumption through site-specific consumption notices issued by the Chief Public Health Officer (e.g., site specific fish consumption advice) and country food fact sheets developed in collaboration with academic researchers. The HSS collaborates with researchers, either by contacting them with questions about contaminants and country foods, or by using information submitted by researchers to inform their messaging. The OCPHO Environmental Health team aims to review and provide feedback on research findings before they are shared with communities. However, this process is not perfect, and participants indicated the need for researchers to keep them better informed and seek their feedback prior to releasing messaging. Researchers who have questions about health messaging often reach out to HSS to partner on research projects.

General dietary messaging about the nutritional and cultural benefits of both country and store-bought foods is developed by the Territorial Nutritionist in collaboration with dietitians, other HSS employees (e.g., communications unit), Indigenous partners, and the OCPHO following federal/national messaging protocols (e.g., Health Canada, Dietitians of Canada).

This messaging informs territory-wide initiatives and specific programs in ISR (e.g., Healthy Families Collective Kitchen promoting healthy food skills and knowledge to parents). Messaging and direction for messaging is not developed for all HSS programs, nor for all health professionals delivering health messaging in the ISR.

Regional level

The IRC Health and Wellness Division involves and employs local trusted knowledge holders through their programs, leveraging Inuvialuit knowledge about healthy and safe country food practices through these knowledge holders' teachings and thus obviating the need for specific messaging. If dietary messages are communicated by the IRC, they often come from federal and territorial public health departments (such as Health Canada or GNWT HSS) and then are filtered through an IRC board that internally reviews and revises the messages as the board members know and understand how the specific messages will be interpreted by communities.

> "Truthfully, not a lot of specific messaging. It's more, it happens ... more organically where someone has a reputation for being knowledgeable and you just make sure that they're involved in the program or service. And so the idea being that just by the very nature of being there and being present, whatever traditional [Inuvialuit] knowledge needs to be respected will... I don't see a lot of very specific messaging. Like the way that government would do it would be like, you know "eat seal because it's high in vitamin D" or you know, "process muktuk like this because of botulism". You don't see that kind of specific messaging coming from our office very often." (Participant 3)

Dietitians from the GNWT Health and Social Services Authority Beaufort-Delta Region are involved in providing dietary messaging to clients and communities through one-on-one consultations and community programs. They also conduct presentations about nutrition, healthy food choices, diabetes, and cooking, incorporating both traditional and healthy store-bought foods.

Local level

Community Health Representatives (CHRs), workers who provide community health services in collaboration with local medical professionals, select topics they believe will be interesting and relevant to their community, and develop topic-specific programs, presentations, posters or resources. The CHRs receive information from the GNWT HSS and CHRs in other communities. In the ISR, the regional dietitians in Inuvik train the CHRs to deliver Nutrition North Canada (NNC) nutrition education programming.

Country food knowledge holders (e.g., Elders and harvesters) communicate dietary messages themselves by sharing Inuvialuit knowledge about the country food system. One participant stated,

> "Well an example, since COVID started IRC [Inuvialuit Regional Corporation] has been providing funds for people to go out onto the land and to ensure that their food security issues are addressed, and communities are always doing hunts and different things to help provide for the communities. I think the communities really, they want – they are already taking care of their needs that way. And I think they message themselves, I don't know [laughs]. I mean it's part of tradition, right?" (Participants 8)

The local Hunters and Trappers Committees, responsible for overseeing harvesting rights and

management functions in each ISR community, provide general messaging promoting country foods and safe food preparation practices.

> "Again, you know, you're not going to see them talking about things in specific ways. You're not going to be like "Oh yes, eat char, high in vitamin C, saturated fats." You're not going to see that. But they will say more general things, like "people like it, it makes them feel good, people are healthier when they eat their country food". Stuff like that...If you probe a bit you know, you can glean more information, maybe something along the lines of like "don't process muktuk when it's too warm out."... But again, you won't —yeah you won't see them use that specific terminology, they just say more general things." (Participant 3)

Importantly, not all participants are involved in dietary message development and instead communicate messages that are developed from federal, regional or territorial resources or program curriculums. Furthermore, not all participants develop messages in or for the ISR. For example, the GNWT HSS OCPHO Environmental Health team is not currently involved in developing country food contaminant notices for the ISR.

> "There have been various researchers who have consulted with the HSS on whether or not country food advisories were needed to be issued based on the data. I am not aware of any country food contaminant notices that the HSS may have issued for the ISR." (Participant 6)

Some messages are developed directly by participants themselves by drawing on their knowledge and experiences; federal (Health Canada, Nutrition North Canada), national (Community Food Centers of Canada), territorial (GNWT HSS OCPHO), regional (Beaufort Delta Health Authority, IRC Health and Wellness Division), and local sources (e.g., from other organizations and individuals, Elders, health centers); from the internet, university researchers, or a combination thereof. For example, a local health professional described creating seasonal posters promoting country foods available to harvest in their community. These posters included images of local harvesters, information about traditional methods of processing and storing the country food, and its nutrient content.

Messages from the GNWT HSS OCPHO and the IRC Health and Wellness Division are developed for the general public. When messaging is targeted, the primary target populations are pregnant women and mothers with babies/children, individuals with diabetes, or individuals of low economic status. This messaging is often delivered through diet-related programming specific to these populations.

Types of dietary messages being communicated

Federal, territorial and regional dietary messages disseminated in the ISR by territorial, regional and local disseminators are predominantly focused on store-bought-food. These messages tend to address healthy food choices and nutrition-related information and advice through the promotion of label reading, portion sizes, unhealthy store-bought foods to avoid, how to prepare and cook meals using store-bought foods, and budgeting tips for grocery shopping. As one participant described:

> "...in regards to store-bought food, I think overall our messaging is kind of more around trying to encourage people to pick less processed foods as much as possible...we do

> have a session on label reading as well, in which we try to just encourage people to look at the labels and teach them what things to look out for...as far as deciding what foods would be considered kind of more nutritious [and] which would be less nutritious based on certain kind of indicators on the nutrition facts label." (Participant 7)

The more limited messaging about country foods tends to focus on the nutritional benefits of consuming such foods, with some mention of cultural and economic benefits. For example, a participant indicated that:

> "The GNWT HSS encourages people to eat country food. Country food is a very important part of the diet and traditions of the people living in the Territory. For example, for fish, HSS have emphasized that "fish is good for you, it is high in protein, vitamin B and Omega 3 fatty acids". And, we say the same thing for moose as well." (Participant 6)

Although disseminated less often, participants mentioned additional categories of dietary messages they communicate, including messages about additives to avoid in processed store-bought foods, environmental contaminants and zoonotic diseases in country foods, traditional hunting and harvesting practices and values, and how to safely prepare and store country foods. One participant described the following message about country foods and contaminants that they provide during programming:

> "If I bring in the dietitian...we'll talk about the benefits and also some of the precautions that could be taken with say pregnant and breastfeeding women with regards to char and seal and beluga with the high mercury content." (Participant 12)

In general, participants noted that they generally promote country foods as healthy, or healthier, than store-bought foods and emphasize the importance of eating country foods when available. Participants also highlighted that country foods are safe to eat, promoting the commonly cited message that the health benefits of country foods outweigh the safety risks. As one participant stated:

> "...the messaging is pretty much, like, [country food is] basically always a good choice... what my one message has always been, and I always continue to promote it, and I think other people do too around here who are working with food and with our communities, is that the benefits of consuming country food will almost always outweigh the risks. That's my message and I would say just about anyone who has worked here for any length of time...will usually in some way or another promote that message as well." (Participant 3)

Participants noted a gap in current messaging promoting country foods and expressed their desire to improve country food messaging in the future. A participant expressed this sentiment by saying:

> "I would have to say, in the past our messaging around it has been probably more focused on market food. And I guess we do bring up nutritional content of traditional foods, like maybe very briefly. But that was one of the things we reflected on over this past year, was like 'we need to do a better job of highlighting that.' We need to do better, have more of a focus in the nutrition component of that workshop on traditional foods and how healthy it is for people. And why, and compare it to market food as well." (Participant 7)

Methods of dissemination

Dietary messages are communicated to ISR communities in multiple ways (Table 1). Common methods of dietary message dissemination include

individual consultations with health professionals and group food and cooking programs; written documents (e.g., posters, factsheets); radio announcements; and the internet (e.g., social media posts and websites).

Table 1: Current methods utilized by territorial and regional health professionals, government employees, and community nutrition or food program coordinators to communicate public health dietary messages in the Inuvialuit Settlement Region (ISR).

Methods of dietary message dissemination in the ISR	Examples
In person	• One-on-one consultations with health professionals • Community food and cooking programs • Community food workshops led by the IRC and Inuvik greenhouse • Community presentations (schools, cooking classes) from regional dietitians and local health professionals and allied health professionals • Community healthy living fairs • Word of mouth • Hands-on participation and observation of traditional harvesting activities led by country food knowledge holders
Written documents	• Posters (digital copies on social media and websites; hard copies displayed in communities, provided at health consultations and food workshops) • Newsletters (digital and hard copies) • Factsheets (digital and hard copies) • Country food consumption notices[2] (digital and hard copies)
Audio and digital	• Radio announcements and news items on local and territorial stations • GNWT websites • Facebook and Instagram (community Facebook pages, IRC, NTHSSA, GNWT)

Not all participants were involved in delivering dietary messages directly to the public. Direct, in person contact with public audiences is limited or less frequent at the territorial level. Community health professionals, allied health professionals and cooking/nutrition program workers or coordinators typically deliver messaging on the ground. Territorial message developers play an indirect but important role. One territorial-level participant explained:

> "...I don't have direct public contact. My contact is through community workers, and they're the ones who are delivering the message. They are the ones who are employing the tools. They are the ones who are reaching the public..." (Participant 4)

Considerations regarding food quality and safety

Participants indicated that community members generally perceive country foods to be safe and of good quality, and that the nutritional and cultural benefits of eating country foods outweigh the potential risks. A

[2] While participants often used the term 'advisories', GNWT HSS now uses 'consumption notices' to communicate public health advisories about a country food in a specific area.

few participants were concerned about the safety and quality of country foods due to contaminants and preparation/storage techniques, while some were not at all concerned. They noted that the reporting of contaminated wild meat has increased and that younger generations are less knowledgeable about how to safely prepare country foods. For example, a participant noted,

> "...even like our beluga, some—like we ferment some of it, so you really have to have knowledge as to how to prepare it properly, otherwise you'll poison yourself...There have been some people are kind of leery of that, like especially the younger generation. Like they don't know how to—most people don't know how to prepare and preserve things." (Participant 14)

Participants generally considered country foods to be of better quality than the store-bought foods that are available and affordable in ISR communities. Some participants expressed concerns and distrust about the quality and safety of store-bought foods given the negative history with the Northwest Company and the exploitation of Indigenous peoples through historical and ongoing federal colonial policies and practices.

Barriers to dietary message development and dissemination

Participants identified several barriers to message development and dissemination in/for ISR communities. Local dietary message disseminators often develop messages and programming themselves with limited access to dietary and nutrition information and resources. Limitations occur due to the irregular visits of regional health professionals to communities and high staff turnover. A participant remarked,

> "One of the biggest barriers in the Territories is turnover. We have tremendous turnover...So, every time there's turnover then you have to start all over again." (Participant 4)

Participants noted that misinformation or mixed information sometimes resulted from the involvement of multiple health professionals in disseminating health messages in the communities and the inability of dietitians to visit frequently. This is compounded by poor access to information technology (i.e., Internet), which could offer an important source of health and diet-related knowledge. Furthermore, they noted instances where false or harmful dietary messages were communicated to communities by researchers who were unprepared to answer community questions about whether certain country foods are safe to eat. A participant further described this by saying,

> "I mean sometimes it's like the researcher doesn't even... they don't plan to talk about health at all, but then so often, especially when you're talking about country foods, people's main question is, "well, is it safe to eat?" And so I think if a researcher kind of maybe is unprepared for that question, they start talking about health, even though that is not necessarily where their expertise lies. They can kind of be caught unaware, and then they are the ones communicating health messages that are maybe not even true." (Participant 11)

Participants explained that in the past, researchers have released confusing and inaccurate messages about contaminants in country foods and health risk, which could have been prevented had the OCPHO been consulted. For example, one participant explained,

> "There was one time when we heard about the recommendations from a researcher and we were puzzled. I do recommend that researchers check in with the HSS to have a

> conversation on health messaging before it goes public." (Participant 6)

Participants commented that community members often disregard or distrust public health messages about contaminants in country foods. One participant explained this distrust by saying,

> "And sometimes, I know in another community that I lived in, they would get a message and they'd just kind of laugh and say, "Well, we've never had that issue. And all these steps to prevent it, we do it a different way and we will continue doing it that way." (Participant 8)

Further, participants explained that some communities no longer trust dietary messaging as a result of poor country food health risk messaging delivered by researchers and the government. Some GNWT dietary message disseminators recognized that not all their messages about contaminants and country foods have been helpful—some have been harmful in past—and identified the need to further improve their messaging.

> "... because obviously like the [GNWT] health department has caused harm in the past in terms of our messaging, and how that has led to people not eating fish, or not even eating beluga. And we really don't want that to happen because obviously there's such enormous health benefits to eating these country foods, especially compared to market food...something we're still trying to work out, is how do we talk about contaminants without completely terrifying people, and have that feel like the only thing that they take away from the messaging?" (Participant 11)

Relating to dietary messages delivered via cooking programs, regional and local health professionals and allied health professionals noted that their materials typically originate from southern programs and focus solely on store-bought foods, many of which are not affordable or available in the ISR. As such, they often have to modify recipes and cooking program curricula to incorporate country foods and appeal to ISR communities. A participant explained,

> "And that's kind of a challenge for [us] because we constantly have to modify programs that are given to us. Or we just have to create them ourselves." (Participant 2)

Another participant described the challenge of receiving recipes from the GNWT that focus solely on store-bought foods by saying,

> "...when we get stuff from the nutritionist, or from the health promotions in Yellowknife, it's all like store-bought foods." (Participant 14)

Regional and local health professionals and allied health professionals expressed the need to improve their access to information and resources to be able to answer nutrition and diet-related questions that community members raise. A participant made this request by saying,

> "I wouldn't mind to have some kind of I guess guide to follow on, you know, what—I wouldn't mind to have the information there so that if someone came in and they asked me a question on, you know, 'How can I buy healthier food?' or, 'What do I think is healthy for my kids?' or something like that. You know, I wouldn't mind to have the information there where I could just provide it to the individual..." (Participant 10)

As one local health professional noted, if they are unable to find an answer to a diet-related question on reputable sites, they resort to a general web search, highlighting the need for improved access to trusted sources.

> "If I'm stuck, say like in Health Canada, I find that if I can't find it, then I'll Google." (Participant 1)

Barriers to consistent messaging in the ISR exist due to periodic misalignment between the regional and local health professionals. One participant noted questioning the dietary advice that a physician working in the region provided to the public.

> "So sometimes it's like 'yeah the doctor told me to do this so I'm doing that'. Like 'OK, that's fine, you know, if it works for you' kind of thing. But sometimes they'll be like 'my doctor told me this, why?' And I'll be like 'I don't know'". (Participant 2)

Furthermore, there are few guidance documents for dietitians and community health workers to use when delivering nutrition education and skills training to ISR communities. As such, it is difficult to ascertain whether knowledge and skill development are consistent across the region. A participant expressed this challenge saying,

> "...from a territorial viewpoint, we haven't put together a guidance document for small groups which outlines key messages and provides speaking notes. We don't have that...They [dietitians and nutrition program coordinators] teach what they know and may have lesson plans. Apart from saying 'traditional food is good food', I don't know what else they say." (Participant 4)

The high cost of purchasing country foods and regulations for selling country foods in the ISR have hindered the development of programming utilizing country foods. For example, a participant described how these challenges have made it difficult for local cooking program coordinators to incorporate country foods into their programming,

> "...even though it's funded by the Inuvialuit Regional Corporation, it's really tough to get native [country] food, very tough. The cost of acquiring native [country] food is expensive. Like people—when people hunt here, you know, they have to pay for their gas, their time, their ammunition, all that stuff, so it's hard to get specific native [country] foods... And there's lots of restrictions, yeah, with the Hunters and Trappers." (Participant 14)

Finally, evaluation of dietary messaging appears to be lacking. While participants described evaluations they have conducted for cooking and food programming, no evaluations of dietary messages or methods of message dissemination appear to have been conducted by territorial or regional public health departments or other researchers in the NWT. As one participant explained, this may be due to challenges regarding capacity to conduct evaluations in the NWT, including a lack of resources and budget.

Facilitators of dietary message development and dissemination

Participants emphasized the importance of collaboration during message development, particularly among researchers, Inuvialuit knowledge holders, the GNWT HSS, and health professionals in the communities. One participant suggested the following,

> "I think researchers need to just check in...with the department here and say "Hey, what do you think of what we're recommending? And can I recommend this action? What are your thoughts?" If we have any thoughts we will look into it and then convey it as well, we will do our best to help out." (Participant 6)

Further, a participant highlighted the need for community-led message development, promoting a decolonizing approach:

> "...You know, it has to be what people want and not what we tell them they should want, because that's where all our problems started." (Participant 13)

It was noted that Elders and Indigenous knowledge holders need to be actively included in the development of messaging to ensure this process is grounded in local culture, values and practices, in ways that celebrate the local country food system and Indigenous knowledge. A participant expressed this need by explaining,

> "I think that gathering messaging from those knowledge keepers or Elders is a really important component of any messaging. Communities are inundated with messages and information from outsider organizations who mean well, but maybe they didn't sit down and talk to the Elder or, you know, they're just kind of sending out the message that Health Canada sends out, or the message is contradictory maybe to what they know. And so, you know they've been hunting and trapping for hundreds and hundreds of years, and to get a message maybe about, I don't know, salmonella or something—find out how they've addressed those issues." (Participant 8)

Participants explained the importance of developing balanced messaging (i.e., including not just risks but also benefits related to certain foods), keeping messaging about health risks and country foods general and positive, and promoting country food. It was noted that being familiar with the political and cultural community contexts is beneficial when developing messages to ensure they are relevant and appropriate.

Participants described that messaging is best received by the public when it is delivered in person, and involves hands-on components (e.g., cooking-based programs and on-the-land programs), discussion and storytelling. For example, a participant said,

> "And like it goes back to that traditional [Inuvialuit] knowledge and how things are done up here, like people don't want to read a flyer from the government...or from whoever. They want a conversation, they want to sit down, have a cup of tea..." (Participant 13)

A common view amongst interviewees was the importance of involving local residents in the communication of messages. A participant explained,

> "Well, I think it's really important... you have to consider who the voice is that's giving the message...And so for us it's really important to find someone who is passionate in the community, employ them, don't ask them to volunteer...Give them the skills, give them the knowledge, let them be the voice. Because it works so much better if somebody who understands the local culture and who has lived in the local culture explains these new ways of doing things or better ways of doing things." (Participant 13)

Participants indicated several practices that improve public reception of dietary messages. Disseminators are encouraged to use local pictures, visuals and social media; ask the public questions and listen rather than just talk; present messages clearly and simply; utilize engaging programming to deliver messaging; and incorporate programming with Elders. Participants also highlighted the need to review messages prior to communication, as is being done by the IRC and GNWT HSS, to ensure appropriateness and improve reception by the public.

Discussion

Our study sought to characterize dietary messaging in the ISR from the perspective of territorial, regional and local dietary message disseminators to further improve message communication in the region. We found that dietary messages disseminated to the public in the ISR are developed at all scales (federal, territorial, regional and local) and communicated by a range of people, including territorial and regional government health professionals; allied health professionals and representatives; regional and local food program coordinators; academic researchers; local leaders; and country food knowledge holders. At the local level, knowledge holders (e.g., Elders and harvesters) communicate their own messaging about country foods through the sharing of Inuvialuit knowledge while harvesting and preparing country food in their community, often supported through territorial and regional government-funded programming.

Our findings indicate that messages developed at the federal level are typically not designed for northern Indigenous communities, and that territorial messages often lack tailoring for Inuvialuit communities, whereas regional and local messaging are designed for the ISR with consideration of local culture, realities, food availability and preferences. This aligns with other Arctic environmental health risk communication literature, which indicates that messages are most effective when they are regionally and locally tailored, providing information and advice that accounts for social, economic, cultural and health factors specific to Indigenous populations (AMAP, 2015, 2021; Boyd & Furgal, 2019, 2022; Krümmel & Gilman, 2016).

Regarding the types of messages developed for/in the ISR by public health departments, our findings indicate that messages focus predominantly on promoting healthy store-bought food choices and providing nutritional information about store-bought foods. Messaging about country foods from public health departments typically promotes the nutritional benefits associated with country foods and the safety of such foods from an environmental contaminant lens. Given that dietary messages are largely developed for the ISR by public health departments located outside the ISR, messages focus heavily on western biomedical conceptions of food and physical health. These findings align with scholar Leslie Dawson's (2020) explanation that the dominant biomedical narrative of food in Canada reflects a Eurocentric worldview, framing food as nutrition for physical health, and overlooking Indigenous worldviews of food and health, which includes connections to physical, cultural, spiritual and mental health. For Inuit, the practice of harvesting, processing and consuming country foods is integral to community identity, cultural identity and well-being (CCA, 2014; ITK, 2021). Further, Inuit (and other Indigenous peoples) perceive food as alive and sacred, extending beyond the Western view of food primarily as nutrition for physical health (Settee & Shukla, 2020).

The results of our study illustrate that when country foods are included in dietary messaging they are promoted as safe and nutritionally superior to store-bought foods, with some mention of cultural benefits related to harvesting, preparation and consumption. Importantly, although current dietary messaging in the ISR focusses more on store-bought foods, participants expressed their desire to develop more country food messaging to better reflect local culture and diets. Some participants expressed concerns with dietary messaging and distrust among Inuvialuit, which has previously been identified in Arctic risk communication literature

(AMAP, 2021; Boyd et al., 2019). This distrust stems largely from the mistreatment of Indigenous peoples by the Canadian government; colonial policies and practices that (have) harm(ed) Indigenous food systems, cultures and wellbeing; and alarmist messaging from researchers and the government about high levels of contaminants in country foods. Indigenous involvement in message development and communication is essential for tackling this distrust (AMAP, 2021; Myers & Furgal, 2006).

In the ISR, the barriers to dietary message development and dissemination that we documented are similar to those described in Arctic environmental health risk communication studies regarding contaminants in country foods. Challenges include a lack of collaboration among stakeholders involved in dissemination, communication of messaging that communities do not trust, and lack of inclusion of Indigenous culture and knowledge (AMAP, 2015; Boyd & Furgal, 2022; Furgal et al., 2005; Myers & Furgal, 2006). Likewise, the facilitators of dietary message dissemination emphasized by our study participants reflect best methods described in environmental health risk communication studies related to communications about contaminant risk in country foods. These facilitators include the provision of balanced and positive messaging about country foods, the involvement of Indigenous peoples in the development and communication of messaging, the development of messages that align with a community's cultural beliefs, the use of trustworthy people to deliver messages, and the dissemination of simple, engaging messaging in person and via social media (AMAP, 2015; Boyd & Furgal, 2019; Krümmel & Gilman, 2016; Ratelle et al., 2018; Reinfort, 2015). Similar to the recommendations raised by some of our participants, Bjerregaard and Mulvad (2012) determined that simple dietary guidelines promoting cultural, social and physical benefits of harvesting, preparing and eating foods are preferred over detailed advice about serving sizes and food groups. Further, previous research by Sharma et al. (2010) reiterates the importance of involving locals in nutrition message development to ensure that messages are culturally appropriate and reflect community values.

Our findings indicate that dietary messaging in the ISR draws predominantly on a Western biomedical knowledge system and worldview of health and food, elucidating the need for better representation of Inuvialuit worldviews, culture and values in dietary messaging, which can be achieved through co-development. We suggest strengthening collaborations among ISR dietary message developers and communicators at all scales, especially with local country food knowledge holders and community leadership, to better reflect Inuvialuit knowledge and worldviews related to food and health. Our recommendation reflects calls made in Arctic environmental health risk communication literature for increased inclusion of Inuit perspectives in risk communication and food security initiatives via collaborations with affected communities to ensure that messages are grounded in local culture and worldviews (AMAP, 2015; Boyd & Furgal, 2019; 2022; ITK 2021; Krümmel & Gilman, 2016). Further, as dietary messaging in the NWT predominantly follows a top-down model of information delivery, more participatory methods of message development and communication are needed. This inverts the mainstream model of public health communications to rather promote community-driven and culturally relevant messaging in ways that further develop trusting relationships and increase message effectiveness (Boyd & Furgal, 2022; Dutta-Bergman, 2016; Gyapay et al., 2022; Krümmel & Gilman, 2016). Similar to the Two-Eyed Seeing approach (Bartlett et al., 2015), we support

the braiding of strengths of both Western science and Inuvialuit knowledge to develop and communicate culturally relevant messaging in the ISR. We encourage non-Indigenous NWT dietary message disseminators at all scales to support Inuvialuit participation in dietary message development and dissemination to shift away from creating messaging *for* the ISR to working *with* and *by* Inuvialuit for such purposes. This is supported by other studies that recognize the need for public health message communication efforts to shift away from a top-down model of information delivery towards a more participatory communication approach, empowering communities to make healthy and safe food choices grounded in both science and Indigenous knowledge (AMAP, 2015; Boyd & Furgal, 2022; Dutta-Bergman, 2016; ITK, 2019).

While dietary messaging is important, knowledge and awareness about healthy and safe food choices and behaviours is clearly only one factor that influences Indigenous peoples' ability to engage in positive dietary change (Willows, 2005). An interplay of environmental, social, socio-economic, and individual factors and inequities influence dietary decisions (Dutta-Bergman, 2005; Marcone et al., 2020). Therefore, continued efforts and policies to improve the social determinants of Inuvialuit health (e.g., food security, climate change and environmental contaminants, culture, housing, employment, education and mental wellness) are greatly needed in addition to locally tailored, culturally meaningful health communication to promote healthy, safe and culturally appropriate food choices and behaviours (ITK, 2014).

While our findings support the call for increased collaboration with Indigenous communities during the development and communication of dietary messages by public health departments, it remains unclear whether involvement in the co-development of culture-centered dietary messages is desired by all territorial, regional, and local disseminators in the NWT and if so, what this process should look like in the ISR (Gyapay et al., 2022). Furthermore, there is a need to determine the nature of Inuvialuit knowledge and local perspectives about food that residents would like to see shared in messaging, and how this knowledge should be gathered and communicated. Reflecting a similar gap in message evaluation identified in the literature, the effectiveness of dietary messages in the ISR remains understudied (AMAP, 2015; Boyd & Furgal, 2022). Thus, future evaluations are needed to determine facilitators of communication and reception of these messages from the perspective of the public. Recognizing that we only interviewed territorial, regional and local dietary message disseminators in Yellowknife, Inuvik, Tuktoyaktuk and Paulatuk, further research is needed to account for the varying perspectives and experiences of federal, national, and local dietary message disseminators in the additional ISR communities.

Although we have identified a need to further increase Inuvialuit involvement in dietary message development and dissemination in and for the ISR, we acknowledge the noteworthy steps taken by territorial and regional public health departments in the NWT to develop messages in partnership with Indigenous peoples in ways that better align with cultural beliefs and values about healthy and safe food. We appreciate the willingness of our government partners to collaborate with researchers and recognize the time, energy and resources required to develop respectful, trusting relationships with Indigenous community partners to effectively work together on dietary message initiatives.

This study makes an original contribution to research on public health communication about country and store-bought foods in the ISR by describing the nature of dietary messages developed and disseminated in/for the region, and how and by whom

they are disseminated. Our findings have informed the development of an ISR survey to evaluate the effectiveness of existing dietary messages as part of the ongoing CFGH project. Our government partners are also well-poised to integrate study recommendations to inform territorial and regional public health representatives and further improve dietary messaging for/in the ISR (see Table 2). Overall, this study contributes valuable insights, which support improved dietary messaging in the ISR and in other regions of the NWT through more participatory, culture-centered processes.

Table 2: Summary of recommendations for improved dietary messaging in the ISR and NWT

Recommendation	Target audience
1. Strengthen collaborations among territorial, regional and local public health dietary message disseminators, environmental monitoring and health researchers/professionals, local leadership and Inuvialuit country food knowledge holders to create culturally meaningful dietary messages grounded in Inuvialuit culture, knowledge and diets	All dietary message stakeholders in the NWT and ISR
2. Improve frequency of communication among dietary message stakeholders at all scales	All dietary message stakeholders in the NWT and ISR
3. Improve access to scientific information about the health risks and benefits of country and store-bought food choices and processes for local and regional health professionals, allied health professionals and cooking/nutrition program coordinators in the ISR	GNWT HSS; NTHSSA Beaufort-Delta Region
4. Create ISR-specific messages promoting the nutritional, cultural, spiritual and mental health benefits of harvesting, preparing and consuming country foods, rooted in Inuvialuit worldviews of food	GNWT HSS; NTHSSA Beaufort-Delta Region, IRC; researchers; local dietary message disseminators
5. Support Inuvialuit participation in dietary message development and dissemination, especially Elders	GNWT HSS; NTHSSA Beaufort-Delta Region, IRC; local dietary message disseminators
6. Create ISR-specific recipes and nutrition/cooking program curricula, designed by Inuvialuit	GNWT HSS; NTHSSA Beaufort-Delta Region; local dietary message disseminators; local country food knowledge holders
7. Collaboratively review messages with Inuvialuit country food knowledge holders and local public health dietary message disseminators to improve consistency, trustworthiness, and cultural relevancy	GNWT HSS; NTHSSA Beaufort-Delta Region; IRC; academic researchers
8. Improve current methods of dietary message communication in the ISR by using preferred methods (e.g., social media and in person via cooking and on-the-land programs) and forming active collaborations among environmental monitors and health researchers and professionals to co-present country food contaminant messaging	GNWT HSS; NTHSSA Beaufort-Delta Region; researchers; local dietary message disseminators; local leadership

9. Fund and support evaluation projects to understand the effectiveness of dietary messages communicated in the ISR and the impact of messages on dietary behaviours in the ISR for both country and store-bought food	GNWT HSS; IRC; academic researchers

Conclusion

This participatory study characterized how public health dietary messages addressing the health and safety of country and store-bought food in the ISR are developed and disseminated, based on data from interviews with territorial, regional and local dietary message disseminators in the NWT. We provide novel insights about the types of messages currently being communicated, which relate primarily to healthy store-bought food choices, nutritional aspects of store-bought and country foods, and safety risks of consuming country foods. Dietary messages currently disseminated publicly in the ISR are developed at all scales and communicated by a range of sources, including: territorial and regional health professionals, territorial and regional health representatives, regional and local food program coordinators, academic researchers, country food knowledge holders, and local leadership. Messages are shared using a variety of in-person, written, audio and online methods.

A noteworthy gap is the lack of locally tailored, culturally relevant dietary messaging developed and communicated by Inuvialuit. We recommend evaluating dietary messages in the ISR and further improving collaborations among Inuvialuit knowledge holders and dietary message developers at all scales. This can help to foster more culturally relevant messaging in the ISR and NWT, with the goal of supporting Inuvialuit food sovereignty through participatory, culture-centered processes. Lessons learned here may also be applicable to other Indigenous contexts across the North.

Acknowledgements: We thank all participants who took part in this research and our territorial, regional and community partners at the Government of the Northwest Territories Department of Health and Social Services, Inuvialuit Regional Corporation Health and Wellness Division, and community leadership in Tuktoyaktuk and Paulatuk. We appreciate the funding provided by the Northern Contaminants Program and Canadian Institutes for Health Research, which made this project possible.

Julia Gyapay is a second-generation white settler, born and raised on Treaty 8 territory in Hay River, Northwest Territories (NWT). Gyapay completed a Master of Science in Public Health and Health Systems at the University of Waterloo where she characterized culture-centered dietary messages for healthy, safe and culturally appropriate diets in the Inuvialuit Settlement Region, NWT.

Sonja Ostertag is a Research Assistant Professor in the School of Public Health Sciences at the University of Waterloo. Sonja has sixteen years of experience conducting research in the Inuvialuit Settlement Region (ISR), Northwest Territories, in close collaboration with community members, local and regional organizations. Their background is in toxicology, risk assessment, participatory research, Inuit Qaujimajatuqangit and risk communication. Dr. Ostertag co-leads the Country Foods for Good Health project in the ISR, a multi-year research project that bridges western science and Indigenous Knowledge to better understand how environmental change may impact the Inuvialuit food system.

Sonia Wesche is an Associate Professor in Environmental Studies, Geography and Indigenous Studies at the University of Ottawa, and Co-Director of the Environment, Community and Health Lab (ECoHLab). Of settler origins,

she works collaboratively with Inuit and First Nations communities in the Yukon, Northwest Territories, and Nunavut to better understand local- and regional-scale impacts of environmental change, and implications for fostering adaptive capacity. Her interdisciplinary research is primarily community-based, and focuses on linkages among environmental change, food and water security, and Indigenous health and well-being.

Brian Laird is an Associate Professor within the School of Public Health Sciences and Associate Dean (Graduate Studies) in the Faculty of Health at the University of Waterloo. His work focuses on: (i) quantifying the health risks from contaminants in food, water, and soil, (ii) informing the design of risk mitigation strategies, and (iii) improving our understanding of the links between external dose and target organ concentration. To these ends, Dr. Laird is examining population level contaminant exposure through environmental monitoring as well as human biomonitoring in the Northwest Territories and Yukon.

Kelly Skinner is an Associate Professor in the School of Public Health Sciences at the University of Waterloo and holds a CIHR-PHAC Applied Public Health Chair. The Chair has an emphasis on community action, self-determination, and knowledge sharing, to better understand the intersections between food security and climate change with Indigenous communities in the Northwest Territories. Kelly engages in interdisciplinary, community-based, and collaborative research and evaluation with northern communities, partners, and governments to capture community-led food initiatives in adapting to climate change and improving food security, northern food systems and environments, health and risk communication, health equity, and well-being.

References

Arctic Monitoring and Assessment Programme [AMAP]. (2015). *AMAP Assessment 2015: Human Health in the Arctic.* https://www.amap.no/documents/doc/amap-assessment-2015-human-health-in-the-arctic/1346

Arctic Monitoring and Assessment Programme [AMAP]. (2016). *Influence of Climate Change on Transport, Levels, and Effects of Contaminants in Northern Areas – Part 2.* https://www.amap.no/documents/doc/influence-of-climate-change-on-transport-levels-and-effects-of-contaminants-in-northern-areas-part-2/1561

Arctic Monitoring and Assessment Programme [AMAP]. (2021). *Human health in the Arctic 2021- Summary for policy-makers.* https://www.amap.no/documents/doc/human-health-in-the-arctic-2021.-summary-for-policy-makers/3509

Bartlett, C., Marshall, M., Marshall, A., & Iwama, M. (2015). Integrative science and two-eyed seeing: Enriching the discussion framework for healthy communities. In Guehlstorf, N., Parkes, M., & Hallström, L (Eds.), *Ecosystems, society, and health: Pathways through diversity, convergence, and integration* (pp. 280-318). McGill-Queen's University Press.

Beaumier, M. C., Ford, J. D., & Tagalik, S. (2015). The food security of Inuit women in Arviat, Nunavut: the role of socio-economic factors and climate change. *Polar Record*, *51*(5), 550–559. https://doi: 10.1017/S0032247414000618

Bjerregaard, P., & Mulvad, G. (2012). The best of two worlds: How the Greenland Board of Nutrition has handled conflicting evidence about diet and health. *International Journal of Circumpolar Health*, *71*(1), 18588–18588. https://doi.org/10.3402/ijch.v71i0.18588

Blanchet, C., & Rochette, L. (2008). *Nutrition and Food Consumption among the Inuit of Nunavik. Nunavik Inuit Health Survey 2004, Qanuippitaa? How are We?* https://www.inspq.qc.ca/node/2735

Boyd, A. D., & Furgal, C. M. (2019). Communicating environmental health risks with Indigenous populations: A systematic literature review of current research and recommendations for future studies. *Health Communication*, *34*(13), 1564–1574. https://doi.org/10.1080/10410236.2018.1507658

Boyd, A.D., Furgal, C.M., Mayeda, A.M., Jardine, C.G., & Driedger, S.M. (2019). Exploring the role of trust in health risk communication in Nunavik, Canada. Polar Record *55*, 235–240. https://doi.org/10.1017/ S003224741900010X

Boyd, A. D., & Furgal, C. M. (2022). Towards a participatory approach to risk communication: the case of contaminants and Inuit health. *Journal of Risk Research*, *25*(7), 892–910. https://doi: 10.1080/13669877.2022.2061035

Bradley, E., Curry, L., & Devers, K. (2007). Qualitative data analysis for health services research: Developing taxonomy, themes, and theory. *Health Services Research*, *42*(4), 1758–1772. https://doi: 10.1111/j.1475-6773.2006.00684.x

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi: 10.1191/1478088706qp063oa

Bush, E., & Lemmen, D. S. (2019). Canada's Changing Climate Report; Government of Canada, Ottawa, ON. https://changingclimate.ca/CCCR2019

Center for Disease Control and Prevention. (2011). What is health communications? http://medbox.iiab.me/modules/en-cdc/www.cdc.gov/healthcommunication/healthbasics/WhatIsHC.html

Council of Canadian Academies [CCA]. (2014). Aboriginal food security in northern Canada: An assessment of the state of knowledge—Expert panel on the state of knowledge of food security in northern Canada. https://cca-reports.ca/reports/aboriginal-food-security-in-northern-canada-an-assessment-of-the-state-of-knowledge/

Damman, S., Eide, W. B., & Kuhnlein, H. V. (2008). Indigenous peoples' nutrition transition in a right to food perspective. *Food Policy, 33*(2), 135–155. https://doi: 10.1016/j.foodpol.2007.08.002

Dawson, L. (2020). "Food Will Be What Brings the People Together": Constructing Counter-Narratives from the Perspective of Indigenous Foodways. In P. Settee & S. Shukla (Eds.), *Indigenous food systems: Concepts, cases, and controversies* (pp. 83–97). Canadian Scholars.

Donaldson, S., Van Oostdam, J., Tikhonov, C., Feeley, M., Armstrong, B., Ayotte, P., Boucher, O., Bowers, W., Chan, L., Dallaire, F., Dallaire, R., Dewailly, É., Edwards, J., Egeland, G., Fontaine, J., Furgal, C., Leech, T., Loring, E., Muckle, G., ... Shearer, R. (2010). Environmental contaminants and human health in the Canadian Arctic. *The Science of the Total Environment*, *408*(22), 5165–5234. https://doi.org/10.1016/j.scitotenv.2010.04.059

Dutta-Bergman, M. J. (2005). Theory and practice in health communication campaigns: A critical interrogation. *Health Communication*, *18*(2), 103–122. https://doi: 10.1207/s15327027hc1802_1

Dutta-Bergman, M. J. (2016). Cultural context, structural determinants, and global health inequities: The role of communication. *Frontiers in Communication*, *1*(5). https://doi: 10.3389/fcomm.2016.00005

Egeland, G. M., Pacey, A., Cao, Z., & Sobol. I. (2010). Food insecurity among Inuit preschoolers: Nunavut Inuit Child Health Survey, 2007-2008. *CMAJ*, *182*(3),243-=–8. https://doi: 10.1503/cmaj.091297

Fillion, M., Laird, B., Douglas, V., Van Pelt, L., Archie, D., Chan, H. M. (2014). Development of a strategic plan for food security and safety in the Inuvialuit Settlement Region, Canada. Int J Circumpolar Health. *8*(73), 25091. https://doi: 10.3402/ijch.v73.25091

Ford, J. D. (2009). Vulnerability of Inuit food systems to food insecurity as a consequence of climate change: A case study from Igloolik, Nunavut. *Regional Environmental Change*, *9*(2), 83–100. https://doi: 10.1007/s10113-008-0060-x

Furgal, C., Powell, S., & Myers, H. (2005). Digesting the message about contaminants and country foods in the Canadian North: A review and recommendations for future research and action. *Arctic*, *58*(2), 103–114. https://doi: 10.14430/arctic404

Furgal, C., & Seguin, J. (2006). Climate change, health, and vulnerability in Canadian northern Aboriginal communities. *Environmental Health Perspectives*, 114(12), 1964–1970. https://doi: 10.1289/ehp.8433

Gavaravarapu, S. M. (2019). Nutrition communication - Rhetoric & reality. *The Indian journal of medical research*, *149*(3), 333–344. https://doi: 10.4103/ijmr.IJMR_1772_18

Government of the Northwest Territories [GNWT]. (n.d.). *Nutritional food fact sheet series.* https://www.hss.gov.nt.ca/en/services/nutritional-food-fact-sheet-series

Guyot, M., Dickson, C., Paci, C., Furgal, C., & Chan, H. M. (2006). Local observations of climate change and impacts on traditional food security in two northern Aboriginal communities. *International Journal of Circumpolar Health*, *65*(5), 403–415. https://doi: 10.3402/ijch.v65i5.18135

Gyapay, J., Noksana, K., Ostertag, S., Wesche, S., Laird, B.D., & Skinner, K. (2022). Informing the co-development of culture-centered dietary messaging in the Inuvialuit Settlement Region, Northwest Territories. *Nutrients, 14*(9), 1915. https://doi: 10.3390/nu14091915

Health Canada. (2016). *Evidence review for dietary guidance: Summary of results and implications for Canada's Food Guide.* https://www.canada.ca/en/health-canada/services/publications/food-nutrition/evidence-review-dietary-guidance-summary-results- implications-canada-food-guide.html

Inuit Circumpolar Council- Alaksa [ICC]. (2020). *Food sovereignty and self-governance: Inuit role in managing Arctic marine resources.* https://iccalaska.org/wp-icc/wp-content/uploads/2020/09/FSSG-Report_-LR.pdf

Inuit Tapiriit Kanatami [ITK]. (2014). *Social determinants of Inuit health in Canada.* https://www.itk.ca/wp-content/uploads/2016/07/ITK_Social_Determinants_Report.pdf

Inuit Tapiriit Kanatami [ITK]. (2019). *An Inuit-specific approach for the Canadian food policy.* https://www.itk.ca/inuit-specific-approach-for-canadian-food-policy/

Inuit Tapiriit Kanatami [ITK]. (2021). *Inuit Nunangat food security strategy.* https://www.itk.ca/inuit-nunangat-food-security-strategy/

Israel, B. A., Eng, E., Schulz, A. J., & Parker, E. A. (Eds.). (2012). *Methods for community-based participatory research for health*. ProQuest Ebook Central https://ebookcentral.proquest.com

Jeppesen, C., Bjerregaard, P., & Young, K. (2011). Food-based dietary guidelines in circumpolar regions. *International Journal of Circumpolar Health*, *70*(Suppl. 8.), 1–42. https://doi: 10.1080/22423982.2011.11864610

Jull, J., Giles, A., & Graham, I. D. (2017). Community-based participatory research and integrated knowledge translation: advancing the co-creation of knowledge. *Implementation Science, 12*(1), 150. https://doi: 10.1186/s13012-017-0696-3

Kenny, T. A., Hu, X. F., Kuhnlein, H. V., Wesche, S. D., & Chan, H. M. (2018). Dietary sources of energy and nutrients in the contemporary diet of Inuit adults: results from the 2007-08 Inuit Health Survey. *Public health nutrition*, *21*(7), 1319–1331. https://doi: 10.1017/S1368980017003810

Kolahdooz, F., Pakseresht, M., Mead, E., Beck, L., Corriveau, A., & Sharma, S. (2014). Impact of the Healthy Foods North nutrition intervention program on Inuit and Inuvialuit food consumption and preparation methods in Canadian Arctic communities. *Nutrition journal*, *13*, 68. https://doi: 10.1186/1475-2891-13-68

Krümmel, E. M., & Gilman, A. (2016). An update on risk communication in the Arctic. *International Journal of Circumpolar Health*, *75*, 33822. https://doi: 10.3402/ijch.v75.33822

Kuhnlein, H. V., & Chan, H. M. (2000). Environment and contaminants in traditional food systems of Northern Indigenous Peoples. *Annual Review of Nutrition, 20*(1), 595–626. https://doi: 10.1146/annurev.nutr.20.1.595

Kuhnlein, H. V., Receveur, O., Soueida, R., & Egeland, G. M. (2004). Arctic Indigenous Peoples experience the nutrition transition with changing dietary patterns and obesity. *The Journal of Nutrition, 134*(6), 1447–1453. https://doi: 10.1093/jn/134.6.1447

Lemire, M., Kwan, M., Laouan-Sidi, A. E., Muckle, G., Pirkle, C., Ayotte, P., & Dewailly, E. (2015). Local country food sources of methylmercury, selenium and omega-3 fatty acids in Nunavik, Northern Quebec. *Science of the Total*

Environment, *509–510*, 248–259. https://doi: 10.1016/j.scitotenv.2014.07.102

Marcone, M. F., Madan, P., & Grodzinski, B. (2020). An overview of the sociological and environmental factors influencing eating food behavior in Canada. *Frontiers in Nutrition (Lausanne)*, *7*, 77–77. https://doi.org/10.3389/fnut.2020.00077

Mayfield, B. J. (2020). *Communicating nutrition: the authoritative guide.* Academy of Nutrition and Dietetics. Chicago, IL.

Myers, H., & Furgal, C. (2006). Long-range transport of information: Are Arctic residents getting the message about contaminants? *Arctic*, *59*(1), 47–60. https://doi: 10.14430/arctic363

Nowell, L., Norris, J., White, D., & Moules, N. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*(1). doi: 10.1177/1609406917733847

Ratelle, M., Skinner, K., Laird, M.J., Majowicz, S., Brandow, D., Packull-McCormick, S., Bouchard, M., Dieme, D., Stark, K., Aristizabal Henae, J. J., Hanning, R., & Laird, B. D. (2018). Implementation of human biomonitoring in the Dehcho region of the Northwest Territories, Canada (2016–2017). *Arch Public Health*, *76*(73). https://doi: 10.1186/s13690-018-0318-9

Reinfort, B. C. (2015). *Inuvialuit perceptions of contaminants and communication processes in Sachs Harbour, Northwest Territories.* (URI: http://hdl.handle.net/1993/30165) [Master's thesis, University of Manitoba]. University of Manitoba Libraries Mspace.

Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). SAGE Publications, Inc.

Schiavo, R. (2014). *Health communication: from theory to practice* (2nd ed.). Jossey-Bass.

Settee, P., & Shukla, S. (Ed.). (2020). *Indigenous food systems: Concepts, cases, and controversies.* Canadian Scholars.

Sharma, S., Gittelsohn, J., Rosol, R., & Beck, L. (2010). Addressing the public health burden caused by the nutrition transition through the Healthy Foods North nutrition and lifestyle intervention programme. *Journal of Human Nutrition and Dietetics: the official journal of the British Dietetic Association*, *23* (Suppl. 1), 120–127. https://doi: 10.1111/j.1365-277X.2010.01107.x

Tagalik, S. (2009). *Inuit Qauijimajatuqangit: The role of Indigenous knowledge in supporting the wellness in Inuit communities in Nunavut.* http://www.nccah-ccnsa.ca/docs/fact%20sheets/child%20and%20youth/Inuit%20IQ%20EN%20web.pdf

Thomas, R. K. (2006). *Health communication*. Springer. https://doi: 10.1007/b136859

Vincent, Zhang, X., Brown, R. D., Feng, Y., Mekis, E., Milewska, E. J., Wan, H., & Wang, X. L. (2015). Observed trends in Canada's climate and influence of low-frequency variability modes. *Journal of Climate*, *28*(11), 4545–4560. https://doi: 10.1175/JCLI-D-14-00697.1

Wesche, S. D., & Chan, H. M. (2010). Adapting to the impacts of climate change on food security among Inuit in the Western Canadian Arctic. *EcoHealth*, *7*(3), 361–373. https://doi: 10.1007/s10393-010-0344-8

Willows, N. D. (2005). Determinants of healthy eating in Aboriginal Peoples in Canada: The current state of knowledge and research gaps. *Canadian Journal of Public Health*, *96*, S32–S36. Retrieved from https://pubmed.ncbi.nlm.nih.gov/16042162/

Appendix: Key informant interview guides

Interviews with government representatives:

1. What is your role at [the Inuvialuit Regional Corporation/ GNWT HSS]?
   a. Are you involved in the development and/or communication of health messages related to country foods and store-bought foods for the ISR? If yes, what is your involvement?
2. What can you tell me about how health messages are developed?
3. What can you tell me about how health messages are communicated?
   a. What are the current dissemination tools that are being used?
   Are there specific target groups that receive advice regarding diet? If so, please
   b. describe the type of advice provided to specific target groups. Is there other advice that you are also providing to the general population?
   c. Is there an evaluation method that is being used to determine how the messages are being received? If so, what evaluation method is being used?
4. What are some barriers and facilitators to the current dissemination tools that are being used?
5. Have you had the opportunity to speak to communities about health messages?
   a. If so, what barriers and facilitators of the dissemination tools did you hear about?
6. Do you know of other agencies or places that release health messages besides the IRC and GNWT HSS?
   a. If so, who are they and do you communicate with these other agencies?
7. Is there anything else about health messages related to country foods and store-bought foods that you would like to share?

Interviews with public health professionals:

1. What is your role in delivering healthcare services?
   a. Are you involved in the development and/or communication of health messages related to country foods and store-bought foods for the ISR? If yes, what is your involvement?
2. What can you tell me about how health messages related to country foods and store-bought foods are communicated to patients?
   a. What are the current dissemination tools that are being used?
   b. Are there specific target groups that receive advice regarding diet? If so, please describe the type of advice provided to specific target groups.
   c. What are some barriers and facilitators to the current tools that are being used?
   d. Is there an evaluation method that is being used to determine how the messages are being received? If so, what evaluation method is being used?
3. Is there anything else about health messages related to country foods and store-bought foods that you would like to share?

Interviews with community health representatives:

1. How would you describe the _____ program?
   a. What is your role in delivering this program?
   b. Are you involved in the development and/or communication of health messages related to country foods and store-bought foods for the ISR? If yes, what is your involvement?

c. If yes, how are they developed?

2. What can you tell me about how health messages related to country foods and store-bought foods are communicated to participants?
   a. What methods do you currently use to communicate these messages to participants?
   b. Are there specific target groups that receive advice regarding diet? If so, please describe the type of advice provided to specific target groups.
      i. Do you provide advice to people with diabetes? If so, what kind of advice do you give to them?
   c. Because we don't have nutritional labels on country foods like we do on store-bought foods, do you provide nutritional facts to participants about country foods?
   d. What ways seem to work best when talking with people about healthy foods?
   e. What doesn't seem to work well when talking with people about healthy foods?

3. Is there a method that you use to find out how your messages are being received by your participants? If so, what method do you use?
4. Do you know of other people or programs that communicate health messages in your community?
   a. If so, who are they and do you communicate with these other people or programs?
5. Is there anything else about health messages related to country foods and store-bought foods that you would like to share?