

# HEAT VS. HEAT WAVE RELATED MORTALITY – ARE THE SUSCEPTIBLE GROUPS COHERENT?

Joacim Rocklöv, *Umeå University, Sweden*

Kristie Ebi, *Carnegie Institution of Science, U.S.*

Bertil Forsberg, *Umeå University, Sweden*

**Background and Aims:** Several recent studies explored the separate mortality effects of heat and the duration of heat waves. Some of them show large differences in the associated effects. However, few studies have investigated whether the effects related to heat and heat waves are homogeneous or heterogeneous in subgroups of a study population. We aim to study the effects of heat and a heat wave's duration according to age, cause of death, social factors and medical history.

**Methods:** We studied the population of Stockholm, Sweden. We used Poisson models adjusting for over-dispersion, regressing daily ambient weather condition on daily deaths by strata of the population. We additionally adjusted for calendar effects, seasonality, influenza and long-term time trends using smooth functions and factor variables. We assessed the sensitivity of confounding by air pollution. To evaluate effect-modification of individual social and medical factors, we employed the case-only design.

**Results:** For natural causes of death, the effect of heat wave duration was estimated as a RR of 1.024 (1.010 to 1.038) per day in sequence, while the effect of elevated heat was estimated as a RR of 1.006 (1.001 to 1.010) per degree C. The effects varied by age and cause of death. Heat wave duration was significantly related to higher deaths in ages from 65 years and with cardiovascular and non-cardiorespiratory causes, while heat was found associated only with deaths in ages 80+ and with non-cardiorespiratory causes.

Men appeared to have lower RR to heat, while higher RR to heat wave duration compared to women. A recent hospitalization appeared to reduce the RR for both stressors. We found a strong effect-modification of the RR related to heat wave duration for the group having pre-existing mental disorders. A pre-existing cardiovascular hospitalization appeared to reduce the effect of both stressors.

**Conclusions:** The effect of heat and a heat wave's duration differs among subgroups of the population in Stockholm, Sweden. A differentiation of heat exposure and heat wave duration can yield a better understanding of when a susceptible group is particularly vulnerable, and, thus, help targeting adaptive and preventive efforts with benefits for the public health.

## References:

Rocklöv J et al. (2010). Mortality related to temperature and persistent extreme temperatures: a study of cause specific and age stratified mortality. *Occup Environ Med*. DOI:10.1136/oem.2010.058818

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