The Arctic Region and its Inhabitants

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Abstract

There are numerous definitions of the Arctic according to the One Health concept, which adopts a broad, holistic approach to the health of humans, wildlife, and the environment. In different sources it is stated that there are from four to ten million people living in the Arctic, of whom 500 000 to 1 000 000 belong to numerous Arctic indigenous groups. This chapter starts by presenting several definitions of the Arctic and how these definitions are used to examine health impacts. There is considerable diversity among arctic regions in population size, composition, growth rates, settlement patterns, and economic structure. In each arctic region, these differences impact the health outcomes of the human populations, such as mortality, morbidity, quality of life, and others. The major differences in health outcomes are between Arctic Indigenous groups and others, mostly migrants from the southern portions of the arctic countries. This chapter describes the demographic and health situations in the different arctic regions.

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Borders of the Arctic

There is no unified border of "The Arctic". Eight countries, different in many ways, have land and waters in the arctic region – the Russian Federation, the United States of America, Canada, Norway, Denmark (Greenland and the Faroe Islands), Sweden, Finland, and Iceland. Russia has the longest border to the Arctic, with a coastline spanning 22,600 km of the total 38,700 km (58.4%). Natural and social sciences employ different definitions of "the Arctic", and there needs to be awareness and appreciation of these differences. The first Arctic Human Development Report (AHDR) published in 2004 (Einarsson et al. 2004) and the second one in 2015 (Larsen and Fondahl 2015) employ the same delimitation of the Arctic, discussing the various ways of defining it. They provide a commonly used definition for the social sciences, although this definition has certain drawbacks. In particular, it underscores the great sub-regional differentiation across the arctic territory, although "Arctic residents do face many of the same challenges across the entire region" (Larsen and Fondahl 2015). The detailed definition of the Arctic in the AHDR (Einarsson et al. 2004) takes onboard the approach, where the location of jurisdictional or administrative boundaries and the availability of data are prioritized for practical reasons. For the specific focus of this chapter, we will follow the same approach, utilizing the available population and health data (Figure 1). As can be noted from Figure 1, large regions defined as Arctic administrative areas are in fact south of the Arctic circle, which sometimes is used as a strict boundary of the Arctic.

The Arctic Council is a high-level intergovernmental organization that works with the issues faced by the Arctic countries. It consists of several working groups and they use different definitions of the Arctic, known as the Arctic Monitoring and Assessment Programme (AMAP) working group's borders, Emergency Prevention, Preparedness and Response (EPPR) borders, and the ones from the Conservation of Arctic Flora and Fauna biodiversity working group of the Arctic Council (CAFF). These definitions of the Arctic consider various bioclimatic subzones, vegetation, glaciers, oceans, governance, laws and regulations, tourism, husbandry, and many other key elements of the Arctic. These various borders show that "Arctic regionalism is territorially erratic and potential boundaries are set (and change) along principally functional landmarks and towards problem-oriented governance” (see the figure e.g. in Knecht 2013).

Several interconnected interdisciplinary approaches provide an exhaustive basis for determining the boundaries of the Arctic. One approach, recently published in the largest Arctic Encyclopedia (Lykin 2017), mentioned some distinctive features of the Arctic border e.g., the Arctic Circle (66° North latitude). This definition is particularly different from the AHDR definition that includes the territory north of the 60° latitude, especially in the Western Northern hemisphere. Others include physical features e.g., differentiation of landscapes, zoning, tundra, forest tundra, and taiga, as well as societal features such as discomfort for human life in high latitudes, a rise in labor costs, production costs, depreciation of fixed assets, and quality of life of the population (Lykin 2017). Zaikov et al. adds that the growth season in the Arctic is much shorter than in lower latitudes, the periods with colder air temperatures are longer, there are large territories of permafrost, and that also other physical features of the Arctic are economically challenging. Some examples include higher costs of industry and infrastructure development and maintenance, higher costs of energy supply and transportation, special requirements for the communal services in the arctic settlements, and in many places a limited diversity of the local economy (Zaikov et al. 2019).

All the above-stated approaches to defining the borders of the Arctic are evolving due to the processes of globalization and climate change, which represent new challenges and opportunities for modern arctic people. Perhaps these definitions do not so much focus on e.g., nomadic Arctic people’s livelihoods. One example is reindeer herding: When Sámi herders ruled northern Fennoscandia, they travelled with reindeer between the coast and inland, utilizing different pastures. Then, the borders between Norway, Sweden, Finland, and Russia were drawn between the 18th and 20th centuries and “their country” was divided between four nations, with perhaps little interest in the Sámi or reindeer herding (Evengård et al. 2015). Hence, the borders are important structures when talking about inhabitants, both human and wildlife, of the Arctic.

Prehistoric human settling of the Arctic

For thousands of years, the Arctic was a home to many diverse groups of Indigenous people, "surviving in at times unforgiving conditions while developing vibrant cultures" (Evengård et al. 2015).

A number of sources discuss various aspects and dates of human colonization of the Arctic, going back 30,000 to 45,000 years ago (e.g. Pitulko et al. 2016). The times of colonization vary across the different Arctic regions. Proto-Eskimo culture (ancestors of all modern Eskimo) in the Far Eastern North appeared about 12,000 years ago, when the first signs of humans were found in Alaska (Gusev and Shumkin 2011; Guseinov 2012). The first groups of hunters entered the high latitudes in America already 24,000 years ago (Diakonov 2019). Gusev and Shumkin stated that people may have been attracted to the Far North to hunt animals of the large Pleistocene fauna for food and valuable raw materials (e.g., mammoth, woolly rhinoceros, musk buffalo, bison) and reindeer. Later, about 8,000 – 7,800 years ago, the main objects of hunting were reindeer, polar bear, smaller prey, and birds, according to the early hunter settlements of the Arctic. Domestication of dogs was one unique feature of human activity at that time (Diakonov 2019). Humans peopled the North American Arctic (northern Alaska and Canada) and Greenland around 6,000 years ago, leaving behind a complex archaeological record that consisted of different cultural units and distinct ways of life (Raghavan et al. 2014). According to Diakonov, Gusev and Shumkin, Greenland was settled from the East about 4,500 years ago when larger groups of proto-Eskimo hunters for marine mammals moved into the area (Gusev and Shumkin 2011; Diakonov 2019). After that, the Bering Sea culture began to develop about 3,500 years ago (Guseinov 2012). The inhabitants of the Bering Strait and the Arctic coastal area of Fennoscandia started forming stationary settlements and community support systems, improving housing, and establishing specialized marine mammal hunting with the use of a harpoon (Gusev and Shumkin 2011).

Numerous detailed descriptions of how the Arctic was settled have been published (Anderson et al. 2014; Raghavan et al. 2014; e.g. Filatov 2017; Kotlyakov et al. 2017; Diakonov 2019). In Russia, the inclusion of the territories of the Russian European North (10 – 12th until 17th century) and Siberia and Far East (16th to 20th century) made this country the largest of the Arctic nations. The colonization or resettlement of the Russian arctic regions was done by many different peoples living in Russia and started almost a century later than the colonization processes run by some of the European countries. It continued until the late 20th century, when many people moved up north from the middle latitudes of Russia, partly forcefully (prisoners) but mainly voluntarily (labor migration). The essence and peculiarities of the colonization of the northernmost regions of Russia, especially the Asian regions, were compared to similar processes in America and other parts of the world (Rybakovsky 2018).

The population of northern Norway grew three to four times bigger after acquiring independence from Denmark (1814) and building infrastructure; for example, in1902 a railway was built that connected the north of the country to its south and neighboring countries. For a very long time, the Canadian North was a colony and not free to make decisions, including those regarding settling policy and processes. It was visited by professional workers in a so-called shift method (several weeks/months in the Arctic, several weeks/months out) until the main cities were established in the 20th century (Filatov 2017). Many scientists and adventurous explorers from outside of the Arctic entered the northernmost territories in the 18th century (Evengård et al. 2015). Those far away Arctic lands were already well settled with Indigenous peoples and a small number of settlers from the outside. The new visitors were also the first people to introduce the Arctic to the global world, to describe its landscape, the wildlife fauna, humans and the various cultures met there (Evengård et al. 2015). While curiosity was one factor driving people up North, commercial interests over the Arctic resources started to prevail in the last three centuries, bringing more people to the region. The economic reasoning behind the Arctic settlement was changing massively over time. In the period from the 17th – 19th centuries to the beginning of the 20th century, biological resources (fur and food) were traded, and the main industries were hunting and fishing. From the end of the 19th century until now, transportation development became important to satisfy not only national, but also world interests. Since the 1930s, military defense activities in the Arctic were strengthened, flourishing especially in the 1950s and 1970s, during the Cold War. Today, the minerals and raw material, oil, and gas business of the Arctic economy are the main driving economic forces, which started to take shape from the end of the 19th century (the beginning of gold mining in Alaska – 1880) (Fauzer and Smirnov 2018).

Ongoing population and health developments in the Arctic

When assessing the health changes in the Arctic, it is crucial to understand the demographic elements. In the recent past, population dynamics in the whole arctic region have been shaped in many ways by the Russian depopulation processes. This is because the Russian population comprises the largest share of the total Arctic population.

From 1989 to 2019, the Russian Arctic lost about 30% of its population (Danilova 2020; Fauzer et al. 2020). In contrast, population growth has increased by 16.3% in the non-Russian Arctic during the same period, due to several concurrent population processes. In the North American and North Atlantic Arctic, the arctic communities experienced a marked population growth in the 20th century due to internal and external factors (Emelyanova 2018). In 1945 the population of Alaska (USA) was 100,000 and grew sevenfold by 2015. In Greenland, the increase has been more than fivefold in the same period, and a fourfold increase occurred in Iceland since 1945. At present, only Alaska, Iceland, and the Canadian Arctic have continued to experience population growth due to positive net migration and natural population increases (more births than deaths) (Larsen and Fondahl 2015). Figure 2 depicts the regions of the Arctic that underwent population growth in the last decade (colored blue) and regions with a declining population (colored red). The numbers of inhabitants of northern parts of Sweden and Finland have declined up to 10% as well as in many regions of Russia due to accelerated out-migration and natural population decrease; the latter happens when there are more deaths than births. Starting in the 1990s, the profound growth seen in Greenland and the Faroe Islands reversed to a declining population trend. By 2018, the populations in these two countries had returned back to the levels of 1990 (Gløersen et al. 2006).

In the Russian Arctic and Far Eastern regions[1], one recognized challenge for the Russian government today is to cope with significant population decline (The President Executive Order of 9.10.2007 №1351 2007). These include the Russian regions with the highest levels of population decline (Republic of Komi, Arkhangelsk, Murmansk, Magadan, and Sakhalin oblasts) as well as the Republic of Karelia and Sakha (Yakutia), which lose their population but at a lower scale. The continued shrinking of the Russian Arctic population is projected to decline from seven million people to only 5.9 million during 2018–2050. The fastest relative population loss is expected in the Barents or North-West of the Russian Arctic (Table 1). The populations of the Arkhangelsk, Murmansk, and Magadan regions keep declining even under the optimistic Arctic Boost scenario in one of the projection exercises (Emelyanova 2017).

The main reasons for the decline in the Russian Arctic population during different periods were related to the booms and busts in exploration of natural resources, lower quality of life in comparison with the central regions (Smirnov 2020), and the policy of the state (Danilova 2020). Population density in the Far East is the lowest in Russia, less than one person per one km2, which was addressed in the policy for the development of the region (Golubeva and Emelyanova 2020).

In 2017, the Russian government developed the Concept of Demographic Policy in Russia's Far East for the period up to 2025 (The Government Decree of 20.06.2017 №1298-p 2017). One priority is to reverse population decline caused by large out-migration and natural decrease. Several related governmental orders are to be implemented in two stages, during 2017–2020 and 2021–2025. In 2020, the President signed the Decree to update "The Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period until 2035", where it was reiterated that out-migration, population loss, lower quality of life and lower health indicators in the Arctic compared to the rest of the nation are threats to national security (The President Executive Order of 26.10.2020 №645 2020).

Selin states that in order to avoid economically driven demographic losses, financial mechanisms must be strongly considered in addition to the demographic policy framework; a boost of

[1] 11 areas of Russia with a population of about seven mln total in 2018: republics of Karelia, Komi, Sakha Yakutia, autonomous okrugs of Nenets, Khanty-Mansi, Yamalo-Nenets and Chukotka, Arkhangelsk, Murmansk and Magadan oblasts, and Kamchatka kray.

development must be encouraged, rather than the current stabilization approach (Selin 2016). People from the arctic regions of Russia are much poorer than nation-wide, even though they transfer more money into the federal budget than they receive back after federal reallocation (Selin and Bashmakova 2010). Compared to other arctic regions where larger companies tend to involve and hire the local arctic population, Russian companies prefer to hire shift workers as well as experts and machinery from abroad (Kryukov and Kryukov 2017).

Fauzer and Smirnov stated that the global Arctic has 415 settlements with a population of over one thousand people, 135 of them located in its Russian part (Fauzer and Smirnov 2018). The process of urbanization has done its job of enlarging urban centers and regional capitals, e.g., nine out of 15 larger cities in the Arctic with a population above 50,000 are located in Russia (Fauzer et al. 2020) (Figure 3). However, in Russia the largest northernmost cities have also lost their population to other southern cities in Russia or abroad. The current Russian settlement policy focuses on developing larger community centers using already developed infrastructure with more shift work and transportation opportunities to the remote locations of the Arctic, rather than building new settlements for temporary projects (The Government Decree of 15.12.1994 №31 1994; Blagodeteleva 2017).

The larger settlements of the Arctic are mainly regional or administrative centers especially in the Canadian Arctic, Greenland, Iceland, and the Faroe Islands (Figure 3). In Alaska (USA), Arctic Fennoscandia, and in a few areas of Russia, the settlement density is in general high, including many large settlements (Jungsberg et al. 2019; Wang 2019). In Nunavut and Northern Quebec (Canada), Greenland, the Faroe Islands and Finnmark (Norway), most of the population live in small settlements. The Yukon, bordering Alaska in the west, differs from other Canadian Arctic regions due to its regional center Whitehorse, which comprises 65% of the total population of Yukon. In the Northwest Territories and Labrador (Canada), Iceland, Troms and Nordland (Norway), Norrbotten (Sweden) and Lapland (Finland), there is not such a remarkable difference in the share of the population in small and large settlements (Jungsberg et al. 2019).

The population residing in the Arctic is in fact a very small share of the overall population of eight Arctic countries and keeps declining. In Russia, each of the regions Chukotka, Kamchatka, Magadan, Karelia, Nenets and Yamalo-Nenets autonomous areas located in the Arctic have <0.05% of the total Russian population, similar to the Canadian Arctic and Alaska (Emelyanova 2018). This small percentage contrasts sharply with the colossal part of the country's land mass these arctic provinces occupy. In many cases, this characterizes the region as a place of pristine wilderness with low anthropogenic activity. The settlements are divided into highly urbanized cities and, on the other hand, highly dispersed small communities and villages situated across the region (Emelyanova 2017).

Table 1. The indicators related to the demographic and health profile of the Russian Arctic (RA) regions. Source: Scherbov et al., 2019

	Population size as of Jan 1st (thous.)	Projected population size as of Jan 1st (thous.)	Projected population size as of Jan 1st. Zero migration scenario (thous.)	Net migration (total)	Relative population change	Number of women per 100 men at ages 60+	Total fertility rate. Number of children per woman	Female life expectancy at birth (years)	Male life expectancy at birth (years)	Difference between female and male life expectancy at birth (years)	Population median age (years)	Projected population median age (years)	Human Life Indicator. Both sexes (years)**
Reference period	**2018**	**2050**	**2050**	**2017**	**2018-2050**	**2018**	**2017**	**2017**	**2017**	**2017**	**2018**	**2050**	**2017**
The Russian Federation	146,880	137,360	131,218	211,878	-6.5	181	1.62	77.6	67.5	10.1	39.2	43.9	67.7
Republic of Karelia	622	470	530	-1,916	-24.4	202	1.56	76.2	64.9	11.3	40.9	46.3	65.4
Republic of Komi	841	491	830	-9,470	-41.6	193	1.78	76.6	65.3	11.3	38.7	43.6	66.6
Nenets autonomous area	44	49	59	-231	-11.0	164	2.35	77.2	65.9	11.2	35.4	37.0	65.4
Arkhangelsk oblast	1,111	668	994	-7,814	-39.8	190	1.65	77.2	66.1	11.6	40.4	43.3	66.8
Murmansk oblast	754	588	666	-3,503	-22.0	210	1.56	76.3	66.5	9.8	38.5	40.9	67.0
Khanty-Mansi AO* – Yugra	1,655	1,756	1,757	-4,067	6.1	149	1.88	78.3	69.3	9.1	35.2	38.3	69.4
Yamal-Nenets AO	539	578	601	-2,418	7.4	137	1.95	77.9	69.0	8.9	34.8	36.1	68.2
Republic of Sakha (Yakutia)	964	885	1 105	-4,649	-8.2	159	1.93	77.1	66.4	10.7	33.1	37.3	66.6
Kamchatka kray	316	272	280	544	-13.7	167	1.78	75.3	65.2	10.0	37.9	40.5	64.9
Magadan oblast	144	99	120	-1,398	-31.6	164	1.60	75.5	63.4	12.1	39.0	41.4	64.8
Chukotka AO	49	41	67	-656	-17.5	126	2.08	71.7	60.3	11.3	36.1	36.1	58.0
RA total	7,039	5,897	7,009	-35,578	-196	169.2	1.83	76.3	65.7	10.7	37.3	40.1	65.7

*AO- autonomous okrug. ** The Human Life Indicator expresses well-being in terms of years of life, similar to life expectancy at birth, and takes the inequality in longevity into account.

Fertility processes changed toward less children born in many regions (Figure 4). In 2016, the Total Fertility Rate (TFR) has been around the replacement level at which a population exactly replaces itself from one generation to the next, without migration (2.1 children per woman) in Nunavut, the Faroe Islands, Greenland, Nenets autonomous okrug (AO), Chukotka and other areas next to the red line in Figure 4. The remaining areas have fertility rates below the replacement level, with the lowest level found in Magadan and Murmansk oblasts, Troms in Norway, and Lapland in Finland.

Even though the general population in Arctic areas is considered rather young compared to other central and southern areas of Arctic countries, the process of population aging is underway. We can see it in declining fertility rates, changing population structure toward a declining proportion of people of working age and an increasing number of older persons. The old-age dependency ratio (OADR; % of working-age population based on pension age x 100) is as high in the Russian Karelia and Arkhangelsk regions as in their Fennoscandian neighbors, whereas the Siberian regions reached OADR levels similar to those in Arctic areas mostly inhabited by indigenous people, e.g., Greenland, and the Canadian Arctic. As Scherbov et al. further details for the Russian Arctic, the OADR index will grow in all Russian Arctic regions during the period 2018–2050 with an average growth of 26.8 index points, increasing at the fastest speed in the republic of Karelia (40.7) (Scherbov et al. 2019).

Prospective old-age dependency ratio (POADR) (x 100) is another important indicator of population aging. Unlike the OADR, POADR is adjusted according to the health gains and increasing life expectancy. This ratio is based on a flexible threshold of who is considered old. It is calculated as a ratio of the number of people older than the old-age threshold to the number of people between age 20 and the old-age threshold. The ratio is multiplied by 100 (Scherbov et al. 2019). POADR will grow less rapidly than OADR; the average change is 6.0 points, with the fastest aging registered in Arkhangelsk oblast (10.4). It is interesting to note that according to POADR, people in Chukotka will not age at all as a group, with only a 0.2 index value change over three decades. Hence, societal challenges associated with population aging might not yet apply there (index values come from Scherbov et al. 2019).

There is a significantly varying pattern of longevity in the Arctic. The average Life Expectancy (LE) at birth in the Russian Arctic is shorter than in many other Arctic places and was 65.7 years for males and 76.3 years for females in 2017. The male LE is especially low compared to that of men in e.g., Iceland, the Faroe Islands, and the Swedish north (> 80 years). When comparing the Russian northern areas, there is a particularly large gap between the areas of around seven years in female and nine years in male LEs with the lowest indication in Chukotka, and the highest indication in the Khanty-Mansi AO – Yugra. The difference between female and male life expectancy at birth has been up to 12 years longer for females in the Magadan oblast, with the lowest difference between sexes found in Yamal-Nenets AO (nine years) – another unique and sad feature of Russian longevity. The gender gap is significantly lower in other parts of the Arctic.

The ethnic composition greatly affects processes in health and population development. The United States classify people by race, Canada – by ethnicity of Aboriginal peoples, Greenland – based on place of birth. Iceland and the Faroe Islands do not have Indigenous populations since they were settled relatively recently by outsiders. Fennoscandia has only one Indigenous group in the north – the Sámi. The only areas where Indigenous people reside in the Russian Arctic are Khanty-Mansi, Sakha (Yakutia), and Nenets AO. Arctic Indigenous populations often show different "results" in demographic and health indicators compared to those of the non-Indigenous population (Coates and Holroyd 2020). The Indigenous population often has a much younger age structure, higher fertility and mortality, faster growth, and is more likely to be located in predominantly rural regions (Emelyanova 2018; OECD 2020). Indigenous groups in Russia are facing a lower quality of life, lower quality of social and health services as well as poorer housing, educational and communication opportunities in the remote areas of their residence compared to the general population of Russia (The President Executive Order of 26.10.2020 №645 2020). This is often true based on the analysis of the wealth and the livelihoods and living conditions of the Inuit, Sámi, and other Indigenous populations in arctic settlements (Poppel et al. 2015; OECD 2020).

The health of people living in rural, remote Indigenous communities in the Arctic is persistently poorer than that of their urban and non-Indigenous counterparts. According to Bjerregaard et al. (Bjerregaard et al. 2004), the incidence of infectious diseases in the Inuit and other Indigenous peoples of the circumpolar north has declined considerably in the second half of the 20th century, but is still high compared to many European countries. Dramatic rises in mortality have been registered every winter for most developed countries (Keatinge 2002), with a reliably higher share of pathological weather sensitivity among the northernmost European population compared to the regions with a warmer temperate climate, and high levels of emotional stress in arctic residents (Hasnulin and Hasnulina 2012). Chronic diseases such as diabetes and cardiovascular diseases are on the increase, while accidents, suicides, violence, and substance abuse are of major importance for the pattern of ill health in most Inuit communities in their homelands stretching from the easternmost tip of Russia in the west to Greenland in the east (Bjerregaard et al. 2004). Lifestyle changes, social change, changes in society, and the environment and circulating contaminants are major determinants of health among the Inuit in many countries of the arctic region (see e.g. Bjerregaard et al. 2004; Curtis et al. 2005, 2012; Singh et al. 2014).

Many global and local processes have changed the community well-being in the Arctic (Ribova 2000), including climate change and other environmental changes. These processes have posed more longstanding and also emerging health challenges to the inhabitants related to e.g., food and water security, changes in disease patterns, and impacts on healthcare infrastructure (Parkinson and Evengård 2009; Larsen and Fondahl 2015; Ruscio et al. 2015; Evengård and Thierfelder 2021). Climate change has been predicted to be the most influential factor in the emergence of infectious diseases (Sonne et al. 2017; Waits et al. 2018). Climate change can promote multiplication rates of pathogens and introduce new infections to previously isolated areas (Dudley et al. 2015; Waits et al. 2018). Climate change can also indirectly affect health by changing human behavior e.g., lead to more people using public bathing facilities, providing increased risks for waterborne disease outbreaks (Eze et al. 2014). In the case of Arctic warming, people can spend more time in nature and public places, subsequently increasing chances to contract more infectious diseases (Chashchin et al. 2017). Climate change can also affect contaminant levels, which can lead to human health effects (Pacyna et al. 2015; Abass et al. 2018).

Warming of the climate might slightly prolong commercial anthropogenic activity in the Arctic; however, there will still be unfavorable conditions for shipping, fishing, and resource extraction during a major part of the year. There will also be lots of obstacles (e.g., lack of appropriate infrastructure, machinery and equipment) to overcome with considerable financial resources and time before the very much discussed "economic boom" connected to climate change is realized (Voronkov 2015). In addition to affecting socio-economic activities like transportation, marine sea food production, resource exploitation, governance issues and many others (Crépin et al. 2017), the dominant drivers of arctic societal changes such as climate change and globalization will change the traditional livelihoods in the North, e.g., bringing diversity to the cultures and languages, with a transition from traditional foods based on hunting and fishing (e.g., "country food") to the Western diet (Larsen and Fondahl 2015). Overall, the manifestations and future predictions of climate change vary across the Arctic and between and within communities, and consequently the need for adaptive responses varies (Larsen and Fondahl 2015).

The above-mentioned increasing globalization is another megatrend affecting the inhabitants of the Arctic in many ways. For example, health and disease patterns (increased obesity, diabetes, and cardiovascular diseases) are changing, population out-migration is promoted as people seek opportunities and alternatives outside the Arctic, and energy security is compromised by shifting energy prices. Increased globalization also has many other both positive and negative effects on the daily lives of inhabitants in the Arctic (Larsen and Fondahl 2015). Globalization in the circumpolar world and its various effects on the economies of the North, traditional livelihoods, security, well-being and other systems have been described in detail in the book by Heininen and Southcott (Heininen and Southcott 2010; Jabour 2011). Some chapters in the book examine the impacts of globalization on groups of Indigenous people: e.g., the Sea Sámi in northern Norway and the Nenets reindeer herders in Russia. Both groups have been able to find new ways to deal with the challenges they face (Heininen and Southcott 2010).

More research is required on innovative, economically effective ways to improve human and wildlife well-being (Larsen and Fondahl 2015). In the view of Stephen (2018), challenges for future research on societal impacts of a rapidly changing Arctic include achieving greater clarity and critical reflection around key concepts. Arctic sustainable development, climate change and globalization as the dominant drivers of societal impacts in the Arctic, the Global Arctic, and the Arctic stakeholder concept are some concepts to be considered. The use of comparative methods to investigate societal impacts of a changing Arctic is essential for cases both within and also beyond the Arctic, as the Arctic is certainly unique but not the only place affected by global change processes (Stephen 2018). The use of best practices and reinforcing all possible assets is essential. One Health is also a prominent approach to consider these connections between the environment, plant, animal, and human health. Understanding this is increasingly critical in assessing the impact of global climate change on the health and well-being of Arctic inhabitants (Ruscio et al. 2015).

Conclusions

The approaches to defining the borders of the Arctic stated in the chapter are numerous and currently evolving due to the processes of globalization and climate change. These definitions have not yet shown much focus on nomadic Arctic people's livelihoods.

Based on historical data, human colonization of the Arctic by indigenous people goes back 30,000 to 45,000 years ago, depending on the area of the Arctic. The population of the northernmost areas grew much faster in the 19-20th centuries due to commercial interests over the Arctic natural and biological resources.

Currently, most territories in the Russian Arctic experience a natural decrease (30% population lost from 1989 to 2019) due to severe out-migration and prevailing count of deaths over births, while a population growth of 16% was found in many other non-Russian Arctic territories during the same period. Special policies and governmental strategies are nowadays in place to stimulate population growth in the Arctic. The ethnic composition greatly affects processes in health and population development. The Indigenous population often has a much younger age structure, higher fertility and mortality, faster growth, and is more likely to be located in predominantly rural regions. They are facing a lower quality of life, lower quality of social and health services as well as poorer housing and educational and communication opportunities, which requires continuous effort from all decision makers to improve the situation.

Climate change and environmental changes also affect community well-being to various degrees across the Arctic and between and within communities. In addition, as documented above in this chapter, there is a clear trend toward the emergence of new human infectious diseases in the Arctic, and a strong impact on contaminant levels. There is a consequential need for adaptive responses. One Health is one of the prominent approaches to consider the connections between the environment, plant, animal, and human health in a rapidly changing Arctic.

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Figure legends

Figure 1. Arctic administrative areas are denoted by a purple line, compiled by Winfried K. Dallmann, Norwegian Polar Institute

Figure 2. Population changes (number of people) in the Arctic from 1990 (first bar of a region) to 2018 (second bar of a region), based on data from the national statistical database. (For Nunavut, the population change is from 2000 to 2017, for Russian Arctic regions from 1990 to 2017, and for the Taymyr, Evenki, and Koryak okrugs, from 1990 to 2011)

Figure 3. Settlements by population size in the Arctic by Nordregio (Wang 2019)

Figure 4. Total fertility rate in the Arctic region in 2000 and 2016

Table legends

Table 1. The indicators related to the demographic and health profile in the Russian Arctic (RA) regions. Source: Scherbov et al. 2019