

**AT-RISK CHILDREN AGED 0-14 YEARS COVERED BY  
EFFECTIVE, INTEGRATED VECTOR CONTROL AND  
MANAGEMENT SYSTEMS**

| <b>GENERAL CONSIDERATIONS</b>     |   |
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| <i>Issues</i>                     | Insect-borne diseases   |
| <i>Type of indicator</i>          | Action  |
| <i>Rationale</i>                  | <p>Control of vector-borne diseases requires a varied and integrated approach. Prevention depends upon the implementation of appropriate development and land use strategies, which can reduce the extent of habitats for the disease vectors, or at least separate them effectively from human populations. Vector control programmes are needed to reduce or eliminate vector species (e.g. through use of insecticides). Treatment requires the existence of effective surveillance systems and treatment programmes, supported by adequate drug supplies. Programmes are needed to monitor drug and insecticide resistance. Education is also needed to help those concerned reduce their risks of exposure, recognize the symptoms of infection and follow the prescribed treatments effectively. This indicator is intended to evaluate the effectiveness of the available prevention, control and treatment systems.</p>   |
| <i>Issues in indicator design</i> | <p>This indicator can be defined and assessed in various ways. Possibly the most feasible and informative in many situations is to determine the percentage of children at-risk who are covered by effective and integrated vector prevention, control and treatment systems, by disease type. This requires the ability to define and recognize the existence and extent of effective programmes.</p> <p>As alternatives, the indicator might be separately defined for different types of programme (e.g. prevention, control, treatment), or by disaggregating these programmes into their constituent activities.</p> <p>Where treatment, rather than control, is the main focus of interest, an indicator might be developed to assess the number of treatment centres specifically equipped to deal with the vector-borne diseases of interest per thousand children at risk. In this case, treatment centres might be defined in terms of the availability of trained staff and continuous and adequate supplies of drugs. Alternatively, an indicator could be defined in terms of the proportion of the at-risk population inoculated against infection.</p> <p>Where avoidance and control are the focus of attention, an indicator might be developed in terms of either: a) the number of children living in endemic areas (a measure both of exposure and of the effectiveness of actions taken; or b) the area of endemic land which has been cleared of the disease vector.</p> <p>An age range of 0-14 years is used for this indicator, since treatment needs to be available across the age range, in order to deal with chronic as well as acute infections.</p> |
| <b>SPECIFICATION</b>              |   |
| <i>Definition</i>                 | Percentage (or number) of at-risk children covered by effective, integrated vector control and management systems.  |
| <i>Terms and concepts</i>         | <p><b>Vector-borne disease:</b> a disease which is transmitted by a biological agent (e.g. insects, snails, worms).</p> <p><b>Integrated vector control and management programme:</b> a programme</p>   |

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|   | <p>which is explicitly designed and implemented to control, manage and monitor vector-borne diseases at all relevant points of control, in a co-ordinated and integrated manner. Such programmes typically include actions to manage or remove habitats of the vector species, to control the vector species directly (e.g. by pesticides or biological controls), to educate and inform those most at risk, to provide early treatment to those at risk or affected, and to monitor the disease vectors (including their resistance to insecticides, drugs etc) and the effectiveness of the control programmes. Such programmes should usually include all of the following components:</p> <ul style="list-style-type: none"> <li>• <b>Vector control programme: a specific programme aimed at controlling the disease vectors, for example by use of pesticides, by introduction of biological controls (e.g. natural predators), habitat removal or by habitat management.</b></li> <li>• <b>Development controls: specific controls on developments aimed at avoiding the construction of potential habitats for vectors. These might include the need for impact assessment as part of the development process, or the enforcement of specific design standards for developments.</b></li> <li>• <b>Vector-borne disease surveillance programme: a system or programme for the routine monitoring and reporting of vector-borne diseases, operating over a sufficient geographic area, and at a sufficient frequency, to identify local/regional and short-term variations in disease incidence and prevalence.</b></li> <li>• <b>Education programme: a programme of education and awareness raising, aimed at improving public understanding of the risks of vector-borne diseases, and the avoidance/treatment strategies which individuals should adopt.</b></li> <li>• <b>Treatment programme: a specific programme of health care, aimed at early and effective treatment of the disease. This should include the availability of trained personnel with sufficient and continuous supplies of relevant drugs, with easy access to those at risk.</b></li> <li>• <b>Children at risk: children at risk from vector-borne disease, by virtue of living in an infected area.</b></li> <li>• <b>Children covered by an effective integrated vector-borne disease control and management systems: children living in areas where each of the above types of programme is in place and operational.</b></li> </ul> |
| <i>Data needs</i>                             | <p>Number of children aged 0-14 years at-risk.</p> <p>Number of children aged 0-14 years covered by effective vector control systems.</p>  |
| <i>Data sources, availability and quality</i> | <p>Reliable data on the at-risk population are difficult to obtain, but estimates can be made by analysis of national census data and information on the extent of the vector-borne diseases of interest. Where data on the extent of the endemic area are not directly available, estimates may be made on the basis of the distribution of potential vector habitats (e.g. using remotely sensed data). GIS techniques might usefully be applied in order to estimate the number of people living in the endemic area.</p> <p>Information on the extent and scope of management and control systems can best be obtained by examining relevant legislation and through direct contact with the health or other officials concerned. Where relevant data are not available, questionnaire surveys of relevant officials may be used.</p>  |
| <i>Level of spatial aggregation</i>           | <p>Region</p>  |

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| <i>Averaging period</i>            | Annual or longer term  |
| <i>Computation</i>                 | <p>The indicator can be computed as a simple percentage:</p> $100 * (C_{prog} / C_{tot})$ <p>where: <math>C_{prog}</math> is the number of children aged 0-14 years covered by an effective, integrated programme of vector-borne disease control and management;</p> <p><math>C_{tot}</math> is the total number of children aged 0-14 years at risk from vector-borne diseases.</p>  |
| <i>Units of measurement</i>        | Percentage   |
| <i>Worked example</i>              | <p>Assume that a country contains 1 600 000 children aged 0-14 years at risk from vector-borne diseases; assume further that effective, integrated vector control and management systems are in place, covering 730 000 of these children. In this case, the value of the indicator is:</p> $100 * (730\ 000 / 1\ 600\ 000) = 45.6\%$  |
| <i>Interpretation</i>              | <p>This indicator provides a general measure of the adequacy and effectiveness of the actions taken to control and treat vector-borne diseases (including insect-borne diseases). In general, an increase in the percentage of at-risk children covered by these programmes, the more effective the actions. As with all action-based indicators, however, it is important to make a distinction between the existence of strategies or programmes and their impact on the ground. For this reason, the indicator is best interpreted in association with indicators of effect (e.g. the mortality rate due to vector-borne diseases) or exposure (e.g. the number of children at risk).</p>   |
| <i>Variations and alternatives</i> | <p>This indicator can be further refined in a number of ways. One approach is to score vector-borne disease control programmes according to their degree of effectiveness: for example, one point might be given for each of the five components outlined above. In this case, the indicator can be computed as the product of the programme score (from 0 to 5) and the percentage of people covered:</p> $\sum (E_{prog_i} * C_{prog_i}) / C_{tot}$ <p>where: <math>E_i</math> is the effectiveness score for programme <math>i</math>;</p> <p><math>C_{prog_i}</math> is the number of children aged 0-14 years covered by that programme;</p> <p><math>C_{tot}</math> is the total number of children aged 0-14 years in the area.</p> <p>The indicator may also be designed in relation to specific vectors or diseases or only to insect-borne diseases; these are, however, less preferable because they tend to diminish the importance of proper integration of vector-borne disease control programmes, across all vectors and diseases. They may also be based on different age ranges of children, as appropriate.</p> |

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| <i>Examples</i>          | <p>WHO <i>Catalogue of health indicators</i></p> <ul style="list-style-type: none"> <li>• <b>Availability of anti-malaria drugs in health facilities</b></li> </ul> <p>WHO <i>Environmental health indicators: framework and methodologies</i></p> <ul style="list-style-type: none"> <li>• <b>Adequacy of vector control and management programmes</b></li> </ul>  |
| <i>Useful references</i> | <p>WHO 1994 <i>Information systems for the evaluation of malaria control programmes, a practical guide</i>. AFRO/CTD/MAL/ 94.3. Brazzaville: World Health Organization Regional Office for Africa.</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 <a href="http://www.who.int/docstore/peh/archives/EHIndicators.pdf">http://www.who.int/docstore/peh/archives/EHIndicators.pdf</a> )</p> |