

| FAMINE RISK | |
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| GENERAL CONSIDERATIONS | |
| <i>Issues</i> | Perinatal diseases |
| <i>Type of indicator</i> | Exposure (distal/state) |
| <i>Rationale</i> | <p>Undernutrition is a major cause of both morbidity and mortality in children, both directly and through its interactions with other risk factors. Inadequate maternal nutrition during pregnancy, for example, can result in children with intrauterine growth retardation, low birthweight or a range of gestational problems. Undernutrition during development can cause a range of both physical and cognitive disabilities. Lethargy and mental confusion due to prolonged under-nourishment may also impair people's ability to learn, work or look after themselves adequately. Acute lack of food may drive people to use unsafe food sources. Under-nourishment also reduces resistance to other risks, such as vector-borne diseases and respiratory infections. In extreme cases, inadequate food results in starvation and death.</p> <p>Long-term, chronic under-nourishment is often a function not only of the ability to grow sufficient food locally or nationally, but also of inadequacies in food distribution and access (e.g. due to poverty). Famine also occurs more acutely, however, in many parts of the world, usually due to the effect of short-term events such as drought, superimposed on longer-term social or political dysfunction. Children living in areas susceptible to famine are thus especially vulnerable to environmental health problems, and famine acts as an important distal risk factor for a range of health effects. Maternal exposures to famine are also especially important in determining risks of perinatal diseases (e.g. low birthweight, gestational problems, perinatal mortality).</p> |
| <i>Issues in indicator design</i> | <p>As with other natural hazards, several metrics may be used to measure famine risk. These include: frequency (i.e. the number of years on average between famines, or the annual probability of a famine event); extent (the area subject to famine); severity (e.g. the magnitude of drought, degree of food shortage or increase in death rate). None of these is easy to apply, for famines rarely occur as discrete or isolated events. Instead, most famines are to a large extent endemic. They often occur to differing degrees, and over a varying area, on a more or less continuing basis, erupting into major disasters or episodes only when social and/or environmental factors conspire to cause an abrupt failure in the food supply. Defining famines as specific, time- and geographically-bound events can be difficult, as is any attempt to attribute mortality and morbidity to individual famine events.</p> <p>Three key characteristics nevertheless define a famine – namely, a failure in the food supply, a marked increase in death and disease, and the need for an emergency response. On this basis famines can be recognized as "a regional failure of food production or supply, sufficient to cause a marked increase in disease and mortality due to severe lack of nutrition and necessitating emergency intervention, usually at an international level" (Cox 1981). Given this definition, famine frequency can then be measured as the number of children at risk from current and imminent famines.</p> |

| SPECIFICATION | |
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| <i>Definition</i> | Number of women of child-bearing age living in areas at risk from current or imminent famines |
| <i>Terms and concepts</i> | Famine: regional failure of food production or supply, sufficient to cause a marked increase in disease and mortality due to severe lack of nutrition and necessitating emergency intervention, usually at an international level. |
| <i>Data needs</i> | Extent of current or imminent famines Total number of women aged 16-45 years |
| <i>Data sources,</i> | Data on famines is usually available from both national and international agencies responsible for food security and emergency response. In some cases these data are provided as maps, showing the extent and severity of famine each year. Though somewhat subjective, these should permit the definition of the extent of current famines. Warnings of emergent famines are also available both from field-workers on the ground (e.g. from relief agencies) and from environmental monitoring agencies (e.g. meteorological agencies), often on the basis of satellite data. In order to develop and sustain this indicator, systems may need to be established to capture, evaluate and process this information routinely. Data on the number of women aged 16-45 years, living in these areas, should be available from national censuses. Because famine-affected areas are often subject to massive population displacements, however, these are not always wholly accurate. In some cases, therefore, reliance may need to be placed on population estimates made by the relevant agencies. |
| <i>Level of spatial aggregation</i> | Broad region or country |
| <i>Averaging period</i> | Annual |
| <i>Computation</i> | The indicator can be calculated as the total number of women of child-bearing age in famine-affected areas. This can usually best be done by overlaying maps of the famine-affected area onto population maps, and estimating the numbers affected on an area-weighted basis using a GIS. Alternatively, estimates may be made by manually summing population counts for administrative regions within the famine-affected area. |
| <i>Units of measurement</i> | Number of women at risk |
| <i>Worked example</i> | Assume that famine is affecting three areas as follows. In A (which has a population of 127 000 women of child-bearing age) it covers the whole area; in B (240 000 women), it covers 80% of the area; in C (310 000 women), it covers 55% of the area. The total number of women affected is thus: $(1.0 * 127\ 000) + (0.8 * 240\ 000) + (0.55 * 310\ 000) = 489\ 500$ |
| <i>Interpretation</i> | Because the indicator is based on somewhat subjective definitions of famine, it needs to be interpreted with care. Minor variations in the indicator values are unlikely to be meaningful, and comparisons between different countries need to take account of possible differences in definition or uncertainties in the data. It is most relevant as a way of identifying famine hotspots, therefore, or making broad assessments of the overall magnitude of risk. If relative risk estimates are available (e.g. giving the expected death rate per 1000 births due to famines), then the indicator can be used as a basis for assessing the attributable burden of disease. |
| <i>Variations and</i> | Various alternatives to this indicator are possible. It could, for example, be |

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| <i>alternatives</i> | <p>defined simply in terms of the area subject to famine (without weighting according to the number of women at risk). It could also be expressed not in relation to women of child-bearing age, but for other age or gender groups (e.g. young children).</p> <p>Where a longer term indicator is required, estimates could be made of the population-weighted famine risk – for example by multiplying the annual probability of a famine in each area by its resident population of women of child-bearing age. Again, this might be translated into a measure of the expected mortality or morbidity rate if suitable exposure-effect relationships are available.</p> |
| <i>Examples</i> | None known. |
| <i>Useful references</i> | <p>Cox, G.W., 1981: The ecology of famine: An overview. In: <i>Famine: Its Causes, Effects, and Management</i>, ed. by J.R.K. Robson. New York: Gordon and Breach, 5-18.</p> <p>FAO Committee on World Food Security 1998 <i>Guidelines for national food insecurity and vulnerability information and mapping systems (FIVIMS). Background and principles</i>. Rome: Food and Agricultural Organization. (Available at www.fao.org/docrep/meeting/W8500e.htm)</p> <p>USAID <i>Famine early warning system network</i>: http://www.fews.net/</p> |