The circumpolar North is comprised of a collage of various cultures, languages, lifestyles, and microclimates and as a result the health impacts related to climate change in the Arctic are likely to vary both between and within communities and regions. Some changes may in fact be positive (e.g. reduction in cardiac related deaths in some regions related to warming winter temperatures) (1) while others will adversely affect the health of individuals, (e.g. introduction of new zoonotic or infectious diseases) (2,3). The relationship between changes in local climate and some health impacts may be quite direct (e.g. exposure to extremes and human injuries) while the majority are expected to be complex second, third or fourth order indirect impacts, (e.g. changes in transport and bioavailability of contaminants and increased human exposure and resulting health impacts) (4); changes in environmental conditions which provide the foundation for traditional lifestyles and well-being resulting in impacts to social and mental health (5).

Interpreting whether aspects of the local environment (e.g. temperature or precipitation) are in fact continuously shifting in one direction or even in variability over time, and whether such changes are related to alterations in particular health endpoints is very difficult. However, in the face of reported changes already taking place and projected to continue that may affect Arctic health, communities must develop strategies to take advantage of opportunities that may be created and to minimize risks to residents’ well-being. In some regions, communities have already started to adapt to climate related changes that have potential impacts on health. In Inuit communities of the western Canadian Arctic for example, individuals report now taking bottled water on trips due to the lack of fresh water sources while on the land and hunters have adapted their hunting and fishing times to compensate for the changes in species availability and access to continue to provide fresh traditional foods (6).

A key component in this ability to adapt and respond is the development of a better understanding of the relationship between climate and the health of northern peoples and access to locally relevant information on the changes taking place over time. The identification, selection, and monitoring of some basic indicators for climate and health is one tool communities can use to help their response to these changes at the local level. In this case, the indicators would be measurements or observations of a parameter that link climate, the environment, and an aspect of community or individual health. They may include environmental measurements such as average ice thickness near a community relying heavily on ice travel during winter months; the survey of key wildlife species in a region where warming annual temperatures are thought to support the survival of new zoonotic diseases (2); the recording and identification of new insect species in a region where warming is occurring and insects may act as vectors for the
introduction of new human infectious diseases (3); the water temperature and incidence of water-borne organisms in local freshwater ponds used for human consumption (7) or the incidence of mental and social health pathologies in a community during critical times of the year when seasons are reported to be changing significantly and disrupting people’s ability to pursue traditional activities for extended periods of time (5). Such information can support the community’s ability to know what changes are occurring, what changes are likely to take place, and what impacts these changes may have on residents’ health and well-being.

Monitoring of some basic indicators in this sense could help communities confirm changes or trends in a condition over time (e.g. date of freeze-up of the local bay), assess the current condition of the environment to judge its adequacy with reference to a standard (e.g. safety of ice for travel); anticipate hazardous conditions before negative impacts occur, to prevent damage (e.g. to know when a severe storm event is coming; to predict a shortage of a fresh source of a specific traditional food in the community related to difficulties with access and availability); or identify causes for effects that are being experienced, and to identify appropriate action (e.g. windchill factor and human injuries, to warn people about cold injury).

Many of the papers presented in this Special Edition include indicators that could be monitored at the local level, by community representatives and residents. When gathered in a standardized and organized way, they can enhance the community’s ability to detect changes in its environment that may be having an impact of the health of its residents. Further, by relating this locally gathered information to the projected scenarios of change reported by the climate modeling community, communities will be able to monitor, and where required more easily develop strategies to minimize negative impacts on the health of their residents in the future.

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