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Vector control

Major vector-borne diseases account for an estimated 17% of the global burden of all infectious diseases, and disproportionately affect poor populations. These diseases impede economic development through direct medical costs and indirect costs such as loss of productivity and impact on tourism.

The WHO South-East Asia Region bears the highest burden of some of the vector-borne diseases such as malaria and lymphatic filariasis and is among the highest burden for dengue. The Region is also reporting Zika virus disease and is at risk of introduction of new vector-borne diseases such as yellow fever. Outbreaks of dengue and chikungunya are increasing in frequency and intensity in many countries in the Region.

Health systems must be prepared to detect and respond quickly and effectively to eliminate, control and prevent the existing and emerging vector-borne diseases. In this regard a Global Vector Control Response (GVCR) was developed through a consultative process with active participation of the SEA Region.

The GVCR along with a resolution (resolution WHA70.16) was approved by the Seventieth World Health Assembly. The resolution urges Member States to develop or adapt existing vector control strategies to implement the GVCR, invest on human resources and strengthen national and subnational capacity. The resolution requests to consult Member States through the Regional Committee on developing regional action plans to implement and monitor the GVCR.

The attached working paper was presented to the High-Level Preparatory (HLP) Meeting for its review and recommendations. The HLP reviewed the paper and made the following recommendations for consideration by the Seventieth Session of the Regional Committee:

Actions by Member States

- (1) Collaborate in human resources development to fill the gap in trained entomologists in the Region.
- (2) Collaborate in the field of public health entomology, particularly in research and capacity-building.
- (3) Strengthen cross-border collaboration and alignment of vector control programmes in order to deal with vector-borne diseases.

Actions by WHO

- (1) Develop a comprehensive Regional Action Plan for Vector Control for consideration by the Member States after discussions at the Regional Committee.
- (2) Provide guidance in research and training for integrated vector control management.
- (3) Support capacity-building in Member States on public health entomology.

This Working Paper and the HLP Meeting recommendations are submitted to the Seventieth Session of the WHO Regional Committee for South-East Asia for its consideration and decision.

Introduction

Context

1. Social, demographic and environmental factors have led to an increase in many vector-borne diseases in recent years, with major outbreaks of dengue, malaria, chikungunya, yellow fever and Zika virus disease since 2014. Major vector-borne diseases account for an estimated 17% of the global burden of all infectious diseases, claiming more than 700 000 lives every year and disproportionately affecting poor populations. More than 80% of the global population lives in areas at risk from at least one major vector-borne disease, with more than half at risk from two or more. The risk of infection for certain viral pathogens is particularly high in towns and cities where *Aedes* and *Culex* mosquitoes proliferate, because of favourable habitats and their close contact with human beings. Major outbreaks of dengue, malaria, chikungunya and yellow fever are afflicting populations, claiming several lives and overwhelming health systems in many countries. These diseases impede economic development through direct medical costs and indirect costs such as loss of productivity and tourism.

2. Most vector-borne diseases are preventable by vector control, if well implemented. The full impact of vector control, however, is yet to be achieved owing to inadequate delivery of interventions and limited investments resulting from a dire lack of public health entomology capacity, poor coordination within and between sectors, weak or non-existent monitoring systems and limitations in the number of proven tools for interventions.

3. The transmission dynamics and risk of vector-borne diseases are rapidly changing due to unplanned urbanization, increased movement of people and goods, environmental changes, and biological challenges such as vectors emerging resistant to insecticides and evolving strains of pathogens. Health systems must be prepared to detect and respond quickly and effectively to these changes. Such a response requires not only the availability of effective, evidence-based control interventions, but also well-trained staff who can build sustainable systems for their delivery. Flexible vector control delivery and monitoring systems that support approaches tailored to local contexts are urgently needed along with new tools and approaches. To achieve these goals, reforming vector control programmatic structures are urgently needed.

4. In this regard a Global Vector Control Plan was developed through a consultative process with active participation of the SEA Region. The plan along with the attached resolution (resolution WHA70.16) was approved by the Seventieth World Health Assembly. The resolution urges Member States to develop or adapt existing vector control strategies to implement the global plan, invest on human resources and strengthen national and subnational capacity.

Objectives

5. The objectives of the Global Vector Control Response (GVCR) are to:
- reduce mortality due to vector-borne diseases globally (by at least 30% by 2020, 50% by 2025 and 75% by 2030 relative to 2016);

- reduce case-incidence due to vector-borne diseases globally (at least 25% by 2020, 40% by 2025 and 60% by 2030 relative to 2016); and
- prevent epidemics of vector-borne diseases (in all countries without transmission in 2016 by 2025 and in all countries by 2030).

6. The resolution requests that Member States be consulted through the Regional Committee on developing regional action plans to implement the GVCR and to monitor its implementation.

Regional context

7. The WHO South-East Asia Region bears the highest burden of some of the vector-borne diseases such as malaria and lymphatic filariasis and is among the highest for dengue. The Region is also reporting Zika virus disease and is at risk of introduction of new vector-borne diseases such as yellow fever. Outbreaks of dengue and chikungunya are increasing in frequency and intensity in many countries in the Region. However, the Region is challenged by an acute shortage of entomological capacity to effectively control and prevent vector-borne diseases. This is the first time vector control has been looked at holistically in an integrated manner unlike disease-specific approaches in the past. Effective implementation of the GVCR in Member States would accelerate the progress of eliminating diseases such as malaria and lymphatic filariasis and would strengthen the capacity to control and prevent diseases such as dengue, chikungunya and Zika virus disease. Moreover, there are strong institutions in the Region that could take up the regional/global leadership role in training to build entomological capacity, undertake research and support implementation of the GVCR in the Region and beyond.

Current situation and challenges

8. Multiple interconnected challenges impede the progress against vector-borne diseases. Threats to effective vector control can be grouped as systemic, structural, informational, environmental, political, financial, ethical, and arising out of human movement. Systemic challenges include insufficient capacity for vector surveillance and control in most countries at risk of vector-borne diseases. Structural challenges include disease-specific programmes in many countries that are endemic for more than one major vector-borne disease and strategies that do not optimally leverage synergies, sometimes competing for resources. Limited evidence base to support effective vector control for most vector-borne diseases due to lack of research support is an informational challenge.

9. Increased global human population movement due to current travel patterns, migration for employment, or displacement resulting from humanitarian crises, as well as increased global trade are likely to accelerate the introduction of invasive species or exotic pathogens into receptive areas and expose non-immune populations to new infections and disease. This has emerged as another major challenge in controlling vector-borne diseases. Political and financial challenges include inadequate financial support to implement and sustain vector control. Ethical concerns are noted in some of the vector control methods and their implementation, including those with novel interventions.

Strategic issues relevant to the Region in adoption and implementation of GVCR

Implications for policy development

10. Priority activities are set out with clear time-bound implementation targets. GVCR requires intersectoral and private sector coordination mechanisms, including inter-ministerial task forces and workforces to strengthen vector management. Investing in entomological capacity including training existing and new staff, and establishing or strengthening effective entomological surveillance systems are key elements of the response. Vector control has linkages to several of the Sustainable Development Goals including Goals 1, 3, 6, 11, 13 and 17.

Proposed actions

11. Effective and locally-adaptive vector control systems depend on two fundamental elements: (i) enhanced human, infrastructural and health system capacity within all the locally relevant sectors involved in vector surveillance and vector control, monitoring and evaluation; and (ii) increased basic and applied research to underpin optimized vector control, and innovation for development of new tools and approaches.

12. Both elements are required to ensure maximum impact of sustainable vector control by using an evidence-based approach in planning and implementation. Action is required in four key areas (pillars) to attain effective locally adapted and sustainable vector control. These four areas are aligned with integrated vector management, and include:

- (i) Strengthening inter- and intra-sectoral action and collaboration: Effective coordination of vector-control activities is required between health and non-health sectors (e.g. other ministries and authorities, development partners, and the private sector) as well as within the health sector (e.g. national malaria and other vector-borne disease programmes, water, hygiene and sanitation initiatives, and health management information systems section). This will maximize efficiencies, have greater impact than isolated, uncoordinated activities and harness the diverse capital available in various areas.
- (ii) Enhancing vector surveillance and monitoring and evaluation of interventions: Vector control must be implemented on the basis of up-to-date local data generated by appropriate methods. Vector surveillance involves the regular and systematic collection, analysis and interpretation of entomological data for health risk assessment, and for planning, implementing, monitoring, and evaluating vector control.
- (iii) Scaling up and integrating tools and approaches: This is a key action to maximize the public health impact of vector control through the deployment and expansion of interventions appropriate to the epidemiological and entomological context. Proven and cost-effective vector control interventions include long-lasting insecticidal nets, indoor residual sprays, space sprays, larvicides and environmental management for specific target vectors.

- (iv) Engaging and mobilizing communities: Community engagement and mobilization requires working with local residents to improve vector control and build resilience against future disease outbreaks. Implementation of the GVCR will require strengthening of three key areas, i.e. country leadership; advocacy, resource mobilization and partner coordination; and regulatory, policy and normative support.

The way forward

13. For tracking progress at national and regional levels in implementing the GVCR, progress indicators are suggested at the national and regional level. Priority activities in this direction are (i) conducting or updating the national vector control needs assessments and developing the resource mobilization plan (including for outbreak response); (ii) developing or adapting national and regional vector control strategic plans aligned with the GVCR; and (iii) establishing the national agenda for basic and applied research on entomology and vector control or reviewing its progress.

Conclusions

14. There was an overwhelming agreement on the need of and support for a regional action plan on vector control owing to the high burden of vector-borne diseases in the Region and increase in frequency and magnitude of outbreaks. Member States noted the acute shortage of entomological capacity in the Region and emphasized the need to build capacity and strengthen entomological surveillance and vector management based on an integrated vector management framework. In view of this, the Regional Office will:

15. Undertake vector control needs assessment in all Member States.

- Prepare an inventory of entomologists, vector control experts and institutions in the Region with the capacity to undertake training and research.
- Develop a regional action plan for vector control in line with the Global Vector Control Response.
- Support Member States to adapt or develop national action plans in line with the regional action plan.
- Support Member States to build entomological capacity and vector management at the national and subnational level.
- Promote research and generate evidence for informed decision-making at the local level.

Global vector control response: an integrated approach for the control of vector-borne diseases

The Seventieth World Health Assembly,

Having considered the report on global vector control response;¹

Appreciating the work of the Secretariat in developing, through broad consultation with Member States and members of the global health community, a comprehensive global vector control response 2017–2030,² which served as the basis for the report;¹

Acutely aware of the burden and threat of vector-borne diseases to individuals, families and societies throughout the world, and the influence of social, demographic and environmental factors, including climate change and other climate- and weather-related factors, and increasing vector resistance to insecticides and the spread of mosquitoes and other vectors to unaffected areas;

Recognizing the need for cooperation to prevent, detect, report on and respond to outbreaks of vector-borne diseases so as to avoid a public health emergency of international concern under the International Health Regulations (2005);

Noting the recent gains that have been made against malaria, onchocerciasis, lymphatic filariasis, Chagas disease and others, as well as previous failures and existing challenges, and that lessons learned could be used for other vector-borne diseases;

Recognizing the need for an integrated, comprehensive approach to vector control that will enable the setting and achievement of disease-specific national and global goals, and that will contribute to the attainment of the Sustainable Development Goals, to addressing the social determinants of health and to tackling health inequities;

Deeply concerned by the current limited capacity and capability for vector control globally, and in particular the acute shortage in public health and development programmes of personnel with skills in public health entomology,

1. WELCOMES the strategic approach for integrated global vector control and response, as articulated in the report and its Annex;

¹ Document A70/26 Rev.1.

² The full draft document can be accessed at <http://www.who.int/malaria/global-vector-control-response> (accessed 15 May 2017).

2. URGES Member States:¹

(1) to develop or adapt, as appropriate, existing national vector control strategies and operational plans to align them to the strategic approach for integrated global vector control and response, as summarized in the report,² and consistent with the International Health Regulations (2005);

(2) to build and sustain, as appropriate, adequate human-resource (especially public health entomology), infrastructural and institutional capacity and capability at all levels of government and across all relevant sectors, based on a vector control needs assessment;

(3) to promote basic research on vectors and their transmission of pathogens, and applied research on vector control tools, including biological tools, technologies and approaches to evaluate their impact on disease, socioeconomic development, human populations and the environment; and to assess how to integrate them with vaccines, medicines and other interventions;

(4) to promote collaboration in line with the “One Health” approach and the integrated vector and communicable disease approach, as appropriate, across all levels and sectors of government, including municipality and local administrative structures, and with the engagement and mobilization of communities through organized stakeholder groups;

(5) to strengthen national and subnational capacity, as appropriate, for vector surveillance, forecasting and intervention monitoring, including for vector pesticide resistance, and the impact of pesticides on environmental and human health, and to integrate them with public health surveillance systems;

(6) to strengthen and engage in cross-border and regional collaboration by means that include networks in line with the International Health Regulations (2005) in order to build adequate capacity for prevention, surveillance, control and response for vector-borne diseases;

(7) to collaborate, as appropriate, with international, regional, national and local institutions and non-State actors from relevant sectors to support and contribute to the implementation of WHO’s strategic approach for integrated global vector control and response;

3. REQUESTS the Director-General:

(1) to continue to develop and disseminate normative guidance, policy advice and implementation guidance that provides support to Member States¹ to reduce the burden and threat of vector-borne diseases, including to strengthen human-resource capacity and capability for effective locally adapted sustainable and ethically sensitive vector control;

¹ And, where applicable, regional economic integration organizations.

² Document A70/26 Rev.1.

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- (2) to continue to promote research on vector-borne disease systems and development of innovative products, methods, tools, technologies and approaches, and to support the generation of evidence-based knowledge on their safety, efficacy and impact on disease, socioeconomic development, human populations and the natural environment;
 - (3) to review and provide technical guidance on the ethical aspects and issues associated with the implementation of new vector control approaches in order to develop mitigating strategies and solutions;
 - (4) to undertake a review of the ethical aspects and related issues associated with vector control implementation that will include social determinants of health, in order to develop mitigating strategies and solutions to tackle health inequities;
 - (5) to disseminate widely, and update as appropriate, technical guidance on integrated vector control for all relevant vector-borne diseases, especially as new evidence-based knowledge becomes available for improved and novel products, tools, technologies and approaches;
 - (6) to strengthen the capacities and capabilities of the Secretariat at the global, regional and country levels and ensure that all relevant parts of the Organization across all three levels are actively engaged to lead a coordinated global effort that includes collaboration with other bodies of the United Nations system and other intergovernmental agencies for better implementation of vector control;
 - (7) to develop, in consultation with Member States and through regional committees, as appropriate, regional action plans aligned with WHO's technical guidance on vector control, including the priority activities as described in the report;¹
 - (8) to provide support to countries to develop and/or update national vector control and vector-borne disease control strategies aligned to the strategic approach for integrated global vector control and response and, as appropriate, to other ongoing communicable disease control strategies and emergency responses to outbreaks;
 - (9) to monitor the implementation of the strategic approach for integrated global vector control and response, and report back on its impact and the progress made towards the milestones and targets at the Seventy-fifth, Eightieth and Eighty-fifth World Health Assemblies.

Tenth plenary meeting, 31 May 2017
A70/VR/10

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¹ Document A70/26 Rev.1.