

ATTRIBUTABLE CHANGE IN NUMBER OF HOUSEHOLDS LACKING BASIC SERVICES	
GENERAL CONSIDERATIONS	
<i>Issues</i>	Perinatal diseases Diarrhoeal diseases
<i>Type of indicator</i>	Health outcome
<i>Rationale</i>	<p>To a large extent children are most at risk in their own home. This is not only because they spend much of their time there, but also because it is there that they are often in most intimate contact with risk factors. This is especially true in the case of diarrhoeal diseases, for it is at home – or in the immediate vicinity of home – that they are most likely to be exposed to contaminated water or food, or to human and animal wastes. The availability and quality of facilities for drinking water, food storage and handling, personal hygiene and waste removal thus have an important influence on risks of diarrhoeal disease.</p> <p>Many different types of action may be taken to improve this situation and reduce the risks to children's health. Ultimately the most important, however, is to provide the basic amenities needed to provide adequate water supply, sanitation and hygiene. This indicator is designed to measure and monitor the degree of success of such interventions.</p>
<i>Issues in indicator design</i>	<p>As with other measures of action, this indicator should ideally be focused on monitoring the degree of success of the actions, rather than simply the action itself. For this reason, the preferred indicator is not one that reports on the existence or extent of policies to improve access to basic amenities, but instead measures changes attributable to such policies.</p> <p>One difficulty in this respect is to devise a consistent definition of basic services. Perceived basic needs tend to vary from one country to another, depending on local conditions, experience and expectations. It is also not enough simply to have basic facilities connected to, or provided in the home: these facilities also have to operate reliably. Water supplies, for example, need to be sufficient to meet family needs; waste collection must be regular and must dispose of the waste safely; excreta disposal facilities must operate correctly, and must not cause contamination elsewhere. Defining services in these terms is often difficult. Another difficulty in many cases is lack of reliable data due either to inadequate data collection, or to deliberate misreporting.</p> <p>Where suitable data can be obtained (often through household surveys or special monitoring campaigns), the indicator can be designed to measure changes in the number or percentage of children with access to basic services. In principle, the indicator may be developed either to monitor changes in the extent of these services over time, as a result of the introduction of the policies, or to compare areas in which action has been taken with those in which it has not. In both these cases, however, interpretation can be difficult, because changes may be confounded by other events or other differences between the study areas. Ideally, therefore, the indicator should be measured by comparing rates of change in an 'intervention area' (before and after the intervention) with those in a matched 'control area' (a similar areas in which the intervention has not been carried out).</p>

SPECIFICATION	
<i>Definition</i>	Attributable change in the percentage (or number) of children aged 0-14 years living in households without access to basic services for water supply, sanitation and hygiene.
<i>Terms and concepts</i>	<p>Adequate sanitation services: facilities that provide for the controlled disposal of human excreta in ways which avoid direct human exposure to faeces, or contamination of food and local water supplies by raw faeces. Suitable facilities might range from simple but effective pit latrines, to flush toilets with sewerage. All facilities, to be effective, must be correctly constructed and properly maintained and available within the home or within 50 metres of the home. Shared or public toilets are normally not considered to be adequate.</p> <p>Adequate water supply services: facilities that provide a safe and reliable supply of water, of potable quality, within the home. To be regarded as safe, water must be free from harmful or distasteful contaminants, either naturally or as a result of treatment. Supplies must also be continuous (i.e. running for 24 hours per day) and sufficient to meet the needs of the user for drinking and hygiene. The minimum volume required may be defined as 20 litres per person per day.</p> <p>Adequate solid waste disposal facilities: regular and reliable services that provide for the collection (where appropriate) and safe disposal, of domestic solid wastes. Services might comprise: domestic solid waste treatment facilities (e.g. composting plants); domestic bin- or bag-collection systems; contained, community solid waste collection points (e.g. closed waste skips); or controlled solid waste disposal sites (e.g. contained community landfills or incinerators). Facilities should be available within a short walking distance (10 minutes) of the home.</p> <p>Note that households should have all three sets of services to be considered adequately provided. Thus households lacking any one of these facilities is considered inadequately served.</p> <p>Attributable change: the percentage (or number) of fewer or additional children living in households lacking basic services as a direct or indirect consequence of the intervention.</p>
<i>Data needs</i>	<p>Number of households with basic sanitation, water supply and waste disposal services</p> <p>Total number of children aged 0-14 years by household</p>
<i>Data sources, availability and quality</i>	<p>Data on service provision are usually available from the relevant service providers or their regulatory authorities (e.g. local authorities, environmental ministries). Where these data are lacking, special surveys may be necessary to estimate the extent of service provision for a sample of households.</p> <p>Data on the total number of children and number of households are usually available in aggregate form from national censuses, and should be broadly reliable. Alternatively, estimates can be made through sample household surveys.</p>
<i>Level of spatial aggregation</i>	Local authority district
<i>Averaging period</i>	Annual
<i>Computation</i>	<p>The indicator can be computed as the percentage difference in the rates of change between the intervention and control areas, as follows:</p> $100 * \{[(Clack/Ctot)_i - (Clack/Ctot)_j] / n_i\} - \{[(Clack/Ctot)_i - (Clack/Ctot)_c] / n_c\}$ <p>where: <i>Clack</i> is the number of children living in households lacking one or</p>

	<p>more of the basic services;</p> <p>C_{tot} is the total number of children aged 0-4 years</p> <p>t = current year and b = baseline (pre-intervention) year</p> <p>i = intervention area; c = control area</p> <p>n = number of years between current and baseline surveys</p>
<i>Units of measurement</i>	Percentage or percentage change per year
<i>Worked example</i>	<p>Assume that, for the intervention area, the baseline (pre-intervention) survey shows that 550 children from a sample of 1200 live in homes lacking one or more of the basic services, whilst the current (post-intervention) survey, four years later shows that 600 from a sample of 1880 children now live in homes relying on coal, wood or dung as the main fuel source for cooking and heating. Assume, also, that for the matched control area, the pre-intervention survey showed that 490 children from a sample of 1170 lived in homes without adequate basic services, while the post-intervention survey, also four years later, showed that 460 from a sample of 1190 children live in homes relying on coal, wood or dung as the main fuel source for cooking and heating. The value of the indicator is thus:</p> $100 * \left[\frac{(600/1880) - (550/1200)}{4} - \left[\frac{(460/1190) - (490/1170)}{4} \right] \right]$ $= 100 * \left[(0.319 - 0.458)/4 \right] - \left[(0.386 - 0.418)/4 \right]$ $= 100 * (-0.035 - -0.008) = -2.7 \text{ (i.e. a 2.7\% per year reduction in the number of children lacking basic amenities)}$
<i>Interpretation</i>	<p>This indicator provides a general measure of changes in potential exposures as a result of inadequate water supply, poor sanitation and poor hygiene in the home. A positive value indicates that the proportion of children potentially exposed has increased; a negative value indicates a reduction in potential exposure (and thus a reduced risk of illness).</p> <p>The extent to which these changes can be truly attributable to the intervention does, of course, need to be interpreted with caution. Many other events may contribute to the measured change, and if these are acting differentially between the intervention and control area they can seriously bias the indicator. Careful selection of the control area is essential to minimize this risk.</p>
<i>Variations and alternatives</i>	<p>As described above, this indicator requires before and after surveys in both the intervention area and a matched control area. For various reasons this may not be possible: because of cost, because the intervention is taking place everywhere (thereby leaving no suitable control areas), or because suitable baseline surveys were not undertaken before the intervention started. In these cases, a weaker version of the indicator can sometimes be computed, for example simply by comparing the proportions of children living in homes lacking basic amenities before and after intervention in the one area; or by comparing these proportions between intervention and control areas only at one moment in time, after intervention. Inevitably, however, the indicator is more difficult to interpret in these situations, because it becomes impossible to adjust for confounding by other factors, and thus to assess the amount of change actually attributable to the intervention.</p> <p>This indicator may be designed in different ways to reflect local circumstances and data availability. The range of basic services included, for example, and the level of service specified as a threshold, can both be varied according to need. In some cases (e.g. where the availability of the various services differs greatly or where policies are targeted at specific services), it may be more useful to define separate indicators for different amenities.</p>
<i>Examples</i>	None known, although many indicators of the current state of services and

	amenities are available (see related Exposure indicator).
<i>Useful references</i>	<p>UN 1996 <i>Indicators of sustainable development. Framework and methodologies</i>. New York: UN.</p> <p>WHO 1996 <i>Catalogue of health indicators: a selection of health indicators recommended by WHO programmes</i>. Geneva: WHO (under revision).</p> <p>WHO 1999 <i>Environmental health indicators: framework and methodologies</i>. Geneva: WHO. (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: WHO.</p> <p>WHO and UNICEF 2000 <i>Global water supply and sanitation assessment. 2000 report</i>. Geneva: WHO/UNICEF.</p>