

Neglected tropical diseases in Africa: a new paradigm

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Programmes to control onchocerciasis have been ongoing for over 40 years. What was once a devastating blinding and disabling disease, particularly in West Africa, has largely been eliminated at least as a public health problem. Efforts continue to eliminate the transmission of the disease. However, as the elimination agenda has developed so have efforts to control/eliminate other neglected tropical diseases (NTDs). The African Programme for Onchocerciasis Control will close at the end of 2015. There has been considerable discussion as to what should replace it and the World Health Organization Africa Region has been consulting widely during the first part of 2015 and has established a new project framework that will be presented to a wider group of stakeholders to mobilise support with the aim of the coordination of NTD activities in the region. This will be called the Expanded Special Project for Elimination of Neglected Tropical Diseases (ESPEN). This will put the countries in the driving seat but offer technical advice, capacity building and financial support, where needed, to enable countries to implement their NTD Master Plans, and also to implement recommendations of the Regional Programme Review Group. An NTD forum will be held periodically to consult with stakeholders.

Keywords: Africa, APOC, Expanded Special Project for Elimination of NTDs, Lymphatic filariasis, Neglected tropical diseases, Onchocerciasis

Introduction

The WHO Africa Regional Office (AFRO), under their new Regional Director Dr. Matshidiso Rebecca Moeti, has been consulting widely with countries and other stakeholders to create a new neglected tropical disease (NTD) coordinating programme, the Expanded Special Project for Elimination of Neglected Tropical Diseases (ESPEN), which will be based in Brazzaville. This programme will assume oversight of the current activities of the African Programme for Onchocerciasis Control (APOC), which will close in December 2015. However ESPEN represents a paradigm shift from a vertical programme targeting primarily one disease to country owned programmes also targeting the other preventive chemotherapy (PC) diseases: lymphatic filariasis (LF), trachoma, soil transmitted helminths (STH) and schistosomiasis. The emphasis of this new programme will be on scaling-up mass drug administration (MDA) for all PC diseases according to national NTD Master Plans. The NTD Master Plans are strategy plans but need complementing with annual plans of action. Where funding has been available, school-based programmes for STH and schistosomiasis have developed. Some countries have been able to distribute intermittently without outside funding but coverage has generally been low. It is hoped with the coordination by ESPEN these other PC NTDs will get the boost they need. Trachoma has benefitted from considerable funding recently both for mapping

and implementation and continues as a vertical programme although with differing levels of integration into primary health care. There will also be an emphasis on proving success, particularly for the diseases where elimination of transmission is possible, i.e., onchocerciasis and LF, or in the case of trachoma with the elimination of blinding trachoma. Countries that will benefit most from ESPEN will be those that have not yet started control or elimination programmes or are struggling to scale-up activities.

The APOC has been a successful programme for the control of onchocerciasis in Africa and has now demonstrated evidence of elimination of transmission in some foci. Evaluations are ongoing to see if treatment can be stopped in eight African countries in 2015/16. However, it was felt that after 40 years of two onchocerciasis programmes covering the continent it was time to change the emphasis. Onchocerciasis programmes need to be part of national NTD programmes. Endemic countries need to take more ownership, including responsibility for funding their programs, and for implementation of their endemic NTD programmes (e.g., decisions on treatment strategies including when to start and stop treatment, using WHO guidelines). Funding organisations also require more flexibility either donating to a trust fund, to countries, or through non-governmental development organisations (NGDOs), etc. All these funding streams need coordinating to make sure that there is no double funding, or that some countries are not left without any support. Although details for this new entity

are still to be finalised by all stakeholders, the general objectives, priorities and working concepts have been agreed and will be the basis for the final programme objectives and plan. Because this will take some time to organise a transitional plan has been developed to assure ongoing activities during the setting-up phase.

The Onchocerciasis Control Programme and the African Programme for Onchocerciasis Control

Control programmes for onchocerciasis (caused by the parasite *Onchocerca volvulus*) have been ongoing in Africa for over 40 years.¹ The first programme, the Onchocerciasis Control Programme (OCP), eventually operated in 11 countries in West Africa and was based on vector control. This was the only strategy possible in 1974 when the programme began. *O. volvulus* larvae (microfilariae) are transmitted to new hosts by the bites of the vector, mostly *Simulium damnosum* s.l. The principle of OCP was to control the vector until the adult parasites in the human host died and there were, therefore, no more microfilaria (larvae) in the skin that could be transmitted to new hosts even when the vector returned. A new strategy became possible in 1987 using annual treatment with ivermectin that can clear the skin of microfilariae for up to 6 months. With the donation of Mectizan® (ivermectin-MSD) by Merck & Co. Inc., (Kenilworth, NJ, USA), MDA was added to the strategy in some sites of OCP. Outside of the OCP area, NGOs, mostly those working in eye care, used the opportunity of the donation to start mass treatment with ivermectin in some of the worst areas of onchocercal blindness, which was often where they were working in blindness rehabilitation. Although the skin manifestations of onchocerciasis were well known, its impact in terms of morbidity and effects on social and family life were not understood.²

MDA was a new concept. Community diagnostic methods had to be developed and criteria for starting treatment of whole populations had to be established. These were new concepts in the late 1980s. By 1994 most areas where there was severe blinding onchocerciasis were under treatment, but it was clear the NGOs had more or less reached their technical and financial limits, and a more wide reaching organisation was needed. Negotiations between WHO, World Bank, endemic countries and NGOs eventually led to the creation of APOC, a partnership formalised at the first Joint Action Forum (JAF) in December 1995.³⁻⁵ APOC was a control programme, and even in 2003 elimination of transmission of the disease in Africa was not thought possible⁶ except in certain foci. The mandate of APOC was the elimination of onchocerciasis as a public health problem and the creation of sustainable distribution of ivermectin to affected communities. It was thought that ivermectin might have to be distributed annually for 10 to 20 years, but it was not really known, and it soon became clear that the period of treatment depended on the initial prevalence of the disease and the coverage with MDA. APOC undertook major research, mostly with the Special Programme for Research and Training in Tropical Diseases (TDR) to create an evidence base for national strategies.⁷ Research included mapping of the disease and moving from rapid epidemiological assessment to rapid epidemiological mapping of onchocerciasis (REMO) which enabled programmes to define simple trigger points for identifying areas for treatment.⁸ TDR and APOC also developed and tested the concepts of community directed treatment with ivermectin (CDTI),

which gave responsibility to endemic communities to run their own programmes after suitable mobilisation and training.⁹⁻¹² The APOC programme also had vector elimination in its mandate, but only in certain foci, and this was implemented in areas where *Simulium neavei* was the vector and also on the Island of Bioko in the Gulf of Guinea where the vector was confined to the island.¹³

Scale up of MDA has continued each year in the countries in the APOC programme, including in some of the difficult areas of Africa in remote and post-conflict situations.¹⁴⁻¹⁶ However, after a few years, questions were asked about how long treatment needed to be continued and what would happen if treatment was stopped. Experience from the Americas in small isolated foci had shown that transmission could actually be interrupted. It was not clear if this could be repeated in the different epidemiological situations in Africa. Early studies in West Africa on the Senegal Mali border showed evidence that transmission had probably been interrupted in areas that had been under treatment for 16 years or more. Follow up studies showed that stopping treatment was possible as transmission had been interrupted in those areas.^{17,18} Further studies in Kaduna State in Nigeria, an APOC country, confirmed the same finding.¹⁹ These research findings led to consultations in February 2009 on the feasibility of the elimination of transmission of onchocerciasis in Africa.²⁰

The principle of the 'elimination of transmission where possible' was accepted by the JAF of APOC. In some areas where prevalence levels were not too high and coverage with MDA has been good, this could probably be achieved by 'business as usual' with ongoing annual MDA with ivermectin. However, with elimination as a target, there is the need to review current strategies;^{21,22} for example, to consider expansion of treatment in hypoendemic areas of onchocerciasis where MDA has not occurred as blindness and serious skin disease are not important in these areas. For elimination these areas will now need to be re-evaluated. Similarly, there are some areas where transmission is still ongoing after several years of treatment and alternative strategies are necessary. Ivermectin sterilises the skin temporarily but in areas of high prevalence skin repopulation becomes important. To interrupt transmission the skin must be kept permanently clear. Twice yearly treatment will interrupt the transmission cycle by keeping the skin clear and preventing re-infection of *Simulium*. No new adults will enter the system and those already present in the host will gradually die off. Although APOC has reviewed alternative strategies, due to financial and other constraints these have not been implemented.²³

Neglected tropical diseases in Africa

Progress in NTD control or elimination in the African region has been very patchy. Some countries have benefited from financial and technical support to carry out integrated drug distribution over several years through bilateral funding arrangements although implementation has often been coordinated through NGOs. However, other NTD endemic countries lack this technical and financial support. Generally, STH and schistosomiasis control are carried out using school-based systems whereas LF, onchocerciasis and trachoma require community-wide treatment of all eligible populations. Other countries have adopted maternal and child health days (or weeks) when various endemic diseases

are targeted using vaccinations, deworming and vitamin A supplementation. Some of these activities have targeted only pre-school children, but some have included school-aged children as well. The coverage of MDAs as reported to WHO in their Third Report (page 53) show some scaling up but many countries have not sufficiently scaled up to reach 2020 targets.²⁴

Mapping of NTDs has not yet been completed although it is hoped all basic maps of the PC NTDs will be completed by the end of 2015. Meanwhile, what is completed has been published and made available as a mapping tool.²⁵ Trachoma mapping has benefited from sufficient funding for mapping globally and is mostly already available for Africa.^{26,27} LF mapping also has some important gaps but major progress has been made recently and maps are available for much of Africa.²⁸ These maps will inform intervention strategies, including those for treatment.

LF elimination in Africa uses the same drug as onchocerciasis, ivermectin, together with albendazole for MDA. Combining ivermectin with albendazole is one of the most effective strategies for control of STH. There have been some major successes in integrated PC treatment in some countries in Africa,^{29,30} but it is in those countries with outside financial support³¹ or in a research setting. APOC was funded for the onchocerciasis areas and could easily add on albendazole but it in most cases did not have funding for expansion into the whole implementation area for LF.

Although APOC carried out coordinated MDAs, coordination with other national strategies for school-based treatments, or maternal and child health programmes, was not always optimal. In 2012, the APOC JAF agreed a draft concept note for a new programme in Africa called the Programme for the Elimination of Neglected Diseases in Africa (PENDA) which would have integrated NTD efforts in the AFRO region. However, in 2014 concerns were raised around the budget and financing mechanisms of PENDA as well as its structure and position within the AFRO NTD department and how PENDA would fit with countries NTD master plans.

WHO made a decision, which was communicated to the Committee of Sponsoring Agencies (CSA; the 'executive committee' of APOC) and the JAF in December 2014, that APOC should be closed at the end of 2015 as planned and it would be replaced by a new NTD programme. An ambitious programme of consultations with stakeholders was arranged starting in January 2015, and continuing under the leadership of the new regional director of AFRO, leading to the creation of a framework for the new programme following the last consultation in Geneva in July 2015 (WHO AFRO. Draft Framework for the establishment of the Expanded Special Project for Elimination of Neglected Tropical Diseases. NTD Department WHO AFRO Brazzaville Rep of Congo. Unpublished; 2015). The new framework is ESPEN and the emphasis of this new framework will be a basic coordinating mechanism to respond to countries' needs for funding, capacity building and technical assistance to implement their national NTD master plans and respond to the recommendations of the AFRO NTD Regional Programme Review Group, responsible for making recommendations to countries to achieve results both within countries, and across the region.

Funding for programmes would be flexible. Some countries could receive direct bilateral funding; others could obtain funds through a trust fund to be set up probably at the World Bank. These funds could be earmarked for specific countries or activities or be available for countries requiring special assistance not provided from other sources.

During the transition period of 2016, continued emphasis would be put on maintaining MDA for all PC NTDs as well as establishing success with elimination of onchocerciasis in the eight countries where APOC considers elimination of transmission to have been achieved, or probably achieved. Transmission assessment surveys for LF will also be facilitated in implementation units where LF transmission has probably been eliminated. ESPEN will have focal points for STH/schistosomiasis, onchocerciasis/LF and trachoma, as well as for data management and resource mobilisation. These posts will be created during the transitional period but will be part of the final framework. It has been emphasised in discussion that the disease-specific focal points will be polyvalent so that they will be able to give advice on any programmatic issues related to any of the PC diseases.

The Expanded Special Project for Elimination of Neglected Tropical Diseases (ESPEN) goal

The goal, objectives and scope of the new programme are best explained directly by the draft framework provided below.

Taking into account the full advantage of effective donated medicines, the goal of ESPEN is to contribute to an accelerated reduction in the burden of disease of the five PC NTDs by providing technical support to endemic countries in their efforts to control and eliminate targeted NTDs, including morbidity management and prevention of disabilities due to PC NTDs, and thereby contributing to poverty alleviation, productivity and improved quality of life of affected people in the African Region. The ESPEN will have a life span of 5 years from 2016 to 2020. The first year will be a transition period for the establishment of ESPEN.

Objectives

As a special project responsible for technical support planning and management, its objectives are as follows:

1. Support achievement of the NTD goals and targets through the provision of technical assistance to national governments, in collaboration with other stakeholders;
2. Assist in capacity building of national and regional experts to provide relevant high quality technical support;
3. Encourage a harmonised approach in the delivery of technical support;
4. Provide support to countries to scale up their implementation and identify funding opportunities.

Scope

The ESPEN will address all five PC NTDs (LF, onchocerciasis, schistosomiasis, STH and trachoma) and function as the technical arm of the Regional Office on PC NTDs, aimed at improving access to timely, high quality short-term and longer-term technical assistance for achieving the PC-NTD set goals and targets for preventive chemotherapy, morbidity management and disability prevention in countries of the WHO African region. The entity will also contribute to resource mobilisation and promote collaboration with other sectors, such as water, sanitation, hygiene and environment, to achieve the NTD elimination goals. The case management NTDs will remain under the direct responsibility of the AFRO NTD programme.

Stakeholder's role in developments of NTDs strategy and implementation in Africa

These roles have been defined in the Framework Document but just a few are highlighted below.

WHO

WHO AFRO will serve as the secretariat of ESPEN, and will continue to support national programmes. WHO will continue to provide technical guidelines and the RPRG will continue to be the main technical advisory group providing guidance to countries and to ESPEN on implementation of preventive chemotherapy. A number of task forces will be convened in order to advise on specific technical issues.

National programmes

NTD programmes are national programmes. Countries in AFRO have developed master plans and work on annual plans of action. This national leadership is critical to the development and sustainability of programmes. However, it is not just about planning. In December 2014, during the week of various NTD meetings in Addis Ababa, The Hon. Minister of Health Dr Kesetebirhan Admasu took the initiative in what is now the Addis Ababa NTD Commitment, which emphasises five actions: increase domestic funding; promote a multi-sectorial approach; ensure long range strategies and annual implementation plans; report data in a timely fashion so it can be used for planning; and ensure NTDs contribute to health system strengthening.³² These indicate real ownership of the programmes by countries. Ethiopia is one of the few countries that have set up their own Onchocerciasis Elimination Advisory Committee, which working with national and international experts has developed plans to speed up the elimination of transmission of the disease by introducing alternative therapies (twice yearly treatment) as well as improving the laboratory facilities to increase the diagnostic capabilities in line with WHO guidelines. The LF national programme is part of this committee and similar committees to coordinate ivermectin distribution with the LF elimination plan.

Non-governmental development organisations

In the APOC structure, NGDOs had a role as defined in the programme document at both the international and policy level and at the national level as part of the national onchocerciasis task forces, working with governments and communities to develop and implement their national plans. NGDOs will have a seat on the Steering Group of ESPEN. There will be discussions with NGDOs involved in water, sanitation and hygiene (WASH) activities, and with groups working on different aspects of morbidity management and disability to promote a multi-sectorial approach. AFRO will convene a forum on NTDs but this will not be part of the governance structure. At the country level, it is envisaged that NGDOs will play an active part in the NTD programme country coordination mechanisms, which will be adapted to each countries' needs, and will continue to offer technical, logistical and financial support where possible and within their respective mandates and agreements with governments.

Funding partners

One of the key aspects of the new NTD programmes is the flexibility of the funding mechanisms. It should be stressed again that

domestic financing will be a major part of the programme. A trust fund is being created and this will help to fund the organisation of ESPEN and some country activities, but there will also be direct bilateral funding. An important element of the funding is to ensure good coordination so that double funding is avoided and 'orphan countries' that do not attract bilateral funds will still be able to implement their programmes.

Challenges for ESPEN

Funding

Funding for countries will depend on various funding mechanisms to implement their activities. This includes for most countries a significant increase in domestic funding. Most countries with APOC programmes have received regular contributions from the APOC Trust Fund but this will change. Whatever funding that will be available from ESPEN will be for specific countries with special needs or for special activities. The initial request for the first year of ESPEN is for a minimum of US\$6 million to cover costs at WHO AFRO and for basic support to countries.

Administration

ESPEN is meant to be an administratively 'light' organisation with a small staff so that most funding will go to implementation. The balance between staff and administrative costs and funds allocated to implementation needs to be kept under close review.

Technical assistance

The staff of ESPEN will be small. Good use must be made of skills available throughout Africa in academia or in other implementing organisations to outsource the tasks and make sure assistance to countries is given in a timely manner.

Elimination and scaling up

Scaling up school-based programmes requires different strategies to the specifics of targeting elimination. LF, onchocerciasis and trachoma require community wide strategies with high coverage. STH and schistosomiasis, where elimination strategies are not yet well defined, require good school-based coverage for control. These differences will need good coordination at the country level.

Integration

Activities do not only need to be coordinated but, for sustainability, need to be fully integrated into the primary health care system. A vertical programme may work for a short 3–5 year MDA programme as in trachoma or LF but the longer term morbidity management requires sustained input from the community and primary health care system. Likewise, long term MDA, as with onchocerciasis, requires a sustained programme. The APOC programme has worked hard at strengthening the health system from the bottom up and has largely succeeded but to be really successful it is necessary to include NTD control in the package of activities undertaken and reported on through the primary care system, including water and sanitation improvements, which tend to be more long-term and costly.

Conclusions

In December 2015, the Nobel Prize for Physiology or Medicine will be shared by Youyou Tu for her discoveries concerning a novel therapy against malaria, Professor Satoshi Omura from Japan who identified various samples of fungi and to Dr William Campbell who led the development of one of these samples into what is now ivermectin. Ivermectin led the way with onchocerciasis control but other medicines are now equally available for MDA for NTDs, and a new era in public health for the most disadvantaged. Africa has generally lagged behind other continents in the implementation of NTD programmes. Although some countries have made progress, others have only patchy success due to lack of funding or working in difficult areas. The year 2016 will see major changes in the WHO Africa region for support to NTD programme implementation. ESPEN will be established as a technical and funding body responding to needs of all endemic countries for the implementation of their PC programmes. Stakeholders will be actively involved through a regular forum on NTDs and by participation on the Steering Committee. NGOs will continue to support and play an active part in the process and the coordination of the different organisations through the NTD NGDO network as ESPEN evolves.

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