Social Networks and Human Health in the Arctic

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ABSTRACT

The current paper introduces a social networks model as a way to understand arctic health through social networks, social capital, and social exchange. The paper argues that the Arctic is a unique place wherein social networks are formed within an environment of rapid sociocultural, political, and economic change. Though the Arctic is made up of varied geopolitical boundaries, governments, cultures, peoples, and histories, a unified arctic identity has been forged by cooperative international social networks. Though arctic health has improved over the decades, health statistics and research show that many health and behavioural problems are especially burdensome for arctic citizens. Arctic populations have been shown to disproportionately experience ill-health relative to their southern, non-arctic counterparts within their sovereign countries. In this paper, arctic health is viewed as important for all arctic people, indigenous and non-indigenous. The current paper suggests that socio-structural macro-level conditions can be linked with psychosocial micro-level mechanisms via social networks in the Arctic.

INTRODUCTION

Early research in arctic health was largely paternalistic in nature and favoured examination of logistical issues such as geographic isolation, harsh weather conditions, lack of physical infrastructure, and training of medical staff (World Health Organization, 1963; 1979; 1982). Contemporary research, however, has increasingly begun to consider the sociocultural aspects of health in the Arctic (Arctic Human Development Report, 2004; Arctic Monitoring and Assessment Programme, 2009). Although the social sciences generally have become more visible in arctic health research (Arctic Research Consortium of the United States, 1999), scant literature exists where social networks from a sociological grounding have been explored specifically within the Arctic. Even rarer is any integrated discussion of social networks and health for arctic populations. Young et al. (2012, p.135) write that ‘the relationship between social networks [and health] is well established [but] data specific to circumpolar populations are not available.’

Arctic countries include Norway, Sweden, Finland, Russia, United States (Alaska), Canada, Denmark (Greenland and Faroe Islands), and Iceland. In the current paper, the arctic population includes both indigenous and non-indigenous persons. This approach is intentional because it allows for a transnational, human-centred view of the Arctic as a unique place wherein social networks and health are relevant for all social actors across individual, community, regional, national, and international levels. Indigenous persons account for only 5% to 10% of the total estimated 4 to 10 million arctic population though they represent the majority in Nunavut, Canada, Greenland, and parts of arctic Russia (Bogoyavlenskiy and Siggner, 2004; Young et al., 2012). Detailed considerations of what is indigenous and non-indigenous are impossible here, but see Coates (2004) for a comprehensive discussion on indigenous peoples generally. Population sizes of individual
villages and cities vary. The largest metropolitan area in the Arctic is Arkhangelsk, Russia with only 350,000 people (Russian Federation Federal State Statistics Service, 2012, p.471).

Arctic human health is concerned broadly with all people living in the circumpolar north. The arctic human health perspective taken in this paper embraces a holistic representation of health for the entire arctic populace. Such a view does not undermine the importance of indigenous health issues which stem often from poverty, discrimination, and rapid social change. Instead, viewing arctic health as a human phenomenon rather than singly an indigenous one refocuses the locus of health in a broader framework of arctic identity that may benefit all people residing in arctic place. Research has demonstrated that the standard social determinants of health (i.e., age, income, education, etc.) are related significantly to health outcomes in both indigenous and non-indigenous populations (Wilson and Rosenberg, 2002). Plus, targeting arctic indigenous peoples as sufferers of health conditions apart from the rest of the Arctic may unintentionally perpetuate false images of defencelessness and dependency. Thus, whilst strictly indigenous health issues remain a concern, basic public health problems can be addressed equally for all arctic residents irrespective of indigenous identification.

**Why special attention to the Arctic?**

Many social and health concerns prevalent throughout the Arctic have been discussed in key literature such as Andersen and Poppel (2002), *Arctic Human Development Report* (2004), *Arctic Monitoring and Assessment Programme* (2009), Bartlett et al. (2007), Bjerregaard (2001), Bjerregaard and Young (1998), Bjerregaard et al. (2004), Chatwood et al. (2012), Curtis et al., (2005), Kruse et al. (2008), Parkinson (2010), Waldram et al. (2006), Young (2008), Young and Bjerregaard (2008a), and Young et al. (2012). These topics include cold weather extremes and climate changes; underdeveloped living conditions and lack of infrastructure; toxic contamination of food and water sources; radical changes in diet, nutrition, and food security; and challenges in health care delivery. Although all arctic countries are well-developed [see United Nations Development Programme’s Human Development Index (2013)], the key literature notes that rural and urban arctic populations experience a greater burden of the aforementioned concerns when compared with southern, non-arctic areas within their sovereign countries.

Recent statistics compiled by Young (2008) show that throughout the Arctic, both men’s and women’s life expectancy is lower in northern populations when compared to the respective country or state average. For example, the 2000-2004 average life expectancy of Alaska Natives in Alaska was 6.5 years lower for males and 4.6 years lower for females than of the whole state. In Canada, the largest gap in life expectancy is in Nunavut where males live 10.6 years less and females 11.3 years less than the greater Canadian population. In Greenland, men live 10.3 years less and women 9.2 years less than the average life expectancy in Denmark. Many arctic areas of Russia have lower life expectancies for men and women by as much as 10 or 11 years when compared to Russia as a whole.

Life expectancy in arctic Russia is dire (Kennedy et al., 1998; Shkolnikov, 1998). In Arkhangelsk Oblast, men die 15 years earlier than women. In Koryak, a male is expected on average to live only to 50 years of age. In arctic Russia, life expectancy rates can be lower than those found in some of the most impoverished countries of Africa, middle Asia, and the Asian Pacific (United Nations Population Division, 2011, table S.16, pp.122-126).

Infant mortality rates from 2000-2004 show higher values for most arctic areas when compared to respective national rates. Infant mortality is substantially high in Nunavut, Canada (15.3 vs. 5.3 national) and Greenland (12.7 vs. 4.7 Denmark). Within the Arctic,
infant mortality is a pressing concern in most of northern Russia with the highest rates at 22.5 in Evenki and 20.3 in Chukotka. Of particular concern with infant mortality in the Arctic is the role of poor maternal health (Odland and Arbour, 2008).

Across various years, age-standardized mortality rates broken down by infectious disease are experienced disproportionately by Alaska Natives (19.8) relative to Alaska as a whole (11.5). Similar disproportions were evident in Northwest Territories (13.9) and Nunavut (20.7) when compared with Canada (9.1). The highest rates of arctic infectious mortality occur in Greenland (36.3) and Russia’s Evenki (47.1) and Koryak (117.4). Transmission of infectious disease, including sexually-transmitted infections, remains a problem across much of the Arctic despite intervention efforts (Butler et al., 1999; Cruwys and Nuttall, 1992; Parkinson et al., 1999; 2008; Young et al., 2012; Zulz et al., 2009).

High rates of tuberculosis from 2000-2004 are found among Alaska Natives (35.3 vs. 9.7 state) and Nunavut, Canada (107.6 vs. 5.4 national), Greenland (137.5 vs. 8.4 Denmark), and Koryak, Russia (333.9 vs. 88.8 national). Resurgence of tuberculosis is a major problem for Alaska Natives, all of arctic Russia, Nunavut, and Greenland. Known risk factors such as diabetes, high immigration rates, and substance abuse help propagate tuberculosis throughout vulnerable arctic populations (Orr, 2011a; Parkinson et al., 2008).

Age-standardized mortality rates of deaths specific to circulatory, respiratory, digestive, and cancerous conditions illustrate a similar repeating pattern – many populations of arctic North America and arctic Russia share a greater burden of death relative to the nations of which they are a part. For example, the highest rates of all cancer deaths belong to Nunavut, Canada (378.9) and Greenland (358.8) with much of arctic Russia closely following. Circulatory diseases are a major arctic Russian health crisis where mortality rates are as high as 1,581.7 in Koryak. Epidemiologic transition in the Arctic is evident by increases in incidence and death for cardiovascular disease, Type II diabetes, cancer, and obesity which mimic similar health patterns of the industrialised West.

Epidemiology of injury death across various years in the Arctic shows higher rates when compared with national rates. Injury death occurrence is 15-20% higher in Finnmark, Norway; Norbotten, Sweden; and Lappi, Finland. Rate of death by injury is 38% higher in Alaska, 65% higher in arctic Canada, and 76% higher in Greenland. Injury death is widespread in arctic Russia where ten out of thirteen Russian geopolitical divisions report higher-than-national rates by as much as 47%.

Behavioural problems including suicide; alcohol, drug, and tobacco use; and family violence are significant public health issues in Alaska, arctic Canada, Greenland, and arctic Russia (Adelson, 2005; Bjerregaard et al., 2002; Lehti et al., 2009; Segal and Saylor, 2007; Shkolnikov, 1998).

As these statistics show, poor health throughout the Arctic is evident by low life expectancies, high infant mortality rates, high rates of infectious diseases, increasing rates of acute and chronic diseases, high rates of injury, and increases in behavioural problems. Although some segments of the Arctic are worse off than others, taken as a whole Young’s (2008) statistics demonstrate that measures of many social and behavioural indicators for the Arctic are indicative of poorer health than the national statistics for the same indicators in the same countries. In general, the people of the Arctic continue to display substandard indicators of health and social development, and feature a mal-distribution of health resources, when compared with their fellow national citizens.

The Arctic is a unique place wherein a complex array of factors influences human health. Research already has found that place generally dictates ‘health, illness, and preventative
care [as well as] treatment rates, types, and outcomes' (Pescosolido, 2006, p.199). Despite recognition that ‘the Arctic is considered as a specific geographic and cultural area’ (Csonka and Schweitzer, 2004, p.51), arctic studies have been slow to synthesise contextual and compositional place in the sociological sense (see Macintyre, 2004) as a distinguishing feature of arctic health. In a book review of Young and Bjerregaard’s (2008a) Health Transitions in Arctic Populations, Jacobsen (2009, p.1134) writes that…

‘hundreds of books focus on tropical medicine, but almost none concentrate on health in the polar regions of the globe.’

This single quote underscores the pressing need for more studies and literatures on health, illness, and healing in the Arctic.

**Berkman’s conceptual model**

Berkman et al. (2000, p.847) and Berkman and Glass (2000, p.143) propose a model emphasising the importance of social networks in the health and illness context across multiple social, cultural, and behavioural structures. This model provides a thorough identification of the myriad factors affecting arctic human health. According to the model, the effects of social networks on human health are dictated by the structure and characteristics of the network, existing macro- and micro-level conditions, and both upstream and downstream factors. The model is reproduced in the current paper as Figure 1.

**Figure 1 – Model proposed by Berkman et al. (2000) and Berkman and Glass (2000).**

The model shows that health is largely dictated by social networks at the meso-level. These social networks are conditioned by existing macro-level social forces. Social networks, in turn, cultivate micro-level psychosocial mechanisms. Driven by social networks, these mechanisms impact health via behavioural, psychological, and physiological pathways. Running concomitantly alongside the macro-, meso-, and micro- components of the model are upstream and downstream factors further controlling how social networks affect health.

**Social networks: Theory, structure, and characteristics**

Although a comprehensive examination of social networks is beyond the scope of the current paper, a succinct definition of social networks is...
‘the web of social relationships that surround an individual and the characteristics of those ties’ (Berkman et al. 2000, p.847).

Ertel et al. (2009, p.74) define social networks as…

‘aspects of the social environment that have to do with social relationships from intimate ties to more extended community ties and social engagement, participation, and social integration.’

According to Pescosolido (2006, p.194)…

‘social networks provide the structural element of the mechanism of social interaction … it is the structure and content of social networks that together shape and give meaning to context.’

Generally, research focused on the structure and characteristics of social networks (e.g., range, density, proximity, etc.) have found that these aspects fundamentally shape how and why social networks develop (Haines and Hurlbert, 1992; Seeman and Berkman, 1988).

Many types of social networks exist in the Arctic. Kinship and family have been well-recognised as a fundamental unit of social organisation across nearly all human societies and are important markers for arctic identity and livelihood. Religion – a set of beliefs about existence – also has long been a part of human activity in most all societies and is a prominent cultural element in arctic lifestyle. A sense of community and citizenship provide additional strata of social organisation and also are key elements of arctic identity. Kinship, family, religion, community, and citizenship have been discussed at length in the key arctic literature mentioned earlier.

Via social networks such as kinship, family, religion, community, and citizenship, social capital allows resources to be exchanged. Again, a thorough review of social capital is not possible here, but Bourdieu (1986, p.248) defines it as…

‘the aggregate of the actual or potential resources which are linked to possession of a durable [social] network of… institutionalized relationships of mutual acquaintance or recognition.’

Schuller et al. (2000, pp.1, 35) defines it as…

‘the reciprocities that arise from [social networks] and the value of these for achieving mutual goals … [it] shifts the focus of analysis from the behaviour of individual agents to the pattern of relations between agents, social units, and institutions … [it is] a link between micro-, meso, and macro-levels of analysis.’

Social capital makes up the features of social networks that facilitate or restrict the flow of resources; it is not the resources themselves per se, but those qualities and characteristics – for example, reciprocity, trust, friendship, altruism, expectation, frequency of contact, purpose, and intimacy – that assist in the production of resource delivery (Coleman, 1988; 1990; Kawachi and Berkman, 2000).

Much research has shown generally that lack of favourable social networks, capital, and support has deleterious effects on health outcomes (Berkman, 1985; 1995; Berkman and Syme, 1979; Bruhn, 2005; Cattell, 2001; House et al., 1982; Kawachi and Kennedy, 1999; Kawachi et al., 1997; Kennedy et al., 1998; Lomas, 1998; Seeman, 1996). Research on varying types of social networks indicates that ‘better health is observed … in [social] network types characterized by greater social capital, regardless of cultural setting’ (Shiovitz-Ezra and Litwin, 2012, p.902), lending credence to the notion that social networks and capital are fundamental to health even when cultural environments vary.
Socio-structural conditions, social networks, and health in the Arctic

Recall from Berkman’s model that the socio-structural macro-level conditions of culture, socioeconomic status (SES), politics, and social change influence social networks. All four of these are salient in the Arctic and have a major role in the current state of Arctic development, social networks, and health. The following is an integrated discussion of how these four elements have convened to restructure arctic social networks and health outcomes.

Ten years before Berkman’s model, Berry (1990) proposed a model of acculturative adaptation directly applied to the arctic context that features some of the same elements. Although acculturation is less emphasised in the canon of social network literature, it nonetheless plays a pivotal role in understanding micro-level health effects brought on by macro-level sociocultural change. Wolsko et al. (2007) has shown that acculturation can negatively affect – but enculturation positively affect – health in the Arctic when traditional life ways, social networks, and community identities are altered.

Research examining social networks and health in the Arctic has been scant, but research with arctic and subarctic populations has come to similar conclusions (Elo et al., 2010; Mignone and O’Neil, 2005; Nuttall, 1992; Richmond, 2009; Richmond and Ross, 2008; Richmond et al., 2007). Community integration, participation, and close-knit social networks yield high social capital that result in resources exchange, including social support. Health-related problems occur less when positive social exchange stemming from favourable social networks is present. However, engagement of health-damaging and destructive behaviours are possible when there is mal-adaption to life situations, including rapid sociocultural change, lack of positive peer social networks and resources, and impoverished material living conditions. Mostly for indigenous populations, social networks have been shown to foster a heightened sense of belonging, identification with traditional culture and activities, and social support that correlates with better health outcomes. Underscoring the importance of community, Berkman and Glass (2000, p.137) note...

‘the degree to which an individual is interconnected and embedded in a community is vital to an individual’s health and well-being.’

Young et al. (2012, p.134) recognise that in the Arctic ‘there are many examples of how cultural beliefs and practices expose people to, or protect them from, disease and injuries, including dietary customs, childcare practices, religious rituals, migration patterns, kinship relations, and medical therapies.’ That social networks exert influence over health in the arctic population is not unlike the existing evidence that social networks influence the health of the general population.

A social exchange framework (Molm, 2006) placed inside Berkman’s model is helpful for considering arctic social networks, social capital, and human health. In an arctic context, the health of indigenous and non-indigenous citizens is dependent on negotiated and reciprocal exchanges of resources within same and across different groups. Out of these uniquely created social networks arise the social capital that allows resource exchanges to occur (Molm, 1994). One reason why behavioural health problems are numerous in the Arctic may be because breakdowns in positive social networks result in (dis)stress that yields unfavourable social exchange behaviours and ill-health. Research elsewhere has already shown that stress can negatively affect health and that social support can act as a buffer to stress. The development of social capital leading to resources such as social support is likely impeded when social networks fail creating a cycle of (dis)stress that is difficult to break. The social capital that encourages positive social exchange and favourable health for arctic residents may dissolve due to the decay of social networks already made unstable by rapid,
unfamiliar social change. In this way, a social exchange framework embedded within Berkman’s model allows a possible way to understand why poor health in the Arctic is not random. Ill-health does not occur randomly (Bury, 2005; Link and Phelan, 1995; Wilkinson, 1996). Poor health in the Arctic may be explained partially due to opportunistic pathways dug out by stress, lack of social support, and other social factors as shown in Berkman’s model that rely in many ways on social exchange activity occurring in uniquely arctic contexts.

A common arctic identity has risen out of increased social change and political activity between indigenous and non-indigenous governments and organisations. A heightened awareness of circumpolar commonalities and shared initiatives – termed circumpolarity (Johansson et al., 2004, p.181) – reverberates throughout the Arctic and has empowered arctic people to be collective actors on a global stage (Heininen, 2010). In the Arctic, ‘indigenous and non-indigenous identities are converging’ (Csonka and Schweitzer, 2004, p.64) into a pan-arctic identity encompassing the entire Arctic. As Young and Bjerregaard (2008b, p.3) note, ‘a circumpolar approach to identifying common issues and developing solutions that transends national borders has increasingly been adopted by national and subnational governments, indigenous peoples’ organizations, as well as professional and scientific associations.’ Research has yet to explore what a unified circumpolar identity means for the development of arctic social networks or how a sense of being arctic may affect health outcomes and experiences, but Berkman’s model may hold a clue. The numerous social networks allowing arctic cohesion and cooperation will continue to intensify and converge as long as social capital promotes the amicable exchange of social resources such political self-determination, public policy inclusion, and improved socioeconomic conditions. Such social networks could be used as a proxy to analyse a circumpolarity phenomenon that links international macro-level socio-structural conditions with micro-level psychosocial mechanisms that result in new pathways of health in the arctic.

The future of Arctic health?

The arctic population is mobile and transitory, and this mobility is likely a factor for health outcomes (Snyder and Wilson, 2012). Some rural indigenous groups change arctic locations according to the seasons; winters on the coast and summers inland. In urban areas, residents move in and out of the city due to temporary but lucrative industry work in construction; engineering; fishing; forestry; oil, gas, petroleum, and diamond mining; tourism; and research (Glomsrød and Aslaksen, 2008). Native people have begun to emigrate out of the Arctic to embrace a modernised way of life where they have access to increased employment and education opportunities, improved healthcare, current technology, and other modern conveniences. Future arctic health research should examine how such population fluctuation impacts social networks and capital.

Embedded within an exploration of social networks and capital could be future community and public health studies that directly involve arctic peoples for research planning, implementation, and follow-up procedures. Active incorporation of arctic residents into community and public health studies would be beneficial because these types of studies 1) do not depend on passive dissemination of information to an uninvolved target audience, 2) have the potential to be highly empowering among both rural and urban circumpolar groups, and 3) allow researchers to better understand the unique health communication needs of and best health practices for the arctic populace. Some studies already have recognised the importance of including arctic residents in developing local community, public health, and well-being initiatives (Bjerregaard et al., 2008; Orr, 2011b; Wilson and Young, 2008). The practice of involving the arctic population in their community and public health care education, communication, and delivery should continue and become even more
sophisticated. Future programmes seeking to expand health resources into the Arctic will be wise to encourage the cultivation of strong, collaborative social networks within parameters that are supported by the people for which they are intended. Future arctic health programmes also should employ models that create optimal conditions for enabling favourable health behaviours that are aligned with the realities of living in the Arctic.

Following Waldram et al.’s (2006, pp.122-124) call for life-course perspectives in indigenous health research, life-course approaches should be considered for all arctic populations. A primary benefit of using life-course as a conceptual synthesiser in arctic health research is that it could take into account longitudinal influences across the lifespan rather than only at a cross-sectional point. Some people live in the Arctic all of their lives, whilst others migrate in and out of the Arctic. Employment of life-course perspectives may yield a greater understanding of long-term social network and capital development along with their relationships to health resources and behaviours throughout one’s life.

Finally, given the current arctic Russian health crisis (Young, 2013), new social and health data for and research on this area are needed due to geopolitical boundary changes that have occurred since Young’s (2008) compilation.

CONCLUSION

Berkman’s model provides a conceptual vehicle for the analysis of health through social networks. Within Berkman’s model, a social exchange framework can help identify many positive resources such as social support and circumpolarity, as well as unhealthy stressors such as weak social ties and propensity to engage in unfavourable coping behaviours. The current paper has introduced a social network model to begin understanding how macro- and micro-level forces might influence health in the Arctic, and how those social networks depend on social capital and resource exchange in the highly diverse and volatile arctic environment.

In general, arctic people are living longer and healthier than they have in the past. However, data presented in this paper show that serious health issues in the Arctic are real and in need of attention. At the macro-level, the Arctic has been affected by global changes in culture, politics, and society. At the micro-level, resources such as social support, community involvement, and cultural identity are shown to be important for much of the arctic population. The social networks of Berkman’s model stimulate the pathways of social capital and resource exchange between these macro- and micro-level events toward human health outcomes for all arctic citizens.

The specialty of ‘arctic health’ – that is, the study of health, illness, and healing in the Arctic for all people and groups – is still a relatively new area of inquiry. Sociology is poised to add to the discourse on social networks and capital in the outcomes of health occurring in arctic place.
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