

CHILDREN AGED 0-14 YEARS LIVING WITHIN REACH OF SPECIALIST EMERGENCY MEDICAL SERVICES

GENERAL CONSIDERATIONS	
<i>Issues</i>	Physical injuries
<i>Type of indicator</i>	Action
<i>Rationale</i>	Rapid access to emergency medical services is one of the main ways of reducing fatalities from injuries. Improvements of these services, therefore, represents one of the most effective means of action to reduce mortality amongst children. This indicator, therefore, provides a measure of access to emergency services.
<i>Issues in indicator design</i>	<p>The main problems in developing this indicator are the definition of specialist emergency health care and the measurement of travel times to the available facilities. Specialist care centres may take many forms, vary greatly in their quality, and differ substantially in terms of the range of services they offer, the numbers of people they can deal with, and their response times. The simple existence of such facilities, therefore, does not necessarily indicate that effective care is available.</p> <p>Estimation of travel time to specialist emergency health care requires the ability to define both the place of residence and the location of the care centre with some degree of accuracy, as well as the travel route and speed. With the help of GIS techniques, and with suitable georeferenced data, this is possible; where these data are not available, only rough approximations can be made. For these reasons, the indicator may be subject to major uncertainties.</p> <p>An age range of 0-14 years is used for the indicator, because risks extend throughout the early years of life and adolescence.</p>
SPECIFICATION	
<i>Definition</i>	Percentage (or number) of children aged 0-14 years living within 1 hour's travel time of specialist emergency health care.
<i>Terms and concepts</i>	<p>Specialist emergency health care: a hospital or other care centre providing a full range of accident and emergency facilities, including surgical treatment and intensive care.</p> <p>Living within 1 hour's travel time: living at a place of residence within less than one hour's travel time of the nearest specialist facilities, given available emergency transport facilities</p>
<i>Data needs</i>	<p>Location of specialist emergency medical facilities and associated road and air ambulance coverage.</p> <p>Numbers of children aged 0-14 by place of residence.</p> <p>Road network.</p>
<i>Data sources, availability and quality</i>	<p>Data on the location of health care facilities are generally available from the health services or ministry.</p> <p>Data on population distribution can usually be obtained from national censuses. Where census tracts are small, these may be sufficient to estimate the numbers of women of childbearing age within the specified travel time of the specialist health care facilities.</p> <p>Where these data are not of a sufficiently high resolution, it may be necessary to use modelling techniques to estimate the more local population distribution (e.g. on the basis of land cover type derived from satellite data, or land use maps).</p>

	Data on road networks may be available in a digital or map form (e.g. from mapping or highways agencies). Where data on population or transport facilities are unavailable, questionnaire surveys of emergency medical services may be necessary to estimate their population coverage.
<i>Level of spatial aggregation</i>	Census tract, community or health district
<i>Averaging period</i>	3-5 years
<i>Computation</i>	The indicator can be computed as a simple percentage, as follows: $100 * C_{near} / C_{tot}$ where: <i>C_{near}</i> is the number of children aged 0-14 years living within 1 hour's travel of an emergency medical department; <i>C_{tot}</i> is the total number of children aged 0-14 years.
<i>Units of measurement</i>	Percentage
<i>Worked example</i>	Assume that, within an area containing 210 300 children aged 0-4 years, 41 670 live within 1 hour's travel of a specialist maternal and perinatal health care facility. In this case, the value of the indicator is calculated as: $100 * 41\ 670 / 210\ 300 = 19.8\%$
<i>Interpretation</i>	Where reliable data exist, this indicator can be interpreted as a measure of the ease of access to emergency medical services. An increase in the indicator represents an improvement in accessibility; a fall in the indicator implies a reduction in accessibility. These changes can, of course, occur for different reasons: because of changes in the extent and availability of the services, or because of changes in population numbers and distribution. Care is also needed in interpreting the indicator because the existence of services within the specified travel time does not necessarily mean that it is freely accessible. In addition, variations may occur in the definition (and quality) of emergency medical services from one area to another, so that caution is needed in making geographical comparisons. Uncertainties may also be expected in the indicator, due to data limitations and the need to estimate travel times.
<i>Variations and alternatives</i>	The main variations that may be required in this indicator are in the way in which access is defined and calculated. The specification of 1 hour as the threshold for travel time is, for example, arbitrary; other thresholds may be more appropriate in some cases. Where travel times cannot easily be calculated, it may be more practicable to base the indicator on a distance measure (e.g. percentage of children living within 30 km of emergency medical facilities). Another alternative is to base the indicator on the average distance to the nearest emergency medical department. Both these alternatives can readily be estimated using GIS techniques. A simpler alternative is the average population-weighted density of the available services (i.e. number of people per facility); this, however, takes no direct account of proximity and is not sensitive to clustering of the services in certain (e.g. more affluent) areas.
<i>Examples</i>	None known
<i>Useful references</i>	American Academy of Pediatrics, Committee on Pediatric Emergency Medicine. 1995 Guidelines for Pediatric Emergency Care Facilities RE9536. <i>Pediatrics</i> 96 (3), 526-537. American Academy of Pediatrics, Committee on Pediatric Emergency Medicine. 1999. Emergency preparedness for children with special

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American College of Emergency Physicians Emergency care of children.
Fact Sheet. (Available at <http://www.acep.org/1,167,0.html>)

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