

<b>DIARRHOEA MORTALITY RATE IN CHILDREN AGED 0-4 YEARS</b>	
<b>GENERAL CONSIDERATIONS</b>	
<i>Issues</i>	Diarrhoeal diseases
<i>Type of indicator</i>	Health outcome
<i>Rationale</i>	Diarrhoea and related gastrointestinal illnesses continue to be one of the most important causes of illness and death worldwide, especially amongst young children. Much of this illness is due to exposures to contaminated water or food, as a result, for example, of poor water quality, limited access to water, poor food hygiene and safety, or poor sanitation in the home. Major pathogens include Salmonella, Shigella, <i>Campylobacter</i> , <i>E. coli</i> and rotavirus. Mortality rates have declined in many countries in recent years, partly as a result of environmental improvements (e.g. in access to effective sanitation and safe drinking water) and advances in health care and treatment (e.g. oral rehydration therapy). This indicator provides a measure of mortality of young children due to diarrhoeal diseases.
<i>Issues in indicator design</i>	Data on mortality rates for diarrhoeal diseases are widely collected and reported. Diarrhoeal diseases, however, take many different forms and can occur in association with a wide array of other illnesses, so differences in diagnosis can occur, affecting the reported mortality rates. For these reasons, also, design of the indicator (e.g. which ICD codes are included) should take account of the context and purpose of application, as well as the completeness and reliability of the available data.  An age range of 0-4 years is used for this indicator, since mortality from diarrhoeal diseases tends to be strongly age-related, and at its highest in the very young.
<b>SPECIFICATION</b>	
<i>Definition</i>	Diarrhoea mortality rate in children aged 0-4 years
<i>Terms and concepts</i>	<b>Death due to diarrhoea in children aged 0-4 years:</b> death in which diarrhoea is defined as a primary cause of a child of less than five years of age at the time of death.  <b>Total population of children aged 0-4 years:</b> number of live children less than five years of age at the midpoint of the survey year (or other survey period).
<i>Data needs</i>	Total number of deaths due to diarrhoea in children aged 0-4 years.  Total population of children aged 0-4 years.
<i>Data sources, availability and quality</i>	Data on death due to diarrhoea in children aged 0-4 years should be available through national or regional/local death statistics. Differences in both diagnosis and reporting practice may be significant in these data, especially where diarrhoea is part of a complex of symptoms (e.g. associated with malnutrition). Where statistical data are not available from routine sources, special surveys will be necessary.  Data on the total population of children aged 0-4 years should usually be available via national censuses. Inter-census estimates can be made using vital registration data, or demographic models. Care is needed in applying a consistent and appropriate census date, especially where marked seasonal patterns in birth may occur.
<i>Level of spatial</i>	Community, health district

<i>aggregation</i>	
<i>Averaging period</i>	Annual (or shorter term for major outbreaks)
<i>Computation</i>	<p>The indicator can be computed as a simple mortality rate:</p> $1000 * (D_{diar} / C_{tot})$ <p>where: <math>D_{diar}</math> is the total number of deaths amongst children aged 0-4 years due to diarrhoeal diseases;</p> <p><math>C_{tot}</math> is the total population of children aged 0-4 years.</p>
<i>Units of measurement</i>	Number per thousand children aged 0-4 years.
<i>Worked example</i>	<p>Assume that 568 reported deaths of children due to diarrhoeal disease occur in an area in one year, amongst a population of 11 400 children. In this case the value of the indicator is:</p> $1\ 000 * (568 / 11\ 400) = 49.8 \text{ deaths per } 1\ 000 \text{ children}$
<i>Interpretation</i>	<p>This indicator is a powerful measure of health status of children, especially under conditions of inadequate water or food hygiene and basic sanitation. Action to improve these conditions can generally help to reduce mortality rates. Like other infectious diseases, however, marked short-term variations in mortality may occur, making identification of long-term trends difficult. Death of young children due to diarrhoea may also be a result of several different, and often inter-related, exposures: attributing changes in mortality to any one of these without consideration of the others might be misleading. Rates of mortality are also fundamentally affected by the effectiveness of, and access to, the health service and levels of awareness amongst parents.</p>
<i>Variations and alternatives</i>	<p>Variations to this indicator are possible, for example by basing it on a different age range (e.g. 0-1 years of age), or to a more specific set of diseases (e.g. cholera or typhoid). Alternatively, it could be defined using a broader category of illnesses (e.g. diseases of the digestive system - ICD codes 520-579). While this would broaden the potential range of exposures of relevance, it would tend to reduce inconsistencies due to diagnosis. Stratification by gender may be useful in some cases.</p>
<i>Examples</i>	<p>WHO <i>Catalogue of health indicators</i></p> <ul style="list-style-type: none"> <li>• <b>Deaths due to diarrhoea among infants and children under 5 years of age</b></li> </ul> <p>WHO <i>Environmental health indicators: framework and methodologies</i></p> <ul style="list-style-type: none"> <li>• <b>Diarrhoea mortality on children</b></li> </ul> <p>WHO <i>Environmental health indicators for the European region</i></p> <ul style="list-style-type: none"> <li>• <b>Diarrhoea mortality rate in children aged 0-4 years</b></li> </ul>
<i>Useful references</i>	<p>WHO 1987 Diarrhoeal diseases morbidity, mortality and treatment surveys. <i>Control of Diarrhoeal Diseases Update 1</i>, 1-13.</p> <p>WHO 1992 <i>Readings on diarrhoea: student manual</i>. Division for the Control of Diarrhoea and Acute Respiratory Disease, Geneva: World Health Organization.</p> <p>WHO 1994 <i>Household survey manual: diarrhoea and acute respiratory infections</i>. WHO/CDR/94.8. Geneva: World Health Organization.</p> <p>WHO 1996 <i>Catalogue of health indicators: a selection of health indicators recommended by WHO programmes</i>. Geneva: World Health Organization</p>

(under revision).

WHO 1999 *Environmental health indicators: framework and methodologies*.  
Geneva: WHO. (Available at  
<http://www.who.int/docstore/peh/archives/EHIndicators.pdf> )

WHO 2002 *Environmental health indicators: development of a methodology  
for the WHO European region*. Bonn: World Health Organization.