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## Towards estimating the indigenous population in circumpolar regions

T. Kue Young<sup>a</sup> and Peter Bjerregaard<sup>b</sup>

<sup>a</sup>School of Public Health, University of Alberta, Edmonton, Alberta, Canada; <sup>b</sup>Department of Health, Centre for Public Health Research in Greenland, Greenland Government and University of Greenland, Copenhagen, Denmark, Nuuk, Greenland

### ABSTRACT

Despite the importance of indigenous people in the Arctic, there is no accurate estimate of their size and distribution. We defined indigenous people as those groups represented by the “permanent participants” of the Arctic Council. The census in Canada, Russia and the United States records status as an indigenous person. In Greenland, a proxy measure is place of birth supplemented by other information. For the Nordic countries we utilized a variety of sources including registered voters’ lists of the various Sami parliaments and research studies that established Sami cohorts. Overall, we estimated that there were about 1.13 million indigenous people in the northern regions of the 8 Member States of the Arctic Council. There were 8,100 Aleuts in Alaska and the Russian North; 32,400 Athabaskans in Alaska and northern Canada; 145,900 Inuit in Alaska, northern Canada and Greenland; 76,300 Sami in northern Norway, Sweden, Finland and Russia; and 866,400 people in northern Russia belonging to other indigenous groups. Different degrees and types of methodological problems are associated with estimates from different regions. Our study highlights the complexity and difficulty of the task and the considerable gaps in knowledge. We hope to spur discussion of this important issue which could ultimately affect strategies to improve the health of circumpolar peoples.

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### Introduction

An important demographic characteristic of the Arctic is the presence of indigenous peoples, who constitute the majority of the population in some regions. The importance of indigenous people in circumpolar issues is recognised by the fact that the Arctic Council, the intergovernmental forum of the 8 Arctic States – Canada, Kingdom of Denmark, Finland, Iceland, Norway, Russian Federation, Sweden, and USA – includes also “permanent participants”. Permanent participants are international organisations of indigenous peoples whose homelands cross national borders as well as the national organisation in Russia. These are the Aleut International Association [AIA], Arctic Athabaskan Council [AAC], Gwich’in International Council [GIC], Inuit Circumpolar Council [ICC], Russian Association of Indigenous People of the North [RAIPON], and Saami Council[1].

Despite the importance of the indigenous population in the Arctic, an accurate estimate of its size and distribution remains elusive. In some countries, ethnic identity is not recorded by national statistical systems,

while in others it is recorded but with varying degree of completeness and accuracy.

This paper attempts to assemble available statistics from diverse sources to estimate the size of the indigenous population in the 8 Arctic States and their northern regions. We present regional estimates of the total indigenous population as well as the population of specific indigenous groups across the Arctic. We do not present data on the health status of Arctic indigenous peoples, as these are extensively documented elsewhere [2,3].

We do not attempt to define “indigenous people” in this paper. While various definitions exist, including some from international organisations, there are vastly different national contexts, legislations and practices that defy a comprehensive, universal definition. The diverse perspectives and many challenges in identifying indigenous peoples globally were reviewed by Bartlett et al.[4]. As an operational definition, we include in this paper only those groups that are represented by one of the permanent participants of the Arctic Council. AIA is an organisation of Aleuts in the USA and Russia. AAC and GIC represent Athabaskan and Gwich’in communities in Alaska and northern Canada. While the Gwich’in language is a member of the Athabaskan (also spelt Athabaskan, Athapaskan)

**CONTACT** T. Kue Young  [kue.young@ualberta.ca](mailto:kue.young@ualberta.ca); [pb@niph.dk](mailto:pb@niph.dk)  School of Public Health, University of Alberta, Edmonton, Alberta, Canada

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language family, Gwich'in communities formed a separate political organisation. ICC has member organisations in Alaska, Canada, Greenland and Russia. We follow the ICC usage of "Inuit" to refer to Inuit collectively across all four countries, recognising that there are different regional terms for self-designation. The Saami Council represents the Sami in Norway, Sweden, Finland and Russia.

Table 1 cross-tabulates the various indigenous groups and circumpolar regions covered in this paper.

We use "ethnicity" to refer to different cultural groups of people, as the term is used in Canada and the Nordic countries. In the USA, the term "race" is used, while the term "ethnicity" is used by the Census Bureau to refer to Hispanic or Latino identity only. In Russia, the equivalent would be "nationality" [*natsionalnost*]. We also use the term "indigenous" across all the circumpolar regions, recognising that there are other terms such as "Aboriginal", "Native", etc., that are also in use in some regions.

In presenting our data, we proceed eastward from the International Date Line, starting in Alaska, followed by northern Canada, the North Atlantic, Fennoscandia, and across Russia to Chukotka, its easternmost region directly across from Alaska.

## Methods, definitions and data sources

Where available, data on indigenous populations were obtained from various national statistical agencies. Additional sources included the published literature and relevant websites of indigenous peoples' organisations. For each of the Arctic States, we identified various administrative regions as constituting their "North", with the exception of Iceland, which was treated as both a sovereign nation-state and a northern region. Greenland and Faroe Islands, self-governing territories of the Kingdom of Denmark, were regarded as its northern regions. As indicated in Table 1, indigenous people as defined in this paper were not present in either Iceland or the Faroe Islands.

### USA and Alaska

The State of Alaska is the only Arctic region of the USA. The US Census Bureau publishes data on "American Indians and Alaska Natives" [AIAN] collectively, derived from the decennial census[5] and annual population estimates[6]. Data from the 2000 and 2010 Census were presented in this paper. The census also provided a more detailed breakdown of AIAN into Athabascan, Aleut, Eskimo [Iñupiat, Yupik], Tlingit-Haida and Tsimshian. Census respondents could report one ethnicity alone or in combination with another ethnic group.

Table 1. Distribution of indigenous groups in the Arctic States and their northern regions.

Indigenous Group	USA		Canada			Kingdom of Denmark		Iceland		Norway		Sweden		Finland		Russian Federation		
	Alaska	Other	Yukon	NWT	Nunavut	Other	Greenland	Faroes	Denmark	North	Other	North	Other	North	Other	North	Other	Other
Inuit	x	x					x									x		x
Athabascan	x	x	x	x	x	x												x
Aleut	x																	x
Sami										x	x							x
Other Russian indigenous*																		x
Total	x	x	x	x	x	x	x		x							x		x

\* Other than Inuit, Aleut and Sami who are also present in other countries.

### Canada and its northern territories

The three northern territories of Yukon, Northwest Territories [NWT] and Nunavut constituted the Canadian North in this paper. For data on Inuit, we also included the predominantly Inuit regions of Nunavik in northern Québec and Nunatsiavut in Labrador. The census held once every 5 years by Statistics Canada provided data on indigenous [Aboriginal] people, constitutionally defined as comprising First Nations [North American Indians], Métis, and Inuit. Data from the 2001, 2006 and 2011 censuses are presented[7]. Note that in 2011, questions on ethnicity were included in the National Household Survey, which replaced the long-form questionnaire containing detailed sociodemographic variables used in previous censuses.

The census included questions on Aboriginal “identity” as well as “ancestry” or “origins”. For Aboriginal people, the concordance of responses to these two questions was not high: one study showed that among those who identified themselves as Aboriginal, only 63% reported having an Aboriginal ancestor, while among those who claimed Aboriginal ancestry, only 57% identified themselves as Aboriginal[8].

### Denmark and Greenland

The indigenous population in Greenland call themselves *Kalaallit* [singular *Kalaaleq*] in Greenlandic and *Grønlandere* in Danish. Neither Statistics Greenland nor Statistics Denmark records ethnicity. The size of the indigenous population can only be estimated indirectly, by place of birth [in Greenland or outside Greenland] and information about self-perceived ethnicity from population surveys.

The population statistics of Statistics Greenland and Statistics Denmark is based on *Det Centrale Personregister* [Central Population Register] which covers the population of Denmark and Greenland. This register was created in 1968 for Denmark, with Greenland joining it in 1972. Each citizen has a unique ID number that follows a person from cradle to grave and it is linked to parents, children and spouses in addition to a vast amount of information about social, economic and health issues. The last census in Greenland was held in 1976.

Defining indigenous ethnicity based on place of birth is often misleading. Including information about the place of birth of parents improves the accuracy. However, the number of indigenous persons would vary depending on whether only persons with both parents or only one parent born in Greenland are included. Genetic studies of participants of health

surveys in Greenland have found that on average 25% of the Kalaallit genome was of European origin[9]. Among participants who regarded themselves and who were also regarded by others as Kalaallit, 12% had 50% or more European ancestry [P. Bjerregaard, unpublished data]. Annual counts of the population of Greenland by place of birth are available from Statistics Greenland[10]. Data on the parentage of people born in Greenland living in Denmark are available from Statistics Denmark[11].

### Nordic countries and their northern regions

The northernmost counties in Norway [Nordland, Troms, and Finnmark], Sweden [Västerbotten and Norrbotten], and Finland [Lappi and Oulu] constitute the northern regions of those countries. “County” here refers to *fylke* in Norway, *län* in Sweden, and *lääni* in Finland. In Finland, the *lääni* was abolished in 2010 and replaced by the *aluehallintovirasto* [AVI, or regional state administrative agency]. The former Oulu *lääni* is now the Pohjois-Suomi AVI with no change in boundaries.

The Sami [also spelt Saami, Sámi, Same] are the only indigenous people in the Nordic countries. Their homeland – Sápmi – extends into the Kola peninsula in the Murmansk Oblast of Russia. While the precise number of Sami in Russia is known, based on the census, there is only very limited information on the Sami population in the Nordic countries, due to the non-use of ethnicity labels in government statistics.

While Statistics Norway’s Statbank has a section on “Sami Statistics”[12], the data refer to the total population, Sami and non-Sami, living in “Sami settlement areas”. These areas refer to certain northern municipalities identified by the Sami parliament under its business development fund [*Sametingets tilskuddsordninger til næringsutvikling* or STN]. The proportion of Sami within the STN population is not known.

Norway, Sweden and Finland each has a Sami parliament, which maintains voters’ lists. While these can serve as sources of information, it is unclear how much they underestimate the Sami population. Furthermore, the total all-age population must be extrapolated from voters over 18 years of age.

Research studies on the health of Sami use different criteria to identify Sami for inclusion. However, they do not provide a regional or national estimate of the Sami population.

In Norway, the SAMINOR survey of health and living conditions, conducted in 2003–2004, sampled adults aged 30–79 living in selected municipalities where more than 5% of the population was identified as Sami [with at least one Sami grandparent] in the 1970

census[13]. The cohort was re-surveyed in 2012–14 as the SAMINOR 2 study[14].

In Sweden, a Swedish Sami cohort covering the period 1960–2000 was created from a variety of sources: those who were registered to breed reindeers from Statistics Sweden’s occupational register and the national register of reindeer enterprises, and those eligible to vote in the Swedish Sami parliament. From these “index-Sami” their ancestors, siblings and descendants were identified from the national kinship register. The 41,000+ cohort comprised up to 5 generations of Sami who were alive in 1941 or later[15].

In Finland, a Sami cohort covering the period 1979–1998 included Sami in two northern municipalities [Utsjoki and Inari]. All residents were identified from the national population register and their Sami status was ascertained by cross-referencing an earlier genealogical study and also personal knowledge of the study’s lead author familiar with the communities through years of medical practice[16]. This cohort was extended to 2005 and again to 2010 in subsequent years[17].

### **Russia and its northern regions**

The Russian Federation is composed of different types of administrative divisions called federal “subjects” (*subyekty*), including republic, *kray*, *oblast*, autonomous *okrug*, and federal city, with varying degrees of autonomy. Autonomous okrugs [hereafter AO], with the exception of Chukotka, are generally part of some higher-level units such as oblasts or krays, and usually represent the traditional territories of some indigenous ethnic groups. Demographic data are usually available for these AOs separately.

The various definitions of the Russian North have been discussed in detail by Kozlov et al. [18,19]. Since 2007, the Taymyr, Evenk and Koryak AO ceased to exist as distinct federal subjects. Their population was published by the 2002 census but not by the 2010 census. For the purpose of this paper, we identified 11 regions as constituting the Russian North.

Information on ethnicity is available from the census, which was conducted in 2002[20] and 2010[21], available from the Federal State Statistics Service [*Federal’naia sluzba gosydarstvennoi statistiki*] or Rosstat. In the 2010 census, about 4% of respondents did not indicate their ethnicity, compared to 1% in the 2002 census.

A 1996 federal law defined “indigenous, numerically small people of the North, Siberia and Far East” [*korennyye malochislennyye narody Severa, Sibiri i Dal’nego Vostoka*, hereafter to be referred as KMNS] as people who live on their traditional ancestral territories, adhere

to their original way of life, and believe themselves to be independent ethnic entities, with a population under 50,000 people[18]. Between 1926 and 1993 26 groups were officially recognised. The number of such groups rapidly increased after 1993. The 2010 census recognised 47 groups. Forty groups are listed on the RAIPON website[22]. Bogoyavlensky discussed the methodological problems of the census as they related to indigenous people[23].

The 50,000 upper limit of population size excludes some groups that would otherwise qualify as indigenous, such as the Yakuts, Komi and Komi-Permyak. Over time, some indigenous groups were consolidated with others by the census, while new groups were also separated from other larger groups.

## **Results**

We presented our results both by regions and by ethnic groups. Where possible, we presented population estimates from 2 time points or periods within the first 2 decades of the 21<sup>st</sup> century. In most jurisdictions, the number quoted referred to people who self-identified with an indigenous group; in regions where information on both indigenous identity and ancestry was available, we chose identity. For the USA and Canada, we focused our discussion on single indigenous identity rather than multiple identities involving an indigenous and other ethnic groups. For the other regions, single and multiple identities cannot be distinguished.

### **USA and Alaska**

Table 2 presents the AIAN population in the USA nationally and in Alaska from the 2000 and 2010 censuses. Individuals with AIAN-only identity accounted for only a small proportion of the total all-race population in the USA [about 1%], whereas in Alaska it was about 15%. In Alaska, people who identified themselves as AIAN increased by 7% during the decade between the two censuses.

In 2010, among individuals who declared only one ethnicity, AIAN in Alaska numbered 104,871. With 48,270 people, the Inuit were the largest indigenous group in the state, followed by Athabaskans [12,318] and Aleuts [7,696]. There were also other indigenous groups including the Tlingit-Haida and Tsimshian, accounting for 9,996 people. About 90% of Inuit, 80% of Athabaskans and 65% of Aleut in the USA resided in Alaska, their homeland.

In Alaska, the Inuit comprised two major linguistic and cultural subgroups, with 20,941 Iñupiat and 27,329 Yupik in 2010.

**Table 2.** Indigenous people in the USA and Alaska, 2000 and 2010.

Population group	2000		2010	
	USA	Alaska	USA	Alaska
Total population, all races	281,421,906	626,932	308,745,538	710,231
American Indian and Alaska Native alone % of total population	2,475,956 0.9	98,043 15.6	2,932,248 0.9	104,871 14.8
AIAN alone or in combination % of total population	4,119,301 1.5	119,241 19.0	5,220,579 1.7	138,312 19.5
Athabaskan alone	14,520	11,910	15,623	12,318
Athabaskan alone or in combination	18,838	14,546	22,484	16,665
Aleut alone	11,941	8282	11,920	7696
Aleut alone or in combination	16,978	10,695	19,282	11,216
Eskimo alone	45,919	41,481	53,786	48,270
Eskimo alone or in combination	54,761	46,733	-	-
Inupiat alone	-	-	24,859	20,941
Inupiat alone or in combination	-	-	33,360	25,687
Yupik alone	-	-	28,927	27,329
Yupik alone or in combination	-	-	33,889	30,868
Tlingit-Haida alone	14,825	9153	15,256	8547
Tlingit-Haida alone or in combination	22,365	12,523	26,080	13,186
Tsimshian alone	-	-	2307	1449
Tsimshian alone or in combination	-	-	3755	1939

AIAN – American Indian and Alaska Native

### Canada and its northern territories

Table 3 presents the indigenous [Aboriginal] population in Canada nationally and in each of the three northern territories separately and combined, from the 2001, 2006 and 2011 censuses.

In 2011, over 56,230 indigenous people resided in the northern territories, accounting for 53% of the population, compared to 4% of Canada's population who identified themselves as indigenous. Between 2001 and 2011 the indigenous population in Canada's North increased by 17%. The proportion of indigenous people in Nunavut, NWT and Yukon was about 86%, 52% and 23%, respectively. The indigenous people in Nunavut were almost all Inuit, whereas 20% of the indigenous people in the NWT were Inuit. The number of Inuit in northern Québec [Nunavik] and Labrador [Nunatsiavut], part of *Inuit Nunangat* [the Inuit homeland], were 13,100. They were added to the total population of Canadian Inuit and also the circumpolar Inuit.

The languages spoken in First Nation communities in Yukon and NWT are members of the Athabaskan language family. In this paper, we counted all First Nation people in these two regions as Athabaskans, even though there were First Nation people originally from other parts of Canada living in Yukon and NWT. Thus, we were able to estimate the number of Athabaskans in the Canadian North but not in Canada nationally. There were few, if any, Athabaskans living in Nunavut, Nunavik and Nunatsiavut.

### Denmark and Greenland

Table 4 presents the number of people in three main categories – those born in Greenland and

living in Greenland; those not born in Greenland and living in Greenland; and those born in Greenland and living in Denmark. We averaged the annual population into two 5- year periods [2010–14 and 2015–19]. The number of Kalaallit who was born in Denmark and living in Denmark is not known. They are likely Kalaallit who have lived in Denmark for more than a generation, with parents who themselves were not born in Greenland.

We adjusted the official population data on the three categories of people based on new analyses of two surveys that investigated the issue of self-identity among participants – a survey in 1997–98 among Greenlanders in Denmark[24], and a survey in 2018 among residents in Greenland [Bjerregaard: unpublished data]. We counted as Kalaallit those individuals who regarded themselves and were also regarded by others as Kalaallit; we also included those individuals who regarded themselves as both Kalaallit and Danes.

Among participants in the 2018 survey who were born in Greenland and living in Greenland, we estimated that 98% were Kalaallit. We applied this proportion to the population of all residents. As shown in Table 4, the number of Kalaallit born and living in Greenland was estimated to be 49,357 in 2010–14 and 49,154 in 2015–19.

Among survey participants who were born outside Greenland and living in Greenland, 38% were Kalaallit. When applied to the population of all residents, the number of Kalaallit was estimated to be 2,329 in 2010–14 and 2,187 in 2015–2019 [Table 4].

Table 3. Indigenous people in Canada and its northern territories, 2001, 2006 and 2011.

	2001					2006					2011				
	Canada	Yukon	NWT	Nunavut	North	Canada	Yukon	NWT	Nunavut	North	Canada	Yukon	NWT	Nunavut	North
Total population	29,639,030	28,520	37,105	26,670	92,295	31,241,030	30,190	41,060	29,325	100,575	32,852,320	33,320	40,795	31,700	105,815
Total with Aboriginal identity	976,305	6540	18,730	22,720	47,990	1,172,790	7580	20,635	24,915	53,130	1,400,685	7710	21,160	27,360	56,230
% of total population	3.3	22.9	50.5	85.2	52.0	3.8	25.1	50.3	85.0	52.8	4.3	23.1	51.9	86.3	53.1
First Nation single identity	608,850	5600	10,615	95	16,310	698,025	6275	12,640	100	19,015	851,560	6585	13,345	130	20,060
Métis single identity	292,305	535	3580	55	4170	389,785	800	3580	125	4505	451,795	845	3245	135	4225
Inuit single identity	45,070	145	3910	22,560	26,615	50,480	255	4160	24,640	29,055	59,440	175	4335	27,070	31,580
Multiple Aboriginal identities	6665	100	180	0	280	7740	50	105	30	185	11,415	30	45	15	90
Other Aboriginal identities	23,415	165	445	10	620	26,760	190	145	20	355	26,470	70	185	15	270
Total with Aboriginal ancestry	1,319,890	6990	18,955	22,860	48,805	1,678,235	7810	20,905	25,165	53,880	1,836,035	8050	21,030	27,430	56,510
% of total population	4.5	24.5	51.1	85.7	52.9	5.4	25.9	50.9	85.8	53.6	5.6	24.2	51.6	86.5	53.4
First Nation single origin	455,805	3895	9855	85	13,835	512,150	3560	10,740	65	14,365	1,318,375	7280	13,665	255	21,200
FN/non-Aboriginal origins	501,840	2320	2095	110	4525	693,360	3235	2830	150	6215	-	-	-	-	-
Métis single origin	72,210	115	1265	20	1400	77,295	135	1105	25	1265	399,110	840	1845	95	2780
Métis/non-Aboriginal origins	193,810	325	765	20	1110	285,750	360	925	45	1330	-	-	-	-	-
Inuit single origin	37,030	75	2945	20,185	23,205	40,975	135	3175	22,095	25,405	65,620	275	3985	26,805	31,065
Inuit/non-Aboriginal origins	14,365	100	555	2260	2915	18,610	100	690	2600	3390	-	-	-	-	-
Other Aboriginal multiple origins	44,835	165	1480	180	1825	50,090	275	1440	185	1900	52,935	335	1535	0	1870

**Table 4.** The population of Kalaallit in Greenland and Denmark by place of birth and place of residence, 2010–14 and 2015–19.

	2010–14				2015–19			
	All residents		Kalaallit		All residents		Kalaallit	
Number of people living in Greenland		56,494				55,912		
Number of people born in Greenland, living in Greenland	[a]	50,364	[b]	49,357	[A]	50,157	[B]	49,154
Number people not born in Greenland, living in Greenland	[c]	6130	[d]	2329	[C]	5755	[D]	2187
Number of people born in Greenland, living in Denmark		14,991				16,291		
Number with one or both parents' birthplace known	[e]	9735			[E]	10,866		
Number with both parents born in Greenland	[f]	983	[g]	934	[F]	1408	[G]	1338
% among those with one or both parents' birthplace known	[h]	0.10			[H]	0.13		
Number with one parent born in Greenland	[i]	4068	[j]	2969	[I]	4600	[J]	3358
% among those with one or both parents' birthplace known	[k]	0.42			[K]	0.42		
Number with both parents birthplace unknown	[l]	5255			[L]	5425		
Number likely to have both parents born in Greenland	[m]	531	[n]	504	[M]	703	[N]	668
Number likely to have one parent born in Greenland	[o]	2196	[p]	1603	[O]	2297	[P]	1676
Estimated number of Kalaallit in Greenland				51,686				51,341
Estimated number of Kalaallit in Denmark				6011				7040
Estimated number of Kalaallit in Greenland and Denmark				57,697				58,381

Original data from Statistics Greenland and Statistics Denmark are shaded; all other numbers are derived;

98% = those born-in-GL-living-in-GL who identified as Kalaallit, from 2018 survey

38% = those not-born-in-GL-living-in-GL who identified as Kalaallit, from 2018 survey

95% = those born-in-GL-living in DK with both parents born in GL who identified as Kalaallit, from 1997–98 survey

73% = those born-in-GL-living-in DK with one parent born in GL who identified as Kalaallit, from 1997–98 survey

[b] = [a] x 0.98; [B] = [A] x 0.98

[d] = [c] x 0.38; [D] = [C] x 0.38

[g] = [f] x 0.95; [G] = [F] x 0.95

[h] = [f]/[e]; [H] = [F]/[E]

[j] = [i] x 0.73; [J] = [I] x 0.73

[k] = [i]/[e]; [K] = [I]/[E]

[m] = [l] x [h]; [n] = [m] x 0.95; [M] = [L] x [h]; [N] = [M] x 0.95

[o] = [l] x [k]; [p] = [o] x 0.73; [O] = [L] x [K]; [P] = [O] x 0.73

For those who were born in Greenland but living in Denmark, the adjustment was more complicated. Statistics Denmark reports the number of residents in Denmark who were born in Greenland and also the birthplace of their parents, whether in Greenland, Denmark, abroad or unknown. The place of birth of both parents were unknown in about one-third of the people. These parents with unknown birthplace likely died before the introduction of the Central Population Register, among whom would likely be a substantial number of Kalaallit.

For those with unknown birthplace of the parents, we assumed that the proportions of persons with both or one parent born in Greenland were similar to the proportions for those whose parents' birthplace was known. Furthermore, re-analysis of an earlier survey[24] involving Greenlanders living in Denmark showed that 95% of those with both parents born in Greenland identified themselves as Kalaallit, while 73% of those with one only one parent born in Greenland identified themselves as Kalaallit. We applied these proportions to estimate the number of Kalaallit in Denmark.

The footnotes for Table 4 show the derivation formulae used in estimating the number of Kalaallit living in Greenland and in Denmark. Our estimates for those

living in Denmark are comparable to those obtained by Togeby in 2000[25].

As shown in Table 4 the number of Kalaallit in 2010–14 was estimated to be 57,697, with about 51,686 living in Greenland. In 2015–19 there were 58,381 Kalaallit, of whom 51,341 were living in Greenland.

### Nordic countries and their northern regions

In the Nordic countries, Sami organisations provide some estimates but without firm evidence. For example, the Sweden-based *Samiskt informationscentrum* suggested that there are about 40,000 to 50,000 Sami in Norway; 20,000 to 35,000 in Sweden; and 5,000 to 6,500 in Finland[26].

One source of information is the number of registered voters of the various Sami parliaments [*Sámediggi* in Northern Sami, *Sametinget* in Norwegian and Swedish, and *Saamelaiskäräjät* in Finnish].

According to Statistics Norway, the number of eligible voters for the Norwegian *Sámediggi* increased from 12,538 in 2005 to 16,958 in 2017. The election is held once every 4 years. In the 2005 election, the number for the three northern counties of Nordland, Troms and Finnmark combined was of 83% of the national total. This proportion declined in subsequent elections to 76% in 2017[27].



In Sweden, there were 7,180 registered voters on the voting list in 2005, which increased to 8,766 in the 2017 election. In the 2017 election, there were 4,012 [46%] voters in Norrbotten and 1,962 voters in Västerbotten[28].

Finland's *Sámediggi* reported that the number of registered voters [aged 18+] increased from 5,155 in 2003 to 5,878 in 2015 in Finland, including those living abroad. It also registered the number under 18 and not yet eligible to vote. The total population for all ages increased from 7,956 in 2003 to 10,463 in 2015. Of these, 3,669 [about 46% of the national total] lived in the Sami homeland in 2003, defined as the municipalities of Inari, Utsjoki, Enontekiö, and Sodankyla, all within Lapland. This number declined to 3,499 [about 33% of the national total] in 2015[29].

The Norwegian and Swedish *Sámediggi* figures refer to adults aged 18+. If we assume that Sami have the same age structure as non-Sami, with about 80% of the population over the age of 18, then the number of Sami of all ages would be about 21,000 in Norway and 11,000 in Sweden in 2017. This is only about half of the low end of the estimates of Sami cited by the *Samiskt information-sentrum*. Clearly, voters lists do not provide an accurate estimate of the Sami population in these two countries.

In Norway, SAMINOR researchers in 2003–04 established a list of 28,000 Sami, aged 30–79 living in the three northern counties as well as several municipalities further south, to be invited to participate in the survey [13]. Assuming the Sami have the same age structure as other Norwegians in the North, the age group 30–79 represented about 60% of the total population. The total number of Sami of all ages living in the SAMINOR study area would be about 47,000.

For Sweden, we can use the Sami cohort established by Hassler and colleagues[15]. In a publication in 2008, they generated from the cohort a national estimate of 36,000 Sami alive at that time, 18,000 of whom lived in Norrbotten and 6,000 in Västerbotten, a total of 24,000 in the Swedish North[30].

### **Russia and its northern regions**

Table 5 shows the population of the 47 officially designated KMNS groups residing in the Russian Federation and its northern regions. Some groups have very small populations, while there were 6 groups with more than 10,000 people each. The 40 groups recognised by RAIPON are listed individually in Table 5. Note that the primary residence of some groups are in Siberia and the Far East and not in the North.

Table 6 presents the regional distribution of the 15 largest groups living in the North. KMNS accounted for a substantial proportion of the AOs, as high as 40% in Koryak AO.

Only about 7% of the Russian population of all ethnicities resided in the North. KMNS people collectively were a very small minority within the Russian Federation [0.2%]; even in the North, they accounted for only about 2% of the total population. Almost 60% of the KMNS people, however, resided in the North.

If we include the Komi, Komi-Permyak and Yakut, three numerically large [i.e. >50,000] indigenous groups, the share of indigenous people in the Russian Federation increased slightly to 0.8% nationally and 9% in the North.

### **Circumpolar Inuit**

The number of Inuit in the USA was about 46,000 in 2000 and 54,000 in 2010. About 90% of them lived in Alaska – 41,500 in 2000 and 48,300 in 2010 [Table 2].

The number of Canadians who identified themselves as Inuit increased from about 45,100 in 2001 to 59,400 in 2011. Within the three northern territories, the number increased from 26,600 in 2001 to 31,600 in 2011 [Table 3]. In the 2011 National Household Survey, there were also 2,325 self-identified Inuit in Nunatsiavut and 10,755 in Nunavik. These numbers were added to the Inuit population of the three northern territories to yield a total of 44,700 for the Canadian North in Table 7.

We estimated that the number of Kalaallit/Inuit living in Greenland to be about 51,700 [2010–14] and 51,300 [2015–19]. The proportion of Kalaallit living in Denmark increased by 17% between the two periods [Table 4].

There were fewer than 1,800 Inuit in Russia, about 1,600 in the North, with the majority [about 1,530] living in the Chukotka AO [Tables 5 and 6].

### **Circumpolar Aleuts**

In the USA nationally, Aleuts numbered about 11,900 in 2000, but did not change much in 2010. About 65% of all Aleuts in the USA [7,700] lived in Alaska in 2010 [Table 2].

There were 540 Aleuts in the entire Russian Federation in 2002, of whom 455 resided in the North. This number declined to 482 nationally in 2010, of whom 410 resided in the North [Tables 4 and 5]. Almost all Aleuts in northern Russia lived within the Kamchatka Kray.

Adding the number of Alaskan Aleuts with the number of Aleuts in the Russian North produced a combined circumpolar population of approximately 8,740 in 2000/02 and 8,100 in 2010 [Table 7].

### **Circumpolar Athabaskans**

There were 12,300 Athabaskans in Alaska in 2010 [Table 2]. Across the border, they were joined by 20,100 [in 2011] members of Canadian First Nations,

**Table 5.** Indigenous people in Russia and its North, 2002 and 2010.

	2002			2010		
	Russian Federation	North	% living in North	Russian Federation	North	% living in North
Total population who reported ethnicity	145,166,700	10,414,524	7.2	137,227,107	9,487,379	6.9
Total 47 KMNS groups	306,517	170,248	55.5	316,011	181,406	57.4
% of population	0.2	1.6		0.2	1.9	
Total 40 KMNS groups	252,222	169,337	67.1	257,895	180,379	69.9
% of population	0.2	1.6		0.2	1.9	
Nenets	41,302	40,170	97.3	44,640	43,570	97.6
Khanty	28,678	26,046	90.8	30,943	28,655	92.6
Evenks	35,527	23,076	65.0	37,843	25,520	67.4
Evens	19,071	17,408	91.3	22,383	21,005	93.8
Chukchi	15,767	14,990	95.1	15,908	15,244	95.8
Mansi	11,432	10,115	88.5	12,269	11,171	91.1
Dolgans	7261	7087	97.6	7885	7726	98.0
Koryaks	8743	8308	95.0	7953	7657	96.3
Veps	8240	5088	61.7	5936	3568	60.1
Itelmens	3180	2965	93.2	3193	3025	94.7
Selkups	4249	2244	52.8	3649	2304	63.1
Kamchadals	2293	2206	96.2	1927	1843	95.6
Sami	1991	1793	90.1	1771	1616	91.2
Eskimos	1750	1592	91.0	1738	1598	91.9
Yukagirs	1509	1369	90.7	1603	1559	97.3
Kets	1494	1247	83.5	1219	986	80.9
Chuvans	1087	1006	92.5	1002	968	96.6
Nganasans	834	814	97.6	862	807	93.6
Aleuts	540	455	84.3	482	410	85.1
Shors	13,975	404	2.9	12,888	317	2.5
Enets	237	217	91.6	227	223	98.2
Nanais	12,160	174	1.4	12,003	147	1.2
Chulyms	656	160	24.4	355	145	40.8
Orochi	686	134	19.5	596	85	14.3
Nivkhs	5162	37	0.7	4652	55	1.2
Kumandins	3114	62	2.0	2892	50	1.7
Ulchi	2913	43	1.5	2765	43	1.6
Tofalars	837	19	2.3	762	32	4.2
Teleuts	2650	26	1.0	2643	21	0.8
Udege	1657	30	1.8	1496	13	0.9
Negidals	567	10	1.8	513	4	0.8
Soyots	2769	7	0.3	3608	4	0.1
Uilta [Oroks]	346	2	0.6	295	3	1.0
Taz	276	5	1.8	274	3	1.1
Kereks	8	5	62.5	4	1	25.0
Telengits	2399	3	0.1	3712	1	0.0
Alyutors	0	0	0.0	0	0	0.0
Chelkans	855	1	0.1	1181	0	0.0
Tubalars	1565	18	1.2	1965	0	0.0
Tuvinian-Todzhins	4442	1	0.0	1858	0	0.0
3 indigenous, numerically large groups	862,493	714,218	82.8	800,776	688,767	86.0
% of population	0.6	6.9		0.6	7.3	
Komi	293,406	274,451	93.5	228,235	216,512	94.9
Komi-Permyak	125,235	5354	4.3	94,456	3574	3.8
Yakut	443,852	434,413	97.9	478,085	468,681	98.0
Total "indigenous"	1,169,010	884,466	75.7	1,116,787	870,173	77.9
% of population	0.8	8.6		0.8	9.3	

KMNS – indigenous, numerically small people of the North, Siberia and the Far East.

assumed to be predominantly Athabaskans living in Yukon and NWT [Table 3]. The combined Athabaskan population in Alaska, Yukon and NWT in 2011 was about 32,400 [Table 7].

About 80% of Athabaskans in the USA live in Alaska. A national estimate of Athabaskans in Canada is not available. They are widely spread across the Canadian subarctic in 2 territories and 4 provinces.

### Circumpolar Sami

With the exception of Russia, there is no firm estimate of the Sami population in the Arctic.

There were 1,991 Sami in Russia in 2002 and 1,771 in 2010. The corresponding number in the North was 1,793 and 1,616 [Table 5], showing a decline both nationally and regionally. Almost 90% of all Sami in Russia resided in the Murmansk Oblast.



**Table 6.** Regional distribution of selected indigenous groups in the Russian North [a] 2002 Census [b] 2010 census.

2002 Census	Murmansk Oblast	Kareliya Republic	Arkhangel'sk Oblast	Nenets AO	Komi Republic	Yamalo-Nenets AO	Khanty-Mansi AO	Krasnoyarsk Krai	Taymyr AO	Evenki AO	Sakha Republic	Magadan Oblast	Kamchatka Krai	Koryak AO	Chukotka AO	North
Total population	892,534	716,281	1,336,539	41,546	1,018,674	507,006	1,432,817	2,966,042	39,786	17,697	949,280	182,726	358,801	25,157	53,824	10,414,524
Total KMNS, Komi, Komi-Permyak, Yakut	4482	5299	14,401	12,299	258,568	43,855	34,789	19,204	9949	5091	465,688	5542	15,669	10,265	16,969	884,466
% total population	0.5	0.7	1.1	29.6	25.4	8.6	2.4	0.6	25.0	28.8	49.1	3.0	4.4	40.8	31.5	8.5
Total KMNS only	2151	4931	8466	7783	961	37,459	28,969	16,835	9881	4086	33,196	5001	15,405	10,240	16,874	170,248
% total population	0.2	0.7	0.6	18.7	0.1	7.4	2.0	0.6	24.8	23.1	3.5	2.7	4.3	40.7	31.4	1.6
Nenets	163	6	8326	7754	708	26,435	1290	3188	3054	12	27	5	3	1	19	40,170
Khanty	11	4	15	5	88	8760	17,128	19	8	1	8	2	7	1	4	26,046
Evenks	13	1	15	13	6	57	43	4632	305	3802	11,657	25	15	7	37	23,076
Evens	3	1	2	1	4	7	6	17	1	8	602	248	1487	1412	14,990	
Chukchi	4	3	8	1	10	3	1	8	1	6	6	1	1	1	10,115	
Mansi	6	1	2	1	11	172	9894	16	1	30	1272	1	1	1	7087	
Dolgans	2	1	3	1	2	4	1	5805	5517	10	10	888	7328	6710	55	8308
Koryaks	128	4870	31	37	1	1	2	10	2	7	4	643	2296	1181	15	2965
Veps	1	1	1	12	1	1797	22	412	9	1	1	314	1881	132	8	2206
Itelmens	1769	7	7	3	1	2	1	1	1	3	6	1	2	3	1534	1592
Selkups	1	1	1	5	1	1	1	5	1	1097	79	1	1	1	185	1369
Kamchadals	2177	282	5745	4510	256,464	6177	3081	353	10	10	71	22	69	1	10	274,451
Komi-Permyaks	133	72	178	3	1118	205	2704	648	13	4	131	50	103	7	12	5354
Yakuts (Sakha)	21	14	12	3	25	14	35	1368	45	991	432,290	469	92	17	73	434,413
2010 Census	Murmansk Oblast	Kareliya Republic	Arkhangel'sk Oblast	Nenets AO	Komi Republic	Yamalo-Nenets AO	Khanty-Mansi AO	Krasnoyarsk Krai	Taymyr AO	Evenki AO	Sakha Republic	Magadan Oblast	Kamchatka Krai	Koryak AO	Chukotka AO	North
Total population	721,925	617,668	1,201,944	40,299	854,303	505,387	1,430,105	2,727,566	934,664	934,664	506,817	152,066	293,995	47,756	9,487,379	
Total KMNS, Komi, Komi-Permyak, Yakut	3628	3725	12,742	11,145	203,651	47,038	36,766	18,588	506,817	506,817	5435	5435	14,768	17,015	870,173	
% total population	0.5	0.6	1.1	27.7	23.8	9.3	2.6	0.7	54.2	54.2	3.6	3.6	5.0	35.6	9.2	
Total KMNS only	1885	3478	8082	7519	629	41,758	32,232	16,653	40,208	40,208	4999	4999	14,540	16,942	181,406	
% total population	0.3	0.6	0.7	18.7	0.1	8.3	2.3	0.6	4.3	4.3	3.3	3.3	4.9	35.5	1.9	
Nenet	149	4	8020	7504	503	29,772	1438	3633	23	23	1	1	5	22	43,570	
Khanty	9	6	9	1	48	9489	19,068	14	5	5	1	1	6	1	28,655	
Evenk	5	2	14	13	6	42	33	4372	21,008	21,008	1	1	19	18	25,520	
Even	3	2	2	2	2	2	1	27	15,071	15,071	2635	285	1872	1392	21,005	
Chukchi	3	3	1	2	2	2	1	9	670	670	285	1	1496	12,772	15,244	
Mansi	3	1	1	8	1	166	10,977	6	5	5	1	1	2	1	11,171	
Dolgan	2	1	1	1	1	2	3	5810	1906	1906	11	900	6640	3	7726	
Koryak	2	1	1	1	1	1	7	26	11	11	69	6640	1	69	7657	

(Continued)

**Table 6. (Continued).**

2010 Census	Murmansk Oblast	Kareliya Republic	Arkhangelsk Oblast	Nenets AO	Komi Republic	Yamalo-Nenets AO	Khanty-Mansi AO	Krasnoyarsk Krai	Taymyr AO	Evenki AO	Sakha Republic	Magadan Oblast	Kamchatka Krai	Koryak AO	Chukotka AO	North
Vep	82	3423	18		23	3	8	7			4					3568
Itelmen							2	6			1	613	2394		9	3025
Selkup					6	1988	27	281			2					2304
Kamchadal								2			4	280	1551		6	1843
Sami	1599	8	3		1	1	2	2								1616
Eskimo	1							10			11	33	14		1529	1598
Yukagir					5	1	1				1281	71	1		198	1559
Komi	1649	182	4583	3623	202,348	5141	2364	159			32	14	33		7	216,512
Komi-Permyak	78	50	59		659	129	2134	308			85	15	53		4	3574
Yakuts (Sakha)	16	15	18	3	15	10	36	1468			466,492	407	142		62	468,681

Data for Arkhangelsk Oblast include also those for Nenets AO; data for Krasnoyarsk Krai also include those for Taymyr AO and Evenki AO.

We entered the estimate extrapolated from the SAMINOR study in [Table 7](#) as the number of Sami living in the Norwegian North [47,000]. For Swedish Sami, estimates from Hassler's research cohort were used [24,000]. Both the Swedish and Norwegian numbers date back to the early years of the 2000s. For Finnish Sami, data from the Sami parliament for 2015 were used [3,500].

### **Circumpolar indigenous peoples**

By our methods, we estimated a total of 1.13 million indigenous people in the northern regions of the Arctic States [[Table 7](#)].

### **Discussion**

As any population health researcher recognises, knowing the size, composition, and distribution of the population is central to any investigation into health issues affecting that population. The characteristics of the target population are essential pieces of information for policymakers, managers and practitioners who design, plan, implement and evaluate policies, programmes and services. Yet, such information is largely incomplete for the indigenous population in the Arctic, whose importance is acknowledged by the special status their organisations have as "permanent participants" in the Arctic Council. This knowledge gap is particularly glaring since there is widespread recognition of the health inequality that exists between indigenous and non-indigenous populations in many, though not all, circumpolar regions.

Our attempt at enumerating the size of the different indigenous groups in the Arctic clearly demonstrates the complexity and difficulty of the task. Even when ethnicity is captured by the census, there are issues that compromise the validity of the information. Questions on ethnic origin or identity may change over time, such that two censuses may not be completely comparable. Individuals may change how they report their ethnic identity over time, a phenomenon observed in the national censuses of Canada, Russia and USA, unrelated

to natural increase and migration. This is particularly the case with the surge in ethnic pride in some groups at various times. Although an individual's reporting of indigenous identity in the census does not confer eligibility for government benefits or enrol them as beneficiaries of land claims settlements, respondents could be motivated by the possibility that a larger population count may confer collective benefits for their ethnic group. While we commented on change over time, where there were at least 2 time points or periods, we refrained from assessing the significance of any change.

The increasing proportion of mixed heritage in the indigenous population supports our preference for identity over ancestry. However, even when identity is used, an individual may choose to report more than one identity, if such a response is allowed by the census. Our task was further complicated by the fact that multiple identities are not treated consistently across jurisdictions.

Even when the size of the population "denominator" is known, the next hurdle is to identify the ethnicity of the "numerator" [cases, patients, events, etc.]. Here the problem is aggravated by the fact that even in countries/regions where the census enquires about ethnic identity, as in Canada and Russia, their healthcare registries, databases, and surveillance systems do not generally record ethnic identity. Enterprising researchers are able to design studies with built-in inclusion criteria to identify indigenous people for both the numerator and denominator. However, the lack of ethnospecific surveillance systems is a major obstacle to monitoring the changing patterns of the health of indigenous people in the Arctic.

How each country records and reports the ethnic backgrounds of its population is a matter of national policy. The political dimensions of ethnicity and health are complex and highly contentious, a discussion of which is beyond the scope of this primarily methodological paper. On the one hand, there is the argument that "if you don't count, you don't know". However, there are indigenous organisations in some regions that are hesitant for indigenous people to be identified

**Table 7.** Indigenous population in the circumpolar regions.

	Alaska	N. Canada	Greenland	N. Norway	N. Sweden	N. Finland	Russia	Total Circumpolar Regions
Aleuts	7700						400	8100
Athabaskans	12,300	20,100						32,400
Inuit	48,300	44,700	51,300				1600	145,900
Sami				47,000	24,000	3500	1800	76,300
Other Russian indigenous*							866,400	866,400
<b>Total</b>	<b>68,300</b>	<b>64,800</b>	<b>51,300</b>	<b>47,000</b>	<b>24,000</b>	<b>3500</b>	<b>870,200</b>	<b>1,129,100</b>

Numbers rounded to nearest 100.

\* includes 47 KMNS groups, Yakuts, Komi, and Komi-Permyaks, excluding Aleuts, Inuit and Sami.

Data years: Alaska, 2010; N. Canada 2011; Greenland, mean of 2015–19; Norway, 2004; Sweden, early 2000s; Finland, 2015; Russia 2010

in statistics, over concern with stigmatisation by the high prevalence of poor health outcomes. Some countries are also reluctant to institute ethnic identification in the belief that all citizens are equal and entitled to the same services and benefits. It is the desire of the authors of this paper, both long-time circumpolar health researchers, to spur discussion on this important issue that could affect strategies to improve the health of circumpolar peoples.

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No potential conflict of interest was reported by the authors.

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