Climate vulnerability of Swedish newborns: Gender differences and time trends of temperature-related neonatal mortality, 1880-1950.

https://arctichealth.org/en/permalink/ahliterature304298

Author: Johan Junkka
Lena Karlsson
Erling Lundevaller
Barbara Schumann

Author Affiliation: Centre for Demographic and Ageing Research, Umeå University, 901 87, Umeå, Sweden.

Source: Environ Res. 2021 Jan; 192:110400

Date: Jan-2021

Language: English

Publication Type: Journal Article

Abstract: In resource-poor societies, neonatal mortality (death in the first 28 days of life) is usually very high. Young infants are particularly vulnerable to environmental health risks, which are modified by socioeconomic factors that change over time. We investigated the association between ambient temperature and neonatal mortality in northern Sweden during the demographic transition.

Parish register data and temperature data in coastal Västerbotten, Sweden, between 1880 and 1950 were used. Total and sex-specific neonatal mortality was modelled as a function of mean temperature, adjusting for age, seasonality and calendar time, using discrete-time survival analysis. A linear threshold function was applied with a cut point at 14.5 °C (the minimum mortality temperature). Odds ratios (ORs) with 95% confidence intervals (CIs) were computed. Further analyses were stratified by study period (1800-1899, 1900-1929, and 1930-1950).

Neonatal mortality was 32.1 deaths/1000 live births, higher in boys than in girls, and decreased between 1880 and 1950, with high inter-annual variability. Mean daily temperature was +2.5 °C, ranging from -40.9 °C to +28.8 °C. At -20 °C, the OR of neonatal death was 1.56 (CI 1.30-1.87) compared to the reference at +14.5 °C. Among girls, the OR of mortality at -20 °C was 1.17 (0.88-1.54), and among boys, it was 1.94 (1.53-2.45). A temperature increase from +14.5 to +20 °C was associated with a 25% increase of neonatal mortality (OR 1.25, CI 1.04-1.50). Heat- and cold-related risks were lowest between 1900 and 1929.

In this remote sub-Arctic region undergoing socio-economic changes, we found an increased mortality risk in neonates related to low but also to high temperature. Climate vulnerability varied across time and was particularly high among boys. This demonstrates that environmental impacts on human health are complex and highly dependent on the specific local context, with many, often unknown, contributing determinants of vulnerability.

PubMed ID: 33129863 View in PubMed