

LIMITATIONS AND UNCERTAINTIES

Cheng and co-workers have undertaken a modelling exercise. They have made use of existing data, from reliable sources possessing some level of uncertainty, which they have minimized by careful quality assurance and data management according to accepted practices. The models, their rationale and assumptions have been carefully explained, but most importantly, a formal model result verification process has been built into the whole exercise. The results of the verification, based on historical observations of the outcome variables predicted by the models show surprisingly good agreement, and are presented in detail in their report.

Cheng et al. have summarized the results of their analysis of the limitations of the process:

- uncertainties associated with the Global Climate Models, which they have attempted to reduce during the downscaling process;
- limitation of statistical power by the choice of mortality as an indicator of burden of illness: especially for the smaller cities, and in the study of air masses with lower frequency of occurrence, or limited variance of the factor of interest;
- limitation in air quality data, especially data on exposure to fine particle pollution (which has only recently been measured).

One is struck by how remarkably similar the results of this study are for both heat- and air pollution- related acute mortality to those found in studies already carried out for recent archival data.

This study focuses on acute weather-related deaths such as heart attacks with shovelling snow in the cold or heat stroke with high heat, or respiratory or cardiac deaths associated with acute exposures to air pollution. With doubling and tripling of CO₂ and resulting global temperature increases/fluctuations, other global impacts of climate change are predicted to occur, such as flooding of coastal areas, more sickness due to tropical diseases and insects moving into temperate zones, increased food-borne illness, degraded water quality etc. All of these other impacts are associated with increased mortality, but it should be made clear that the Cheng *et al.* study is not making projections on deaths related to these more long-term types of impacts, but rather only due to acute air pollution interactions and direct effects of extreme temperature on the body.