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A database for environmental contaminants in traditional foods in northern and Arctic Canada: development and applications.

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Abstract: The potential health effects of environmental contaminants in traditional food has become a concern among northern communities because of the presence of environmental contaminants in the Arctic ecosystem. Exposure assessments are needed but they require comprehensive dietary information and contaminant data. Over the last 10 years, there has been considerable effort to monitor the level of contaminants in fish and wildlife collected from different regions in northern and Arctic Canada. The development of a database and its application for dietary contaminant exposure assessment are described. We conducted an extensive literature review on levels of environmental contaminants in northern and Arctic Canada. The ranges of levels of four contaminants of major concern (chlordane, mercury, polychlorinated biphenyls and toxaphene) in 81 species of marine mammals, terrestrial mammals, birds, fish and plants are summarized. These data represent 69% of the 117 species of fish, wildlife and plants mentioned in our dietary interviews conducted in the northern communities. A significant percentage of the foods had contaminant levels exceeding the guidelines used by Health Canada for market food consumed by the 'southern' populations. Mathematic modelling of the distributions of the data showed that contaminant levels in most food groups are log-normally distributed and have a typical coefficient of variation of about 100%. Examples are presented to demonstrate the use of the data for contaminant exposure assessment. Average contaminant exposure levels estimated using the database for two communities are comparable to those obtained previously using community specific data. With the current knowledge of environmental contaminant levels in the northern traditional food system, it may be feasible to conduct preliminary risk assessment of dietary exposure of environmental contaminants when some diet information for a community is available. Further sampling and analysis may be needed only for confirmation purposes.

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