PROVISIONAL STRATEGY FOR INTERRUPTING LYMPHATIC FILARIASIS TRANSMISSION IN LOIASIS-ENDEMIC COUNTRIES

REPORT OF THE MEETING ON LYMPHATIC FILARIASIS, MALARIA AND INTEGRATED VECTOR MANAGEMENT

LYMPHATIC FILARIASIS

ACCRA, GHANA, 5–9 MARCH 2012

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World Health Organization

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Printed by the WHO Document Production Services, Geneva, Switzerland.

WHO/HTM/NTD/PCT/2012.6

Contents

1. Background **1**

2. Objectives of the meeting **1**

3. Provisional strategy for eliminating lymphatic filariasis transmission in loiasis-endemic countries **2**

3.1 Current situation: globally and in the WHO African Region 2

3.2 Provisional strategy for eliminating lymphatic filariasis in areas where loiasis is co-endemic 4

3.3 Country situations and national action plans 6

3.4 Next steps 9

4. User opinions on the "Manual on entomology of lymphatic filariasis" **9**

5. Integrated vector management: experiences in Africa **10**

6. Conclusions and recommendations **11**

Annex 1. List of participants **13**

Annex 2. Programme of work **16**

Annex 3. The Accra Strategy (provisional strategy)

Statement recommended by the meeting on the implementation strategy for lymphatic filariasis elimination programmes in countries where loiasis is co-endemic **19**

1. Background

The Global Programme to Eliminate Lymphatic Filariasis targets the global elimination of lymphatic filariasis as a public-health problem by 2020. The main strategy is to interrupt transmission through integrated preventive chemotherapy, using mass drug administration to treat entire populations at risk of the disease, with a combination of albendazole plus ivermectin or albendazole plus diethylcarbamazine administered as a single dose once a year for at least 5 years.

Because ivermectin or diethylcarbamazine can cause serious adverse effects in people infected with *Loa loa* causing loiasis (African eye worm), an endemic disease in a large part of central Africa,[1] the current guidelines for preventive chemotherapy contain no recommendation for areas where lymphatic filariasis and loiasis are co-endemic but where onchocerciasis is hypo-endemic or non-endemic. Consequently, mass drug administration to eliminate lymphatic filariasis using the combination of medicines recommended by the World Health Organization (WHO) could thus far not be implemented in these communities. In order to meet the 2020 goal, it has become urgent to develop an alternative strategy for interrupting transmission of lymphatic filariasis adapted to the specific situation of co-endemicity with *Loa loa*. This strategy could potentially include both medication and vector control.

The milestones for the Global Programme to Eliminate Lymphatic Filariasis 2010–2020 stipulate that by 2012, a provisional strategy for interrupting lymphatic filariasis transmission in loiasis-endemic countries should have been developed; and that by 2013, a revised strategy for interrupting lymphatic filariasis transmission should have been implemented in all loiasis-endemic countries.[2]

In June 2011, a preliminary meeting on *Loa loa* in Lusaka, Zambia, proposed the following provisional strategies for eliminating lymphatic filariasis in areas where *Loa loa* is co-endemic: integrated vector management as the main strategy, and mapping of lymphatic filariasis and *Loa loa* at the lowest possible administrative level to potentially identify small areas that can be treated for lymphatic filariasis.

2. Objectives of the meeting

The meeting convened experts in lymphatic filariasis, malaria and integrated vector management to discuss how multiple disease programmes (for lymphatic filariasis and malaria) could be implemented to achieve elimination of lymphatic filariasis. Participants included country representatives of national programmes for elimination of lymphatic filariasis and control of malaria from Angola, Cameroon, the Central African Republic, Ghana and Liberia (Annex 1). The objectives of the meeting were:

> to identify an alternative strategy for elimination of lymphatic filariasis in areas where loiasis is co-endemic but whose populations are not eligible for treatment with ivermectin to control onchocerciasis; and
>
> to develop strategic action plans with Member countries for implementing integrated vector management of lymphatic filariasis and malaria in areas where lymphatic filariasis and loiasis are co-endemic.

[1] Zouré HGM et al. The geographic distribution of *Loa loa* in Africa: results of large-scale implementation of the rapid assessment procedure for Loiasis (RAPLOA). *PLoS Neglected Tropical Diseases*, 2011, 5(6):e1210.

[2] *Progress report 2000–2010 and strategic plan 2010–2020 of the Global Programme to Eliminate Lymphatic Filariasis: halfway towards eliminating lymphatic filariasis*. Geneva, World Health Organization, 2010 (WHO/HTM/NTD/PCT/2010.6).

The expected outcomes of the meeting were:

a global strategy (provisional) for interrupting transmission of lymphatic filariasis in loiasis-endemic countries;

a draft action plan for the national programme to eliminate lymphatic filariasis, specifying next steps and key partners providing support to the programme; a draft "Manual on practical entomology in lymphatic filariasis"; and

success stories of integrated vector management in the African Region, in collaboration with RTI International/United States Agency for International Development.

Annex 2 provides the programme of work for the meeting.

3. Provisional strategy for eliminating lymphatic filariasis transmission in loiasis-endemic countries

3.1 Current situation: globally and in the WHO African Region

Mapping of the distribution of lymphatic filariasis is a prerequisite to starting national elimination programmes. In WHO's African Region, some countries have yet to initiate mapping (Chad and Eritrea) and 10 countries are in the process of mapping (Angola, Cameroon, the Central African Republic, Côte d'Ivoire, the Democratic Republic of the Congo, Ethiopia, Liberia, Nigeria, Zambia and Zimbabwe).

In 2010, mass drug administration had not yet been implemented in 15 countries of the African Region with lymphatic filariasis (Angola, Central African Republic, Chad, the Congo, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Gabon, Gambia, Guinea, Guinea-Bissau, Liberia, Sao Tome and Principe, Zambia and Zimbabwe), and South Sudan and Sudan (in WHO's Eastern Mediterranean Region).

Of the 34 countries in the African Region where lymphatic filariasis is endemic or suspected to be endemic, 9 countries (Angola, Cameroon, the Central African Republic, Chad, the Congo, the Democratic Republic of the Congo, Equatorial Guinea, Gabon and Nigeria) are co-endemic for both lymphatic filariasis and loiasis. In WHO's Eastern Mediterranean Region, South Sudan is co-endemic for lymphatic filariasis and loiasis. Hence, most countries with co-endemicity for both diseases have neither completed mapping nor implemented mass drug administration for lymphatic filariasis.

During 2006–2011, the WHO Global Malaria Programme reported major advances in the African Region in increasing the percentage of households owning at least one long-lasting insecticidal net or covered by indoor residual spraying, in providing personal protection and in interrupting malaria transmission. This success, combined with improved diagnosis and treatment of cases, has significantly reduced morbidity from malaria and malaria-specific mortality. Nevertheless, the development of insecticide resistance, the use and maintenance of distributed nets and the decline in funding are growing challenges for the programme.

Integrated vector management, defined as a rational decision-making process to optimize the use of resources for vector control, aims to increase the efficacy, cost effectiveness, ecological soundness and sustainability of vector control. As a result of recent WHO consultations, three guidance documents have been published to assist countries in implementing integrated vector management: a handbook, a core curriculum and guidance on policy-making. Although national policy on integrated vector management is available in half of African countries, the mandate to implement policy remains weak.

A key intervention for elimination of onchocerciasis is community-directed treatment with ivermectin. To interrupt transmission, annual treatment with ivermectin should be continued for as many years as the prevalence of nodules reaches the breakpoint.

Loiasis is a vector-borne disease caused by *Loa loa* worms transmitted through the painful bite of deer flies, *Chrysops* spp., which inhabit tropical forested environments. Treatment with ivermectin commonly administered in programmes to eliminate lymphatic filariasis and control onchocerciasis has the potential to cause serious adverse events (e.g. encephalopathy) in patients with heavy *Loa loa* infection, particularly where *Loa loa* eye worm prevalence exceeds 40%. It is therefore essential to map the distribution of *Loa loa* to assist in benefit–risk assessments for decision-making. WHO's rapid assessment procedure for *Loa loa* (RAPLOA) is based on the collection of information from the community on the presence of the eye worm. The African Programme for Onchocerciasis Control has completed RAPLOA mapping of the level of prevalence and identified 10 countries at high risk of loiasis: Angola, the Congo, the Central African Republic, Cameroon, Chad, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, Nigeria and South Sudan.

The Mectizan Expert Committee scientific working group on *Loa loa* has published guidelines on mass drug administration with ivermectin in co-endemic areas, based on benefit–risk assessments. Because mass drug administration for lymphatic filariasis elimination has no direct benefit to the patient, it is not worth the risk of organizing any ivermectin-based mass treatment for lymphatic filariasis elimination in areas of loiasis that are associated with a high risk of serious adverse events. In areas where ivermectin can be used in mass drug administration, capacity-building on preparedness for serious adverse events for prompt case detection and adequate management is required. To date, of serious adverse events have been reported mainly from two countries: Cameroon and the Democratic Republic of the Congo.

Research has demonstrated that a single annual dose of albendazole (400 mg) resulted in acceptable reductions in levels of lymphatic filariasis microfilariae[3] and the efficacy is greater at higher doses,[4] suggesting that albendazole alone can be used to interrupt transmission of lymphatic filariasis. More robust community trials are under way to confirm the effectiveness of albendazole alone on lymphatic filariasis (the DOLF – death to onchocerciasis and lymphatic filariasis – project).

Some of the recommendations of the scientific working group were: (i) to establish an integrated database for mapping of lymphatic filariasis, onchocerciasis and loiasis in order to assess the mapping gaps and the risks; (ii) to use single-dose albendazole (400 mg) twice a