FROM THE CONFERENCE MELTING ICE—A HOT TOPIC?

Health in the Arctic and climate change

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The Arctic environment is like a magnifying glass. Many of the hazards stemming from industrial activity in the South tend to concentrate in the North. This is true for DDT, PCB, heavy metals and many other substances that may endanger human health. Climate change is yet another example of how the negative impact of industrial activity may be magnified in the Arctic region.

We know that the increased level of CO_2 in the atmosphere is causing global warming, but we do not yet know how rising temperatures may affect individuals biologically. By studying the impact of other forms of pollution we can get an idea of the indirect impact, however. This is likely to include an effect on the overall status of communities, including social life, culture and the availability of animal species that serve as a food supply to the population.

Greenland

Eighty per cent of its surface being covered permanently by ice, Greenland is particularly vulnerable to climate change. In spite of the harsh living conditions, the island has supported human existence on and off for 6000 years. At the present time, 57 000 people—most of them of Inuit origin—live in settlements along the coast. As has always been the case, life here is extremely dependent on the resources of the sea, i.e. fish and sea mammals.

My own introduction to Greenland was 30 years ago. At first I was a teacher in a small traditional community. My dream was to become a hunter: free and independent in the great Arctic. I soon realized, however, that I would not survive for long if I were to depend on my hunting skills. Instead I chose to return to the somewhat more comfortable existence as a university student and became a physician. In the past 25 years I have been involved in environmental research in Greenland. At the same time I have been holding a position as a family doctor. I also teach Environmental and Remote Area Medicine and Indigenous Health to university students in Denmark and Australia.

Globalization of pollution

The increased emissions of CO_2 are only one of many indicators of industrial activity. Almost a billion people worldwide live in poverty, close to the limits of human existence. In order to optimize agricultural production so that a sufficient supply of food may be maintained, pesticides are used. Unfortunately, such chemicals may have an adverse effect on human health in the form of increased risk of cancer and reduced fertility; but if the alternative is starvation, there is no real choice.

In the same manner, the use of DDT against mosquitoes carrying malaria has its pros and cons. DDT may be able to prevent thousands of deaths every year, but the agent has a proven negative effect on human health as well as on the environment as a whole.

Similar arguments may be applied to mercury. A heated shelter and access to facilities for preparing a hot meal are inalienable rights. Unfortunately, the heating source available to millions of people is coal, which, when burning, emits mercury into the atmosphere. Being a very toxic substance, mercury may cause damage to nervous tissues and the brain. It has been estimated that 65 000 tonnes of mercury is deposited in Greenland every year with the rain and snow.

Flame retardants (present in laptops, cell phones, television sets and other electronic equipment to reduce the risk of a fire) are a threat to human health because of their hormone-like qualities.

Pesticides like DDT, as well as mercury, dioxin and flame retardants have all ended up in the Arctic, carried across the globe by winds, currents and through the food chains. Because of this globalization of pollution, the indigenous population of the North now holds world record levels of these contaminants. Yet another threat to people living in the Arctic has now emerged. They may

now be on their way to become some of the primary victims of the effect of CO_2 emissions, i.e. global warming.

World Food Web

We have WWW—the World Wide Web. We have WWF—the World Wildlife Fund for Nature. And we have WFW—the World Food Web. A food web is made up of all the different plants and animals that have an effect on one another by their feeding habits. A group of food chains meshed together makes a food web.

Airborne waste products from industrial activity will sooner or later end up in the sea where they will affect the WFW. By each step in the food web, the substances will be concentrated tenfold. Consequently, the highest concentrations will be found in animals at the end of the chain, such as whales, seals, turtles, sea birds and polar bears. Once introduced into the environment these toxic substances are difficult to get rid of. The half-life in humans is 10–20 years. Stored in fat, pesticides are being passed on to babies through the mother's milk. So we are facing a problem that will persist for generations to come.

By eating food that originates in the sea you are actually subjecting yourself to pollution from all around the world. The more seafood you eat, the more of these contaminants you will receive. The obvious answer might be to avoid food originating from the sea alltogether; but in that case you will not get many essential nutrients, such as omega-3 fatty acids, which are needed for the development of the nervous system, the eye and the brain. Later in life these nutrients reduce the risk of heart disease, arthritis and diabetes. So you are damned if you do, and damned if you don't. The answer to this dilemma is a balanced diet containing elements from both land and sea.

In Greenland, country food (fish, sea mammals, caribou, etc.) represent up to 25% of the diet, with great variations from one settlement to another as well as among individuals. A survey from 2006 shows that local food items only make up 10% of the young and middle-aged people's diet. Even so, their intake exceeds the international food safety levels for persistent organic pollutants, POPs. Instead of eating locally produced food, people in the North are turning to food with a high content of sugar and fat. The market will deliver what people want. Local food is healthy in most respects, but contains contaminants. Imported food may contain no contaminants, but may cause diabetes and heart disease. This is known as the "Arctic dilemma".

Change and adaptation

Human beings possess a strong ability to adapt. This ability is being put to the test by the rapid cultural and environmental changes that are taking place, not least in the Arctic. The genes cannot keep up with rapid change. Rapid change stresses the sociocultural basis. Rapid dietary change can lead to diabetes and heart disease. Unemployment can lead to abuse, violence and social isolation. Migration to urban areas leads to loss of culture and identity.

Inuit, as well as other indigenous peoples, have been exposed to massive changes. One or two generations ago they were extremely physically active: depending on hunting and fishing for their survival. The food supply was not always stable. Genetically they adapted by developing the ability to store energy in the form of fat. This genetic advantage has now turned into a liability, however. Life nowadays does not demand much physical activity, and food is always available. The high-sugar, saturated fat diet that now prevails leads to obesity and diabetes, which is three times more common in Greenland than in Denmark.

Marginalization

Rapid change poses the danger of marginalizing those who cannot keep up. The ensuing social gap and poverty leads to a higher risk of developing diseases—any kind of disease, including infections, cancers and diabetes. When the social gap is widened in a society we always see a higher rate of violence, homicide, suicide, abuse and mental disorders. This has been documented by several reports from the (World Health Organization (WHO). Among Inuit in Greenland and Canada the suicide rate has exploded from a level close to zero in the 1970s to 10% of all deaths today. These are regions that have gained increased political independence and have improved their economies markedly; but the social gap has widened leading to a variety of disorders, including, crime, unemployment, violence, abuse, homicide, suicide, etc. Teenage pregnancies, tuberculoses, venereal diseases and mental disorders have also become more prevalent.

Cultures are not static. Cultures and people must change in order to survive. Cultures, as well as genes, need challenges in order to maintain their strength. To slow down the rapid pace of change is probably difficult; instead, we must take care of the people at risk. In order to prevent or resist the negative impact of change, research and monitoring are needed. Immediate threats, such as the threat of a diabetes epidemic, are easy to relate to. It is much more difficult to attract attention from politicians and others to the risk for environmental hazards because the impact—impaired fertilization, immune system defects, cancer—is not as obvious, and often can only be detected over generations.

People living in remote areas such as the Arctic are not only subjected to pollution of the body, but also pollution of the mind. Through television, the internet, magazines and other media they receive a high dose of Western pop culture. Advertising and soap operas are causing dramatic change to life in the far North, to the Inuit culture. An Inuit politician once likened the effect of television to that of a neutron bomb: it ruins the mind but leaves the body intact. Unfortunately this is not even true, because the body is affected, too—by lack of physical activity and by fast food, which seems to be an indispensible companion to watching TV.

Rapid transition

Climate change in itself may not be a threat to human health; but the rapid cultural changes that may follow in its wake may be. Arctic cultures and societies are at major risk of extinction. The individuals that make up those cultures may survive as individuals, but they may lose their identity, their social and cultural roots, thereby becoming marginalized and more prone to developing disease. The problem is not change itself: it is the pace at which it takes place. Human beings need time—often several generations—to adapt to new circumstances. Climate change may take place too rapidly for people to adjust.

Prevention of diseases needs to be looked upon from a social, economic and cultural point of view. Since World War II the health systems in the Western world have been dominated by enormous hospitals that attract most of the resources allocated for fighting diseases. There is much less prestige and economic interest in *preventing* diseases.

Medical science is based on biology. This is in many ways a useful approach, but the weakness is that the social, historical and cultural causes of diseases are not addressed. Treatment of diseases is based on biology, using medicine or surgery. To prevent diseases requires an understanding of cultural and social habits.

Responsibility

In some ways the environmental problems that are facing the Arctic region today are the result of the uneven distribution of wealth in the world. It is easy to feel angry when realizing that the traditional food supply of the 160 000 Inuit living in the circumpolar region is contaminated with pesticides. The use of chemicals elsewhere in the world makes it necessary to recommend restrictions on the intake of food that has constituted the Inuit population's main diet for thousands of years. The other side of the coin is that pesticides make it possible for millions of people elsewhere in the world to grow enough food for their survival. In the same manner, it seems unfair that the Inuit are the victims of mercury pollution originating far from the Arctic region; but coal is the only energy source available to millions of people. If Third World farmers were better off, if coal users had an alternative, the Arctic region would be a cleaner place. In my opinion, it is the responsibility of rich countries to correct this inequality.

Now the region is facing yet another threat, this time from global warming. It is time to develop a global approach for fighting not only pollution, but also poverty, which is part of the equation. Much human suffering can probably be avoided by keeping reigns on the pace of change, and by monitoring the negative effects of change so that undesirable developments can be corrected or avoided. It is, in short, time for sustainable development, not only physically but also sociologically, socially and culturally.