

VULNERABILITY TO TEMPERATURE-RELATED MORTALITY IN SEOUL, KOREA

Son, Ji-Young, *Yale University, School of Forestry and Environmental Studies, USA*

Lee, Jong-Tae, *Korea University, College of Health Science, Dept. of Environmental Health, Korea*

Anderson, G. Brooke, *Yale University, School of Forestry and Environmental Studies, USA*

Bell, Michelle L., *Yale University, School of Forestry and Environmental Studies, USA**

* Corresponding author

Background and Aims: Temperature's effect on mortality and vulnerability to these risks may vary by population and region. This study examines the relationship between temperature and cause-specific mortality for Korea. We investigated whether some subgroups are particularly vulnerable with respect to sex, age, education, and place of death for Seoul, Korea for the period 2000-2007.

Methods: We applied time-series models allowing nonlinear relationships for heat- and cold-related mortality, and generated exposure-response curves. We also present results comparing mortality risk at mean daily temperatures of 25 °C to 15 °C (90th to 50th percentile of temperatures in Seoul) and 29°C to 25°C (99th to 90th percentile) for heat effect. For the cold effect, we present results comparing mortality risk at -1 °C to 15 °C (10th to 50th percentile) and -4°C to -1°C (1st to 10th percentile). We considered exposure timeframe, co-pollutants, cause of death, and susceptibilities.

Results: Both high and low ambient temperatures were associated with daily mortality in Seoul, Korea. Mortality risk was 10.2% (95% confidence interval 7.43, 13.0%) higher at the 90th percentile of temperature compared to the 50th percentile. Mortality risk was 12.2% (3.69, 21.3%) comparing the 10th and 50th percentiles of temperature. Cardiovascular deaths showed a higher risk to cold, whereas respiratory deaths showed a higher risk to heat effect. We identified susceptible populations such as female, the elderly, those with no education, and deaths occurring outside of a hospital for heat- and cold-related total mortality.

Conclusions: Our findings provide supportive evidence of a temperature-mortality relationship and vulnerability to temperature effects in Korea.