hypothesized that the diurnal apparent temperature range (DATR) within 1 day was associated with cause-specific mortality, and its association was modified by determinants of vulnerability and season. We examined the association between temperature and cause-specific mortality and effects of season and individual socioeconomic status (SES) on the DATR and mortality in Seoul, Korea, from 2000 to 2005.

Methods: We applied generalized adaptive Poisson regression models adjusting for influenza epidemics, day of the week, seasonal trends, PM10 concentrations, and apparent temperature. A total of 204,126 non-accidental deaths were included.

Results: The effects of DATR on cardiovascular mortality were greatest in the spring/fall, while the greatest effects on respiratory mortality were in the spring/ fall and winter. One degree Celsius increase in the DATR in the spring/fall corresponded to a 1.19% increase in cardiovascular mortality [95% confidence interval (CI) 0.45%–1.93%] in a time series analysis in Seoul, Korea. Increases in respiratory in the spring/fall and the winter due to DATR were 2.53% (95% CI, 0.24–4.87) and 2.74% (95% CI, 0.21–5.34), respectively. Disadvantaged groups such as the elderly and the less educated were found to be the most vulnerable groups to DATR for both cardiovascular and respiratory mortality.

Conclusion: Diurnal apparent temperature range was a strong predictor of mortality, independent of apparent temperature. Furthermore, DATR effects differed by season and individual SES.

ISEE-0110
Impairment of Infant Behaviour by Polychlorinated Biphenyls (PCBs): Physiologically-Based Pharmacokinetic (PBPK) Modeling Reveals a Critical Time Window for Postnatal Exposure
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Background and Objectives: Postnatal exposure to PCBs can impair behavioural processes in animal models at doses within the range of human exposure. To date, no clear conclusion can be drawn from epidemiologic studies regarding the impact of lactational exposure to PCBs on infant development. Discrepancies between studies may be due to the limitations of traditional approaches in estimating postnatal exposure, namely through snapshot measures of breast milk levels and breast-feeding duration. Our study evaluated the impact of postnatal exposure to PCBs on infant activity and attention using simulated early-life toxicokinetic profiles.

Methods: A previously validated PBPK model was used to simulate blood PCB-153 levels throughout the first year of life for infants enrolled in a Northern Quebec Inuit longitudinal birth cohort. Monthly area under the curve (AUC) estimates were examined in relation to attention (rate of change from baseline) and activity (rate and duration of movements) during the 11-month Bayley Scales of Infant Development assessment through multiple regression analysis.

Results: We observed significant (P < 0.05) dose-dependent increases in infant activity at 11 months in relation to AUC estimates within the 1–7 month time window. Exposure during the 4th month displayed the strongest association with this outcome (adjusted β = 0.275). No association was detected with indicators of attention. When these two behavioural endpoints were examined in relation to traditional estimates of pre- and postnatal exposure, no association was found.

Conclusions: We found a robust dose-dependent association between increased infant activity at 11 months of age and exposure to PCB-153 during a specific time window. To our knowledge, this is the first study to use PBPK modeling to assess the impact of postnatal exposure to persistent organic pollutants on infants’ health. These results provide new evidence that postnatal exposure to PCBs may impair infant behaviour.

ISEE-0111
Which Days of Hot Weather Are Considered Dangerous by Heat-Health Watch Warning Systems?: A Comparison of the Predictive Capacity of Different Systems
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Background and Objective: Prompted by growing concerns about global warming, many countries worldwide have introduced Heat Health Warning Systems (HHWS) to minimize the public health impacts of exposure to hot weather. These systems issue alerts in response to forecasts of adverse weather conditions. Fundamentally different approaches are currently in place in the various HHWS systems around the world in terms of setting the thresholds of weather parameters which, when forecast to be breached, are expected to be associated with unacceptable levels of adverse health impacts. We compared the alternate approaches for setting HHWS thresholds as measured by how well they predicted heat-associated mortality in a common set of historical weather and mortality records.

Methods: Four different threshold-setting approaches which are currently in operation in HHWS were compared:
• Symptotic classification into air-mass types.
• Epidemiological analysis of retrospective data.
• Physiologic approach based on heat-budget models.
• Empiric set of temperature/humidity indices, e.g. Humidex.

Each approach was calibrated on four 10-year datasets of daily temperature and mortality counts (Chicago, London, Madrid, Montreal) in order to identify the weather conditions associated with adverse health impacts. These parameters were then applied to a further set of 10-year weather only data to provide a ranking of the top 50 most “heat adverse” days occurring in the second dataset as identified by each separate approach. The extent of overlap in the 50 days identified across the approaches was assessed; and temperature, observed mortality, and excess mortality occurring on the identified days was compared.

Results: In each of the 4 cities, there was very little agreement in the most “heat adverse” days identified across the four approaches.

Conclusion: The identification of “heat adverse” days, and therefore the days on which an alert is called and protection measures initiated, is very dependent on the particular approach used to establish the thresholds.

ISEE-0112
Environmental Determinants of Diarrhea among Under-Five Children in Nekemte Town, Western Ethiopia
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Background and Objective: Though the relationship between environmental risk factors and the occurrence of diarrhea in children has been documented elsewhere, there are limited studies in Ethiopia in general and in Nekemte Town in particular. The present study assessed...