

MORTALITY RATE FOR CHILDREN AGED 0-4 YEARS DUE TO ACUTE RESPIRATORY ILLNESS

GENERAL CONSIDERATIONS

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| <i>Issues</i> | Respiratory disease |
| <i>Type of indicator</i> | Health outcome |
| <i>Rationale</i> | <p>Acute respiratory illness is one of the main causes of ill health in children. It includes a wide range of effects, including viral and bacterial infection of the lungs and respiratory tracts. It can also be caused or triggered by a large variety of risk factors, especially exposures to air pollution. Low birthweight, malnutrition and overcrowding are also important risk factors.</p> <p>In developing countries, all these risk factors continue to affect large parts of the population, with the result that acute respiratory illness continues to be one of the most ubiquitous forms of childhood morbidity and one of the major causes of death. In more developed countries, on the other hand, changing environmental conditions and improvements in treatment have led to marked changes in the aetiology and distribution of acute respiratory illness in children. In these, levels of traditional air pollutants – such as smoke from wood and coal fires – has declined markedly while levels of overcrowding have also declined. Partly as a consequence, death rates amongst children have fallen. This indicator thus provides a measure of the effects of these various risk factors on children's health</p> |
| <i>Issues in indicator design</i> | <p>This indicator is perhaps most usefully defined in terms of the reported mortality rate for acute respiratory illness in children aged 0-4 years, since these tend to be the children most at risk. Other age ranges can be used where appropriate. It also needs to be recognized that acute respiratory illnesses tends to be more common in boys than girls. For this reason, it is advisable to standardize the indicator by gender.</p> <p>Acute respiratory illnesses take many forms, so problems may occur in defining precisely the symptoms and illnesses that should be included within the indicator. In some cases, it may be appropriate to limit the indicator to acute respiratory infections (ARI); in others, it may be appropriate to include other acute symptoms, such as wheezing and cough. Differences in diagnosis are likely to affect the reported rates.</p> |

SPECIFICATION

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| <i>Definition</i> | Annual mortality rate due to acute respiratory infections in children under five years of age. |
| <i>Terms and concepts</i> | <p>Acute respiratory infection (ARI): an acute infection of the ear, nose, throat, epiglottis, larynx, trachea, bronchi, bronchioles or lung.</p> <p>Total number of children aged 0-4 years: number of live children less than five years of age at the midpoint of the year (or other survey period).</p> |
| <i>Data needs</i> | <p>Annual number of deaths of children aged 0-4 years due to acute respiratory infections (ARI).</p> <p>Total number of children aged 0-4 years at the mid-point in the survey year.</p> |
| <i>Data sources, availability and quality</i> | Data on childhood deaths due to ARI are usually available from death registrations, though the quality of these data may vary substantially. Problems occur, especially, in diagnosis, or where formal reporting procedures have not been established. In a number of countries, demographic surveillance surveys include a verbal autopsy module aimed at |

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| | <p>collecting information on the cause of death in children.</p> <p>Information on the number of children aged 0-4 years should be available from national censuses, and should be relatively reliable.</p> |
| <i>Level of spatial aggregation</i> | Health district |
| <i>Averaging period</i> | Annual |
| <i>Computation</i> | <p>The indicator can be computed as a simple mortality rate, per 100 000 children:</p> $100\ 000 * \text{Dari} / \text{Ctot}$ <p>where: <i>Dari</i> is the number of deaths of children aged 0-4 years due to acute respiratory infections; <i>Ctot</i> is the total number of children aged 0-4 years.</p> |
| <i>Units of measurement</i> | Rate per 100 000 children |
| <i>Worked example</i> | <p>Assume that in an area there are 237 deaths for ARI amongst children aged 0-4 years, from a total population of 162 900 children. In this case, the value of the indicator would be calculated as:</p> $100\ 000 * 237 / 162\ 900 = 145.5 \text{ deaths per } 100\ 000 \text{ children}$ |
| <i>Interpretation</i> | <p>This indicator may be interpreted to show trends or patterns in mortality due to ARI in young children, as a result of exposure to air pollution in either the home or ambient environment. In this context, an increase in the mortality rate may be taken to infer an increase in exposures; a reduction in mortality may imply a decrease in levels or frequency of exposure.</p> <p>Attribution of deaths to specific environmental exposures or risk factors in this way is, however, difficult. Many different factors influence mortality rates due to ARI. In developing countries, for example, both HIV and malaria are extremely important factors in either causing lower respiratory infection, or presenting as LRI. These may thus have a substantial effect on observed death rates. Mortality is also highly dependent upon the effectiveness of the health care system and availability of treatment; indeed, in many developed countries, mortality rates for acute respiratory illness have remained broadly stable over recent decades, despite a large increase in morbidity.</p> |
| <i>Variations and alternatives</i> | <p>Where appropriate, this indicator could be defined for other age groups (e.g. children aged 0-14 years). It could also be compiled and presented for other, more specific categories of acute respiratory illness, e.g.:</p> <ul style="list-style-type: none"> • Acute lower respiratory infection (ALRI): an acute infection of the larynx, trachea, bronchi, bronchioles or lung. • Acute upper respiratory infection (AURI): an acute infection of the nose, pharynx (throat) or middle ear. <p>In this way, the indicator could be applied to monitor or investigate disease-specific mortality. In developing countries, this might focus on the problem of pneumonia associated with biomass/coal-burning and indoor air pollution. (Typically this will comprise a high proportion of deaths due to acute respiratory illness in these countries.) In developed countries the growing problem of asthma associated with vehicle air pollution may prompt use of asthma-specific indicators.</p> |
| <i>Examples</i> | <p>WHO Catalogue of health indicators</p> <ul style="list-style-type: none"> • Under-five deaths due to acute respiratory infections |

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| | <ul style="list-style-type: none"> • WHO Environmental health indicators: framework and methodologies • Childhood mortality due to acute respiratory illness <p>WHO <i>Environmental health indicators for the European region</i></p> <ul style="list-style-type: none"> • Mortality rate due to respiratory diseases in children > 1 month and < 1 year of age <p>World Bank <i>HNP Indicators on Socio-Economic Inequalities</i></p> <ul style="list-style-type: none"> • Prevalence of ARI |
| <p><i>Useful references</i></p> | <p>Garenn, M., Ronsmans, C. and Campbell, H. 1992 The magnitude of mortality from acute respiratory infection in children under 5 years in developing countries. <i>World Health Statistics Quarterly</i> 45, 180-91.</p> <p>WHO 1992 <i>The measurement of overall and cause specific mortality in infants and children</i>. Report of joint World Health Organization/UNICEF Consultation, 15-17 December 1992.</p> <p>WHO 1994 <i>The management of acute respiratory infections in children. Practical guidelines for outpatient care</i>. Geneva: for the Control of Diarrhoea and Acute Respiratory Diseases, 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 (under revision).</p> <p>WHO 1999 <i>Environmental health indicators: framework and methodologies</i>. Geneva: World Health Organization. (Available at http://www.who.int/docstore/peh/archives/EHIndicators.pdf)</p> <p>WHO 2002 <i>Environmental health indicators: development of a methodology for the WHO European region</i>. Bonn: World Health Organization.</p> |