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5.17 Mean number of people adversely affected by natural disasters each year

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Mean number of people adversely affected by natural disasters each year	Natural and Climate Hazards
Description and justification	This indicator is closely related to the previous indicator on the costing of natural hazards / disasters, but specifically addresses the problem that while intangible costs are important in relation to assessing impacts of natural disasters they may be difficult to assign an

	economic value to. Hence some studies recommend to assess these costs by counting the number of people affected rather than applying an economic value to these adverse effects.
Definition	The definition of the mean number of people affected each year is given as: $$Mean\ number\ of\ people\ affected = \int_A \int_p I(p)\rho dp dA$$ where *I(p)* denotes the number of people exposed to the disaster that occurs at an annual frequency *p*, *ρ* denotes the proportion of people exposed that are affected, and *A* denotes the area in question. The equation assumes that there is no damage for events occurring more often than once per year. There may be several sub-indicators distinguishing between different impacts such as loss of life, relocation, and physical or mental health.
Strengths and weaknesses	The weakness of this indicator is that it is sometimes ignored in decision-making because of the difficulty of assigning an actual economic value to the indicator. This is however also the strength since it may spark discussions among the participants on how to use this indicator in an assessment.
Measurement procedure and tool	By definition this indicator comprise an important part of the intangible costs in the preceeding indicator. For health impacts some studies model individual impacts of sub-indicators, while others advocate the use of more generic indicators across health impacts such as Disability Adjusted Life Year (DALY) and the Quality Adjusted Life Year (QALY). A review of the studies can be found in (Hammond et al., 2015).
Scale of measurement	The scale of the measurements is the physical area impacted by the disaster.
Data source	
Required data	Hazard maps as a function of the frequency of the natural disaster. Typically this will be in the form of raster og shape files in a GIS environment. Impact maps covering the area showing the density of *I(p)* and the value of *ρ* over the area. This data should be available in the same format as the hazard maps
Data input type	Quantitative
Data collection frequency	The data should in principle be collected every time there is a) a change in the population affecting *I(p)* and/or *ρ*, and b) new information about the disaster become available.

Level of expertise required	High.
Synergies with other indicators	This indicator is related to several other indicators, in particular to *Mean annual direct and indirect losses due to natural and climate hazards* and to the indicator group on Health and Wellbeing.
Connection with SDGs	The connection is closest to SDG 1, SDG 3 and SDG 11.
Opportunities for participatory data collection	A participatory approach to defining the sub-indicators to be included in the analysis will both increase the awareness of the indicator and improve the accuracy of the assessment.
Additional information	
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