INDIGENOUS KNOWLEDGE AND HEALTH: EXPLORING AND COMPARING MAINSTREAM ACADEMIC AND INDIGENOUS COMMUNITY PERSPECTIVES

by

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Abstract

There is a global priority to protect and revitalize Indigenous knowledge (IK) and increasing evidence suggests that IK is critical to restoring health and well-being in indigenous communities. How do the dominant cultural perceptions of health-related IK (HRIK) compare with those of an indigenous community whose culture has been eroded? A systematic review of the literature and a brief ethnographic pilot study in a Secwepemc community in British Columbia revealed that mainstream academic perceptions of HRIK often fail to recognize the potential applications of IK in connections between the well-being of the individual, the community, and all aspects of the ecosystem. Culturally-rooted community priorities such as language, stories, and ceremony are absent in mainstream academic depictions of HRIK. Research that incorporates the community's perceptions of HRIK related practices, validated in terms accepted by mainstream academicians and policy-makers as well as indigenous groups themselves, may help communities restore their cultures and health.

Keywords: Indigenous knowledge, traditional knowledge, traditional food, traditional medicine, health knowledge, attitudes and practices

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Introduction:
Indigenous Knowledge and Health: Mainstream Academic and Indigenous Community Perspectives

Indigenous peoples have become the subject of increasing attention on the World stage. The reasons are complex but can be simply put: there is a rising interest in the importance of traditional knowledge not only for medicinal applications, but increasingly, for knowledge associated with a range of practices, including those that are related to conservation of land and other resources. Together, these areas of knowledge are seen to be of value to human health, development and supportive of environmental biodiversity goals. At the same time, the actions of the new global indigenous rights movement have led to a corresponding rise in efforts to restore, protect and preserve indigenous knowledge (IK) and cultures (UN-PFII 2008). In spite of this attention, the majority of indigenous peoples in every country are amongst the poorest, suffer the worst health, and live in the lowest economic and social strata than their mainstream population counterparts (UN-PFII 2005; WB 2000). To make matters more challenging, owing especially to a legacy of colonial oppression, as well as development activities in the global race towards industrialization, traditional indigenous cultural systems are disappearing (Battiste-Henderson 2000, Waldram 2006, UN 1992; Mauro & Hardison 2000).[1] In an effort to address these problems, the UN established the Permanent Forum on Indigenous Peoples and more recently drafted the Declaration on the Rights of Indigenous Peoples (yet to be ratified by the UN member countries) as

[1] If we accept language use as an indicator of cultural survival, the changes in language use suggest that the rich cultural diversity of the many indigenous groups around the world is disappearing. 90% of the world's languages are spoken by indigenous groups (between 5000- and 7000 different languages). Of 6000 languages, 300 are spoken by 95% of the global population (Mauro-Henderson 2000).

a means of protecting indigenous populations and cultures. The Permanent Forum and the Declaration recognize the threat to indigenous knowledge and its importance to biodiversity and have identified indigenous self-determination as a key to addressing social, economic, and health inequities and preserving cultures (UN-PFII 2008; UN-PFII 2005). Under the UN's sister organization, the UN Development Program (UNDP), the Convention on Biological Diversity (CBD) (ratified in 1993 by 132 UN countries) aims to preserve the planet`s biodiversity. It also explicitly acknowledges the demise of cultural diversity and requests that indigenous groups receive "respect, protection, preservation, and maintenance of indigenous knowledge, innovation and practices" (Battiste & Henderson 2000, UN 1992). While this international resolution is important for giving recognition to indigenous rights, including rights to ancestral lands, respect for traditional knowledge and cultural ways of life, it does NOT acknowledge that indigenous rights are only expressible in the context of 'western' cultural/social/and economic frameworks. Nor does it acknowledge the past and present challenges inherent in asserting indigenous rights in the context of community, national and international level institutions that represent the 'western' world view (cultural framework and context).

Many indigenous groups in Canada and around the world attribute their relative poor health status to the oppression of cultural expression[2] and the seizure and/or destruction of their ancestral lands (RCAP 1996; UN-PFII 2005; UN-PFII 2008). Increasingly, indigenous peoples are launching efforts to protect, revive and restore their traditional lands and culture in their communities as a means of restoring the well-being of the people (or the balance in all aspects of life, physical, mental, spiritual, and community) (RCAP 1996; Waldram 2006; UN-PFII 2005; UN-PFII 2008). For many, those whose cultures are severely eroded, this means working tirelessly with a dwindling number of elders to recall the

[2] Culture is defined here as the way of life including the world view and the values, knowledge, wisdom, language, and practices associated with it.

languages, practices, and wisdom, in some instances even drawing on the traditional wisdom of neighbouring communities, to ensure that indigenous cultures have a future role in the production of IK (Waldram 2006; Battiste & Henderson 2000).

The objective of this study was to explore and compare the dominant cultural perceptions of HRIK with those views expressed by an indigenous group engaged in preserving and restoring its indigenous knowledge at a community level, as well as to identify key areas of convergence and/or divergence between these views.

Methods

In the first section, dominant cultural perceptions are represented by a systematic review of peer-reviewed literature published in the area of IK and health and well-being in the last decade.[3] An ethnographic pilot study was conducted in a Secwepemc community located in a rural area of the interior of British Columbia to represent the indigenous views. [4]

[3] 'Dominant cultural ' perceptions of IK (the practices and uses) is captured in a systematic review of peer-reviewed literature (journal articles, book chapters, books) from the last 10 years (1998-2008) related to 'indigenous knowledge' and 'health'. It is worth noting that the selection of the ten year time-frame is arbitrary. Many important articles were published prior to and after the time frame. This is a limitation of the survey of the literature.

[4] The study used ethnographic methods of field research and draws on two primary sources; 1st order data sources were obtained from informal (captured in field notes) and semi-structured interviews (tape recorded and transcribed) as well as field notes of 1st hand experience in application of indigenous knowledge in the Secwepemc ethno-botany and language course; 2nd order sources were obtained in a review of the academic literature pertaining to Secwepemc IK done on site in tandem with courses in applied Secwepemc IK. A purposeful sample of 'leaders,' defined as individuals who hold a position of authority and decision-making capacity within the community was selected for semi-structured interviews. A set of questions was devised with input from several members of the community, to assess cultural relevance and the clarity of the questions. Questions were also prepared in advance to ensure that the same concepts were addressed in each interview (Please see Appendix: Questions for Semi-Structured interviews). The interview results were transcribed, and with the field notes, analysed and coded thematically. These were summarized in a report for the Band Council and Chief in Skeetchestn at the end of the project's term and presented at a Band Council meeting in the fall.

Definitions

In this paper, the term Indigenous Knowledge (IK) is used to refer to ALL knowledge forms created and continually evolving within an indigenous cultural context. I chose this term after reviewing the conceptual problems surrounding such terms as traditional knowledge (TK), traditional foods (TF), traditional medicine (TM) and traditional ecological knowledge (TEK) reflected in the academic literature associated with the disciplines identifying links between IK forms and health and well-being (Waldram 2006; Brant-Castellano 2000; Agrawal 2002). The term was also selected because it evokes not only the wide range of knowledge forms but also suggests the system in which knowledge is generated and evolved over time. In this way, the term encompasses the knowledge, its uses and applications as well as the cultural context in which it emerges.

To define IK, I borrow from Brant-Castellano's (2000) comprehensive review of conceptualizations of IK in the literature. In summarizing the many concepts connected with IK, Brant-Castellano refers to several forms of knowledge: traditional knowledge; empirical knowledge; and, revealed knowledge. She indicates that all these knowledge forms are integral to an IK system. In contrast, Battiste-Henderson's defines TK as "knowledge handed down more or less intact from previous generations; groups knowledge forms such as creation myths; origins of clans in encounters between ancestors & spirits in form of animals/plants/land; records of genealogies and ancestral rights to territory; memories of battles; boundaries; treaties that instil attitudes of trust and mistrust towards neighbours; hero and cautionary tales to reinforce values & beliefs form the substructure of civil society; and technologies & processes referred over generations "(Battiste Henderson 2000). What Brant-Castellano refers to as empirical knowledge is also sometimes referred to as indigenous science, an IK form that is formulated through careful observations made by many people over extended periods of time (Waldram 2006; Brant-Castellano

2000). Additionally, revealed knowledge, or knowledge acquired through dreams visions, and intuitions, is also critical component of the IK system (Brant-Castellano 2000).

In this paper, the term culture is used to reflect the set of shared attitudes, values, goals, and practices that characterizes an institution, organization or group. 'Culture', like IK, is always evolving. As described by the United Nations, "Culture is not a frozen set of values and practices. It is constantly recreated as people question, adapt, and redefine their values and practices to changing realities and exchanges of ideas" (UNDP 2004).

The term 'health' used in this paper refers to a state of complete physical, mental, spiritual, and emotional well-being (WHO 1999). This definition of health also recognizes the primary importance of the relationship with the land and that individual health is tied to the health of the community and the environment consistent with indigenous views (WHO 1999).

Survey of the Literature

In total sixty (60) articles and book chapters were identified by the search terms used.[5] There are a number of disciplines represented in the collections of articles found. The majority represent health sciences but there are also works from social sciences, anthropology, economics and sustainable development disciplines. The health impact of traditional systems is the subject receiving most attention by nutritionists and epidemiologists. The area of traditional medicine (integrated into health services as well as specific healing modalities) is the second largest area. There is one last group of articles that were challenging to classify. These involved the conceptual issues underlying IK and health links across the domains. The sections are titled as follows: 1) Traditional foods (TF) 2) Traditional medicine (TM): treatment modalities and integrated services; 3) Conceptual issues underlying IK and health impacts.[6]

[5] A Boolean search was performed in multi-disciplinary database using search terms using variations on the term 'indigenous knowledge (traditional knowledge OR traditional ecological knowledge OR traditional medicine OR traditional health systems OR traditional healing OR indigenous medicines or traditional foods) and health (and a variation, well-being). The same search was carried out on Google scholar to identify key scholarly books published in the area. Only articles, book chapters and books that met the date and publishing criteria of the study were considered eligible. Additional search for global policy documents related to indigenous rights through Permanent Forum on indigenous Peoples & CBD websites were carried for background purposes only. Other Canadian policy-related documents were researched and used for background and in the conclusion and analysis section.

[6] It is important to note that the literature review does NOT capture any articles published in other languages apart from English. There may be much more information available from researchers working in Latin American countries, Africa, and Asia etc. published in non academic articles and/or government reports or academic publications not necessarily available outside the country or continent. The literature captured in the review is intended to be indicative of the priority that the dominant societies place on the area. Given that English is the language of the dominant cultural society as reflected in mainstream academic works, the absence of translated material is felt to be a direct result of the priority given mainstream academic journals mainly from English speaking nations (the US, UK, Canada and Australia).

Traditional foods

The high rates of modern lifestyle diseases such as diabetes, and cardiovascular diseases and related risk factor of obesity typically found in indigenous populations have attracted much attention from the research community. Malnutrition has also been attributed to the rapid 'nutrition transition' from traditional foods to the more processed foods of the modern global food culture. Studies in the area of TF tend to focus on either associations between change of diet and risk factors of lifestyle diseases (physiological indicators of the individual such as blood pressure, blood tests, adiposity & Body Mass Index) and nutritional adequacy of either specific or a range of foods contained in the traditional diets. With a few exceptions, the majority of the work presented here demonstrates positive evidence of associations between TF consumption and health (physical health). TF is seen as a protective factor against lifestyle diseases and/or malnutrition.

Four complex nutrition studies measure the impacts of the nutrition transition as these relate to risk factors that correspond to cardiovascular disease (CVD) and diabetes (DeWailley 2002; DeGonzague 1999; Milburn 2004; Sorensen 2005). In Canada's James Bay Cree, a high fish diet was seen to provide higher levels of n-3 fatty acids; protective factor against CVD risks (DeWailley 2002). In two Canadian Ojibwa communities the physical adiposity measures were seen to increase with decline in traditional food intake (DeGonzague 1999). One study in this area claims to have reduced a number of indicators of risk for CVDs in three months having induced an Australian indigenous community to return to an exclusively traditional food diet (Milburn 2004). On the other hand, a study carried out in three urban and three rural Yakut communities of Siberia showed the traditional diet to be higher in fats (largely meat and dairy); resulting in higher plasma lipid and high blood cholesterol levels (Sorensen 2005). This finding was counter-balanced with the fact that another indicator of CVD risk, adiposity, was more prevalent in communities in urban

areas suggesting that other lifestyle factors associated with TF were mitigating factors (Sorensen 2005).

Studies carried out in indigenous communities in Canada, India, a number of Latin American countries, Egypt and the United States all show how a shift from traditional diets and/or lifestyles leads to a diet that is in general lower in nutritional value and higher in sugars, fats and salts (Willows 2005; Berti 1999; Batal 2005; Kuhnlein and Receveur 2007; Kuhnlein 2008; Backstrand 2002; Schmid 2006; Roos 2002; Fediuk 2002; Sharma 2008, Hassan-Wassef 2004). All these researchers agree, based on their findings, that inducing communities to change back to TF consumption can make important contributions to improving nutritional contents of the diet. Studies range from a focus on the value of a specific food source to nutritional assessments of the total TF diet with accompanying TF and store bought food use information. For example, two studies focus on the nutritional value of specific TFs, iron in Pulque, a traditional drink of indigenous origin common to Mexican rural areas, and vitamin A in small fish eaten by indigenous and local rural populations in India (Backstrand 2002; Roos 2002). Other researchers have demonstrated that while important nutrients can be found in TFs, people do not consume them often enough to benefit from their nutrients. Berti et al and Willows (1999; 2005) report the same high rates of consumption of store bought foods amongst children and teens (84%) but note that 50% of iron and zinc were coming from traditional foods. Calcium and vitamin A were provided mostly by store-bought foods in Baffin Island Inuit (Berti 1999, Willows 2005). Fediuk et al 2002 concludes that TF contributes to only 20% of Vitamin C intake amongst Canada's Inuit though many TFs potentially offer a rich source of Vitamin C (Fediuk 2002). Still other researchers have made great strides to describe and assess TF food practices and nutritive values as part of promoting their potential for alleviating malnutrition (Batal 2005; Kuhnlein and Receveur 2007; Kuhnlein 2008; Kuhnlein 2006; Milburn 2004; Sharma 2008; Hassan-Wassef

2004). A number of these studies offer comprehensive surveys of dietary adequacy and assessment comparing many communities and in some instances different cultures. They also demonstrate that TF, whether it is being consumed or not, offers some important nutritional contributions to diet in indigenous communities.

Finally, a few larger complex studies like those described above also raise concerns about TF sources. Studies have shown that indigenous peoples are subjected to exposure to environmental contaminants through TF sources in northern Canada and Europe (Kuhnlein and Chan 2000), and in Australia, where cadmium levels in two Torres Straight islanders were associated with consumption of traditional turtle and dugong and potentially linked to higher rates of diabetes (Hasswell-Elkins 2007). In both instances, however, researchers emphasize that there is a need to weigh the negative impact of these exposures with nutritional needs of the community and the potential benefits of TFs.

Traditional medicines: treatment modalities and integrated services

Owing to its wide-spread use in mainstream populations as well as specific cultural groups, the term traditional medicine (TM) is most often recognized as part of the traditional and complementary medicine (TCAM) rubric commonly used by policy-makers.[7] Patterns of use in mainstream populations are very high in many nations: 40% in China; 71% in Chile; 42% in the US (Bodecker & Kronenberg 2002). In poorer nations, TM use is as high as 80% (Bodecker & Kronenberg 2002). IK with its largely anecdotally demonstrated potential in the development of herbal medicine has received much popular attention, and

[7] TCAM refers to 'treatment' outside of conventional biomedicine, including chiropractics, acupuncture, massage therapy, homeopathy, etc. and self-treatment with over-the counter herbal remedies.

for good reason. In 2002, the United Nations Sub-Commission on Prevention and Protection of Discrimination and Protection of Minorities reported that,

> The annual market value of pharmaceuticals derived from medicinal plants discovered by indigenous peoples exceeds US $43 Billion….traditional healers have employed most of the 7000 natural compounds used in natural medicine for centuries…25% of American prescription drugs contain active ingredients derived from indigenous knowledge (UN 2002).

There are a number of nations that have taken on the task of integrating TM and/or TM practitioners into mainstream health services in efforts to extend services to poorer populations. The increasing interest and promotion of indigenous rights and health have created a demand for culturally appropriate health services developed in full consultation with the community. The majority of the literature that does emerge from the search terms used represents either multiple or single case studies assessing parallel and/ or culturally integrated health programs in a number of different countries. In these global studies, specific practices and uses of IK, if itemized at all, are largely described in terms that are comparable to mainstream health systems (an equivalent to health professional such as traditional healers, herbalists, midwives, spiritual healers, etc. and recognition of TMs). There are also a few studies describing IK practices associated with prevention and healing of specific diseases. There is one descriptive study of the World Health Organization efforts to document the current clinical and anecdotal knowledge of TMs (Mahady 2001) and one study of TM use in a small indigenous community (Cook 2005). These are mentioned in brief at the end of this section.

From a national policy perspective, Bodecker (2004) provides a comparative case study of parallel and integrated approaches to nationalizing TM in a number of lower and middle income countries. The parallel systems of India and South Korea and the integrated approaches of China and Vietnam are described. In Bodecker's review, integration of TM at a national level is a

complex process that must include considerations for national professional standards for practice and drug control, insurance provisions particularly for the poor, and increased investment in the sector. Integration is best achieved with 'self-regulation in relation to standards of practice and training' (Bodecker 2004). He notes that in integrated system such as China the dominance of biomedicine and efforts to teach TM within a biomedical paradigm have marginalized it (Bodecker 2004). Janes' study (1999) supports these claims in his findings on Tibetan medicine in China. This is discussed in more detail in the final section of the survey of the literature. Bodecker refers to TM and TM practices in very general terms (as either herbal medicines and/or practitioners). Mignone et al (2007) explore and compare integrated health services in Latin America (Chile, Columbia, Ecuador, Guatemala and Suriname) against a set of best practices criteria (positive impact, sustainable, responsive and relevant, client-focused, etc The IK forms represented in the findings include a range of practices from the basic provision of single IK service such as midwifery, traditional healer spiritual healer, herbalist/masseuse to the provision of a traditional healing clinic offering a range of services (Mignone 2007). In their conclusions they note that at a country level all cases make an attempt to legitimize cultural approaches to the broader health system but fail. This may be in part due to the fact that there is little data available to assess impact of these services at an individual or population level. At a community level, however, they note enhanced community trust, and increase in cultural pride (for four out of five) and sense of ownership and control over the health system, as well as more timely and appropriate services (Mignone 2007). Two important case studies emphasize the importance of incorporating IK into specific community health programs. In India, Hariraramurthi et al (2007) demonstrate how home herbal gardens program implemented in three south Indian states can improve food and health security. The overall aim of the program was to re-vitalize traditional health knowledge and practices in local communities as part of primary health care.

First, traditional and biomedical practitioners assessed the effectiveness of a range of home remedies for human, animal and plant health contributed by the community. Trained community experts were then put in charge of the program and equipped with the means of creating local herbal gardens and promoting use of TMs to the local population. Success was measured in terms of access indicators such as cost savings and confidence in treatment as well as limited impact on the environment. In the second study, Neumann and Bodecker (2007) show how use of culturally sensitized workers and local herbalists (traditional healers) can improve access and self-care. In their case study of Thai refugees in Burma, the researchers show how community involvement has led to the creation of an integrated system that improved overall health care by improving self-care and access.

In Canada, government policies to transfer responsibilities of health services and many other social programs to indigenous groups have led to the development of aboriginal health systems. A great deal of work has focused on the characteristics of these systems. Perhaps the most comprehensive work in this area has been documented in a book by Waldram, Herring and Young entitled, Aboriginal Health in Canada (Waldram 2006). The book presents both an overview of past practices of indigenous peoples in Canada (as documented mainly by past anthropologists) as well as forms of IK currently being integrated into health services under the self-determination model. In the chapters attributed to Waldram, the Canadian aboriginal peoples' traditional health systems, at one time complex and multi-faceted, have all but disappeared as a result of assimilationist government policies (Waldram 2006). Although government has invited indigenous groups to help guide health service program planning, extended to permit inclusion of indigenous healers as members of staff, there are a number of challenges within the Canadian system that make this achievement difficult. In addition to the complexity of funding for indigenous social and health services (federal and provincial), other challenges

to aboriginal health systems include: a shortage of healers and changes to practice (to accommodate a modern work schedule of the patient). Furthermore, Waldram describes the development of a 'pan-Indian approach' whereby communities that lack access to their own IK, borrow and integrate IK from other, often a common, indigenous culture (i.e. the Plains Indians IK common in many Canadian programs)(Waldram 2006). Waldram also notes that traditional healer functions are mostly applied in the area of mental health and spiritual well-being of the individual (Waldram 2006).

Another important study attempts to integrate indigenous perspectives into the assessment of aboriginal-led health programs (Lemchuck-Favel & Jock 2004). In the case study's review of the 'best practices' of aboriginal health systems in Canada, the researchers have revealed the common strengths of aboriginal health systems: equity; culturally rooted; self-empowerment; holism; synergy between western and traditional philosophies; and, partnership (Lemchuck-Favel & Jock 2004). It is unclear from the findings of the nine case studies the authors describe whether these strengths go much farther than underpinning philosophies into programs that adopt and employ IK.

Only two cases provide concrete program examples (midwife program in Nunavut and common use of traditional healers in urban aboriginal health systems) (Lemchuck-Favel & Jock 2004). In addition, programs in central Canada include cultural and spiritual teaching as part of larger programmatic objectives (Lemchuck-Favel & Jock 2004). The number of different small communities, the remoteness of these communities, and the diverse cultures involved, the shortage of traditional healers cited by Waldram, and limited access to funding, may be a few of the reasons that explain why integrated programs led by Canada's aboriginal communities do not always explicitly include IK despite an expressed desire for Canadian aboriginal peoples to do so (Lemchuck-Favel & Jock 2004). A case study of a single program operating in two different Canadian communities aimed at addressing solvent abuse in

youth provides a good example of the type of IK being used in mental health programs. The underlying spiritual focus and traditional programming elements (there is an initial detoxification using TMs, sweat-lodge and traditional mental and spirit health assessments) were identified as those factors most likely to contribute to resilience and therefore improved health in affected youth populations (Dell 2005).

Three recently published articles provide descriptions of traditional healing practices in the prevention and treatment of specific illnesses. Pearn's (2005) study describes the historical and current context of etnobotanical knowledge commonly and/or differently used in paediatric care in a variety of indigenous groups across Australia (Pearn 2005). He argues that long-term survival of practice suggests their efficacy. Pearn's study emphasizes that TM knowledge is not limited to community experts, but all community members make use of TM knowledge of plants in preventative or treatment practices. Atawodi's (2002) study in Nigeria explores the 'traditional healing systems' and practices for treating trypanosomariasis. This study, in addition to providing important qualitative information of the practices, makes important contributions to our understanding of how this knowledge is shared to a lesser or greater extent within and between indigenous communities in Nigeria. As with the work of Pearn, Atawodi finds variation in treatment ingredients and approach as well as variation on the knowledge available to the community. Similarly, Chang et al (2002) provide compelling evidence that applying an indigenous health model for asthma management can reduce hospitalization rates and improve access to health care.

There is only one reference to international efforts to document the current knowledge of traditional herbal medicines. Mahady discusses the merits of the World Health Organizations Plant monographs developed in conjunction with the WHO's Traditional Medicine Strategy (2001). The WHO database contains monographs of the world's plants, including any information known of their

composition, the latest 'scientific information on efficacy and quality' as well as anecdotal information on their use. The database is seen as a means of supporting policy decision-making in poor countries that will improve integration into national health care systems (Mahady 2001). There is no reference to the issues of intellectual property ownership involved in putting this knowledge into a database. Finally, as noted earlier, only one study was found on the use of TM in a community. In a small Mi'kMaq community in Canada , 66% of Mi'kMaq woman used Mi'kMaq TMs (Cook 2005).

Conceptual issues underlying IK and health links across social and cultural domains

There are a number of related conceptual issues that arise when exploring HRIK. In particular, the differences in epistemological approaches and the related differences of perceptions of health and illness and interpretations of what is valid, and/or effective have a critical impact on what IK is identified as health-related.

As with forms of knowledge generated within the academic setting, it is important to recognize that IK in its various forms is created and transmitted within a larger system. This system is structured in such a way as to reflect the values and beliefs and/or world view of the cultural in which it operates. In recognizing the existence of a 'system' for producing knowledge, other system elements come into play that have an impact on knowledge creation, authentication and transmission. In a comparison of knowledge transfer approaches, Smylie demonstrates how theoretical and epistemological frameworks underlying western scientific and IK systems have some important fundamental differences (Smylie 2003). Smylie characterizes the IK system as 'ecological, holistic, relational, pluralistic, experiential, timeless, infinite, communal, oral and narrative-based while Western science is reductionist, linear, objective, hierarchical, empirical, static, temporal, singular,

specialized and written' (Smylie 2003). The western scientific approach is to organize data into abstract theoretical systems, composed of multiple components, each of which requires a specialist to be fully understood (Smylie 2003). In an IK system, 'stories are the basic unit of knowledge' (Smylie 2003). Stories are considered in terms of values and processes of the present day culture and transformed into wisdom through experience and distillation of other knowledge. Finally, these are transformed again into stories' (Smylie 2003). Brant-Castellano, in her model of the IK system, community, ceremony, family and language, the essential 'carrying the code for interpreting reality' form a quadrant wheel that underpins the IK system, as represented by a tree (from the roots up; spirit world, world-view, values of good & evil, and individual behaviour) (Brant-Castellano 2004). Brant-Castellano urges health researchers to include environment studies as part of their topic as this combined approach takes into account the importance of land to indigenous peoples' conception of life (Brant-Castellano 2004). She points out that, in spite of its failure to address the spirit world, the ecology model is more akin to an IK systems model because the area brings together the many variables contained within these systems to consider their interactions unlike the social science models 'that ignores the particular in order to make generalizations' (Brant-Castellano 2004).

In scanning the literature, much of which has concerned itself with validating 'scientifically' the uses and practices of IK in its various forms, several important questions emerge: 'How is health being defined? On whose terms and by what definitional criteria is validity/efficacy defined?' A number of researchers have taken up these specific questions. Waldram (2006) for example, suggests that the language used to define IK in this area is more consistent with 'western' concepts of health than indigenous ones. Terms such as 'traditional' and 'medicine,' as well as 'traditional health systems,' used to explain these systems are said to be culturally bound in western contexts

(Waldram 2006). That is to say, they reflect dominant cultural concept of health, illness and treatment. This issue is also addressed in Brown's study (2001) of the importance of cultural perspectives on health and illness as these are applied in Australian indigenous settings (Brown 2001). Brown's study concludes that the differences between the concepts of health and illness in the 'west' and in the indigenous view are so significant that much more cultural awareness and acceptance of the potential merits of approaches is required on the part of the 'western' system providing health services to indigenous groups (Brown 2001). Godoy et al (2005) note that 'objective measures of health utilized in these studies (clinical exams, blood tests, anthropomorphic indicators of nutritional status) reflect 'western' concepts of structure and function of the body. In their review of studies which have examined the impact of market economics on the health and well-being of indigenous peoples and on their renewable resources, Godoy et al note that there is great variation in how health is being defined. This variation forces the researchers to conclude that health status may improve or worsen depending on the definition applied (Godoy 2005).

Definitions of health and illness pre-determine what potentially constitutes indigenous knowledge related to it. Testing and validating the effectiveness of this knowledge furthermore takes place within the culturally and academically bound frameworks. Waldram concludes that there is no agreement on how efficacy of TM has been conceived, operationalized and studied amongst the broad range of researchers involved. Waldram emphasizes that what constitutes 'proof' is as much a cultural ideal as a 'medical' one (Waldram 2000). For example, efficacy is measured from an individual perspective in the biomedical model, however, in an indigenous model; the basis for a sickness may be the community. Waldram also suggests that the randomized controlled trial removes the human experience from the assessment process, relying on physiological data. While the approach has its merits, it competes with a view

that is 'experiential.' This problem is relevant to mainstream population health, but is particularly pronounced when determining effectiveness of HRIK and practices. Along similar lines, Bodecker et al (2007) discuss the difficulties of assessing the efficacy of TM using accepted mainstream randomized clinical trial method. The researchers note that important aspects such as disease prevention measures as well as belief and attitude measures (such as meaning response effect) are important components of TM not included in clinical trials (Bodecker 2007).

Consequences of differences in views in a broader socio-economic and policy framework

There is some evidence that the gulf between western and non-western cultural framings of HRIK is further exacerbated as one examines IK in the context of broader sets of social, economic and cultural factors. Some researchers suggest that the scientific validation of IK and its subsequent integration into health policy and/or product development has both a negative impact on IK system itself, as well as on the health of indigenous peoples (Agrawal 2002; Bodecker 2002; Janes 1999; Ramos 2006). A number of other studies demonstrate how state actors and global economic forces have contributed to the erosion of IK, stripping it of meaning as it is removed from its original social context. Some researchers employ the terms 'desocialization,' 'decontextualization' as well as particularisation, to describe this process (Janes 1999; Janes & Hilliard 2005; Agrawal 2002). Janes' work in Tibet (1999) demonstrates how indigenous health systems are not only fragmented and redefined by the Chinese-dominated status quo, but also commodified in a way that restricts access by indigenous people to their own medical traditions. Janes notes three areas of impact on the Tibetan healing system: the increase in demand for alternative medicines as a result of the health transition; greater national and global economic incentives for government to interfere in the practice and manufacture of indigenous

medicine; and pressure to privatize TMs. (Janes 1999). Janes demonstrates how these forces fragment Tibetan medicine as it is practiced in market-dominated urban settings. At the same time, in rural areas TM is rapidly disappearing as practitioners migrate to cities where they can earn a better living (Janes 1999, Janes 2002). Moreover, the indigenous healing system is largely reduced to knowledge and production of herbal remedies for distribution nationally and even internationally (Janes 1999, Janes 2002; Janes & Hilliard 2005). One consequence of this process has been the transformation of the underlying theoretical tenets of the Tibetan system so that it more closely resembles principles of biomedical physiology (Janes 1999, Janes 2002; Janes & Hilliard 2005) Durie et al (discussed in more detail in the last section) make reference to a similar process whereby IK is 'scientifically unbundled, manipulated and rendered meaningless by science' (Durie 2004). Agrawal 2002 uses the term 'particularisation' to describe what happens to IK systems are incorporated into standardized systems of classification. He describes a process whereby indigenous medicines or medical practices are stripped of contextual information not explicitly linked to health and/or development, then 'scientifically' validated and 'generalized' outside of its original context or 'scientized' (Agrawal 2002).[8] In his description of the various forms of the 'exploitation of the Indian' (2006); Ramos makes a similar argument. Ramos, though, also provides positive or ideal case examples of 'anti-colonial' strategies or where Indians become 'agents' as opposed to commodities of development (Ramos 2006). In an around the world review of case studies provides evidence that state operated and integrated systems tend to decontextualize IK related to medicines and practices (Bodecker 2002). In many instances, paradoxically, these processes also makes "accessing

[8] Fernando 2003 argues that NGOs in the area of 'development' contribute their interests and efforts to the process of 'identification', particularisation – validation and generalization' in efforts at using IK to empower local communities and this often results in usurping community IK priorities. However he makes no specific reference to plants as TF or TMs but refers to the broad TEK of land use.

Traditional and Complementary Medicines (TCAM) services more difficult for the originators of that knowledge, presumably those who need it most "(Bodecker 2002). The Godoy et al review (2005), discussed in the last section, asserts that there is evidence that exposure to the market economy transforms 'TEK' in such a way that it contributes to further environmental degradation. For example, a national program aimed at promoting the use of a particular TF may through providing incentives for large-scale mono-cropping lead to reduced biodiversity or loss of existing wild food stocks.

Efforts to mitigate consequences of the gap between cultures

The decontextualization of IK systems may also occur as a consequence of the actions of those dominant academic structures charged with exploring, describing and legitimizing IK and its uses. For example, TF systems may be addressed principally through exploring the specific nutritional content of foods and their impact on health. Such an approach tends to elide factors such as the economics of food choices, the influence of community values on food choices, the notion of resource access and resource management, as well as the impact of policies that impact these resources. No consideration is given to spiritual and mental health factors that may be involved in IK practices connected to land use (ceremony, stories, and songs as well as TEK learned and shared). Similarly, in the literature describing IK as 'TM' or TM-related practices, researchers include a range of uses and/or practices that roughly approximate the components of the 'western' health system: identification and use of TM and healing activities of health practitioners In spite of these limitations, there are those researchers who push the boundaries of their fields in efforts to incorporate indigenous views of HRIK. These are discussed in more detail below. There are also researchers who operate in interdisciplinary domains that by their nature are more holistic in their approaches to knowledge systems. A few of these have made explicit references to health and therefore were identified in the literature review. These researchers are

drawing important connections between indigenous foods, traditional resource management, human and economic development, environmental sustainability and biodiversity. IK in these areas is generally referred to as TEK (or traditional ecological knowledge). The work captured in this section represents studies which focus on well-being (mostly through practices related to foods) and does not represent the large corpus of work available on indigenous resource management and environmental sustainability that has emerged in the last 10 yrs.[9] However, the differences between the search terms used in the literature review (health and/or well-being) and the 'jargon' perpetuated by the institutional frameworks supporting these domains may have excluded a number of important studies from the review.[10]

A few researchers studying TFs emphasize the need to consider the area in the larger context within which TF systems operate. Milburn's concept of 'total traditional diet' in protection against non-communicable diseases (NCDs) suggests that researchers need to assess the synergistic effects of a variety of different traditional foods eaten in combination (Milburn 2004). Another study points out that that IK is never static. In an exploration of the nutrition composition of Apache traditional foods consumed in a reserve in Arizona, Sharma (2008) suggests that researchers consider the fact that many traditional dishes have undergone changes in cooking and composition in recent years

[9] A study led by Moller and Berkes compares quantitative research approaches used in environmental assessment with TEK assessment approaches used in Canada and New Zealand to monitor wild game. The study shows benefits and limits of both approaches and the two models in parallel are seen to be mutually reinforcing or complementary although a number of challenges related to differences in ethical principles in regards to the treatment of wildlife remain contentious (Moller and Berkes 2004). Unfortunately, neither of these articles makes explicit reference to HRIK.

[10] For example, much work of anthropologists and/or ethno-botanists may not appear because the domain requires that its actors identify the peoples and pay special homage to the uniqueness TEK in each community. An important and laudable position particularly when used in the context of protecting IK. Furthermore, their work, like the work of those in ecology, environment, sustainable human development, approaches research problems in a holistic fashion. For this reason, they may not explicitly make reference to human 'health and well-being,' while the majority would agree that their particular domains provide some fundamental impacts on human health.

owing to shifting socio-economic contexts. In their fieldwork and policy review, Damman et al (2008) provide some important information relevant to protecting IK. In a comparative case study of Canada and Argentina, policies that impact on indigenous peoples' livelihoods and territories were found to increase the risk of NCDs (Damman 2008). Food security policies were found to increase prevalence of NCDs (Damman 2008). The researchers recommend that future work take into account indigenous rights in the development of food security policies.

In the area of TM and healing-related practices several writers have argued the importance of exploring HRIK related from an indigenous view. As discussed previously, Waldram has spent considerable time and effort describing the complexity of indigenous 'traditional healing systems' and the importance of 'anchoring these in cultural context today recognizing that many aboriginal communities in Canada struggle with restoring shattered cultural systems' (Waldram 2000; Waldram 2006).[11] This suggests that historical as well as socio-economic contexts need to be considered as aboriginal health systems continue to evolve in Canada.

Along similar lines, a review of the current state of health of indigenous peoples in Latin America emphasizes the need to view indigenous health not simply as an issue of health system but of eco-system and socio-political context (Montenegro 2006). In his review of the current state of health for the peoples of the region, Montenegro states that IK is 'a protective factor against social and political violence in and outside community'(Montenegro 2006). For some researchers, participatory and community-based models of research are

[11] Waldram, Herring and Young's academic book emphasizes by demonstration, the importance of historical, cultural and epidemiological perspectives of on Aboriginal Health in Canada in understanding and addressing these issues. Conclusions based on studies available include section related to traditional health systems and their deterioration since pre-contact and recent re-emergence in the 80s as indigenous groups began to take increasing control of health services. The book devotes a chapter section 'unpacking' the term 'traditional healing' as an ever-evolving system that is as much cultural as medical.

keys in bridging the gap between world views and a way of ensuring that dominant concepts of health do not override indigenous ones. The Human Rights-based views expressed by Stephens (2006) promote not only culturally-appropriate health services, but advocate for indigenous 'voice' in all programs addressing underlying causes of health. Elias et al (2004) demonstrate in their case study how, by working with aboriginal peoples in Canada, health information databases can be developed in partnership with the community and university in indigenous contexts. Access and ownership of the information may also be controlled by the community (Elias 2004). An important study by Chandler and Lalonde (2005) show that indicators of cultural continuity such as efforts to restore ancestral lands, self-government, and band-controlled education, health, police and fire services may be protective against youth suicide.[12] In a 2003 review, Kirmeyer suggests that strengthening ethno-cultural identity, community integration and political empowerment can contribute to better mental health.

The importance of culture or more specific spiritual values has been discussed in two important studies of Maori health (Durie 2004; Roue 2006).[13] Durie presents three case studies wherein IK was incorporated into surveys in the area of nutrition and mental health outcomes as well as in the design of the research project itself (Durie 2004).

[12] In a related work, Maar describes how integrated health services clear the path to community health empowerment in Ontario in the aboriginal-led integrated health care services in one community (Maar 2004). Unfortunately, the focus of the article is self-determination and makes no reference to 'traditional healing practices' per se and therefore is not included in the final literature review. Furthermore, Waldram raised some questions of the validity of band-run fire and police as indicators of cultural continuity, albeit other suggested indicators such as language and cultural programs as well as traditional land access (as opposed to efforts to obtain traditional lands) have more direct validity.

[13] Along these lines, McGrath has published an important ethnographic study on end-of life care for indigenous peoples in rural and remote areas showing that the practice of relocation to palliative care services leads to ill health associated with separation from land, family, unfamiliar foods(McGrath 2004).Unfortunately, this article makes no specific reference to IK (or its equivalents) although the implications that these are important cultural indicators can be inferred by her choice of an indigenous community population and ethnographic approach that seeks to voice the community's perspective.

In the area of mental health, Dell et al 2005, also writing of the Maori, employed a broad concept of 'resiliency' that includes 'spirit' to assess the success of the spiritual underpinning and traditional program elements of a solvent addiction program. Already discussed under the TM section, Bodecker's study of national efforts to integrate traditional and complementary medicine (TCAM) into mainstream health services recommends including spiritual dimensions of health in quality of life assessments of TM efficacy (Bodecker 2004). While these researchers come from a position of ensuring TCAM is accessible to all in the larger populations, they also note the need to ensure that the community who owns knowledge also benefits from it.

IK, described as traditional ecological knowledge, or TEK, for some researchers, has an important role to play at the intersection of the domains of health and biodiversity. Johns and Sthapit (2004) suggest there are important links between biodiversity, dietary diversity, the nutrition transition, and TEK in reducing NCDs. Their review of the state of the literature at this intersection explores the nutritional consequences of economic and environmental changes on food systems and health. They conclude that 'ideal diets include not only physiological factors that mitigate disease but also cultural factors that embrace values and seek to define health-positive behaviours' (Johns and Sthapit 2004). In a similar article co-authored with Eyzeguirre, Johns suggests biodiversity is critical to dietary diversity, and that dietary diversity is critical to health (Johns & Eyzeguirre 2006). TF systems often recognize these linkages and therefore may help inform food cultures that are environmentally sustainable (Johns & Eyzeguirre 2006). Godoy et al (2005) also see a relationship between lifestyle diseases, environmental sustainability, and TEK. In their review they explore the effect of market economies on indigenous health, renewable resources, TEK, and TEK as a form of social capital. While no conclusion could be drawn in relation to health (as noted previously), the differences in definitions of TEK made assessing market

impacts in this area challenging, with many arguing that TEK disappears once it is integrated, however, there was some evidence that communities more integrated into local market economies contributed to more environmental degradation. In two case studies of pygmies in Africa, Ohenjo identified dispossession of land, destruction of culture and marginalization leading to poverty as key determinants of health and suggests that IK includes effective use and preservation of land (Ohenjo 2006). In their recently published article Bodecker and Burford (2007) explored the intersection of environment and health, concluding that there is a relationship between biodiversity and human health and that this connection, particularly in regard to medicinal plants, forms a basis for concerns about supply and demand. They argue that management and conservation must be integrated with programs in other sectors (health, education and agriculture). Coming from a Native studies perspective, Wilson (2004) theorizes that indigenous knowledge recovery in communities in Canada and the US has led to the negotiation of new relationships between indigenous peoples and mainstream institutions that in some instances have enhanced the power and influence of indigenous communities (Wilson 2004). She notes that research legitimizing TF systems can be used by indigenous groups to 'protect a way of life.'

Case Study:
Perceptions of HRIK in a Secwepemc Rural Community in the Interior of British Columbia

Community profile

The Secwepemc community in the study, Skeetchestn Reserve, is one of the 17 Bands that form the Secwepemc Nation (Ignace 2008), representing more than 10,000 years of history in South-central interior of British Columbia (Ignace 2008; Ignace 1998, Ignace & Ignace 2004; SNTC 1989). The Secwepemc Nation (also known as Shuswap) is governed by the Shuswap Nation Tribal Council and Northern Shuswap Tribal Council (MARR-BC 2006), except for a small number of communities who are not currently affiliated (www.shuswaporg.ca). The 17 Bands are living on reserves representing only 1% of their ancestral Secwepemc lands (SNTC 1989).

As per 2001 data, Skeetchestn is a small rural reserve with a total population of 265, typically for Canadian First Nations communities, the average age of residents is 34 years. 90% of the resident population is registered under the Indian Act, an Act that recognizes their 'official' aboriginal status in Canada (MARR-BC 2006). As a small community there is no further disaggregated data available, however, information is available for aboriginal peoples in the BC interior Region. Some of the community's characteristics may be inferred by this data. In the Interior region, aboriginal peoples represent 6% of the total population (BCHA-I 2002). Of the 49% of the aboriginal population that live in rural areas in BC's interior, 89% live in rural reserves. In BC's interior reserves 25% of the aboriginal population have knowledge of their language and 13% speak it, whereas off-reserve, these statistics are much lower at 5%and 2% respectively (BCHA-I 2002). The average income for aboriginal peoples on

reserve in the interior is $16,346 (slightly lower than off-reserve average incomes, $22,699; and significantly lower than the average incomes in mainstream population for both the Interior and larger BC region ($27,937 & $31,909 respectively). 37% of on-reserve populations have no educational credentials (slightly higher than off-reserve , 37.%, and significantly higher than in mainstream population in the interior and BC, 25.2%; 21.2% respectively). 18% on-reserve, versus 20% off- reserve, had completed some form of post-secondary education compared with 22% in the Interior and in BC's mainstream population (BCHA-I 2002).

The people of this community, as others in the Secwepemc Nation, share a foundation of Secwepemc indigenous knowledge, but more than 300 years of competing interests from fur traders, mining companies, forestry development, farming and ranching, as well as government's policies of cultural assimilation have substantially eroded Secwepemc cultural traditions and practices (SNTC 1989). In fact, anthropologists of the late 1800s and early 1900s were already describing the extent to which indigenous traditions were falling into disuse at the time (Teit 1975; Dawson 1891). Like other indigenous communities in Canada, the Secwepemc recognize the importance of indigenous knowledge in restoring well-being (SNTC 1989). In 1982, the 17 chiefs signed the Shuswap Cultural Declaration, strengthening their commitment to preserve and revitalize their culture and language (SNTC 1989). These efforts are important but they take time and resources to achieve their objectives. The Secwepemc continue to have concerns about the erosion, as well as appropriation, of their indigenous knowledge (Bannister 2004).

For the Secwepemc today, land, language and the traditional stories and oral histories are the foundation of their culture (Ignace 2008). As a former Secwepemc chief notes, "previous experience of a people, as outlined in stories and oral histories, the markings on the land and names associated with places, and the language itself, shape present day meaning connecting the

people to the norms and values of a culture, or, in the Secwepemc context the 'stsq-emp' or the law and/or charter of rights"(Ignace 2008). Land use and language are also critical unifying elements of the Secwepemc peoples inhabiting the 17 Secwepemc Reserves. In the words of Dr. Ignace, 'what makes us a people is the common knowledge of living in it, knowing and using the land forms and resources, and talking about in our language' (Ignace 2008). The issue of traditional land use is of particular importance to Secwepemc communities as they struggle to reclaim traditional territories:

> The ability of Secwepemc to assert rights to the land rests on continued practice.' Continued practice, in turn, is reliant on the stories to disseminate knowledge, and memories, which anchor us to the land and connect with the ancestors' (Ignace 2008 – p. 160)[14]

Unfortunately, owing in part to the limits of reserve boundaries since the arrival of white settlers, ranchers, and miners, traditional land use on the original Secwepemc Nation territory has long been on the decline as access to traditional sites has been increasingly restricted (Ignace 2008). Furthermore, Secwepemc language use, a critical element in cultural preservation, as in other indigenous communities across Canada, is on the decline (Ignace 2008). In the Skeetchestn Reserve, for example, there are fewer than 10 fluent speakers amongst the approximately 265 community members (Ignace 2008). 'The youth of these communities have few incentives for learning a language or the traditional use of the land because these are not valued by the dominant culture' (Ignace 2008). These challenges are exacerbated by the fact that the majority of the community members, who still remember the language, the oral histories, and stories, are dying (Ignace 2008). Furthermore, as a

[14] The Delgamuukw v. B.C. Supreme Court case of 1997established a precedence whereby Aboriginal rights and title may be established using oral histories and recounted histories of ancestors' use of land (amongst other evidence) (Ignace 2008). As time passes, there are fewer people who recall the oral histories and stories that can provide such evidence to the courts. For this reason, as suggested by the quote, continued practice is essential for preserving such evidence as well as preserving the knowledge itself.

consequence of past oppression, and in more recent years, cultural appropriation, there is a reluctance to share knowledge with youth who may misunderstand, misuse, or exploit it if they are not trained in the responsibility of bearing this knowledge (Ignace 2008; Bannister 2004). Despite these obstacles, the Ignaces and others have continued to carry out extensive work revitalizing the Secwepemc language, oral histories, and stories, as well as practices and values associated with the traditional land.

Study site

The community is nestled along a tributary that joins with the Thompson River in the semi-arid desert-like conditions of the interior mountains. The main village, band office, community daycare, band-run primary school (which offers Secwepemc language instruction in conjunction with mainstream education program) and fire service, and community arbour (for celebrations) is located about 8 km down a partially paved road off a main highway (99). Health, social and cultural services are coordinated by the Shuswap Tribal Council of the Secwepemc Nation.[15] A small trailer park community is located just off the highway and a newer community development, still underway, extends up a hillside near the highway. The community is not currently participating in a Treaty process and they see their lands as extending far beyond the Reserve signposts established by government. These signposts are historically unrecognized by the Secwepemc themselves (Ignace 2008). The Band has had some success in re-acquiring territorial lands and getting reasonable settlements from development that occurs within their territories (For example, the new 'international-standard golf living development that now graces the shores of a nearby mountain lake had to compensate the Band for

[15] The Qwemtsin Health Society (QHS)serves 5 reserves, Secwepemc Child and Family Services Agency serves seven reserves and Secwepemc Cultural Education Society (SCES)serves the Nation. The Shuswap Nation Tribal Council as well as the Northern Shuswap Council coordinate departments of Forestry, Fisheries, Land Rights & Title and human resource development and training programs on behalf of its 17 member bands.

use of the land). The community has made an effort to train its members to meet the community's needs. For example, the construction crew that worked throughout the summer months on reserve were made up almost exclusively of band members.

Summary of findings from participant observations, informal and semi-structured interviews

Over the course of one summer (4 months), in addition to making daily observations in conjunction with volunteer work in the community as well as other opportunities to socialize and interact (such as Powwows, informal language lessons in a neighbour's home, casual discussions and even the funeral of an honoured Secwepemc Elder and environmental advocate, Professor Mary Thomas), I conducted informal interviews with a number of community members, including a few 'key informants,' recorded extensive field notes and carried out semi-structured recorded interviews with nine (9) key informants (8 interviews in total, one interview with two informants) identified as community leaders (please see Appendix: Questions for Semi-structured Interviews). All data were analysed and coded thematically. A brief summary of the complex system of indigenous knowledge, values, language, and cultural practices connected to health are described below.

Defining indigenous knowledge of the Secwepemc

When describing IK a number of common characteristics emerged:

- It is defined by common values and beliefs, a life science that is the Secwepemc culture (a connection to the land and life that leads to a sense respect and responsibility)
- IK is holistic - Includes ALL aspects of life (from story-telling to picking berries)
- It builds upon itself (cumulative, living and useful, adaptable rather than static)

These characteristics of indigenous knowledge provided the context for all values and practices within Secwepemc culture as practiced today or in days gone by. In the words of one community leader, capturing all the themes simultaneously,

> To me there's traditional knowledge and there`s wisdom, they go hand in hand. To me, traditional knowledge is life lived experiences, by a people through their traditional way of life, whether that be hunting, going down fishing, catching the salmon. That`s a life lived experience that informs knowledge. Over time, you accumulate your life lived experiences. Then, generations of elders, or peoples that have that experience, sum up that and develop their world views or philosophies over time which translates into wisdom that informs them of long-term, how they see their future, how they interpret their past and how they view themselves at that point in time. The values evolve too with that experience. From that, you generate your stories, your culture your world view. That gives you your positive self-identify. It places you in the world. It informs you of where your people have come from and where they`re at today and where they ought to be.

Perspectives on traditional values and practices of interest and concern today

The key informants identified a number of important values and practices they felt were less in use in the community today, but nevertheless critical to revitalize. These express and reflect the Secwepemc world view. Here again, there was remarkable consistency in the views of those interviewed. The Secwepemc value, *community unity and mutual/shared responsibility*, remains very strong when it is carried out in the community's traditional practices around death. Even if these practices have changed slightly to accommodate the changing times, the community still supports the family of the deceased in all day-to-day aspects of life for a period of time following a death. Most respondents were concerned that this value, as well as associated practices, were not as strong in the community today with respect to taking care of the

elderly and the sick, nor were community gatherings to share knowledge as common as they were in days gone by.

The value of *connection and respect for the land (*i.e. the recognition that all aspects of life, animate and inanimate, physical and spiritual, are connected and mutually dependent) is most often expressed today in the practices around harvesting and preparing *traditional foods and medicines*. A number of members of the community hunt, pick, and prepare berries, roots, and medicinal herbs. Some still prepare and use Secwepemc medicines. The most common reason cited for using traditional foods was health. For example, Sxusem, or soap berry juice preparation and use, is widespread for "it's good for you" appeal.

In spite of the perception of its nutritional value, for most, TFs are only a supplement to a mainly 'store-bought food' diet. Unfortunately, the *ceremonies and songs* related to these practices are seldom used. In informal and formal interviews a number of community members emphasized that these practices, as well as the traditional stories related to the land, were fundamental to sustaining and perpetuating core Secwepemc values. One might also say that the youth expressed this value through the graffiti art I saw on reserve and surrounding areas. For its capacity to reflect all Secwepemc values, language, Secwecpemctsin, was identified by nearly every person interviewed to be one of the most important aspects of indigenous knowledge. This was not necessarily the view of all members of the community. As one respondent cautions,

> Our languages are on the verge of extinction, so we`re fighting and struggling to bring it back. It`s not easy. I mean there are people, who in our community, think that we shouldn`t be teaching our language. That we should be teaching French, or Spanish or Japanese because they don`t believe there is a value in our language or value in our way of life but what we need to teach is that, hey, we have our own science. There`s a science in our way of life, there`s a philosophy,

> there`s a world view, all of these are part of it that makes us whole. Without it we won`t be whole.

However, to the majority of the key informants, language is a vehicle through which Secwepemc values and concepts can find expression, and therefore is a foundation block of the indigenous knowledge system. As one respondent explains,

> Just in the way you speak, the language carries with it how you should be viewing yourself and how you should be viewing other people. To me that`s an important aspect of a value in traditional knowledge that`s embedded in the language.

Only a handful of fluent speakers still live in the community. The community is making efforts to revitalize their language by teaching it in conjunction with traditional land practices to youth and adults alike. The youth were also using language in the songs that accompany a traditional game, Lehal, reintroduced in the community some time ago. Lehal is a traditional team game at one time played with bones. It involves having one team-mate discreetly hide bones while the others distract their opponents from seeing where they have been hidden by singing traditional songs. While I lived on reserve, Lehal was a mainstay at the local powwows and generated much enthusiasm in the large number of youths that competed in the game. Nowhere are traditional values more different from mainstream cultural values than in the appreciation of *spiritual practice & oral traditions*. These terms are not mutually exclusive. For example, some stories may contain spiritual elements and teachings, just as many songs are spiritual stories. These practices are often carriers of indigenous knowledge that have little in common with mainstream cultural experiences and language. In general, those I interviewed placed a high value on these practices as a means of transmitting traditional values and a sense of identity. The ‘s’qilye’ (sweat-lodge), the ‘extsxem’ (vision quest, songs, and stories) were identified by nearly all the respondents. For example, after

telling the story about how coyote brings the salmon, one person speaks of the connection between the oral traditions as carriers for Secwepemc values,

> That's a value that speaks to values as a way of life that we ought to be as a people. A positive healthy lifestyle that you have to be respectful of life, of the salmon, of the way you handle a deer and all of these things, otherwise you could lose it all.

For many, *ceremony and other spiritual practices*, particularly the s'qilye (sweat lodge) & extsxem (vision quest), are perceived as critical to teaching all Secwepemc values, particularly that of *self-sufficiency/self-respect* (i.e. the responsibility of the individual for him or herself that also values his/her individual contributions to the community and thereby leads to self-respect).

IK and its connections to health

An important finding of the study was the respondents' shared view that ALL indigenous knowledge (traditional ecological knowledge, resources, and practices, songs, stories and ceremony, language, values) is important to health, health of the individual and health of the community. When asked, what makes a person healthy, one respondent answered,

> I'd love to think that traditional knowledge first and foremost is and ought to be connected to well-being. I think it was in the past and it can be where people have the means to still practice it as an integral part of everyday life.

Respondents identified ALL forms of indigenous knowledge as being of value to mental and spiritual health as well as physical health and balance of the person, community and environment. In fact, indigenous knowledge, or at minimum a basic knowledge of Secwepemc cultural values and, in some instances, practices, is perceived as a vehicle through which self-knowledge, self-reliance and responsibility for the community and the environment can be achieved, and with these, so too are aspirations for improved community health . Many of the people interviewed, described the importance of history,

values, experiences, and practices of their culture, the basis for Secwepemc TK, as critical to health. In discussing whether indigenous knowledge affects the well-being of the people in the community, one person noted,

> Any traditional knowledge at all is gonna have an impact on health and well-being. The more obvious ones are medicinal plants. Native foods and medicines... eat fish or eat venison. Things like that have got medicinal qualities to them, just by the fact that you're eating them.

Also significant is that nearly all of those interviewed felt that what made a person healthy was wellness of the mind, body and spirit or soul and all of those interviewed connected this to 'land' and everything in it. In the words of one leader,

> If you don't respect yourself, you don't respect the land that you stand on, you don't respect the things that grow on the land and you're gonna get sick, and you're gonna get sick fast, you know, every time you go to a medicine patch where you go pick medicines from that tree or this ground here, if you don't respect what you are doing, you don't do things properly, you don't do your offerings, you don't do these other things, the medicines that you pick, you might get sick. The medicines that you pick, you go back to get it next year, it's not gonna be there anymore. You've got to show respect, you've got to show respect on both sides. Again, the ground that we stand on, respect everything that you see on the ground. Mother Nature put it there for a reason and all the reasons that are 90-100% to feed us. Without it, we wouldn't survive. I challenge you to go stand on that pavement for a week. You're gonna starve to death. Unfortunately, that's what we're seeing... In the course that industry's goin' its crying shame that we let this happen in our backyard and in our territory. Things are happening up there that should not be happening. It's impacting and it's gonna impact us deeply in terms of food, in terms of survival. It's becoming pavement up there. It's becoming bare.

This statement shows the theme of powerful associations between all forms of indigenous knowledge and health and well-being, the theme that revealed itself in all recorded interviews and participant field observations This conclusion is also validated by the choice of priorities for indigenous knowledge viewed as important to health: i) *language,* ii) *traditional foods, medicines*

and the land and the values, songs, and stories connected to these, and iii) *spirituality & ceremony*.

Analysis and Conclusion

The survey of the literature and Case Study show agreement between mainstream academic and community perspectives in two important priority areas: TFs and TMs. However, despite its importance to the community as well as indigenous peoples' around the world, the critical connections between land, plants and animals, and human health, were rarely recognized in the survey of the literature. There were also relatively few references to IK impacts on 'spiritual health' or the importance of spiritual knowledge. Finally, acknowledged as cornerstones of the IK system by Brant-Castellano and Smylie (2000;2004 and 2003), language, stories (oral histories, traditional stories, and song) and ceremony are absent from the mainstream academic concepts of HRIK. Like all discrete cultural communities, indigenous peoples tend to see the world holistically: emphasizing the systemic relationship between cultural elements, practices, beliefs, and the environment in which the community lives and subsists. Yet many mainstream academics tend to look at discrete elements of a cultural system without examining or even acknowledging the relationships between these elements.

The processes of scientization and decontextualization discussed in the final section of the survey of the literature may account for these differences in perspective. Even the agreed upon priority areas, TFs and TMs reveal important differences in perspective. Researchers exploring and validating TFs emphasize the physical health benefits of TFs over store-bought food in the absence of consideration for other related forms of IK involved in food preparation and cultivation as well as promotion of sound environmental practices. Similarly, in the area of TM and practices, IK is defined as either knowledge of herbal medicines and/or a practitioner specialists delivering this

knowledge in a health services context in most instances in the absence of considerations of the connection between land plants and animals (including traditional foods), and human health, as well as spirit. Even those researchers who have incorporated IK/and or cultural values into their work provide a somewhat fragmented view of the HRIK when compared to that of the community. IK as 'culture' or spiritual practices is important to individual mental health and not other aspects of health (Chandler and Lalonde 2004; Kirmayer 2003; Dell 2005, Durie 2004; Roue 2006; Bodecker 2004). Studies explore connections to the land as factors in physical, mental, or environmental health, but fail to consider the spiritual, cultural and community factors (Damman 2008, Johns and Sthapit 2004, Goddoy 2005; Ohenjo 2006; Bodecker and Burford 2007 and Wilson 2004). With the exception of ecology, which accounts for all elements contained in biological systems, the survey of the literature demonstrates that the majority of the researchers addressing potential uses and applications of HRIK are limited to asking questions from within the boundaries of their respective disciplines, and their methodological as well as cultural frameworks.

Indigenous peoples are in the best position to discuss the concepts, values and past and present applications, as well as changes, in IK. Global efforts to promote indigenous rights, protect IK have recognized the importance of indigenous perspective in all these efforts (UN 1992; UN-PFII 2005). There is evidence that community-based and participatory models are increasing opportunities for indigenous communities to raise the importance of IK and share their view of HRIK (Elias 2004; Montenegro 2006; Stephens 2006; Durie 2004; Brown 2001). However, there is also evidence to suggest that dominant institutional knowledge frameworks as well as the prevailing values of the dominant culture may unwittingly interfere in opportunities to strengthen indigenous knowledge systems (Agrawal 2002; Roue 2006, Damman 2008, Janes

and Hilliard 2005, Janes 1999, Janes 2002; Ramos 2006; Waldram 2000; Waldram 2006).

The Secwepemc community featured in the Case Study has limited access to the forms of IK mentioned in the survey of the literature (TF, TM, and TEK). Knowledge of TFs and TMs, the cultivation and preparation as well as the stories and ceremonies related to them, was only available to a few elders and residents. Access to traditional lands is severely limited (only 1% of original ancestral territories for all 17 bands). There is no resident 'community confirmed' traditional healer. The language, Secwecpemctsin, is only spoken by ten community members. Ceremonies are rarely practiced and traditional stories and oral histories seldom told. Despite these challenges, community efforts to re-vitalize Secwepemc IK through practice continue. However, they do so while operating amongst many complex and competing priorities as well as severe resource constraints (including limited access and use of land). In Canada, indigenous groups have had increasing negotiating power through the rules of self-determination and participatory engagement over natural resources, as well as health and social programs, in a transfer process ongoing for over ten years (Waldram 2006). At the community level, the emphasis on self-determination has translated into a requirement for Aboriginal Reserve Band management to include an ever increasing set of skills and resource capacities to manage day-to-day operations and new demands. This includes developing, securing funding for, and implementing community programs that must be justified on terms defined by federal and/or provincial policy-makers across a range of sectors (health, education, economic development, environment, culture). From the community's perspective, the research published in mainstream academia may be useful in building a case for supporting a community-based TF or a TM strategy but insufficient to legitimize the broad-based IK system approach (one that is likely to cross sectors) reflective of the community's perspective of HRIK. Furthermore, the

relationship to land viewed as essential to sustaining much IK, as well as improving health, cannot be separated from the larger environmental, political as well as socio-economic context. For the Secwepemc community, this translates to ongoing struggles over access and control over ancestral lands. In the words of one community leader,

> Everything that happens in our territory, we gotta challenge it … Give us a rest, give us what we want, simple basic little things. Don't tire us out. We're still battling with the Department of Indian Affairs, we're still battling with the government, all the agencies that are under the government and I'm hoping that with all the battles I went through in my lifetime, this is my (20+) year as member of my community counsel, I'll be able to rest.

In spite of the global efforts to protect and restore indigenous rights and knowledge, and respect indigenous perspectives, few researchers note that larger historical, cultural, socio-economic as well as ecosystem factors need to be considered when exploring the question of what features of IK are related to health. Further research that recognizes the connections between culture, health and the environment, more consistent with an indigenous view, may help community efforts in this regard, particularly if these incorporate community's perceptions of HRIK, and can be validated in terms that are accepted by mainstream academicians and policy-makers as well as indigenous groups themselves. While the rules of participatory engagement may move research within each discipline in this direction, it will take time before differences explicit and implicit in the IK and mainstream knowledge systems are reconciled (this includes in the area of ecology most akin to indigenous views). In the meantime, research may be facilitative in bringing a number of communities with a common desire to re-vitalize IK together to share and/or exchange information on HRIK practices in a number of health-related areas (TFs, TMs, TEK, language, stories, etc.). Such efforts may not only have the benefit of re-vitalizing IK and restoring community pride but also, through

these processes, broaden the researchers own concepts of what IK may relate to health.

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Appendix: Questions for Semi-Structured Interviews

Questions for Semi-Structured Interviews Developed with input from key informants
1. What types of things in the community are ‘traditional knowledge’?
2. How do you use this knowledge?
3. What are the concerns in the community regarding the loss of this knowledge?
4. What makes a person healthy?
5. Does this knowledge have an effect on the health and well-being of the people?
6. If yes, does the loss of traditional knowledge affecting the health and/or well-being of the people?
7. Are there particular areas of traditional knowledge that are more important to health than others?
8. If yes, are any of these being lost?
9. What are the challenges in preserving and restoring traditional knowledge for your community?
10. What are the challenges in preserving and restoring traditional knowledge for your community connected to well-being?