

<i>ECHIM Indicator name</i>	B) Health status 17. Excess mortality by extreme temperatures
<i>Definition</i>	To be developed: Daily number of observed deaths and death rates (all cause) in a region during a heatwave or a period of extreme winter cold in relation to the expected number of deaths and death rate for the same calendar day.
<i>Key issues and problems</i>	<p>Indicator calculation needs more development:</p> <ul style="list-style-type: none"> - Indicator could be calculated based on day-by-day regional mortality and temperature analysis: Daily number of observed deaths (all cause) in a region during a heatwave or a period of extreme winter cold in relation to expected number of deaths for the same calendar day, expressed as number of a) excess deaths and b) excess death rates due to heatwaves/excess winter cold. Expected number of deaths at a certain day is estimated from past number of deaths or past daily death frequencies or both. <p>However, the following issues are related to the indicator calculation:</p> <ul style="list-style-type: none"> - Decide on the definition of heatwave or period of extreme winter cold: above or below a threshold air temperature celsius of a defined value of temperature ? There is no universal definition of a heat wave or period of extreme winter cold because they are relative to the usual weather in a certain area. Robine et al report defines heatwave by identifying exceptional days of excess mortality, not by air temperature itself. - Which age groups: all, below 65, 65-84 and 85+? - Decide on mortality from all non-accidental causes, cardio- or cerebro-vascular and respiratory mortality; or all causes ? Preference for all cause, because specific causes needs more research. - Time frame: deaths during or how many days after the heatwave or period of extreme low temperature? According to report Robine et al: during the days of heatwave only. - Number of excess deaths, or death rates? In principle, the daily number of excess deaths can be computed almost live, i.e as soon as the number of deaths of the day in question is known. It needs more time to calculate excess death rates, as one needs estimates of the size of exposed population. For this almost all methods use a combination of population estimates by January first of the year Y with population estimates by January first of the year Y + 1. Therefore the death rates of summer Y cannot be computed before you get the population estimates by January first of the year Y + 1. <p>The following issues are related to data availability:</p> <ul style="list-style-type: none"> - This indicator requires ad hoc data collection/calculation (as there is not a heat wave or period of extreme low temperatures every year). Detailed (daily) mortality data are available at national level, but not regularly provided to Eurostat. How to incorporate data collection and calculation in regular data collections? It is not very likely that this will happen in the future as this poses a large administrative burden on the MS.
<i>Preferred data type and data source</i>	Preferred data type: mortality registers Preferred data source: Eurostat? (but currently not available)
<i>Data availability</i>	Detailed (daily) mortality data are available at national level, but not regularly provided to Eurostat.
<i>Rationale</i>	Extreme temperatures can induce excess mortality in the population. Excess mortality affects vulnerable groups, particularly those who are old or ill. Important indicator in the frame of health effects of climate change. In some countries winter excess mortality is a problem and in others excess mortality by heat waves. Therefore both excess mortality by heat waves and winter excess mortality are included.
<i>Remarks</i>	- Heat-related deaths are not well defined and heat is usually not listed on death certificates as causing or contributing to death. Heat-related deaths can include many different causes of death and the heat wave can act as a last trigger in elderly and frail persons, especially if no adequate and immediate care is made available. Heat is recorded from other sources.

	- Death due to frostbite (ICD 10 T33-T35) and deaths due to hypothermia and other effects of reduced temperature (ICD T68 and T69) can also occur outside of periods of extreme low temperatures.
<i>References</i>	- CANICULE, Etude de l'impact de la canicule d'août 2003 sur la population européenne: http://ec.europa.eu/health/ph_projects/2005/action1/docs/action1_2005_inter_15_en.pdf - JM Robine, SL Cheung, S Le Roy, H Van Oyen et F R Herrmann: Report on excess mortality in Europe during summer 2003; http://ec.europa.eu/health/ph_projects/2005/action1/docs/action1_2005_a2_15_en.pdf
<i>Work to do</i>	Contact experts to discuss and solve key issues and problems.