WHO position statement on integrated vector management

World Health Organization

Introduction

Diseases transmitted by mosquitoes and other insect vectors continue to place a critical burden on the world's poor, particularly in tropical and subtropical areas. Malaria remains the most important vector-borne disease in public health, and the current intensification of malaria-control efforts includes the delivery of a package of vector-control interventions aimed at controlling transmission. Several other important vector-borne diseases are neglected tropical diseases, and *WHO's Global plan to combat neglected tropical diseases 2008–2015* addresses the challenges of delivering multi-intervention packages that include the promotion of integrated vector management (IVM).

Vector control strategies have a proven track record of successfully reducing or interrupting disease transmission when coverage is sufficiently high. Thus, vector control has an important part to play in reducing the burden of vector-borne disease, adding resilience to the public health gains achieved through disease management and giving high priority to prevention.

However, vector control also has proven weaknesses that are contextual in nature and relate especially to technical and managerial deficiencies and obstacles. It is well known that the development of insecticide resistance played a role in the breakdown of the malaria eradication campaign of the 1960s. But today we know how to better monitor and manage vector resistance. Similarly, we have learnt that significant success in the short-term may be a weakness because it can lead to premature diversion of resources. And we know that any particular intervention may not be suitable for every setting; additionally, over-reliance on a single intervention may undermine the flexibility needed by health services to use an adaptive management approach to the control of vector-borne diseases.

Bringing together different types of vector-control interventions is not simply a matter of adding them up. It requires careful consideration of synergies and antagonisms to achieve vector control goals in specific settings. It also requires reconsideration of these combinations over time, as contexts change and needs evolve.

Vector control is well suited for integrated approaches because some vectors are responsible for multiple diseases, and some interventions are effective against several vectors. The concept of IVM was developed as a result of lessons learnt from integrated pest management, which is used in the agricultural sector; IVM aims to optimize and rationalize the use of resources and tools for vector control.

This document outlines WHO's position on IVM to enable partners to work with countries, through various programmes, institutions and sectors, to jointly address the burden of vector-borne diseases.

What is integrated vector management?

IVM is "a rational decision-making process for the optimal use of resources for vector control". Its goal is to make a significant contribution to the prevention and control of vector-borne diseases.

Implementation of IVM requires institutional arrangements, regulatory frameworks, decision-making criteria, and procedures that can be applied at the lowest administrative level. It also requires decision-making skills that support intersectoral action and are able to establish vector control and health-based targets. The cost effectiveness of vector-control measures is central to IVM.

The important attributes of IVM are described below.

Cost–effectiveness

At the core of the IVM concept is the need to obtain maximum value for money. Like most health-sector programmes, vector control has to operate within budget constraints. This implies that the vector control measures selected to be used as part of the IVM approach need to be tested for their cost effectiveness, both individually and, taking into account possible synergies, collectively. For this reason, national vector control programmes must have the capacity to carry out cost-effectiveness analyses.

Intersectoral action

The environmental and social determinants of health change constantly as a result of decision-making that takes place outside the health sector. For instance, irrigation schemes change the environmental receptivity for vectors, new transport infrastructure allows parasites and vectors to travel greater distances, and population resettlement may introduce parasite carriers to receptive areas or to those who are not immune to pathogens transmitted by vectors. There are opportunities, within the context of IVM, to include measures undertaken by other sectors to help reduce transmission risks through project design, implementation and operation. Moreover, in other economically productive sectors, resources are often orders of magnitude larger than those available in the health sector.

Regulatory and operational measures

The intersectoral framework within which IVM must operate underscores the need for regulatory as well as operational measures. Traditionally, vector-control professionals have been predominantly operations-oriented. However, lessons from the environment sector show that results may often be achieved much more effectively and efficiently by regulating the actions of others. Establishing standards and norms that are supported by sound legislation gives vector-control programmes a strong instrument to engage others within the scope of IVM.

Subsidiarity

Vertical vector-control programmes, often exclusively based on chemical interventions, have a top-down decision-making structure and are often challenged by the need to obtain the cooperation of local communities. In IVM, the involvement of local communities is a critical element. Therefore, the concept of subsidiarity is a key component of IVM: it foresees decision-making at the lowest possible levels (that is, any decision-making higher up in the administrative structure than strictly necessary is subsidiary to local decision-making). This concept also reconfirms the need to assign different responsibilities to different levels: centrally, there should be a core group with strong technical capacities; regionally, there should be quality-control entities; and at the local level, the operational units should exist.

Decision-making

Decision-making on vector control actions at the lowest possible level requires criteria that are relevant to the local eco-epidemiological setting and the inclusion of those control measures that can be locally applied. Clearly, not all necessary expertise will be available at all times at all places, and therefore a regional or national core group should be able to provide technical support to local vector-control operators. Similarly, independent quality control of vector-control operations will be required to ensure that the health-based targets set for IVM are met in an optimal way. Responsibility for such quality control may be efficiently placed at the administrative mid-level – for example, with the provincial authorities.

Sustainability

In a natural-resource context, sustainability as defined by the World Commission on Environment and Development (1987) refers to intergenerational equity: the current generation should use natural resources to fulfil their needs in a way that will permit future generations to use them to fulfil their needs. This has a bearing on vector control, for example, when it comes to possible environmental modification, to the impact of the use of insecticides and the introduction of new species as predators of vectors in stable ecosystems. In addition, there is the need to ensure that vector control is economically sustainable. One of the weaknesses of global efforts to eradicate malaria through the use of indoor residual spraying was that it could be only a time-limited effort, since the level of investment required was impossible to sustain. This led to the premature reduction of activities and the rechannelling of vector-control resources to other health-sector priorities before the outcome of the effort was fully consolidated.

A growing need for IVM

The IVM approach to the control of vector-borne diseases is justified in the interests of global public health for the reasons stated below.

The health status of a population is strongly influenced by social and environmental determinants that are perpetually changing. IVM provides an opportunity to address these changes effectively in an intersectoral context as part of a broader plan to manage public health.

IVM will help consolidate and sustain public-health achievements that result from the investment in and scaling-up of the global malaria initiative.

Concerns about the environmental impact of over-reliance on chemical control methods continue to haunt policy-makers. The World Health Assembly and the Stockholm Convention on Persistent Organic Pollutants advocate reducing reliance on pesticides for vector control. IVM provides the wherewithal to reduce this reliance.

The arsenal of insecticides is limited, and there are few prospects for new candidate compounds coming to market. At the same time, there is a growing problem with insecticide resistance. The application of IVM principles to vector control will contribute to the judicious use of insecticides and extend their useful life.

Conclusion

Vector-borne diseases are responsible for 17% of the global burden of parasitic and infectious diseases. They result in avoidable ill-health and death, economic hardship for affected communities and are a serious impediment to economic development. IVM has an important part to play in controlling these diseases. WHO promotes these management principles as set out in the *Global strategic framework for integrated vector management*. This position statement is intended to support the advancement of IVM. Member States are invited to accelerate the development of national policies and strategies, which in some regions has already shown significant progress. International organizations, donor agencies and other stakeholders are encouraged to support the capacity strengthening necessary for implementation.

Key documents

Global plan to combat neglected tropical diseases, 2008–2015. Geneva, World Health Organization, 2007 (WHO/CDS/NTD/2007.3).

Global strategic framework for integrated vector management. Geneva, World Health Organization, 2004 (WHO/CDS/CPE/PVC/2004.10).

Mörner F, Bos R, Fredrix M. *Reducing and eliminating the use of persistent organic pesticides: guidance on alternative strategies for sustainable pest and vector management*. Geneva, Inter-organization Programme for the Sound Management of Chemicals, 2002 (available at http://www.chem.unep.ch/pops/pdf/redelipops/redelipops.pdf; accessed April 2008).