

## **Disparities in Arctic Health**

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[Dan Rutz] I'm Dan Rutz at the Centers for Disease Control and Prevention in Atlanta and with me via the phone is Dr. Alan Parkinson, Deputy Director of CDC's Arctic Investigations Program in Anchorage, Alaska. Dr. Parkinson is an expert in arctic health issues and also has had two articles in the January 2008 issue of *Emerging Infectious Diseases*, which was devoted to Arctic Health and the International Polar Year.

[Dan Rutz] Alan, so many people may not realize that everyday life in the Arctic is all that different from life elsewhere, beyond climate of course, but what is it that makes it unique and challenging from a health perspective?

[Alan Parkinson] We have about four million people which live in the Arctic and almost half of those actually live in northern regions of the Russian Federation. The populations of these regions are made up of varying proportions of European and indigenous ancestry. For example, every one knows that in the Arctic it's the homeland of the Eskimo; but the Eskimo comprise of various groups including the Inuit of Greenland, northern Canada and northern Alaska and we have the Yupik of western Alaska and the eastern coastal regions of the Russian Federation and we have the Aleut which live along the Aleutian Chain. And, in addition, we have in the north, in the interior and western coastal regions of northern Canada and Alaska, we have a number of North American Indian groups which include the Athabaskan, the Eyak, the Tlingit, Gwich'in, Metis, first nation's populations of Canada. In Alaska, though, the terminology we use for peoples of indigenous ancestry is Alaska Native.

In remote regions of North American Arctic and Greenland and the Russian Federation, many of these indigenous peoples live in very small, isolated communities. They're very dependant on subsistence hunting and fishing. They have very little economic infrastructure in their communities, and in these remote regions, public health and access to hospitals and clinics are often marginal; they're sometimes under-funded, of course under-staffed – they have high staff turnover - and in some cases, access to hospitals and clinics is actually non-existent. In addition, because of the remoteness of these regions, there's also a lack of physical infrastructure, like roads, which would link villages to hospitals. There's inadequate water and sewage disposal systems in many of these villages. It's really amazing today, in this day and age, that about one-third of Alaska Natives have no in-home water or sewage service and of course, this really impacts human health in these regions in a big way.

[Dan Rutz] Sounds like they deal with a fair amount of hardship. There must be some progress over time that we can cite?

[Alan Parkinson] Well, we've seen some improvements in the past decades. Since about 1950, life expectancy for Alaska Natives has actually increased by more than 20 years to about 69, and we've done a good job in decreasing the number of deaths due to infections. Infections caused about half of Alaska Native deaths in 1950, but by 1990 accounted for about only 1.2 percent of deaths. This is really largely due to better living conditions, safe water, childhood vaccination programs in particular, and access to health care, of course, has really made a big difference. But we still see the Alaska Natives facing greater health challenges.

[Dan Rutz] What are some examples of that?

[Alan Parkinson] Well, despite the improvements in health up here in Alaska, the Alaska Natives really face shorter life expectancy, higher infant mortality rates, and higher rates of injury and suicide. And, for Native infants, the rates of pneumonia, meningitis, and respiratory infections are also higher. We have cases of botulism that occur. This is generally caused by people eating improperly prepared - traditionally prepared - fermented subsistence foods, such as fish or seal meat or infections with a parasite called trichinosis where they get that from consuming uncooked bear or walrus meat. At the same time, many communities that for years have been isolated are now really just a plane ride away from major cities. This sounds great, but it also opens up these residents to the introduction of new diseases like influenza, tuberculosis, drug-resistant organisms like methicillin-resistant staph aureus. And we hope by focusing on some of these health problems, we can improve life for Alaska Natives.

[Dan Rutz] A lot of talk these days, Alan, about global warming. I imagine that would also affect or interest people in the Arctic region. How is it affecting them, at this point?

[Alan Parkinson] Well, the changing climate is already having an effect. One of the direct effects of climate change is, of course, an increase in ambient temperature in the Arctic. This warming, in particular, has reduced the amount or extent of sea ice, which is very important for protecting coastal villages from erosion. We also have ice-rich permafrost throughout most of Alaska and parts of the Arctic and this permafrost actually supports entire communities. So, with the recent decades of warming this has been accompanied by extensive loss of permafrost, thawing in many regions, and this causes river bank erosion, ground subsidence, and damage to community buildings and infrastructure. Particularly concerning from a health perspective is the damage to water intake systems resulting in contamination of water supplies, and the thawing can also damage access roads, water storage tanks, waste water treatment facilities, and they can render water and waste-water treatment systems inoperable. This forces families and whole communities to move, which will mean they will have to adapt to new ways of life elsewhere, creating new social connections, we'll probably see some unemployment. Relocation may lead to rapid and long term cultural change and loss of traditional culture which will create additional stress and mental health issues for the Alaska Native population.

Subsistence hunting and fishing is very important to the communities up here, and present climate change already poses serious harm to this way of life in many communities. We have reduction of snow cover, a short river and sea ice season, thawing of permafrost and this all obstructs travel and access to the harvesting of land mammals, such as caribou, making hunting more difficult and dangerous and less successful. So, in addition, climate change is having a big impact on populations of these animals – marine and land animals and water fowl. They have to find different routes - it changes their migration routes - so this further reduces the ability of the people to obtain traditional food.

And with the reduction in traditional food, it forces the people in the communities to increasingly depend on non-traditional, perhaps less healthy, Western food, resulting in increased rates of the so-called modern diseases which are associated with processed foods, this includes, of course, diabetes, obesity, increases in cardiovascular disease, there were outbreaks of food borne infectious diseases associated with imported fresh and processed foods.

Unintentional injury mostly relates to subsistence hunting and fishing. This is already a major cause of morbidity and mortality in our population up here. The reduction in the river and sea ice thickness in a warming Arctic, of course, will create increasingly unpredictable travel conditions, and this will probably increase the chance for injury and death by drowning.

Of course, we still don't really understand the full impact of global warming in the Arctic and we'll have to monitor its effects very closely to see how this will impact the health of the Arctic people.

[Dan Rutz] Doesn't look too good at this point, does it? March 2007 last year kicked off the fourth International Polar Year, a time to focus scientific evaluation of the Arctic and Antarctic regions. Dr. Parkinson, can you tell us why this International Polar Year is so important and what are the goals of it?

[Alan Parkinson] Yes, Dan. What makes the International Polar Year so important is that it's actually a one year focus on science in the Polar Regions. This is actually the fourth Polar Year; it occurs about every 50 years or so. The last was 1957-58.

It's important because it truly is an international effort. It creates collaborations between scientists and institutions worldwide and enables them to sort of band together to tackle the big scientific questions that resources from one country could not ordinarily achieve by itself. The Polar Regions are very important parts of the earth's system. Among other things, the poles are essentially the earth's air conditioning system. They absorb heat from other parts of the globe, and therefore they drive climate changes elsewhere on the planet. So, in an era of climate change it's very important that we understand what's happening in these regions.

Broadly the goals of the International Polar Year are to make significant advances in polar knowledge and understanding, and while leaving sort of a legacy of ongoing international collaborations and partnerships, to set up new or enhance observational systems, research facilities, infrastructure, and assets that could be used for years to come.

But perhaps the most important goal will be to create interest in science and create a generation of new polar scientists and engineers to help rekindle the interest in polar science and exploration, not only among scientists, but also of people who live in Polar Regions, school children, the general public, and policy makers worldwide.

The Polar Year does actually generate new polar scientists. I am actually a graduate of the last polar year. I grew up in New Zealand, and in 1957, when I was only about 10 years of age, I followed Sir Edmond Hillary's trans Antarctic expedition as he led a group of scientists across the Antarctic icecap to determine the total size of Antarctica's ice mass. This event must have made a very big impression on me because I've now spent about 30 years doing infectious disease research in both the Antarctic and here in the Arctic.

[Dan Rutz] What a great way to launch a career. Now you're in a good position, I guess, to judge the difference between the last Polar Year and how this one differs from it. How does it differ?

[Alan Parkinson] Well, while this International Polar Year will focus on climate issues and establish infrastructure for future research, this Polar Year will be the first time that there will be a focus on human health in Arctic regions, and this is an initiative that we at the CDC's Arctic Investigations Program are leading. The Polar Year will be an opportunity to increase global awareness on health concerns of Arctic people, perhaps foster more research, promote strategies to protect their health, and just try and generally improve the health and well-being of the residents of the Arctic.

[Dan Rutz] Talk about, please, a little bit of the activities that are planned around health issues during this Polar Year?

[Alan Parkinson] Well, together with other international partners, we are coordinating what has become known as the Arctic Human Health Initiative, and the goal of this is to increase awareness and visibility of health concerns of the Arctic people, particularly by promoting research and strategies that will improve their health. To date, we have about forty proposals from five of the eight Arctic countries have been accepted as International Polar Year human health proposals, and these are clustered within the Arctic Human Health Initiative. Proposals are clustered in three sort of general areas: expansion of networks, promotion of research, and of course, outreach in education, and we at the CDC's Arctic Investigations Program are using the International Polar Year to expand our International Circumpolar Surveillance network into Arctic Regions of the Russian Federation. This is a network of public health laboratories in seven of the

eight Arctic countries that currently share standardized surveillance information on invasive bacterial diseases and now we're doing surveillance on tuberculosis.

We're collaborating with international partners on a number of research projects to reduce the burden of diseases caused by invasive bacterial disease, hepatitis B, helicobacter pylori, and sexually transmitted diseases in indigenous populations of the Arctic.

[Dan Rutz] So it really does provide an opportunity then to focus new attention on issues that have either been long-standing and perhaps not adequately or fully explored and to open up some new issues as well.

Dr. Parkinson, thanks for sharing information on Arctic Health and the International Polar Year and I hope that we'll see some real improvements as a result.

Our discussion with Dr. Alan Parkinson is based on his work with CDC's Arctic Investigations Program. And in the January 2008 issue of CDC's journal - Emerging Infectious Diseases - you will find many articles of interest on this topic - Arctic Health and the International Polar Year. To check them out, go to the journal, online at CDC's website: [www.cdc.gov/eid](http://www.cdc.gov/eid). Again, that website address: [www.cdc.gov/eid](http://www.cdc.gov/eid). Thank you for joining us.

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