14 Health: Temperature-related mortality (TRM)

There are no restrictions regarding the type of (empirical) models (GAMs, DLNMs, linear threshold model, etc.) to be used as long as the methodology has been documented in previous peer-reviewed publications. It also does not matter at which spatial scale the model operates (city-scale, regional, national, global), with the possible restrictions stemming from the input data provided.

14.1 Experiments

See **Table** 6 for a general explanation of the pressoc, and varsoc experiments. Specification for TRM models are

pressoc: no long-term trend in the relationship between temperature and mortality. E.g., constant exposure-response function (ERF), if possible, estimated from observational data in period centred on the year 2000

varsoc: reflecting historical trend in the relationship between temperature and mortality. E.g., varying ERF, as estimated from observations in adjacent subperiods; if possible, extrapolate to reporting years outside of observational period using external factors (such as climatic factors, etc.).

Table 37: Summary of experiments for TRM models.

Climate Data	Scenario	Human Impacts	# runs
WATCH-WFDEI	Hist	pressoc varsoc	2
GSWP3-W5E5	Hist	pressoc varsoc	2
GSWP3-EWEMBI	Hist	pressoc varsoc	2
GSWP3	Hist	pressoc varsoc	2
PGMFD v2.1 (Princeton)	Hist	pressoc varsoc	2

14.2 Output data

Table 38: Output variables to be reported by TRM models

Variable (long name)	Variable name	Unit	Temporal resolution	Comments
Number of deaths attributable to cold	**ancold-<r>**	1	daily	For ERF models, this occurs when temperature is below threshold (e.g., minimum mortality temperature (MMT)). Report 0 if temperature above threshold. Can have gender, age, etc. dimensions; see below.
Number of deaths attributable to heat	**anheat-<r>**	1	daily	Temperature above threshold (ERFs). Report 0 if temperature below threshold. Can have gender, age, etc. dimensions; see below.
Baseline total mortality	**btm**	1	daily	To be reported as annual series of mean daily total mortality, or as a single number of mean daily mortality; to be used for computations of attributable fractions. Can have gender, age, etc. dimensions; see below.
Population	**pop**	1	annual or 5-year intervals	Baseline population data should be provided for computations of mortality rates (i.e. deaths per total population). Can have gender, age, etc. dimensions; see below.

Instructions on reporting results:

- If different **realizations** of the model are applied, then these should be indicated by the specifier **<r>**. E.g. to reflect a central, upper, and lower estimate of the ERF:
  <r> = lower, central, upper
  Please explain the meaning of these realizations in the online model documentation; contact the ISIMIP coordination team in case of questions.
- If data are disaggregated e.g. by **age group, gender**, etc., they should be reported along an additional dimension, described by an auxiliary coordinate variable, in the NetCDF files. See the example provided at https://www.isimip.org/protocol/preparing-simulation-files/.
- For local (non-gridded) data, **locations (cities/regions/countries)** should be reported along an additional dimension called *location*, with the location name given as string in an auxiliary coordinate variable called *location_name*, in the NetCDF files. In addition, coordinates of the location should be reported in auxiliary variables called *location_lat* and *location_lon*. See the example provided at https://www.isimip.org/protocol/preparing-simulation-files/. The <region> specifier in the file name should be set to "local".
- For gridded data, the <region> specifier in the file name should be "global" or indicate a region or country.

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