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AFRICAN PROGRAMME FOR
ONCHOCERCIASIS CONTROL

The WHO African Programme for Onchocerciasis Control Final Evaluation Report

October 2015

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World Health Organization

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Acknowledgements

The evaluation team is extremely grateful to the many persons who made this evaluation possible. Foremost is Dr Chris Mwikisa who unceasingly moved the planning forward, especially when the pro-cess seemed stalled. His work, along with that of Ms Diallo-Palenfo helped with the complex travel and notification arrangements. The staff of APOC was very helpful, in particular Daniel Boake, Grace Fobi, and Pascal Soubeiga. In the Républic du Cameroun we appreciated the reception of the WHO repre-sentative Jean-Baptiste Roungou and his team as well as staff from the Ministry of Public Health. We express appreciation to Dr Jean-Marie Vianny Yameogo, the WHO representative for the Republic of Chad, the Directeur Général Adjoint des Activités Sanitaires and his team. We are indebted to Dr Kupa Mukengeshai Secretaire Général of the Ministry of Health and Dr Déo Nshimirimana and their staff in the Democratic Republic of the Congo. In the Republic of the Congo the team is grateful for help from Dr Fatoumata Binta T. Diallo, WHO Representative. The evaluation team appreciated the support of Dr Pierre M'Pele K the WHO representative and Kadu Meribo, NTD programme officer for the MoH in the Federal Democratic Republic of Ethiopa. The team expresses its appreciation to by Professor Oben-gui, Director DGLEM, Dr Fatoumata Diallo, WHO representative, in the Republic of Congo (Brazza-ville) who made available their time and the assistance of their staff to the evaluators. The assistance of Dr Storn Kabuluzi, Director of Preventive Health services and Dr Eugene Nyarko the WHO representa-tive was excellent in the Republic of Malawi. In the Federal Republic of Nigeria, Dr Saka made all the arrangements the team needed. Dr Okoeguale, Director, Department of Public Health in the Federal Ministry of Health was gracious in supporting the team's requests. The Minister of Health, Honorable Dr. Elioda Tumwesigye spent a long time with the evaluation team in the Republic of Uganda. The WHO Representative Dr Alemu was generous with logistical support. His contributions in understand-ing programme perspectives were much appreciated. In Geneva, WHO HQ and TDR staff were most helpful with enquiries, as were representatives from USAID, DfID, the World Bank, CBM, The Carter Center, Helen Keller International, MITOSAH, Sightsavers, MDP. The evaluation team is indebted to the many individuals who gave their time towards the accomplishment of its activities. The full listing of people interviewed in the course of this evaluation is found in Annex 4.

Abbreviations

AFRO	WHO Regional Office for Africa
APOC	African Programme for Onchocerciasis Control
CDTI	Community-Directed Treatment with Ivermectin
CDD	Community Drug Distributor
CSA	Committee of Sponsoring Agencies
DfID	Department for International Development
DTC	Direct Transfer of funds from APOC to recipient countries
ESPEN	Expanded Special for Elimination of Neglected Tropical Diseases
IPSAS	International Public Sector Accounting Standards
JAF	Joint Action Forum
LF	Lymphatic Filariasis
LGA	Local Government Area (Nigeria)
MDA	Mass Drug Administration
MDP	Mectizan Donation Program
MDSC	Multi-Disease Surveillance Centre (Ouagadougou)
MoH	Ministry of Health
NGDO	Non Governmental Development Organization
NOTF	National Onchocerciasis Task Force
NTD	Neglected Tropical Disease
OCP	Onchocerciasis Control Program
OEPA	Onchocerciasis Elimination Program for the Americas
PCR	Polymerase Chain Reaction test
PCT	Preventive ChemoTherapy
PHC	Primary Health Care
PTS	Post Treatment Surveillance
REMO	Rapid Epidemiological Mapping of Onchocerciasis
RAPLOA	Rapid Assessment for Loa
STH	Soil Transmitted Helminths
TCC	Technical Consultative Committee
TDR	Special Programme for Research and Training in Tropical Disease (WHO)
WB	World Bank
TOR	Terms of Reference
USAID	United States Agency for International Development

Executive summary

Introduction

The African Programme for Onchocerciasis Control (APOC) was established in 1995 with the World Bank as the fiscal agent and the World Health Organization as the executive agency. APOC started in transition from the Onchocerciasis Control Programme (OCP) with the goal of eliminating the public health and socioeconomic consequences of onchocerciasis. Its work encompassed 19 (later 20) countries. These were countries where blindness was less common than in the OCP countries, but disabling and disfiguring skin disease was common. It was to achieve its goal using a self-sustaining (later sustainable) approach. The use of Community directed treatment with Ivermectin (CDTI) was selected as the primary treatment approach distribution through health facilities and outreach programmes had failed to achieve adequate coverage. For 20 years APOC provided assistance to countries to establish sustainable CDTI programmes to empower communities to take responsibilities for their care. The success of this approach can be measured by the number of other interventions which have utilised this method. This laid the ground work for countries to move into integrating programming for other neglected tropical diseases (NTDs), although some countries have included additional disease control programs in this approach.

Final evaluation of APOC

The final evaluation was carried out at the request of the Committee of Sponsoring Agencies (CSA). The objective of the evaluation was to assess the effectiveness; efficiency; impact; sustainability; and lessons learned from the conception, design, management of APOC programme over the past years and make available to its stakeholders relevant data and information, which can inform follow-on onchocerciasis and NTD control programming.

Specific objectives

- **To assess the effectiveness and the efficiency of the programme**
- **Analyze the programme's wider impact and application of lessons learnt**
- **Identify best practices**
- **Formulate conclusions and make recommendations to stakeholders**

Conduct of the evaluation

Methods for the evaluation started with a desk review of relevant and available documents. Interviews were conducted with key stakeholders in countries visited as well as in the international community. Field visits included discussions with distributors, supervisors, frontline health workers and community leaders. Visits were made to Cameroon, Chad, The Democratic Republic of the Congo, The Federal Republic of Nigeria, The Republic of Uganda, The Republic of Malawi, and the Federal Republic of Ethiopia. The evaluation was conducted in August and early September 2015. In October the draft report was circulated and comments incorporated into the final report. Further interviews were carried out in Geneva, London and Washington DC. The Evaluators were Sam Zaramba (Uganda), Innocent Takougang (Cameroon), Komla Siamevi (Togo) and Gilbert Burnham (USA).

Findings

Efficiency, effectiveness and achievement of objectives

APOC developed began with a clear understanding of the needs to control the public health consequences of onchocerciasis in the non-OCP areas, with an efficient three-year transition from OCP. The start-up of activities was rapid and effective, helping countries create the necessary mechanisms and procedures for effective programming. Where countries lacked the human and material resources, APOC undertook to assist in an effective manner. This assistance was provided in many ways. The rapid provision of vehicles, from light trucks to motorcycles and bicycles enabled ivermectin mass drug administration (MDA) to scale up quickly.

The largest contribution was in the support of human resource training. This took on a massive scale with initial or refresher training of tens of thousands of community distributors each year. Thousands of front line health workers were also trained annually in the monitoring and supervision of community distributors. While national governments, local governments, Non Governmental Development Agencies (NGDOs) implemented the training, it was structured, coordinated and overseen by APOC. The strong and effective start-up provided solid basis for implementation of the objectives set out in phase one, phase two and the phase out period.

Much of the effectiveness of the APOC implementation was due to the rapid scale of up Community Directed Treatment with ivermectin (CDTI). This approach been developed through collaboration with the Tropical Disease Research unit within WHO HQ, and this partnership further refined the methods. The effectiveness of this programme can be demonstrated by the disappearance of onchocercal blindness, and the virtual absence of skin disease manifestations in the programme areas. Regrettably, no indicators were established at the beginning of the programme to measure achievement of these goals.

Goals and objectives targets and principles

Phase one (1995-2001)

The goal of phase one of the project was to establish in a period of 10-15 years effective and self-sustainable (later sustainable) community-based ivermectin treatment the remaining (non OCP) endemic areas of African and to eliminate the disease by vector control in selected foci. This has been almost completely achieved, with the uncompleted areas being unstable, difficult to treat because of heavy infections with *Loa loa*, or with indifferent national treatment programmes. Even in these areas many believe that enough treatment has generally occurred to reduce microfilarial counts to a point where there is little burden of disease.

The second part of the goal delivery of ivermectin through a sustainable community based approach, has been achieved through its partners. Governments have contributed heavily in human resources and through their health systems, though less in monetary support than had been envisioned. The NGDO partners have made excellent and sustained contributions in most countries. While sustainable, this requires a concerted and consistent effort, and extensive resources, which APOC with its country partners has been able to achieve.

APOC has followed carefully the operating principals set out in phase one. It developed standard operating procedures and guidelines with the participating countries for a national onchocerciasis task forces (NOTF) along with assessment, data capture, monitoring and reporting mechanisms. In Augmenting support of national governments and NGDOs, the material and human resource training and support provided has one of the most extensive areas of assistance provided. In applied and operational research the partnership with WHO/TDR has provided a wealth of information which has helped direct the programme to make it more effective. The principle of independent monitoring and evaluation of programmes has been consistently followed with independent evaluations in 2000, 2005, 2010, and a management review in 2014. The provision or strengthening of national staff was done conscientiously through short course training, masters' level sponsorship, seconding of staff and through support of WHO country offices. In 2012, 77,721 persons were trained for onchocerciasis control. This support was frequently cited by national programme staff interviewed. The final working principle of selected vector eradication has been applied successfully in Tukuyu (United Republic of Tanzania) Bioko Island (Equatorial Guinea), and Itwara and Mpamba-Nkusi foci in Uganda.

The objectives and working principles of Phase 2 (2002-2007) and phase out (2008-2015) are considered together

1. Establishment of sustainable onchocerciasis control programmes in all endemic African countries was the first objective for these two phases. This was certainly achieved. Maintaining these programmes is the agreed responsibility of governments. Generally this was done, with varied amounts of committed government funds actually allocated. Civil unrest, and lack of political will decreased the effectiveness of established programmes. Where NGDOs were active, they were important implementation partners.
2. The second objective was the co-implementation of onchocerciasis control with other disease control activities. This was a stated aim from the beginning of APOC. While this was widely done in countries with integrated NTD activities, there were some characteristics of other programmes which made a match-up difficult. Lymphatic filariasis programs were the most compatible. Some national coordinators felt APOC support for integration of NTD programmes was slow in the beginning. Established APOC systems and procedures provided the basis for integration of NTD programming in most countries, and in particular CDTI structures.
3. A third objective was to provide assistance to countries in stopping ivermectin treatment. This is largely still in process at the end of APOC. The lack of a clear plan for follow on epidemiological and entomological support with the closure of APOC puts this objective at risk. This is a time when several countries probably could be celebrating success. Underlying the uncertainty now is a fundamental failure of APOC to undertake a comprehensive assessment of resources and structures required to support the change in paradigms from control to elimination. The failure to adequately manage cross-border transmission complicates elimination plans in some countries such as Uganda and Malawi.
4. Reduction of the risk of transmission in ex-OCP countries was an objective that addressed surveillance through 152 surveillance sites in six countries. Recent data show no or very low transmission ongoing. In addition, APOC has supported control activities in Sierra Leone, Guinea Bissau, Ghana and Cote d'Ivoire through 2012.
5. A critical fifth objective was the devolution to national governments of onchocerciasis control activities. While governments were always the primary partners, the sustainability objective of governments assuming the majority of the financial support was seldom achieved. Governments did assume active programme management and effectively so in most counties there was a dependency on financial transfers from APOC. If the human and other resource contribution from governments had been costed, then this might have provided a balanced view of costs. In some cases NGDOs were able to pick up costs where governments failed.

6. The sixth APOC objective was to cease activities without jeopardizing past activities. The evaluation team felt this may not be achieved. The failure of a well-planned transition plan to ESPEN is of concern. Some countries have expressed concern about meeting distributions targets in 2015/2016. Activities around stopping treatment requiring technical support lack continuity plans. The failure to encourage countries to develop individual elimination plans and not promoting regional sharing of technological and human resource support contributes to the uncertainty among national coordinators. Although transfer of some data from APOC is underway, it is uncertain if the full historical record of OCP and APOC will be adequately accessible.
7. An additional two activities were voted by JAF 12. These were first, mainstreaming gender in APOC activities and providing adequate material and human resource support to APOC. While awareness was effectively promoted through careful data disaggregation for community distributors and training was more gender focused, there was a limit to changes which would be implemented. A second additional objective was to provide sufficient management support. An independent management review was conducted in 2014, which made recommendations for improving utilization of resources, particularly as leading up to the anticipated transition to PENDA.

Principles of work for Phase two and the Phasing-out period

Principles of work included for these phases were similar in some respects to phase one, particularly in community empowerment for ivermectin distribution and sustainability. In phase two there was continued emphasis on evidence-based decision making, though APOC lagged in incorporating newer approaches such as alternative treatment strategies and improved mapping and surveillance methods. APOC continued to recognize partnerships as critical to the success of implementation. The presence of NGDOs was limited in some countries, and APOC worked hard to build participation with local civil societies for MDA activities. Relationships with donors seemed to cool in the past several years. Evaluation or verification of treatments and assessment of geographic and therapeutic coverage was generally well done. There was some concern that the REMO maps of many years ago in some locations were no longer valid given demographic and populations changes over subsequent years.

Functional elements of the programme

Relevance. The basic concept of APOC as a partnership between countries and their communities, WHO, donors, NGDOs and the Mectizan Donation Programme for the control of onchocerciasis was a strong design which continues to remain relevant beyond.

Governance. The established governance structure with the Joint Action Forum as the governing body meeting once yearly, and the Committee of Sponsoring Bodies reviewing plans of actions and budget and the Technical Consultative Committee reviewing technical and research issues. There was a general respect for this orderly systematic and organized structure, even though it entailed many meetings. Organizationally APOC while part of AFRO sometimes was functionally more aligned with WHO HQ. Its leadership scientists were admired for their commitment and dedication as well as technical skills. With time it was perceived that APOC management style had become more top-down, somewhat rigid and not open to alternative approaches or utilizing the technical capacities which developing in participating countries. The organization structure itself, while functioning well, was perhaps more suitable to an earlier time, rather than the more horizontal current programme approaches.

Programme management. APOC was managed competently. Its contribution to building human capacities through training and secondments was very much appreciated. Material contributions APOC to strengthen health systems was providing support for MDA by communities was acting responsibly, and appreciated. Provision of transport was a key factor in the effectiveness of distribution. Relations with NGDOs was good both at the programme and the national level. Programme management used program and research data generated to strengthen decision making.

Sustainability. Some initial confusion was created with the term self-sustainability. APOC helped countries create a sustainable model for ivermectin delivery empowering the community. While this sometimes a management-intensive activity, it was nevertheless an effective strategy, and within the capacities of countries to manage. While countries committed to support MDA in their countries, and did provide extensively in resources both in personnel as well as funding, the level of monitory contributions was a disappointment in many countries. The NGDOs have been very active in sustaining MDA, and in several countries have used the CDTI approach for other programmes.

Programme results. The overarching goal of elimination of onchocerciasis as a public health problem working with participating countries has been essentially achieved, with exception of conflict affected areas and areas lacking political will. A consistent problem has been in areas with high prevalence of *Loa loa*. This most notably has been the Democratic Republic of Congo, and forest areas of Cameroon, where treatment is being held up in areas awaiting a strategy for treatment in areas at risk of serious adverse events following ivermectin treatment. For most areas within participating countries, therapeutic coverage has consistently exceeded 80% and in many countries geographic coverage is close to 100%.

Financial support. In all, some USD 109,868,426 has been provided to countries either in the form of equipment, for DTC field activities or various administrative or technical purposes over the life of APOC. The largest sums ($21 million) went to Nigeria and the Democratic Republic of the Congo (Kinshasa). This was followed by the Republic of Cameroon (US$ 11 million) and the Republic of Tanzania (USD 10 million). Financial assistance came largely from Trust Funds and from AFRO, the Mectizan Donation Program and the Bill and Melinda Gates Foundation. Very little came from the private sector, except in Malawi where the Tea Association has been a steady contributor. Peak years of dispersal were 2010 (USD 10 million) and 2011 (USD 11 million). Amounts by country and year are in Annex 1.

Research. While most operations research has been carried out through the WHO/TDR agreement, additional research has been carried out through universities and other organizations. Countries such as Uganda developed their own research agenda, much of it directed toward elimination. Examples have been the initial development and later refinement of the CDTI approach, creation of the REMO nodule mapping to delineate, and RAPLOA as a community prevalence estimate of *Loa loa*. The ONCHOSIM model has been an important tool in predicting length of treatment required with ivermectin. APOC has used these findings for programme management consistent with its stated practice principles.

Key conclusions

1. APOC has achieved its goal of elimination of onchocerciasis as a public health problem working through participating countries, excepting where unrest, lack of participation, and high prevalence of loiasis have supervened. APOC has achieved this through a sustainable community based approach which has empowered communities for their own health. Use of this model has allowed other mass treatment approaches to more effectively reach communities. Urban areas still provide a challenge for MDA.
2. The Trust Fund mechanism with the World Bank has worked extremely well in the allowing allocation of funds according to needs of countries. With time some of the original donors dropped out and it was difficult to meet all programme requirements with remaining funds. The failure of some endemic countries to allocate funds that had been committed and budgeted, was a major disappointment.
3. APOC has been able to recruit very able and committed leadership and scientists who have made programme achievements possible.
4. The approach APOC chose has built human capacity and strengthened health systems in participating countries.
5. Creation of the National Onchocerciasis Task Force, programme indicators, monitoring and evaluation methods, human resources and standard training curricula was a far-sighted approach. These provided the basis for the subsequent development of national NTD programming in many countries.
6. The research commissioned by APOC was used to improve implementation and greatly expanded knowledge of onchocerciasis and effective and efficient treatment methods.
7. The NGDOs have been major contributors to the success of APOC, particularly at the community interface, and in training activities. However, NGDOs and their activities have been unevenly spread among the 20 countries. Recruitment of national civil society organizations to participate in MDA has been not been very successful, with some notable exceptions.
8. The shift in APOC's paradigm from control to elimination was done without a comprehensive appraisal. This was a missed opportunity to consider alternate treatment approaches, to some devolve technical and management capacities to countries and sub-regional groupings, and to restructure the programme to be more collaborative and horizontal. Instead, many noted that the programme became more top-down and less adaptable to changing circumstances. Countries that did develop their own elimination plans and individual treatment strategies felt disapproval from APOC.
9. The lack of a transition phase from APOC to ESPEN is of concern. Much of the technical skill and institutional knowledge concerning mass treatment across countries using standard approach will probably be lost. This may create serious gaps as NTD treatments move to their next phase.

Key Recommendations

1. Several countries and a number of foci may be ready to stop ivermectin treatment. These need to be verified and then, as appropriate, celebrated and major achievements. All countries should develop their individual onchocerciasis elimination plans, with assistance as required. Loiasis will be a major barrier to stopping treatment in some countries. The continued rapid pace of new developments in this areas should be translated into programming methods for affected areas to hasten the progress toward stopping treatment.
2. Moving forward, the mobilization of resources will be done on a country level, and countries, with their stakeholders and NGDOs, need to be developing country plans to acquire and sustain needed resources. Increasingly activities such as maintaining the CDTI assets will be country responsibilities.
3. ESPEN should carry out a details situational analysis of onchocerciasis treatment in participating countries to develop a planning strategy. This will include a systematic mapping approach to supplement the older REMO morbidity-based map which do not reflect the many changes which some countries have experienced. Costing out the activities required for elimination, in human and financial terms will help to understand the challenge. Consideration should be given to alternative and innovative approaches to treatment and to monitoring to improve efficiency and effectiveness.
4. Sub-regional technical resources can be shared, especially in the area of training and laboratory resources. This needs to be organized soon and can provide assistance in areas such as epidemiology and entomology where assistance is needed now.
5. Cross-border foci are a major problem for some countries working toward elimination. These need to be addressed by building cooperation at local levels, the more high level approaches implemented by APOC having not been very successful.
6. NGDOs have proven key partners, and their role may well be larger in the future. NGDO coalitions may plan an increasingly important role in resource mobilization at the country level. A challenge is to improve relations with governments where there is an underlying suspicion of non-governmental activities.
7. Alternative approaches to centrally-manged trust funds may be needed as the World Bank changes its policies.
8. Continuing support from AFRO will be required for human resource capacity building and health systems strengthening. AFRO must assume responsibility for the storage and accessibility of the great APOC/OCP library of information as well as specimen libraries. Use of historical data is increasing important as elimination planning progressing and problem areas such as loiasis are being addressed with new tools.
9. Among many country programme personnel there is uncertainty about the future on onchocerciasis control with the closure of APOC. Communicating future plans should be done without delay.
10. The governance process for APOC was appreciated by many. Developing an open and transparent approach with adequate country representation is important.
11. Fragile states will continue to frustrate treatment programs. Alternative approaches to these situations should continue to be explored.

PART 1: APOC

1. Introduction

1.1. APOC

In 1995 the African Programme for Onchocerciasis Control (APOC) took up activities from the Onchocerciasis Control Programme (OCP), as ivermectin (Mectizan) became freely available from Merck and TDR studies had shown the effectiveness of Community Directed Treatment with Ivermectin (CDTI). APOC functioned through a partnership among governments, communities, non-governmental development organizations (NGDOs) with the World Bank as the fiscal agent and the World Health Organization as the executive agency. Assistance was provided to endemic countries to develop national onchocerciasis control programmes. Some 19 countries (now 20) have participated. Five countries that were initially part of OCP (Benin, Guinea Conakry, Sierra Leone, Ghana and Togo), where onchocerciasis control activities were stalled and more treatment needed as a result of specific epidemiological circumstances and civil unrest, joined APOC as Special Intervention Zones. The prime objective of the programme was the elimination of the public health consequences of onchocerciasis in a funding partnership with participating countries. The methods to be used were "self-sustaining"– later changed to "sustainable" community directed treatment programmes. By 2009, data from Senegal and Mali as well as the experiences in the Americas helped shift APOCs focus toward elimination.

APOC evaluations were carried out in 2000, 2005 and 2010. With the decision to close APOC at the end of its planned period of operations in 2015, a final evaluation was agreed in December 2014 and terms of reference developed. Following the acceptance of a technical and financial proposal by the Committee of Sponsoring Agencies (CSA), the final evaluation commenced in August 2015. The evaluation was conducted during August and September 2015, with visits to nine endemic countries. Countries selection was purposeful. Criteria included treatment coverage, programme efficiency, areas with urban transmission and the prospects of stopping treatment. Visits were successful in all countries save Angola, where local issues caused cancellation.

2. Terms of Reference

2.1. General objective of the evaluation

The general objective of this end-of-programme evaluation is to assess the effectiveness, efficiency, impact, sustainability, and lessons learned from the conception, design, and management of APOC Programme. One of the intents would be to make available to its stakeholders relevant data and information, to inform the transition to the Expanded Special Project for the Elimination of Neglected Tropical Diseases (ESPEN). In this the hope is that this information will assist in the efficient delivery of mass drug administration for the elimination of 5 PCT NTDs in an integrated manner.

Specific objectives of the evaluation are as follows:

- To assess the effectiveness and the efficiency of the programme and the extent to which it has achieved planned or stated objectives
- Analyze the Programme's wider impact and advise how lessons learnt from the programme could inform future programming.
- To identify best practices and describe the most significant lessons learned from the success or failure of the operations undertaken in APOC areas relevant to the control and elimination of onchocerciasis or other disease control activities.
- To formulate conclusions of the evaluation and recommendations to each stakeholder involved (Countries, WHO, donor community, NGDOs, etc.) which might be useful for any international public health partnership programme.

2.2. Scope and focus of the evaluation

- This evaluation was to look at programme management, country project activities, partnership among stakeholders, issues of capacity and approach. Limited time and resources meant the team focused only on selected countries. Additional time would have allowed the time to review epidemiological and entomological data, particularly its collection and management. The team was unable to visit Angola, one of the countries selected.

2.3. Methodology for evaluation

Evaluation was done through the following methods:

- Desk study, review and analysis of all relevant available documents: strategic plans, Programme Annual Budgets, project annual reports, CSA and JAF reports, audit report, financial report, various guides, manuals and technical tools, publications and research,
- Interviews with key stakeholders at all levels including the community level.
- Focus group discussions with community members as project beneficiaries
- Field visits to some onchocerciasis endemic African countries. (arrangements will be made as required.
- Analysis, approach and methods were participatory.

2.4. Duration of the evaluation

The evaluation took place in the third quarter of 2015, the draft report was presented to the CSA in September 2015. The final report, incorporating comments, was delivered to the CSA at the end of October 2015, with a presentation to the JAF in December 2015.

The timelines for evaluation were 4 months which included desk reviews, field work, interviews, and report writing, incorporating comments and production of the final areport.

2.5. Expected deliverables

The following deliverables were specified in the Terms of Reference:

An inception report, outlining the key scope of the work and intended work plan of the analysis, and evaluation questions, shall be submitted after 5 days of commencing the consultancy. The inception report should detail the evaluators' understanding of what is being evaluated and why, showing how each evaluation question will be answered by way of: proposed methods; proposed sources of data; and data collection procedures. The inception report should include a proposed schedule of tasks, activities and deliverables, designating a team member with the lead responsibility for each task or product. The inception report will be discussed and agreed upon with all stakeholders.

A draft comprehensive report that will inform all the key stakeholders in English and in French for comments.

The Final Report: This will be submitted 10 days after receiving comments from the CSA members.

3. Evaluation process

3.1. The evaluation process

An outline of the evaluation methods was set out in the evaluation technical and financial proposal presented to the CSA and summarized here. This proposed evaluation methods based on interviews with key informants among project personnel, partners, and relevant stakeholders.

The evaluation was preceded by circulation of key project documents obtained from APOC management, among the evaluation team. A tentative travel plan was created. The Actual evaluation began with the evaluators meeting for six days in Ouagadougou. During this time the team reviewed the scope of work, and further discussed the evaluation data collection tools. The list of questions was then developed for individual interviews and group discussions, for uniformity across countries. Briefings were obtained from key APOC staff and an evaluation approach formalized. This was then incorporated into an inception report which was submitted to the APOC director a.i. before the evaluators departed from Ouagadougou. The evaluation team divided into two groups, team 1 visiting Francophone countries, and team 2 visiting Anglophone countries and Ethiopia. The inception report, the data collection framework and biographies of the evaluators are to be found in the Annex 6. Map of travel is in Annex 5.

In each country the teams interviewed key stakeholders and the ministry of health partners. This used a standard template of questions developed by the evaluation team at the beginning of the evaluation. Where possible the teams spent time in the field areas with distributors and supervisors. The APOC office staff had made excellent arrangements with the WHO country offices and the ministries to provide the team resources and logistics required. At the conclusion of field work, the evaluators gathered in Ouagadougou to share findings and consolidate conclusions and recommendations and to agree writing responsibilities.

3.2. The evaluation team

Wide ranging consultations were carried out to identify team members who would not only understand the role of APOC, but have specific technical skills and a good understanding of the context of CDTI is delivered. Members of the evaluation team were selected from a number of candidates. Biographical summaries can be found in the Annex 5.

The four team members were: 1. Innocent Takougang (Cameroon), 2. Samuel Musa Zaramba, (Uganda), 3. Komla Siamevi (Togo), and 4. Gilbert M Burnham (USA).

PART 2: EVALUATION FINDINGS

In the following are set out the evaluation findings according to the elements in the terms of reference.

4. Efficiency, effectiveness and achievement of stated objectives

4.1. Description of APOC

4.1.1. Background

The African Programme for Onchocerciasis Control (APOC) was created in 1995 to provide mass treatment with ivermectin to include African countries outside of the Onchocerciasis Control Project (OCP) that operated vector control activities from 1974.[1] APOC operations targeted onchocerciasis endemic areas outside of OCP, mostly in Central and Eastern Africa where the parasite, vectors and topography differed from those common in West Africa. However, assistance was provided to some former OCP countries constituting a Special Intervention Zone (SIZ). Its main strategy is Community-Directed Treatment with Ivermectin. Mass administration of ivermectin had been started earlier, largely by international Non-Governmental Development Organizations (NGDOs) who had limited financial resources and geographic reach. It was clear a well-funded regional initiative would be required to control onchocerciasis across countries. APOC's ultimate goal was to eliminate onchocerciasis as a public health and scoio-economic problem particularly among the 120 million people living in the 19 countries (later 20) which had been outside the OCP area. Original estimates were that 14.9 million persons infected with onchocerciasis lived outside the area of OCP, with perhaps 217,700 blind from onchocerciasis.[2] A three year transition period from the OCP was established which allowed the technical expertise and organizational memory to move to APOC. APOC was originally planned for 12 years (1995-2007), and then extended to 15 years (2008-2015).

4.1.2. Organization

The fiscal agent for APOC was the World Bank Group, with the World Health Organization the executive agency. The Joint Action Forum (JAF) served as the governing board of APOC and comprised of donors, participating countries, co-sponsors of the programme and participating non-governmental development organizations. JAF's role was to review and approve action plans, budgets and decide programme policies. The co-sponsors of the project as well as the programme management comprised the Committee of Sponsoring Agencies (CSA). The technical aspects of programming are reviewed by the Technical Consultative Committee (TCC) meeting twice yearly. Although the burden of meetings was seen by some as heavy, this consultative and consensus-driven approach worked consistently and was productive.

1 World Bank, 1994. Pan African Programme for Onchocerciasis Control outside the OCP sub-region.

2 World Bank, 1994. Pan African Programme for Onchocerciasis Control outside the OCP sub-region. Annex 1.

Table 1. Ivermectin tablets distributed by year and by country (in thousands)

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL
Angola	0	0	0	0	0	0	0	0	135	196	779	792	1'185	1'992	368	1'205	0	**6'652**
Burundi	0	0	0	0	0	0	0	0	461	2'119	2'409	2'519	2'924	3'209	3'294	3'372	3'486	**23'795**
Cameroon	0	0	1'484	2'038	2'851	4'345	6'715	8'906	10'119	11'615	12'397	13'013	13'466	14'840	15'130	15'401	17'828	**150'147**
CAR	0	0	2'616	3'014	2'181	2'000	2'524	2'558	2'706	2'138	2'029	2'437	3'047	3'541	4'206	2'759	0	**37'756**
Chad	0	1'465	1'656	1'584	2'799	2'779	2'782	2'890	2'983	3'369	3'892	3'980	4'238	4'319	4'539	4'813	841	**48'928**
Congo	0	0	0	0	639	549	989	1'073	1'137	1'167	1'258	1'340	1'728	1'825	1'921	1'930	1'927	**17'483**
DRC	0	0	0	0	1'698	4'565	11'528	14'145	13'655	23'269	26'162	26'697	49'572	56'813	62'731	64'755	68'701	**424'291**
Eq. Guinea	0	0	3	22	30	30	0	136	0	0	140	26	159	162	0	0	33	**742**
Ethiopia	0	0	0	0	653	1'445	2'864	8'290	7'090	10'264	11'580	12'083	12'917	13'468	13'276	18'050	20'134	**132'114**
Gabon	0	0	10	12	15	17	18	17	0	0	0	0	0	0	0	0	0	**89**
Liberia	0	0	497	1'393	2'520	2'520	0	606	1'899	4'246	6'838	10'041	3'608	5'609	6'775	6'689	7'410	**60'652**
Malawi	228	521	638	821	868	1'326	1'336	3'067	3'607	4'171	4'330	4'473	4'587	4'665	4'813	4'925	4'976	**49'353**
Nigeria	0	7'571	34'353	42'385	46'375	50'944	53'386	54'394	58'110	60'820	65'700	66'080	73'859	81'526	85'231	85'434	80'251	**946'420**
South Sudan	0	146	477	70	1'225	388	0	0	1'399	2'622	3'639	5'684	8'432	8'348	9'709	6'926	6'362	**55'425**
Sudan	0	451	731	1'117	986	1'001	695	1'043	752	257	559	160	980	923	923	410	496	**11'484**
Tanzania	0	273	845	795	1'807	2'047	2'945	3'560	3'508	4'350	4'717	4'351	4'527	5'324	4'078	5'242	5'400	**53'768**
Uganda	0	0	3'434	3'926	4'323	4'572	5'134	5'231	5'452	5'684	6'076	6'169	6'519	5'687	7'698	6'608	7'013	**83'526**
TOTAL	**228**	**10'426**	**46'743**	**57'176**	**68'971**	**78'527**	**90'916**	**105'919**	**113'011**	**136'288**	**152'504**	**159'845**	**191'750**	**212'250**	**224'691**	**228'520**	**224'858**	**2'102'624**

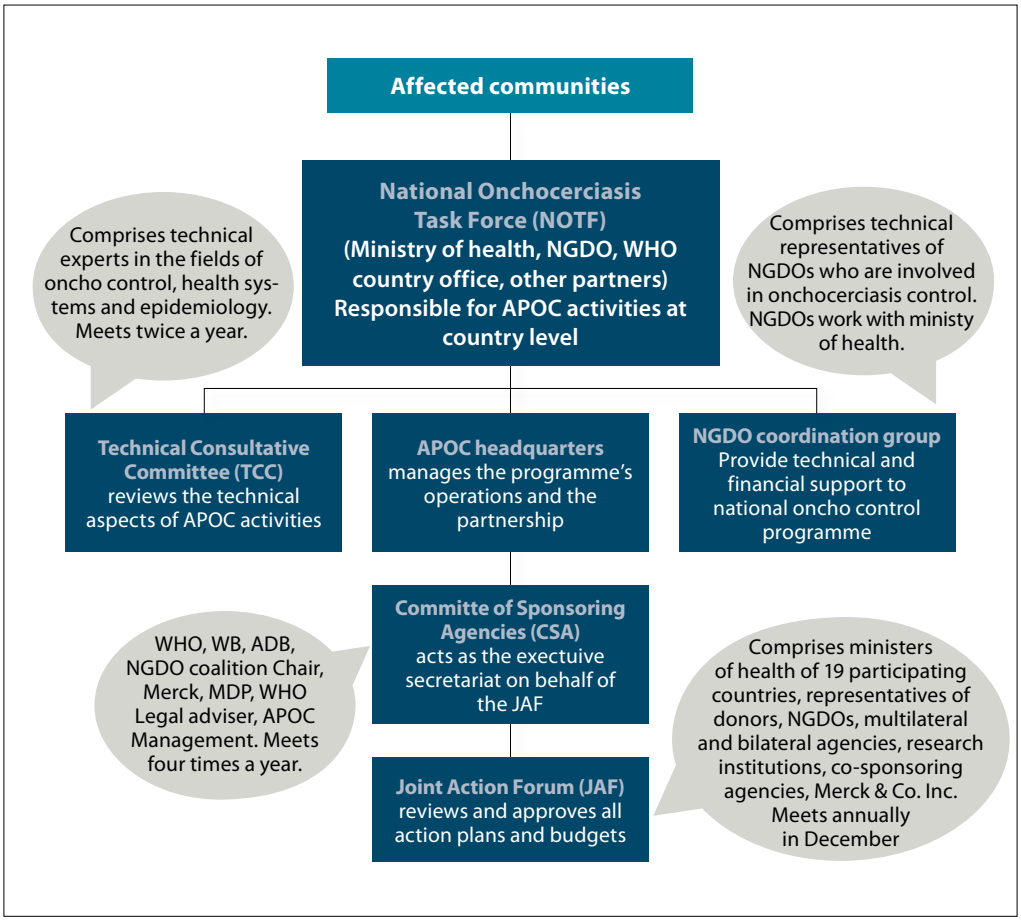


Figure 1. APOC organogram.[4]

4.1.3. Design of APOC

The design of APOC was innovative–a partnership between multilateral organizations, donors supporting the Trust Fund and countries as responsible for national initiatives, and the NGDOs as implementing partners. The 19 (later 20) countries were those not part of the OCP. Some parts of 11 countries that were initially part of OCP (Sierra Leone, Ghana Guinea Bissau, Côte d'Ivoire and Togo), received APOC assistance for 2002-07 because of specific epidemiological circumstances and civil unrest.

In the later years of OCP, annual ivermectin distribution had been rapidly added to vector control efforts with early evidence of substantial reduction in skin microfilarial counts. The CDTI approach was developed and tested in Mali, Uganda and Nigeria, and found to achieve good coverage and develop a sense of community ownership.[3,4]

Early activities by APOC included the development of standard procedures and guidelines, the appointing of a National Onchocerciasis Coordinator (NOC) and creating a National Onchocerciasis Taskforce (NOTF composed of key partners and stakeholders. REMO mapping identified hyper and mesoendemic areas of onchocerciasis for MDA, and excluding hypoendemic and uninfected populations. Working with NGDOs, national programmes trained health workers from Primary Health Care facilities, and large numbers of community drug distributors (CDDs) who were selected by their communities. Further human resource

3 Richards FO, Gonzales-Peralta C, Miri E. Community-based ivermectin distributors: onchocerciasis control at the village level in Plateau State, Nigeria. Acta Tropica, 1996;61:137-144.

4 APOC. Programme Document. JAF2.2, Nov 1996.

capacity building was done for coordinators and technical staff such as laboratory and entomology technicians. From the beginning the programme stressed an evidence base. A joint research activity with the WHO Special Programme for Research and Training in Tropical Diseases (TDR) was funded annually through 2012 to address operational research issues of importance to APOC. This support was started up rapidly, which facilitated a quick scale up of mapping and ivermectin distribution.

4.2. APOC Programme goals, objectives, targets and principles

Listed below are the basic goals, objectives, targets and programming principles which will serve as a focus for the final evaluation.

4.2.1. Phase I start up (1995-2001)

The ultimate goal for the programme was to eliminate onchocerciasis as a public health and scoio-economic problem in the 19 countries (later 20) which had been outside the OCP area. The initial programme had as its objective to establish within a period of 12-15 years, effective and self-sustainable, community-based ivermectin treatment throughout the endemic areas in the geographic scope of the programme and, if possible, to eliminate the vector and hence the disease by using environmental safe methods in selected foci.

The initial programme targets were:

1. Ivermectin delivery projects launched in all endemic areas by 2000;
2. Community based ivermectin delivery established in all eligible communities by 2005 with financial support having ceased, except for monitoring of community distribution;
3. By 2008 all community based systems will be declared sustainable. All APOC financial support will have ceased and support costs absorbed by the national health services.

Plans were for governments and NGDOs to start with a 25% share of financial responsibilities, increasing over time to 75%, as the financial contributions of APOC steadily decreased. Sustainability became a major focus of APOC, with regular monitoring of sustainability indicators.[5]

4.2.2. Phase II (2002-2007) and the phasing out period (2008-2015)

For Phase II (2002-2007) the programme objective was to establish, within a period of 12-15 years, effective and self-sustainable, community directed ivermectin treatment throughout the endemic areas in the geographic scope of the Programme, and, if possible in selected and isolated foci to eradicate the vector by using environmentally safe methods.[6]

For phase II and the phasing out period plan of action (2008-2015), APOC set out six objectives (each with various numbers of targets) and four basic programming principles.[7] These include:

1. The establishment of sustainable onchocerciasis control programmes in all endemic African countries;
2. Implementation of onchocerciasis control activities in conjunction with other activities aimed at reducing the burden of ill-health;
3. The ability to determine when and when ivermectin treatment can be

5 Okeibunor J, Bump J, Zouré HGM, Sékétéli A, Godin C, Amazigo UV. A model for evaluating the sustainability of community-directed treatment with ivermectin in the African programmefor Onchocerciasis Control. Int J Health Plann Mgmt, 2012;27:257-271.

6 WHO. Programme document for the Phase II (2002-2007) and the phasing-out period (2008-2010). 28 Oct 2001.

7 African Programme for Onchocerciasis Control. Phase II and Phasing-Out Period, Plan of Action 2008-2015. JAF, 2006.

stopped and the provision to countries of guidance and trained technical experts;

4. Reduction of the risk of transmission of onchocerciasis from a few ex-OCP countries;
5. Devolution to national governments of onchocerciasis control activities, and
6. Cessation of activities without jeopardizing past OCP and APOC achievements.

A series of five basic working principles were set out for implementing the 2008-2015 strategies and respect of these were considered as well in the evaluation.

4.3. Analysis of the programme implementation

4.3.1. Phase I

In the following sections are considerations of implementation of goals and activities from Phase I.

To establish within a period of 10-15 years, effective and self-sustainable community-based ivermectin treatment throughout the remaining endemic areas in Africa and to eliminate the disease by vector control in selected foci.

This initial objective has been largely achieved. Effective programmes have been put into place in nearly all locations which is self-sustainable by countries. Remaining areas untreated are generally co-endemic for *Loa loa*. Additional areas not now being treated are those affected by conflict, such as South Sudan and Central African Republic, or those areas such as in Angola, where there has been difficulties in effectively implementing projects. The use of community based approaches has been one of the great successes of APOC. This may be one of the most important and lasting health service delivery contributions to community health by APOC. It was this method of delivery that facilitated integration of community delivered treatments, as was envisioned in the initial programme document.

"After using CDTI for our community treatment programmes, we would not consider any other approach for community-based health services."

Country director, Nigeria

Vector control projects were implemented in several locations with the elimination of transmission, which will be discussed further below.

The major weakness in realization of this initial objective was the issues involved in being self-sustaining. "Self-sustaining" and "sustainable" do not mean the same, and with time APOC started using the term sustainable which is more appropriate, as it does not imply a self-perpetuating activity. From the community side, although the community directed approach worked generally well, annual retraining/review is required for distributors. For front line health workers who help manage supplies, materials and data, staff rotation, retirement and transfers required regular training and retraining activities. These activities continued to depend heavily on APOC direct transfer of funds, and NGDO assistance. The goal of having countries NGDOs covering the bulk of costs (75% after the fifth year of implementation) was not achieved, despite the contributions in salary, office materials support. There has been no quantification of these contributions, which would have been helpful. However, some countries, such as in Chad and Cameroon demonstrated their commitments, making substantial to onchocerciasis control/

Table 2a. Therapeutic coverage by country and by year (as reported by NOTFs) in (%)

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Angola	--	--	--	--	--	--	57.8%	46.8%	41.1%	43.4%	49.8%	68%	19.9%	35.5%	--
Burundi	--	--	--	--	--	--	28.9%	67.9%	70.6%	70.1%	74.2%	78.7%	80.1%	80.4%	80.7%
Cameroon	45%	45.7%	37.4%	54.6%	75.9%	73.4%	71.9%	71.5%	74.4%	74.6%	75.5%	78.8%	80.5%	80.3%	79.5%
CAR	74.5%	76%	53.5%	62%	75.7%	70.6%	84%	58.2%	54%	63.5%	77.2%	81.9%	82%	58.7%	--
Chad	44.1%	41.2%	70.9%	68.7%	67.1%	66.1%	66.3%	73.1%	81.8%	80.9%	80.9%	81%	81.1%	82.4%	67.7%
Congo	--	--	39.4%	33.6%	62%	66.6%	69.7%	70.2%	73.6%	74.3%	80.7%	81.2%	81.2%	81.2%	78.2%
DRC	--	--	14.9%	28.7%	41.6%	49.5%	68.6%	44.7%	47.2%	39.1%	65.5%	72.7%	77.1%	76.1%	73.5%
Eq. Guinea	2%	12.2%	16.3%	16.1%	--	68.5%	--	--	71.3%	13.2%	70.9%	71%	--	--	14.6%
Ethiopia	--	--	25.8%	55.6%	65.4%	60.7%	79.3%	70.8%	77.4%	77%	80.1%	80.6%	79.3%	80.4%	74.2%
Gabon	54.3%	53.5%	62.6%	62.9%	66.4%	63.8%	--	--	--	--	--	--	--	--	--
Liberia	16%	23.9%	41.9%	40.6%	--	9.5%	17%	27.9%	44.3%	65.5%	62.1%	80.9%	82.4%	81.3%	84.8%
Malawi	42.8%	21.2%	21.9%	32.8%	28.7%	64.6%	74.2%	82.9%	82.9%	82.5%	82.8%	82.6%	82.7%	82.8%	82.9%
Nigeria	59.7%	66.5%	69.1%	72.3%	68.4%	68.9%	73.1%	75.3%	78.6%	74.6%	79.6%	80%	79.4%	76.3%	78.7%
South Sudan	21%	2.9%	34.9%	10.8%	--	--	41.5%	25.6%	35.8%	39.1%	53.7%	52.2%	60.8%	43.3%	36.6%
Sudan	51.6%	77.4%	63.7%	60.3%	42.3%	66.8%	47.7%	84.7%	69%	18.4%	78.7%	84.1%	81.7%	86.5%	86.5%
Tanzania	51.4%	55.3%	65.1%	50.5%	69.6%	72.8%	74.7%	73.6%	76.3%	74.9%	73.3%	80.1%	80.2%	79.2%	78.9%
Uganda	69.7%	78.9%	78.7%	77%	80.6%	77.5%	71.5%	73%	80%	76.6%	76.4%	64.8%	72.2%	71.9%	73.5%

Table 2b. Geographic coverage by country and by year (as reported by NOTFs) (%)

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Angola	--	--	--	--	--	--	27.6%	22.8%	50.4%	58.8%	65.1%	80.3%	34.8%	50.4%	--
Burundi	--	--	--	--	--	--	100%	100%	100%	100%	100%	100%	100%	100%	100%
Cameroon	82%	91.6%	71.6%	86.7%	99.6%	99.3%	95.2%	97.3%	99.5%	99.5%	98.9%	98.4%	99.9%	99.8%	99.9%
CAR	91.4%	100%	91.6%	93.4%	92.8%	96.4%	84.8%	62.6%	63.7%	61.7%	82.4%	86.8%	90.4%	57.3%	--
Chad	71%	78.1%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	72.5%
Congo	--	--	56.8%	62.6%	96.1%	99.4%	100%	100%	100%	100%	100%	100%	100%	100%	100%
DRC	--	--	29%	45%	56.2%	65.5%	91%	75.8%	70.4%	60.2%	86%	93.2%	97.6%	96.6%	93.2%
Eq. Guinea	11.6%	52.7%	51.9%	73.6%	--	99.2%	--	--	100%	58.1%	41.9%	100%	--	--	65.9%
Ethiopia	--	--	15.1%	63.7%	80.8%	82.3%	100%	100%	99.2%	100%	100%	100%	99.9%	99.7%	0%
Gabon	94.7%	94.7%	94.7%	100%	100%	100%	--	--	--	--	--	--	--	--	--
Liberia	0%	10.8%	76.6%	62.7%	--	0.9%	11.3%	53%	64.5%	48.2%	41.1%	99.2%	94.7%	95.1%	97.7%
Malawi	51.8%	25.4%	27.4%	39.6%	34.7%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Nigeria	61.8%	72.3%	86.3%	87.1	90.5%	90%	93.6%	96.7%	96%	95.8%	98%	99%	99.8%	99.3%	93.3%
South Sudan	0%	94.1%	27.1%	3.1	--	--	44.3%	24.7%	29.1%	69.8%	87.7%	86.2%	82.1%	60.2%	73.6%
Sudan	70.4%	81.7%	86.8%	89.7	73%	100%	70.1%	87.2%	97.9%	74.8%	100%	100%	100%	100%	100%
Tanzania	100%	100%	98.6%	96.1	97.9%	73.6%	100%	100%	100%	87.9%	95.4%	100%	100%	97.7%	0%
Uganda	100%	100%	100%	100%	95.6%	99.4%	100%	100%	100%	96.7%	100%	79.2%	100%	99.8%	89.1%

elimination activities. In other countries such as Malawi and Ethiopia, salaried community-level workers are substantial government contributions.

To eliminate onchocerciasis as a public health and socio-economic problem.

The elimination of onchocerciasis as a public health problem was probably achieved early in most locations. With aggressive ivermectin treatment at the end of OCP and starting with APOC new cases of blindness probably ceased to be a substantial problem in the APOC area early. With the disappearance of blindness, the economic problems of underutilized fertile lands also faded. Some land has remained under utilized because of the biting nuisance of the black fly. In APOC areas skin disease rather than blindness was the major disease manifestation. The severe itching, disfigurement, and distrubed sleep probably had an economic as well as qualty-of-life cost, though harder to quantify.[8] Adverse skin events following treatment dropped after sevearl rounds of ivermectin.

The evaluation team visited the village of Lheur (Logone Oriental Region, Chad), a community that was once known for high prevalence of onchocerciasis (98%) skin and eye manifestations. Blindness was frequent in the village, which was abandoned by the work force. Because of the intervention as reported by the population, the prevalence and morbidity of onchocerciasis has decrease (<1%) substantially since the onset of Mectizan distribution in 1998. The team visit coincided with the Phase 1 entomological evaluation of the project progress towards elimination.

Programme specific activities listed in phase one were to:

Further develop standard procedures and guidelines for the design, execution and monitoring of community-based ivermectin distribution.

With the creation of NOTFs, mapping and surveys were conducted. APOC developed a considerable array of training materials. Standard reporting forms were created and disseminated. A standard computer program, APOCBase, was developed to assist countries in storing and analysing their programme data. Training was provided to national programmes in its use. Where there were difficulties in areas such as accounting, targeted training programs were developed and carried out for designated persons to strengthen capacity. APOC provided logistic support for programme operation, inclusive of vehicles, computer and photocopiers that was a major input for health systems strengthening.

Augment support to the national governments and NGDOs to enable them to develop and implement community-based ivermectin delivery.

The support provide by APOC was appropriate and adequate, and in many ways very particularly generous, particularly in the early years of the programme. A specific area of assistance was with vehicles, had been a major stumbling block to field supervision and training. In many cases these were bicycles or motorbikes. To facilitate NGDO services in the distribution process, APOC contributed to NGDO indirect costs at the level of 12.5%, as well as providing salary for the NGDO coordinator in Geneva. Much of the NGDO activities were at the community level, especially in the collection, and the delivery of medicines, the training or refresher training of CDDs. A particularly important APOC contribution was advocacy for onchocerciasis control, and this took various forms from community to ministry level.

8 Brieger WR, Aedoba AK, Eneanya CI, Hagan M. The effects of ivermectin on onchocercal skin disease and severe itching: results of a multicentre trial. Trop Med Int Health,1998;3:951-61.

Table 3. Logistics provided to countries by APOC in 2011

Logistics support	APOC	Ex-OCP
Transport		
Vehicle (4x4)	22	7
Bicycle	2,038	300
Motorcycle	140	
Computers and accessories		
Desktop computer	41	1
Laptop computer	28	4
Laser printer	39	
Scanner	30	
UPS	7	1
Communication & other		
TV	8	
LCD projector	7	
Photo	5	
Photocopier	4	
Generator	4	

Carry out applied and operational research in support of control and to modify the approaches to control when required.

One of the principles of APOC was the use of evidence in the planning and decision making. A joint agreement with the WHO/TDR produced an extensive series of research studies linked to the programme objectives. The development of the REMO mapping activity at the beginning was a morbidity measure used as proxy for community microfilarial load, allowing the exclusion of the hypoendemic areas from Mass Drug Administration (MDA). Further, TDR worked to develop the RAPLOA instrument to exclude areas from ivermectin MDA from areas which high prevalence of the reporting of Loa eye infection. Working with MDP and using RAPLOA data areas not to treat were identified and a clinical treatment guideline developed for adverse events developing. Further work continues on identifying specific persons at high risk, and this work is supported by the BMGF, USAID and others. WHO/TDR worked extensively with APOC to assess the effectiveness of Moxidectin, an experimental macrofilaracidal drug candidate. Work on this has since stopped. A selection of TDR/APOC research is found in the report annex 2.

Provide independent monitoring and evaluation of ivermectin delivery programmes in relation to the programme objectives and the ultimate goal of regional control of disease.

This current evaluation of the programme is the fourth, with previous reviews during 2000, 2005, and 2010. These have all been very detailed in their assessments and their recommendations. APOC has viewed the findings and recommendations of previous evaluations seriously and taken actions on these. A full presentation of programme outcomes for the preceding 12 months were presented to the JAF at the end of each year for the JAF's interpretation

Monitoring activities were introduced into the community programs and in some cases the local performance was used for peer review. Extensive data have been collected from the program, but it is clear that not all of this will be entered and organized by the 31 December 2015. For future references, especially as there will be need for comparisons of early mapping data going forward toward elimination. The storage, retrieval and use of these data beyond the life of APOC are very important issues and will form part of the conclusions and recommendations of this report.

Provide or strengthen the necessary training to the national staff involved in ivermectin-based control.

Capacity building was a major achievement of APOC. This was carried out at multiple levels, and an enumeration of some of the training activities can be found in the annex 1 of this report. The central level programme mangers then trained regional level implementers, who then trained district and frontline health workers. The community distributors were

trained by frontline health workers, under the supervision of district health workers assisted by the NGDOs. In 2011 there were 614,135 Community Distributors trained, the number dropping to 517,512 in 2012. There were 23 persons were sponsored for further training in epidemiology and entomology at the master's level. In 2013, there were 77,721 persons trained in technical areas at national and local levels in fields such as entomology, epidemiology, microscopy, disease mapping, data management and disease surveillance.

Identify limited foci which might be amenable to vector eradication and provide technical advice, assistance and funds for small scale eradication projects.

There were three of sites within Uganda two in Tanzania and Bioko Island, Equatorial Guinea where insecticide treatment was carried out very successfully. An aggressive programme in Uganda which combined vector control as part of twice yearly ivermectin has halted transmission in several foci.[9] APOC contributed to some of the costs of the vector elimination programme, though there were some in Uganda interviewed who felt that APOC's support for vector elimination was tepid.

4.3.2. Phase II and Phase out

The following are objectives set out for Phase II and Phase out (2008-2105) and these are discussed in light of the successes achieved.

The establishment of sustainable onchocerciasis control programmes in all endemic African countries.

This objective is essentially the same as the phase one objective. Programmes were established during the life of the project in all endemic countries with perhaps the exception of a few spill-over boarder areas from countries without MDA projects, an example being Mozambique. The effectiveness of the national programmes varied. Some were less effective due to conflict or civil unrest, a recurring and difficult issue. In others, such as Angola, there were internal issues preventing effective programme function, despite repeated efforts by APOC, MDP and others. Treatment in cross-border foci continued to be a problem in several locations.

An important problem is that in many cases no remapping or further definition of the infection zones or affected areas have been done since the original REMO nodule mapping which may have been 20 years back in many places. The exception being the countries involved in 1a and 1b phase mapping leading to stopping treatment. Major populations shifts have occurred, ecological changes taken place, and there has been little tracking of the effects of these events on the local foci. Some national onchocerciasis programmes have not monitored the changing status of endemicity in their countries. Part of this is because at times APOC functioned in a top-down manner, and there are feelings that it has not encouraging local initiatives. Some examples are Nigeria, Uganda and Ethiopia, which have used other resources to develop their own strategies which varied from APOC standard approach. In the case of national programs with limited resources, this is somewhat understandable.

The failure to recognize important foci of active transmission adjacent to areas under treatment and posing the potential for reinfection, for over a decade will result in treatment being prolonged in the original foci for fear transmission will spread back into these areas. An example is in Ethiopia were untreated hyper and mesoendmic foci have been identified adjacent to sites having received MDA for many years.

9 Oguttu D, Byamukama E, Katholi C, et al. Serosurveillance to Monitor Onchocerciasis Elimination: The Ugandan Experience. Am. J. Trop. Med. Hyg., 90 ; 2014 :339–345.

In encouraging countries to support programme activities and sustainability, APOC supplied resources, in line with the memorandum of understanding that was signed by stakeholders of the APOC partnership. WHO country offices provided vital support for insuring transfer of resources to support field activities. Other organizations provided assistance, including donor support for NTDs, contracting organizations such as ENVISION (RTI) and NGDOs such as the Carter Center, Sightsavers International, Helen Keller International, Christoffel Blinden Mission, and MITOSATH (Nigeria).

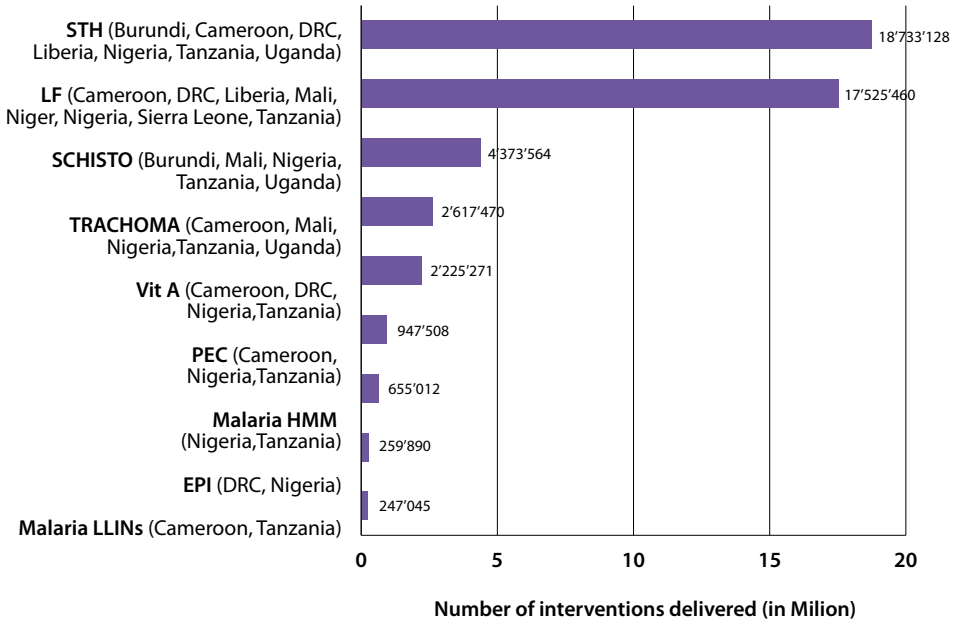
The NGDOs have been major contributors to sustainability. In some countries a rough estimate placed their level of support at about 25-30% of the non-salary costs of distribution. There are some countries where there is little activity by NGDO or activities limited to certain foci. NGDOs in several countries have received substantial five-year grants and they see taking a larger financial responsibility in the future for field level distribution. In some ways the integration of MDA activities among the 5 PCTs may have improved sustainability by diversifying the funding streams which are supporting CDTI programs.

A recurring comment heard was that the management process for national programs was not sufficiently participative, as most health workers at the periphery were unaware of new developments. Many felt that had knowledge and experience to contribute to national program planning for both onchocerciasis and other NTDs.

The implementation of onchocerciasis control activities in conjunction with other activities aimed at reducing the burden of ill health.

The support for the integration of MDA programmes with other MDA is mentioned in the original APOC Programme document, and strongly supported by the first APOC director Yankum Dadzi, but specific promotion of co-implementation for national programmes supported by APOC came late. With the adoption of the 5PCT approach to NTDs by WHO and AFRO, countries began integrating their NOTFs

Figure 2. Number of CDI co-implemented treat-ments 2013



to serve as the task forces for NTDs. This has been easier with LF programming, but a bit more difficult for the Soil Transmitted Helminths (STH), schistosomiasis and trachoma. Difficulties arise because the unit of implementation may differ, being a transmission zone for onchocerciasis and an administrative zone or school district for STH. For trachoma the morbidity treatment component which may make integration more difficult. In some cases other activities have been added, such as vitamin A and malaria activities, including mosquito nets, as in Ethiopia and Albendazol and Praziquantil in Nigeria. At the national and sometimes lower levels, there is a perception that APOC lagged in its support of NTD integration in programmes they supported. In both Nigeria and Ethiopia the integrated national NTD programme was replicated at the state level, following the outline of the national program.[10] In Ethiopia, the states have the latitude to integrate other non-NTD services as they judged appropriate. In other countries there is little co-implementation by national programmes.

In the beginning of integration activities, the rules of the Trust Fund were interpreted such that materials purchased with funds for onchocerciasis MDA could be used for other con-endemic conditions. This has now been changed, and items purchased with Trust Funds as well as with other disease programme-specific resources are used across the NTDs. Most NGDOs are very clear that the conditions of their programme funding do not limit them to using resources solely for onchocerciasis. A major driving force for treatment of several conditions through the existing CDTI structure has been costs. Adding a third or fourth treatment activity to a well-functioning CDTI system has a small marginal cost for the additional treatments.

10 Federal Ministry of Health (2012). Nigeria Master Plan for Neglected Tropical Diseases (NTDs) 2013-2017.

Perhaps an unexpected finding in some locations was that additional MDA activities of the CDDs enhances their position, and may in itself be a non-monitory incentive. The questions of incentives still seems to arise, though this is perhaps less common than in earlier years. There were reports of CDDs refusing to work without incentives, and withholding treatment registers. It may be that attrition has selected those with the willingness to continue without payment in some places. In one country the payment by UNICEF for polio immunization mobilisers created demands from CDDs there for payments. Lack of incentives may be one of many contributors to turnover among CDDs.

Maintaining the CDD network is a great challenge ahead of APOC closure, and there are no clear directions as to how best this should be managed. This should be a priority for ESPEN.

The acquisition of the ability to determine where and when ivermectin treatment can be stopped and the provision to countries of guidance and trained technical experts in preparation to stop ivermectin treatment.

APOC was founded to control the public health consequences of onchocerciasis which it has clearly achieved and done this well. The results from Senegal and Mali published in 2009, reported the disappearance of infection after 15-17 years of annual treatment.[11] Further studies on the outcomes of long-term ivermectin treatment in Africa are needed. This initial finding, along with the results emerging from the Americas encouraged APOC in 2009 to shift goals from control to elimination where this is feasible. The JAF 12 set as a target onchocerciasis elimination in 80% of endemic African countries by 2025.

11 Diawara L, Traoré MO, Badji A, Bissan Y, Doumbia K, Goita SF, et al. (2009) Feasibility of Onchocerciasis Elimination with Ivermectin Treatment in Endemic Foci in Africa: First Evidence from Studies in Mali and Senegal. PLoS Negl Trop Dis 3(7): e497. doi:10.1371/journal.pntd.0000497.

A major problem for APOC was that its structure, data and programmes were focused on control, and adding a new goal of elimination where feasible, made methods and measurements more complex. Initial REMO morbidity mapping was used to exclude hypo-endemic areas from treatment. Under the elimination concept, these hypoendemic areas assumed a new importance as transmission was shown to occur in these areas, and these must be more closely mapped using more precise methods than nodule prevalence.[12,13] APOC created a 3-phase conceptual and operational framework for onchocerciasis for countries to move from control to elimination of onchocerciasis, where feasible, were developed and tested.[14] There was concern that from some in the scientific community that interruption of transmission did not received sufficient emphasis. The first phase, stage 1a involved epidemiological testing to assess a decline in skin microfilariae moving toward the breakpoint at which transmission will no longer occur. Once this has been achieved, a second assessment, 1b requires delineation of the transmission zone, a sampling strategy for skin snips and fly dissections and pool screening for larval DNA in 10,000 blackflies. These drew on the 2001 WHO criteria (which used OCP data) to outline the steps moving elimination and eventual certification.[15] This is a four-stage process, requiring >80-85% therapeutic coverage for 14-18 years after the start of sustained control activities before being eligible for a pre-certification. These criteria are being updated now.[16]

Phase 1a and phase 1b testing are underway or planned in several locations for 2015. A number of entomological technicians have been trained in various countries, and there are suitable laboratory facilities set up by the Carter Center in Uganda, Nigeria and Ethiopia and Sudan. Other countries such as Malawi lack the senior professional staff and the laboratory capacity to do this work.

The survey work for stopping treatment is occurring in some countries with APOC guidance at the time when financial support for field activities was being decreased with APOC closure. Without a clear understanding of what the follow-on support (financial and technical) would be, some country programme personnel found the situation confusing.

The APOC budget provides only limited funds for epidemiological and entomological mapping in 2015 and no funding for post surveillance monitoring. Some of the funding gap is being picked up through assistance from the BMGF. However, the full technical requirements and costs of elimination have not been fully assessed. This clearly needs to be examined in detail before moving into the next phase of MDA in Africa.[17] The procedures for Ov16 assessments have not been developed for APOC, although they are in regular use in the Americas and being used in Uganda, Ethiopia, Nigeria and the Sudan. In Uganda methods have been redefined based on their experience.[18]

When control was the goal of APOC, once yearly treatment seemed appropriate. With the shift to an elimination-where-possible agenda, and evidence that many years of once yearly treatment did not interrupt transmission in several locations

12 APOC.2015. The Plan of Action and Budget: Year 2015.

13 Katabarwa M, Eyamba A, Chouaibou M, Enyong P, et al.. Does onchocerciasis transmission take place in hypoendemic areas? A study from the North Region of Cameroon. Trop Med and Intl Health, 2010 ;15:645-52

14 WHO/APOC. Conceptual and operational Framework of onchocerciasis elimination with ivermectin treatment. 2010.

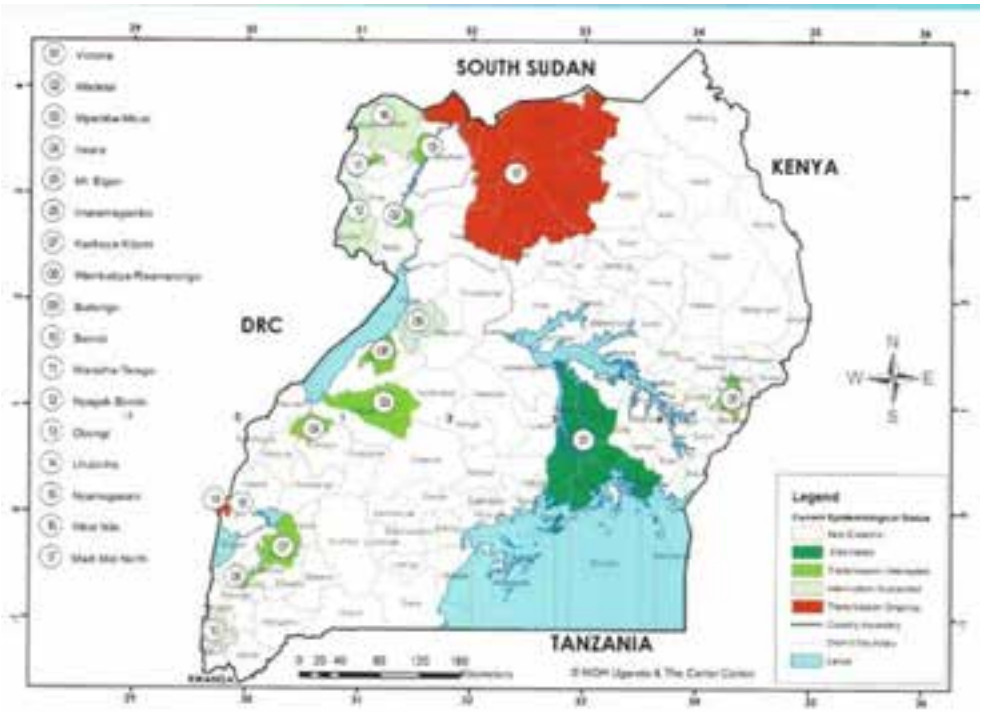
15 WHO Communicable Disease. Certification of elimination of human onchocerciasis: criteria and procedures. WHO/CDS/CPE/CEE/2001.18a. 2001.

16 WHO. Guidelines for verification of elimination of human onchocerciasis, Criteria and procedures. 2015

17 Kim YE, Sicuri E, Tediosi F. Financial and economic costs of the elimination and eradication of onchocerciasis (River Blindness) in Africa. PLoS Neglected Tropical Diseases, 2015; DOI 10.1371.

18 Oguttu D, Byamukama E, Katholi R, *et al.* Serosurveillance to Monitor Onchocerciasis Elimination: The Ugandan Experience. Am J Trop Med Hyg 2013;13-0546.

Figure 3. Uganda cross-border focus with South Sudan



within APOC, there was a need for alternative treatment strategies. This approach was critical to the success in interrupting transmission in the Americas, and has also proved useful in Uganda and elsewhere in Africa. For some years alternative treatment strategies have been proposed to APOC. Several countries have felt that APOC has resisted these proposals.

The presence of a national onchocerciasis elimination advisory committee is an excellent step in the planning process, even if the goal is some distance away. The best example is the Uganda Onchocerciasis Elimination Expert Advisory Committee which meets annually. This group is tracking treatment surveillance in three sites, and tracks progress toward elimination on a "flag." The second meeting of the Nigerian elimination advisory committee occurred during the visit of evaluators, and drew guidance from the Uganda initiative.

When APOC's goal was control, the matter of trans-border foci, while of concern was not a major issue. When a national program is moving toward elimination in a border focus and there is little treatment on the other side of the common border, major concerns arise. This issue is present in several countries such as Ethiopia, Uganda and Malawi. While some high level meetings have taken place across the borders with support from APOC, low-level on the ground meetings have seldom followed and not have not led to sustained coordinated activities. Moving forward regional integration of programming this now becomes very important to address this and other issues.

Reduction of the risk of transmission of onchocerciasis from a few ex-OCP countries whose epidemiological and entomological situation threatens neighbouring countries where the disease has been controlled.

Considerable efforts have gone into the entomological surveillance. There have been 152 sentinel sites in 8 countries which have been followed in the post OCP Countries. The six countries included are Benin, Guinea, Guinea Bissau, Mali, Niger and Senegal. Most of the surveillance site have a transmission level of zero. In Côte d'Ivoire, a few points have transmission rate above the threshold (0.5/1000). The

sentinel sites do not in all cases correspond to a clear representation of the country but represent transmission zones. In Ghana transmission continues despite various control strategies.[19]

When the SIZ support from APOC closed in 2007, at the request of the JAF, Trust Funds were used provide technical and financial support to Sierra Leone, Guinea Bissau, Ghana, and Cote d'Ivoire to strengthen control activities (2008-2012). In addition there was support for advocacy and securing government commitment to strengthen control activities where problems were occurring.

Devolution to national governments of onchocerciasis control activities.

National government management has been a key point of the programme which stressed self-sustainability. The intent of the APOC sustainability strategy with its national indicators was to ensure government would take progressively larger responsibilities in programme support. In general, governments have not made direct allocation of funds to Onchocerciasis control activities to the level of the commitment made. There were some exceptions such as Chad, Cameroon and Malawi, where direct funds were allocated. Some programme personnel interviewed suggested that the original funding should have been conditionality or matching grants.

"Beneficiary countries did not put money on the table. Only a few countries contributed financially. This could lead to donors' fatigue and demotivation."

Decision maker

Governments have, in general, adequately supported staff and salaries, but have not fully provided transportation and other costs. In countries with community based health workers such as Malawi (Health Surveillance Assistances) and Ethiopia (Health Development Army), these salaried workers have made major contributions to MDA delivery as regular salaried employees. In this sense governments are providing a greater degree of direct assis-

19 Lamberton PHL, Cheke R, Ainskill P, et al. Onchocerciasis transmission in Ghana: Persistence under different control Strategies and the Role of Simuliid Vectors.PLOS Neglected Tropical Diseases. DOI 10:1371 April 21 2015.

tance than those programs which depend more on NGDOs to provide supervision and assistance at the point of delivery. We did not find any specific costing of government contributions in human resource costs, but this would have been a useful exercise to document government support.

Advocacy by APOC has created a high-level of awareness among policy makers. In meeting with ministers and senior technical staff, the importance of onchocerciasis programming for health services in their country was universally affirmed. The Chad head of state received MDA reports each month, and is quoted as saying:

"Our objective will not be attained so far as intervention and prevention measures have reached all the communities (of the endemic districts) of Chad. We need to empower communities and strengthen ownership."

The perception of some programme managers is that while funding for onchocerciasis has been diminishing, funds for the other 5 PCT NTDs have been increasing.

4.3.2.1. NGDOs

In several countries there was poor understanding in government about how NGDOs operate and why they may have programs that function in different ways from government. The issue of a perceived misalignment with government policies came up in several interviews. In most locations NGDOs felt they collaborated well with each other and with government. The flexibility of NGDO activities and funding gave them a critical latitude to fill in the gaps in MDA distribution when government funding was absent or insufficient. In several countries some NGDOs foresaw their having to pick up more activities in the future as APOC closed and as the technical demands around epidemiological and entomological monitoring increased. There is some doubt among those interviewed that AFRO will be able to provide the technical support to the countries in the future as APOC did.

In Malawi, when government funding was insufficient, Sightsavers was prepared to pick up the additional costs for distribution, and this included the costs for 1a epidemiological and entomological assessments, and they anticipated this would be required for 1b assessments. In some countries, such as Uganda, the NGOs played a major role in the elimination agenda by helping to support the national advisory committee and the laboratory equipment and even personnel. In a number of countries, such as Nigeria the NGDOs work closely together in a national NGDO coalition, often with sharing of physical resources and personnel. This helps harmonize activities, and avoid duplication and to reduce the number of project areas where there NGDOS are unable to provide assistance with MDA. In other locations government suspicion of NGDOs prevents them from collaborating publicly outside of government sponsored events. Some countries have only a small number of NGDOs who participate in NTD activities, or in some cases, none.

The work of the Carter Center stands out particularly, not just for support of the MDA but their extensive help in human capacity building and technical capacity strengthening. The laboratory and entomology work they have supported has been critical in several countries. Assistance to Uganda in their elimination activities has been a major driving force.

Cessation of activities without jeopardizing past OCP and APOC activities.

This is very uncertain at the moment, and the feeling of most interviewed who were knowledgeable of the issues involved, was that there would be some reduction in onchocerciasis MDA activities for 2016. Some persons were not sure about 2015. Perhaps the greatest criticism heard was the lack of a transition plan from APOC to ESPEN.

The supply of vehicles and equipment as well as the regular training and retraining activities which have been a regular support factor from APOC have been critical to many country programs.

Most countries have integrated national NTD programmes in place, and with the help of the other specific disease programmes at national level, the onchocerciasis programs may be sustained by the networks built. In some countries bilateral assistance may be able to pick up some of the slack. In several countries the WHO office has already been providing assistance, and there may be more assistance required in the short term. Where NGDOs are playing a major role already, several have indicated they may be able to support an increase in their activities. Some examples of countries with robust support from these sectors are Uganda, Ethiopia, Nigeria and Malawi.

4.3.2.2. Technical support

APOC has provided regular technical support to countries in the form of guidelines, assistance with planning and data collection and analysis, and with training for survey work. The latter is particularly important as a number of countries are embarking on epidemiological and entomologic assessments with a view to stopping treatment in some foci and in some cases the entire country soon or very soon. It was not clear if there was a formal quality control for training contents, especially at the CDTI level. At the more technical levels much of the training was given by a small number of people. This is a critical time to have a breech in technical support for 1a and 1b epidemiological and entomological assessments. It is not clear to APOC personnel how these essential technical support services will be continue after December 2015. While there are personnel and laboratory facilities in some of the APOC countries that could take up some of the responsibilities now done by the Multi-Disease Surveillance Centre (MDSC) labs in Ouagadougou, it appears that there have been no specific plans made.

Envision RTI (USAID) is widely appreciated for its assistance to national NTD programmes. There is hope that this programme can help pick up some of the support that was previously provided from APOC at the country level, at least in some of the 17 African countries where they work.

4.3.2.3. Data support

The APOC programme has generated a vast amount of data. Now approaching closure, there is a realisation that much is yet to be digitalized, and a great amount is not readily available. Information in these data are critical to careful planning of elimination activities post-APOC. Currently APOC is taking steps to help make country data available through a web based repository. However, the interviewers found that some countries do not have full records of their own onchocerciasis programme data, which is a serious restriction for comprehensive planning. It maybe that all data related to country activities will not be available on a web portal by the time of APOC closure, so plans need to be made to see this process through.

There were frequent criticisms from country programs and NGDO partners that APOC was often slow in returning epidemiological and entomological data collected from countries during site visits.

"APOC management did not help us much. I have none of the reports of the evaluation of sustainability, epidemiologic, coverage... I have made the request to APOC management on several occasions, but to no avail. No response."

Cameroon

4.3.2.4. Additional activities

Among the additional activities voted at JAF 12 is a mainstreaming of gender in APOC activities, and the provision of adequate resources to support APOC activities.

4.3.2.1. Mainstreaming gender in APOC operations

From 2007, APOC requested NOTFs to disaggregate data for patients and distributors by sex. This found that in some countries there were only small numbers of CDDs were women.[20]

While respecting gender sensitivities in respective countries, APOC stressed to communities the importance of selecting women as CDDs. Many communities were already preferring women as CDDs as they were deemed much more responsible. Through the remaining project time this emphasis on selecting female CDDs was promoted. From 2009 to 2011, a gender specialist was employed by APOC. A number of gender training sessions had been carried out in Cameroon, the Central African Republic and the Democratic Republic of the Congo (Brazzaville).

20 APOC. WHO Year 2014 Progress Report. P76.

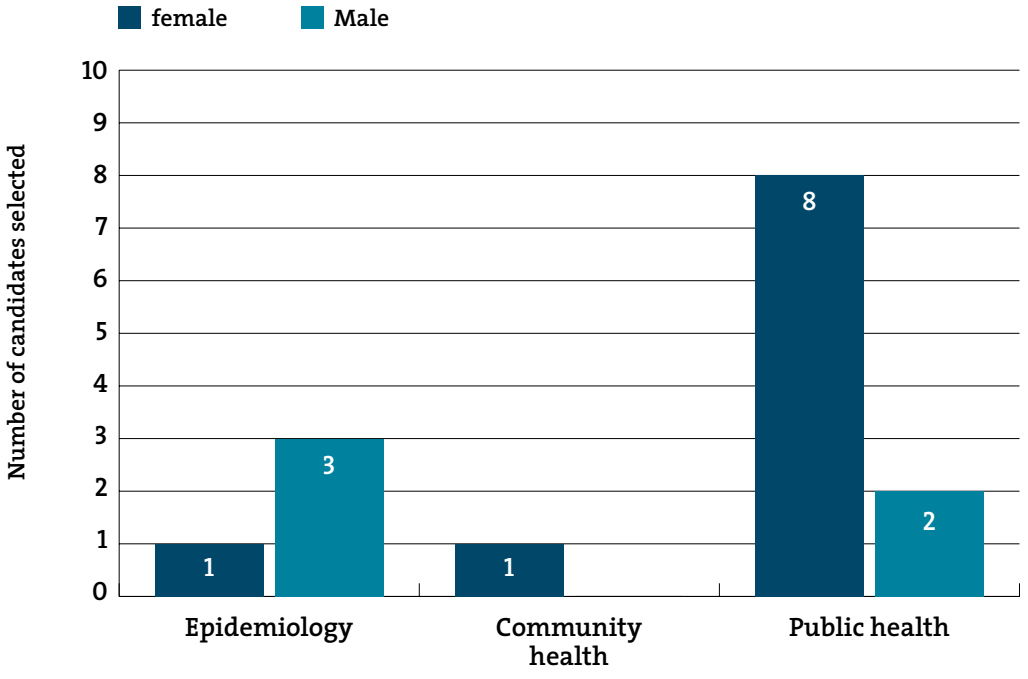


Figure 4. Number of candidates selected for training 2009.

This was in addition to gender activities carried out by APOC staff.

For the year 2009 some $400,000 was allocated from Trust Funds for 15 Master's degree students. The policy was to accept two females for each male to increase the number of women in public health in the APOC countries. The courses and the countries from which participants came are listed in Annex 1. The most recent positions listed are generally within the ministry of health and several are holding positions in epidemiology. Women are well represented in the graduates.

The African Development Bank agreed to assist APOC in identifying a gender specialist who joined the project in 2009. Activities to build the capacity of women was also carried out at APOC headquarters as well as in country programmes. This addition of the mainstreaming of gender was a specific request of two of the Trust Fund donors.

4.3.2.2. Providing adequate human and material resources to address programme needs

As a review of the management function and the allocation of resources to the APOC programme a management review was conducted in 2014. This was also conducted to address some concerns about programme overstaffing and inefficiency, as well as to prepare APOC for transition to PENDA.21

This management review found 83% of APOC approved positions filled, and that the programme was responsible for the oversight of 124 projects in 31 countries. This review found both strengths and weaknesses in the structure and function. Among the positive features noted was APOC as a well-functioning organization, knowledge-led and hardworking and providing good value for money. It was seen as having good relationships with countries and technically strong. Negative features noted in this review were the top-down management style, a directive style, lack of a results framework, and a weak data disclosure practice with insufficient openness about programmes and results. APOC was noted to have difficulty in adapting programming for different situations and to be slow in responding to new evidence in treatment. A final concern was the lack of intervention in the wider NTD community. The management review team found no evidence of overstaffing or obvious failures in efficiency

The interviews conducted by the final evaluation team verified the pattern of strengths and weaknesses noted in the 2014 management evaluation.

4.3.2.5. Analysis of Principles of Work from phase II and Phase out

A series of five basic principles for the 2008-2015 strategies:

1. **Community ownership and empowerment, stressing the CDTI process.** This has been one of the great successes of the programme, and it is hoped this will continue under ESPEN. APOC has been very true to this principle supporting as the central core of the programme.

2. **Sustainability.** A fundamental principle has been to create self-sustainable community programmes. This has been done, and serious work has gone into developing and tracking sustainability indices. This principle has been largely followed with sustainable programming, though persuading governments to financially support these programs was less successful.

3. **Evidenced-based decision making as reflected in APOCs use of scientific research.** APOC maintained a strong research agreement with TDR, and

21 Beattie A, Johnson R. APOC Management Review, Final Report. APOC July 2014.

much useful information was incorporated into practices and procedures from these studies. Later in the programme APOC started lagging in incorporating newer approaches such as in alternate treatment strategies, improved mapping and surveillance methods.

4. **Partnerships as witnessed in the programme's harnessing the strengths and expertise of NGDOs, donors and other international organizations.** Partnerships have been invaluable to the success of APOC. In countries where the NGDOs have been active, their participating has been critical to MDA and to building an advocacy not just for onchocerciasis but for the other PCTs in an integrated NTD framework. At the present time several of the NGDOs working in a multiple countries are well funded which will bode well for the immediate future.

   Relationships with the donors seemed to cool in the past 2-3 years which had implications for the transition to the next phase of onchocerciasis activities. There were some donors such Canada who had dropped at by the end of APOC.

5. **Evaluation.** APOC has been very conscientious in external evaluations. It commissioned external programme evaluations in 2000, 2005, 2010, a management review in 2013/4 and this final evaluation in 2015. The terms of reference have been such that these were serious and comprehensive docu-

Table 4. APOC governance and its main functions

Body	Membership	Functions
Joint Action Forum (JAF)	Donors, financial and material; participating countries; members of the CSA, representatives of the NGDOs, members of the TCC	• Decides overall policy and strategy • Reviews and approves budget and annual plan of action • Assesses the financing requirements of the programme.
Committee of Sponsoring Agencies (CSA)	Representatives of the WHO, WB, ADB, invited are representative of the NGDOs, MDP and Merck & Co.	• Reviews plan of action and budget; • Examines reports submitted by sponsoring agencies and statutory bodies of the programme, and sends these with observations to the JAF • Approves adjustments to the Plan of Action and Budget as funds are available • Acts on behalf of JAF between sessions in circumstances requiring action, subject to the latter's ratification.
Technical Consultative Committee (TCC)	• 11 scientists and experts appointed by the WHO Director-General • Representative of Merck	• Considers technical, implementation and research issues • Reviews new National Plans and Project proposals • Reviews as well as the annual technical reports of projects • Contribute to establishing the APOC supported research agenda. • Reviews progress towards elimination of onchocerciasis infection, sustainability and integration of community directed treatment with ivermectin into the health system and make recommendations to the Programme Director on any appropriate action.

ments by well-known scientists and public health leaders. APOC has taken their results seriously, implementing changes recommended wherever possible.

4.4. Functional elements of the programme (from the TOR)

4.4.1. Relevance

The APOC programme has been highly relevant to the control and elimination of onchocerciasis. The original design as a five component programme with donors, the fiscal and executive agencies, host governments, NGDOs and communities was a complex though highly appropriate approach. This partnership remains relevant as the next phase of ivermectin mass distribution and the upcoming ESPEN entity.

4.4.2. Governance

APOC has a somewhat ambiguous administrative position. Although a part of AFRO, traditionally it has had closer relationships with WHO HQ. This arrangement, coupled with geographical isolation from Brazzaville, led at times to perceptions of autonomy. This distance also made managing financial aspects of the programme difficult as APOC did not have persons with the requisite training in IPSAS and other methods.

The governance structure of APOC has three major components consisting of the Joint Action Forum (JAF), the Committee of Sponsoring Agencies (CSA), and the Technical Consultative Committee (TCC). Related is the NGDO coordination committee. Countries are represented on the JAF, but otherwise some felt underrepresented in APOC. Further details on these bodies are set out in table 7. These bodies have met as scheduled and their proceedings are regularly available on the WHO website. Many have felt that this regular meeting schedule has contributed greatly to the smooth function of the organization, although there was some grumbling about the number of meetings. Some stakeholders within WHO voiced the hope that the new organization ESPEN would adopt a similar governance structure. There was a general perception that APOC had benefited from an extraordinary group of dedicated leaders and staff. Strong personal relationships between APOC directors and country leadership made many things work very successfully. As the programme closes it is difficult to imagine how the remaining staff will manage all responsibilities and commitments. Some former staff have been hired back as consultants.

Some donors were increasingly unhappy with their perceived peripheralization in financial matters at APOC. Donors and NGDOs felt that the JAF budgets were voted without discussions with them about how much money would be available, and that the budget was presented a fait accompli. The donors felt they had difficulty getting a true financial picture of the project, and how the funds were being used. At times there seemed like double counting with items being reported in publications as being financed from one source and in other publications from a different source. In the past 3-4 years the donors felt they were not being heard and the partnership was fraying. Once voted at the JAF, it seemed that APOC did not follow the budget. The donors felt peripherialized from the CSA as well. Some parties felt that NGDOs were not fully participating in management decisions.

There were reports that participating country representatives felt they were unable to fully represent their opinions to members of the JAF, though the evaluation team were not able to speak with any JAF members from participating countries. On the other hand, the JAF was an opportunity for senior MoH leadership

from participating countries to make their views known. However senior leadership tended to skip JAF meetings depending on location. With the shift from control to elimination the JAF could have provided the leadership needed to implement a thorough examination of requirements for this paradigm shift. It appears that the JAF was divided on this topic, and it was not revisited.

An area of concern voiced by several interviewed was the perception of a heavy management structure. Compared with the other NTD programs the management structure is much heavier for a smaller number of persons receiving treatment than for other conditions. And compared with the OPEPA structure, which was primarily coordination, it seemed ungainly and complex. Perhaps a better comparison would be with GAELF or ITI, which achieve large population coverages. When it was decided to extend APOC for an additional 5 years some felt there was a missed opportunity to examine the structure and function of the program. In defence of comparisons with other MDA program, APOC invested heavily in health systems strengthening, vehicles (pickups, motorbikes and bicycles) and training programs, many leading to advanced degrees. Further, there was a heavy investment in research through TDR which continued until 2012. The operations of the laboratory and laboratory services across country sites and the frequent technical visits further added to expenses that other PCT programmes might not have.

At the country level there were frequent comments from onchocerciasis staff about what they perceived as APOC's top-down management style which they felt was not open to country input. There was a feeling of inflexibility with APOC resisting development of new approaches such as Ov16, alternative treatment schedules and more aggressive approaches to elimination. The Uganda team, which has the most well-functioning elimination advisory committee, felt that APOC was not supportive of either the country's elimination efforts or vector control efforts.

APOC supported integration of PCTs and ivermectin MDAs with regional meetings, and supported the mapping of other NTDs. Some country managers felt this was done somewhat reluctantly and late. There were perceptions of territorial issues in the integration of disease programmes.

4.4.3. Programme management (efficacy, effectiveness, efficiency)

Pursuit of the control objective was done very well, and this was the consensus of everyone interviewed. Objectives were focused and resources prudently used. The element of health systems strengthening was very much appreciated, and in turn it helped the project start up and run effectively. There were problems with the accounting for financial transfers to governments. While training accountants to provide returns to APOC helped, there were records of many transfers that were still outstanding at the end of a financial year.

When the decision was made to move from control to elimination, the programme begin having difficulties. In retrospect it would have been wise to halt at that point, or even at the point at which APOC was extended for another 5 years, to do a very careful assessment of the costs and requirements of moving from control to elimination. There were additional mapping, entomology, laboratory, distribution and other costs which would have to be now addressed. This would have been the time to do those estimates and consider restructuring or even redesign of the programme to better address these needs. Some interviewed suggested this was the time when APOC started to become less effective, trying to do addi-

tional tasks without a clear plan. Further, the original programme design, inherited from OCP was of traditional vertical single entity design. With time, health programme management methods were became increasingly more "horizontal" and deconcentrated. This would have been a time not only to consider more carefully what the change to elimination would entail, but also how the programme could be restructured following more contemporary management configuration. The programme's continued location in Ouagadougou, without the direct support which would be present in the regional office, was probably resulted in duplications and inefficiencies which could reduce effectiveness. Accounting procedures are an example.

4.4.4. Sustainability

As noted, "self-sustaining" or later "sustainability" of onchocerciasis control was a fundamental goal of the first phase of APOC. Although the anticipated level of financial support sought from participating countries did not materialize during APOC years, the approach of ivermectin MDA through CDDs is a sustainable approach. The sustained distribution will depend on the commitment of states to support distribution, the cooperation of NGDOs, as well as continuing financial support through AFRO.

The movement forward to elimination may have some sustainability problems because of uncertainty over laboratory facilities and entomological resources.

In some fragile states, MDA is not sustainable even with availability of external funding and technical assistance. Examples include Central African Republic and South Sudan at present. Others like Angola currently lack the political will to organize effective distribution.

4.4.5. Capacity building

Capacity building was a central part of APOC's programme design. It did this in many ways. Perhaps the largest efforts went into training. The number of CDDs training reached 614,135 in 2012, and was 517, 512 in 2013, as there were no reports from CAR and Angola in that year. In 2012 there were 80,315 health workers who received short course training from APOC, and in 2013 the number was 77,721. Master's level training was provided to 24 students between 2009 and 2013. All trained in either public health or epidemiology at one of five accredited African universities. Details are in Annex 1. As noted, preferences were given to female applicants. APOC was consistent and conscientious in providing this training. This was an important contribution to countries. In some countries, ample human resource capacities existed, but in others those trained by APOC not only contributed heavily to the programme processes and outcomes, but made long-term national contributions.

As part of support to ministries of health 12 National Professional Staff were supported by APOC in Cameroon, Ethiopia, Nigeria, Burundi, Tanzania and Angola.

Improving transportation for field staff in participating countries was an early priority of APOC. The allowed a very rapid start up to MDA. In total, some 282 pickup trucks were provided, 1789 motorcycles and 9800 bicycles. These were provided to 14 countries in numbers according to country requests. Details of numbers and countries are found in Annex 1. At all field sites visited, persons interviewed reiterated how important these means of transportation were from national managers to supervisors at the first line health facilities for training, monitoring and supervision. These are in additional to transportation provisions made available by NGDOs.

In addition to vehicles, nearly 1000 computers were provides with many printers and scanners. This was done to enable timely data calculations and reporting as well as forecasting medicines and other supplies. Items provided were allowed to be used for other health activities in the facilities where they were located. Details on numbers and countries are in Annex 1.

Beyond the vehicles and persons trained was the capacity built to map, monitor and treat NTDs. In countries with national NTD programs these capacities were located in the national NTD programmes.

4.4.6. Programme results

Programme outputs were copious. Some of the details of the therapeutic and geographic coverage can be found in the annex 1. There was a rapid scale-up of MDA from the start. Assistance was provided with national planning, establishment of the country NOTF, development of the project information system and forms, and training for ministry staff were extensive. To identify treatment areas, simple measures such as REMO were developed. Later RAPLOA was developed to delineate areas with a high prevalence of *Loa loa*.

Perhaps one of the greatest process achievements of APOC was the development of the CDTI approach for MDA. This has enabled other MDA and PCT treatment programmes to greatly increase population coverage. The movement of large amounts of ivermectin with minimal loss or diversion was another substantial achievement.

Realization of elimination of the public health and socio-economic consequences of infection with onchocerciasis was certainly the most important outcome. Being able to moving beyond control to elimination of transmission is an unanticipated outcome of this original APOC goal.

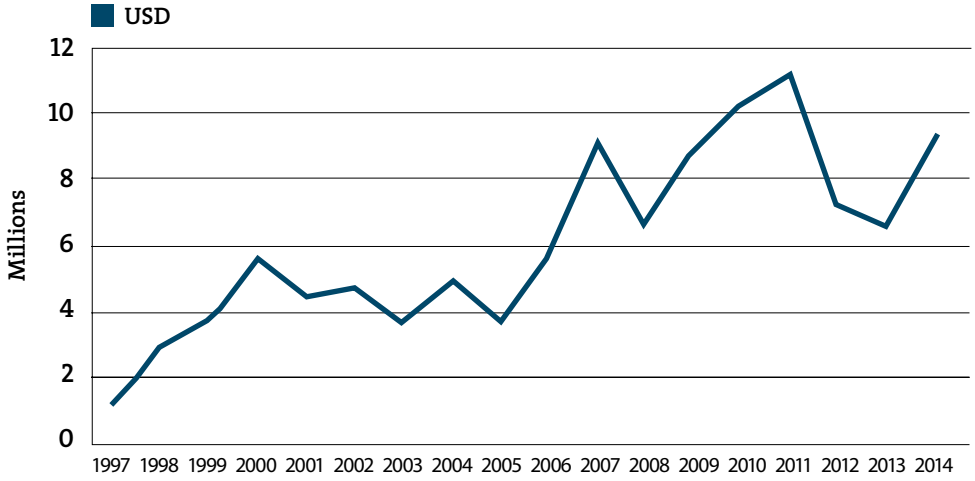


Figure 5. Annual total APOC expenditures

4.4.7. Financial

Following the funding pattern for OCP, APOC was funded through a World Bank Trust Fund which allowed services to be provided to countries according to need and not dependent on specific country. In the beginning, regular donors' conferences were held to update donors, build commitment and expand participation. These stopped in 2004, and some persons interviewed felt this contributed to diminished donor interest. At this time donors began diversifying their interests into other NTDs, and financial crises intervened. The Trust Fund remains an important option for some donors who prefer this to funding through WHO. APOC Trust funds were managed by the Bank without costs, however, this is unlikely to continue under new policies. Although some approaches have been made to the private sector, this has not been successful with a few exceptions. In Malawi, the Tea Association of Malawi is a regular financial supporter, and there have been some promises of assistance in Nigeria from private sources.

Funds were made available to counterpart countries according to the population served and the number of projects present in a given country. As the shift from control to elimination occurred, delineation of the margins of onchocerciasis foci, resulted in expansion of MDA into areas previously excluded by REMO as hypoendemic. This was increasing costs of management and treatment at a time when direct funding transfers to counterparts (DTC) were being scaled back as part of the sustainability plan.

In all, some $109 868,426 has been provided to countries either in the form of equipment, for DTC field activities or various administrative or technical purposes over the life of APOC. This is detailed in the annex 1. The largest sums ($21 million) went to Nigeria and the Democratic Republic of the Congo (Kinshasa). This was followed by the Republic of Cameroon ($11 million) and the Republic of Tanzania ($10 million). Peak years of dispersal were 2010 ($10 million) and 2011 ($11 million).

A major problem with the DTC funds was the accountability. Getting accounts of expenditure of funds from counterpart countries was very difficult. APOC trained and supported accountants in the counterpart countries to specifically manage these accounts, but still it was difficult to get these returns in a timely manner. On the other hand, countries complained in delays in receiving DTC funds from APOC, and felt that sometimes this delayed delivery of

medicines. With the prioritization of the limited APOC trust funds remaining for 2015, several countries may not conduct MDA in 2015/2016.

Funds were generally expended by APOC according to the budget allocation made according to the individual programme objectives. As WHO moved to International Public Sector Accounting Standards (IPSAS) for financial reporting, it became difficult for APOC accountants to meet these new requirements, requiring assistance to be sent from Geneva. IPSAS had been established at AFRO, so the demands for technical assistance for ESPEN accounting will be less.

A Major APOC contribution toward community MDA has been the assistance toward equipment for district and state health teams. The provision of vehicles was very much appreciated by district and community health workers. This has increased mobility of supervisors, and field teams. In Nigeria MoH personnel complained they did not have the same access to APOC vehicles as the States had and were limited in field visits.

The NGDOs in general, did not complain of financial difficulties at the present time. Several had just received five year grant funding for NTDs, of which onchocerciasis elimination would be a prominent part. In the past many NGDOs had received 12.5% of their indirect costs as an APOC contribution. It is not at all clear if this will continue with ESPEN.

4.4.8. Participation from the NGDOs

The NGDOs play a critical part of the function of APO, though they are not part of APOC governance structure. The participate in APOC activities through the NGDO Coordinating Group, which has both an international structure, and local or national groups depending on which organizations are active in various countries. They participate in the JAF meetings and hold their separate closed session, and make recommendations. Although the environment of NGDOs is very competitive, in interviews we found them working closely together to support MDA, not only for onchocerciasis. In the Nigeria onchocerciasis elimination meetings they were active participants. In several interviews the expressed preparedness to step in to fill gaps occurring with the close of APOC.

Table 5. NGDO Coordinating Group Members and functions

Group Members	Functions
• MDP • Charitable Society for Social Welfare • MITOSATH • Christoffel Blindenmission • Organisation pour la Prévention de la Cécité • IMA World Health • Lions Club International Foundation • The Carter Center • Sightsavers • United Front Against River Blindness • Helen Keller Intl • US Fund for UNICEF	• Assists MoHs in preparing national plans and project proposals • Collaborates with MoHs in establishing CDTI programmes • Provides technical expertise in training and supervision • Assists health-care personnel with community mobilization • Conducts operational research and evaluation • Co-finance programme activities • Delivering ivermectin and supplies • Monitoring and reporting for MDA • Encouraging and mentoring local NGDOs in ivermectin treatment

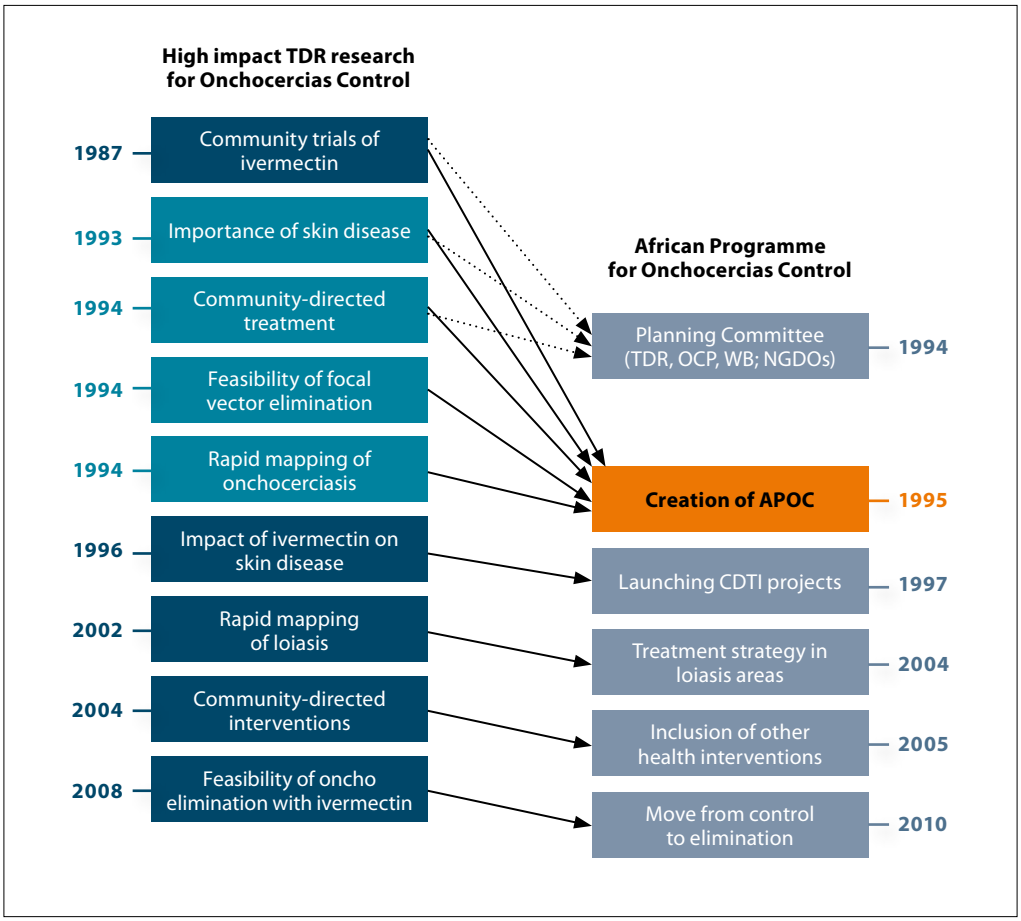


Figure 6. TDR research activities

4.4.9. Research

Consistent with its objective to be evidence-based, APOC had an agreement with TDR to support operations research. Records up until 2012, indicated that an annual sum of $700,000 was made available for operations research with TDR. Additional research activities were provided for research project submitted to APOC and approved by the TCC. In total, some $11m in research funds were provided by APOC. This was complemented by additional funds raised by TDR. There were other research activities carried out that did not involve TDR, such as in Uganda and Cameroon. These involved various academic groups. Notable studies carried out through TDR collaboration provided the basis of REMO, RAPLOA. The TDR studies building on OCP data in Senegal and Mali provided led to the elimination strategies which also used the ONCHOSIM model. Among other research studies carried out included studies on fly population molecular genetics, development of questionnaires to identify priority villages for ivermectin treatment, and modelling potentials for ivermectin resistance in *O. volvulus*.

5. Analysis of programme's wider impact

Analyze the Programme's wider impact and advise how lessons learnt from the programme could inform future programming.

5.1. CDTI approach

The CDTI approach was recognized by all stakeholders as one of APOC's key contributions. It was a novel and innovative strategy to community empowerment and engagement that has involved communities and populations seeking their own health and development. Despite the complexity and time required in establishing it, this approach should continue to be used to foster community ownership of interventions against NTDs.

An important APOC legacy is the network of trained health workers and community distributors that enable communities to become involved in their health issues. National NTD programs must strive to sustain and enhance this system, as these dedicated implementers are central to NTD community activities. Specific issues of incentives to community distributors that have been recurrent under APOC should receive due consideration, especially in urban settings. This becomes more important as the complexity of CDD work increases with additional interventions.

APOC's capacity building and health system strengthening activities covered central, regional, district and community levels. Most logistics provided by APOC for CDTI also assisted in the implementation of other diseases interventions beyond onchocerciasis. These included childhood immunization, vitamin A, HIV/AIDS, and malaria in various locations.

5.2. CDTI gives rise to community development activities

Building on the success in coverage and impact achieved using CDDs for ivermectin, the government of Chad announced that it will increase the number of community health workers to 40,000. They will receive salaries to provide community health services. A related extension of the CDTI strategy to address wider community development issues was initiated in Cameroon, called the Initiative de Développement Communautaire. Under this initiative, community members contributed financial resources to support the ivermectin distribution system, including incentives for CDDs, and to address other community development problems. The following is a quotation from an NGDO manager who supported the process.

"From CDTI, the initiative for community development (IDC) came to life. Communities were sensitized and their awareness raised on specific intervention issues. Their involvement, engagement and they made financial contributions to support the activities. We achieved that in the Littoral Region (of Cameroon). We mobilized more than 4 million francs CFA (Equivalent ~USD 8000). Contributions were obtained from community funds of the Integrated Health Centers, Councils, mosques, economic operators, to support CDDs."

With the adoption of the 2015 Sustainable Development Goals, APOC experience with building community development activities from CDTI activities can hold important lessons for the countries which participated in APOC.

5.3. Building human capacity

Other capacity building programs beyond training CDDs, included more advanced and longer training in areas such as epidemiology, public health, entomology—fly dissections and cytotaxonomy. Many health workers and health technicians trained by APOC continue to provide services to their respective ministries of health or health facilities. The skills they acquired are increasingly important for control of other vector borne diseases. APOC training programmes intentionally sought to increase the number of women entering these areas of science.

This APOC initiative has been an incentive for NGDOs to build technical capacity among their national staff. The laboratory capacity and the human skills this requires have been aggressively built by the Carter Center in Nigeria, Uganda and elsewhere. This capacity is supplementing the work APOC began, and can help supply technical skills in the post APOC period in some locations.

5.4. Partnership for problem solving

An example of partnership in problem solving has been the problem with *Loa loa* co-endemicity. When cases of encephalopathy appeared in patients with *Loa loa* microfilameia treated with ivermectin, APOC teamed up with TDR, the Mectizan Donation Program, and later with scientists funded by the Bill and Melinda Gates Foundation to reduce this threat to MDA. Development of the RAPLOA instrument the first step in identifying areas at risk. With MDP, clinical management

guidelines were established, and now with Gates-supported research, further studies on field tests for high Loa microfilarial counts are being developed. This approach of harnessing research methods to produce evidence for field implementation is a superb example for other NTD programmes, and is true to the original intents of APOC.

5.5. National Onchocerciasis Task Force

The coordination structures that were formed with APOC support at country level, such as the National Onchocerciasis Task Force (NOTF), the NGDO Coalition, have worked very well and are now being used for other NTDs and national disease control programmes. In many countries the NOTF has now become the NTD Task Force. This incorporates the separate activities for various national programmes involved in lymphatic filariasis, onchocerciasis, soil transmitted helminths, schistosomiasis and trachoma. This approach has already helped to integrate efforts, establish synergies, to avoid duplications and competition for resources. This puts the control of NTDs and other disease programmes firmly in the hands of country leadership.

The evaluation team recommends that ESPEN consider promoting a similar structure. Although there is an attraction for ESPEN to be "lite" with minimal meetings, the APOC governance structures for national programmes helped build awareness among stakeholders and generally facilitated communication.

During the evaluation there were some instances where the NGDOs and district supervisors felt unconnected with the national NTD network. A continuing strengthening of the NGDO coalition, incorporating more local NGOs or civil society organization while finding ways to connect people at lower levels in the health system is important. Fora for persons in the distribution activities at district level was suggested by several persons. Accountability at the community level through a peer-review system has been tried and works well in some locations.

5.6. Building national programme capacity

Creating a solid evidence-based platform for programming has encouraged other countries to move beyond the original approaches established by APOC. Uganda has developed an elimination process using its own resources. The Uganda program is an excellent example of using local skills to tackle local issues and creating successful policies appropriate to the context. The combination of vector control with MDA, as set out in the APOC project document in 1996, has shown the effectiveness of this vision. Developing metrics and alternative treatment strategies, Uganda is now setting the example for other countries, the type of national empowerment which APOC was designed to initiate. This has also opened up possibilities of regional collaboration in elimination efforts for the post-APOC environment. Already Nigeria Etiopia, and Sudan are following the lead of Uganda in developing an elimination process. Increasingly there is African competence in onchocerciasis research design and implementation, so there is less dependence on TDR for the conduct of research activities than in 1995.

5.7. Socioeconomic impact

The evaluation team visited the village of Lheur in Cameroon, a community in an area that was once known for high prevalence of onchocerciasis (98%) skin and eye manifestations. Blindness had been frequent in the village, where fertile lands were abandoned by the work force. Because of the ivermectin treatment, the local population reports the prevalence of onchocerciasis and morbidity it caused has

decrease to almost nil since ivermectin distribution began in 1998. Today, the village supports extensive rice farming where once few people dared to live. The team visit coincided with the Phase 1 entomological evaluation of the project progress towards elimination.

From the beginning of APOC the belief was that blindness was less common in the 19 countries than in the OCP countries, and estimates of 217,000 cases of blindness were made. The extent of itching skin was well documented by Brieger et al. While this undoubtedly had a major social as well as economic impact across the region, like blindness, its prevalence was never systematically estimated.

5.8. Health system strengthening

The material support in vehicles and equipment made the initial rapid scale up of distribution possible. By making the distribution process efficient it improved the ability of health workers to carry out supervision and gave them the time to address other community health needs. The challenge will be how to maintain and reinvest in health systems support post APOC.

Transferring ivermectin distribution from the health services, as it had been prior to APOC, to the community has allowed health workers to focus on expanding primary health care services to these communities and address special health needs.

National onchocerciasis control programmes have been an important recipient to local professional support from the WHO country offices. The value of this has been demonstrated with onchocerciasis and now this practice is seen for other NTDs. The WHO country offices will be an even more important source of technical support in the post-APOC period.

6. Best practices and significant lessons learnt

To identify best practices and describe the most significant lessons learned from the suc-cess or failure of the operations undertaken in APOC areas relevant to the control and elimination of onchocerciasis or other disease control activities. (Including identification of factors that influenced the achievement or non-achievement of the objectives, best practices and lessons learned).

To identify best practices and describe the most significant lessons learned from the success or failure of the operations undertaken in APOC areas relevant to the control and elimination of onchocerciasis or other disease control activities. (Including identification of factors that influenced the achievement or non-achievement of the objectives, best practices and lessons learned)

6.1. CDTI was major contribution

This was a major development for not only the distribution of ivermectin but for empowering communities for participating in their own health care. It very effectively bridges the gap between the first line PHC facilities and communities. It is an idea that has been taken up by

other organizations providing community care and community development. Gender issues were a problem in some places where activities of women were culturally limited. Where women played a major role as distributors they tended to function more consistently than men. The CDTI approach was supported by extensive research with TDR.

An area for concern is the intensive annual training or refresher instruction which CDTI requires to maintain its activities. Although CDDs are now being used for integrated NTD services in many countries, it is not clear who will continue these intensive training activities after APOC closes. Already some of the other NTD programs have reportedly been expressing reservations about continuing the CDTI approach, raising concerns for sustainability. As more monitoring and reporting requirements are being added for other disease it is not clear that minimally educated CDDs in some places can manage increasingly complex activities and associated record keeping. Finally, there are the issues of expectations of remuneration or incentives which continue.

6.2. Partnerships

At the heart of APOC successes has been its partnership design. Creating a Trust Fund that could work with donors and provide assistance across endemic countries on as-needed basis coupled with WHO executive oversight; enlisting country commitment; incorporating NGDOs with their community credibility, and finally empowering communities for their health was exceptionally farsighted. The support of Merck in provision of ivermectin was unwavering and support from the MDP.

The failure of many endemic countries to financially support programming at their level of commitment was a signal disappointment. However some countries, such as Cameroon, Malawi and Chad, consistently allocated funds to MDA. Changes in donor priorities and the financial crisis of 2008 affected funding. The shortfall in funding has sometimes been compensated for by increased NGDO activities, using other resources. The independence of NGDOs was seen as in some ministries, but in general has allowed them to be flexible and responsive as needs arose.

6.3. Governance

A very structured system has functioned from the beginning with the Joint Action Forum the top governing body. The meetings of the various committees have functioning in an orderly manner and good records kept. The process is largely unchanged since 1995. APOC leadership and senior positions have been held by dedicated and hardworking mangers and scientists.

Governance within this partnership was difficult at time. Some communications lapses have damaged the programme, and in later years it was seen by some as having top-down, very conventional management approach, and discouraging country initiatives. Yet it was governed in an established and general open manner. Several factors contributed to a sometimes operational autonomy, including its geographic location, which could be damaging to APOC.

6.4. Integration in programming for NTDs

It took time to build support for the concept of integrated programming for NTDs, and it is not yet implemented in some countries. At national level there were some initial problems with sharing resources among programmes, which have been largely overcome. With integration, some NGDOs discovered that MDA for co-endemic NTDs could be added at minimal marginal costs. Other activities such as bed nets and vitamin A are common additions into the integrated

NTD programming, even though not part of traditional NTD projects.

Potential problems arise in coordinating distribution schedules of various MDA rounds, and with ivermectin, as it is likely most places will shift to twice yearly treatment. Even if these can be harmonized, problems with timely shipment and customs clearance of medications will continue to pose problems. Differences in the unit of intervention among problems pose additional problems, yet to be resolved. Inclusion of morbidity management needed for some conditions (LF, trachoma) have not been fully addressed yet.

6.5. Shift in emphasis to elimination of onchocerciasis

The paradigm shift, "...to determine when and where ivermectin can be stopped and provide guidance to countries...." was supported by data and the OEPA experience, and was approved by the JAF in 2009. Several countries are approaching the point of stopping of ivermectin treatment. In other countries, the stopping treatment is a near option in some foci. Elimination is increasingly being taken very seriously by countries. APOC has established elimination guidelines and has been supporting countries with the required epidemiological and entomological surveys required and required laboratory services.

An opportunity was missed with the shift from control to elimination to thoroughly assess what this paradigm shift entailed, both operationally and from the costs aspects, and to address these up front. APOC's elimination framework (based on OCP data) was seen by some to be at variance with the WHO guidelines, and different from the OEPA approach relying on Ov16 testing rather than skin snips. This caused some confusion. The additional mapping and sampling issues for stopping treatment need to be resolved so the route to the elimination dossier for countries is straightforward. With the shift to ESPEN it is not clear if the required technical and laboratory services will be available to countries through AFRO. OEPA provides useful comparisons in some regards, though it is shaped by an environment, disease and disease vectors, and populations much different from the APOC region.

6.6. Capacity building and health systems strengthening

Much of the success of APOC in achieving high therapeutic and geographic coverage across most participating countries was due to building human resources and strengthening health systems to support ivermectin MDA. The initial provision of vehicles produced a very rapid start at the beginning of APOC. This success was sustained by intensive training programs starting with CDTI, and including advocacy, training for national coordinators and long term graduate training in public health with a gender focus. Curricula for professional schools in CDTI were developed. Health systems strengthening included basic equipment and training at the operational levels. All of this greatly benefited APOC programming but also helped other health activities separate from the other NTD programmes. In these activities, APOC was the model programme.

These extensive support and capacity building activities did not come cheaply, and added substantially to programming costs. In this way they may have contributed to the image that some had that APOC was inefficient and not using its funds effectively. Using a results-based approach it would be hard to show how much providing laptops for district managers or financial training for accountants contributed directly to control or elimination goals. With a future emphasis on

a lean programming for ESPEN, it may be that these activities will not be sustained. However, there are opportunities on a country-specific basis for donor countries to help integrate 5PCT MDA into other capacity building activities.

6.7. Knowledge base

APOC has acquired a rich data base which was enhanced through many years of joint research work with TDR, the REMO and RAPLOA surveys, and excellent individual country databases. As well, APOC inherited data and extensive records from OCP. APOC has generated excellent maps, trends and patterns from these data sources. While data do belong to individual countries, having a central organizing and analytic capacity is a major asset.

Some country programmes have complained about delays and reluctance in sharing data by APOC. In some instances countries lack complete records of their own treatment programmes, so they depend on APOC data, which they cannot readily access. APOC is currently working to build a web-based open data storage system which will alleviate this problem. A deeper problem is that much has changed in APOC countries since initial REMO data was done up to 20 years ago, with migration and severe ecological changes. Countries now need to consider how to update this information to help in elimination plans.

6.8. Cross-border issues

The problems with cross-border foci have been acknowledged and a special presentation to the JAF was made on this issue, and AFRO resolutions made. When the objective was control, spread of vectors and population did not pose such a great threat to neighbouring countries. This changed with elimination strategies especially when on country was nearing stopping treatment and across the border there were limited control activities.

APOC recognized these problems, convening meetings and worked hard to create cross-border dialogue and planning. However, country level follow-up was generally disappointing. As a consequence, several countries have their goals of elimination threatened. Going forward new approaches may need to be considered at the country and regional or sub-regional level. A number of established mechanisms exist which could be utilized.

6.9. Operations research done

A large budget was agreed annually with TDR which was focused on operations research issues. Many studies were done around CDTI, skin disease, simulation models, suboptimal responding parasites and macrofilariacidal drugs. APOC appreciated and utilized research findings.

Research findings were utilized by APOC and many were published in scientific literature. However, countries that participated in the studies felt the results were not shared with them, and sometimes, that the APOC research topics were not focused on country needs, and did not build country research capacity. Other countries, like Cameroon and Uganda built their own onchocerciasis research agenda. Organizations such as the Carter Center, Centre de Recherches sur les Filarioses et autres Maladies Tropicales (CRFilMT), Foundation for Research on Tropical Diseases and Environment in Cameroon and Institut de Recherche pour le Developpement, Montpellier, France have contributed to research findings and could assist elimination strategies.

6.10. Lack of transitional phase

APOC benefited greatly from a 3-year transitional phase from OCP which utilized the accumulated skills and knowledge as well as the institutional memory. Although there are limited funds at this final phase of APOC and only three months remain until closure, APOC needs to receive the support from AFRO and others for the transfer of accumulated information to minimize the kinetic loss in support for ivermectin mass distribution. It is important that the structure for future support of ivermectin distribution be communicated to country program managers and ministries of health without further delay, as many are not clear on the future.

Considerable efforts went into developing a plan for PENDA. A better understanding of current program design trends and closer links with the donors could have channelled this effort into a better transition to follow-on AFRO activities.

7. conclusions and recommendations

To formulate conclusions of the evaluation and recommendations to each stakeholder involved (Countries, WHO, donor community, NGDOs, etc.) which might be useful for any international public health partnership program.

APOC was launched in 1995, to control onchocerciasis in 19 (now 20) endemic African countries outside the 11 countries of the former OCP, following the pledge of Merck to supply ivermectin to endemic community for as long as was needed. Working through a partnership involving communities, policy makers, health workers, UN system, donors, and NGDOs, APOC used CDTI as its main strategy to establish a sustainable system for ivermectin distribution in onchocerciasis meso- and hyperendemic areas. CDTI was appreciated as an innovative approach that helped build communities capacities in establishing sustainable drug distribution schemes. Later this approach was used to address other health and development issues. The financial contributions committed by endemic countries to insure continuity and sustainability of the distribution process were not fully realized. In the last years of programme operation, APOC experienced considerable resource constraints. Further, implementing the paradigm shift from control to elimination proved complex. In planning for follow-on NTD control, considerable efforts went into plans for PENDA. Eventually this

was abandoned, to be replaced with the Brazzaville-based Expended Special Project on NTD Elimination (ESPEN). The present recommendations are geared towards assisting the ESPEN stakeholders with planning for future onchocerciasis elimination activities.

7.1. Key conclusions

1. APOC has created a structure which has met the goal of eliminating onchocerciasis-related blindness and wide-spread skin disease through an innovative public-private partnership, though specific indicators for this goal/objective were not created. The exceptions being in areas complicated by loiasis. Even in conflict areas or poorly implemented programmes microfilarial counts are low. Although the programme lacked specific socio-economic indicators, an estimated 8.2 million disability-adjusted life-years (DALYs) between 1995 and 2015 have been averted by the mass distribution of ivermectin.
2. APOC successfully established a relatively simple and sustainable system for distribution of ivermectin at country and community level using community level using community directed distributors (CDDs) which became part of the primary health care system (PHC). Not only was this an effective distribution method, but it built community ownership and demonstrated that communities could participate in seeking solution to their own health issues when empowered. Some NGDOs now use the CDTI approach for all of their health programming. How this CDTI system will fare following APOC closure remains to be seen.
3. Treatment coverage increased gradually, reaching 80% in most countries in 2015. The programme performed best in rural rather than in urban locations. Coverage has been less in conflict-affected areas and countries lacking political will to effectively implement programming.
4. The innovative CDTI approach to mass treatment provided the basis for the 5PCT integrated NTD programmes in many countries, building on the failure of health facility and outreach activities. Although the support from APOC to integrated NTD programming was seen by some as hesitant in the beginning, APOC support was key in providing a solid NTD platform in many places. Major assets supporting NTD programmes were the design of common reporting and joint approaches to ordering NTD medicines.
5. APOC was a superbly designed partnership between the WHO/World Bank, donors, countries, communities and NGDOs. The NGDOs played a key role in the distribution process, especially when government allocation of funds in support of programme activities lagged below their commitments.
6. The Trust Fund mechanism was useful for funding activities across countries, including those with an insufficient or no donor base. There were perceptions that beyond 2004, the cessation of donors' conference hampered relationships with donors and failed to sustain their interest in the programme. With the growing international momentum around NTDs and the financial crisis, donors became less attracted to single-disease programmes. Some donors dropped out. The Trust Fund mechanism offered a credible channel for pooling donations that was judged satisfactory by most stakeholders. In the final years of APOC, some donors and countries indicated that they were feeling sometimes excluded from the decision making process.
7. The governance structure was well organized with JAF, CSA and TCC

having clear roles and responsibilities. Some stakeholder have expressed the wish that this structured approach be continued for ESPEN, despite the heavy meeting schedule.

8. Health systems strengthening activities were an important component of the APOC programme which was widely appreciated by countries. The quick start-up of national programs and field implementation resulted from the rapid building of country capacities and supply of equipment, vehicles and logistical support. This continued through the life of the programme, though on a declining scale. Many of these provided by APOC are used to support other NTD programmes as well.

9. Human capacity building was a priority from the first. The many short-term training and advocacy courses were key to APOC success in building an efficient distribution system with country and community ownership. Candidates were supported for master's degree programmes. Community health CDTI training curricula were developed for training health professionals at various universities. NGDOs partnered extensively with APOC in training activities. Professional officers were seconded to country programmes offices where there were specific country needs. The support for building human capacity was one of the most appreciated aspects of APOC activities. Special attention was given to gender issues in training after 2009.

10. Research activities supported the objective of APOC being an evidence-based organization. Much of this was done through TDR, but some directly by APOC. With the closure of APOC, it is critical that the data and findings from these research activities be preserved for future access.

11. With time, it was perceived that APOC had assumed a more "top-down" management style, with less flexibility, and less openness to new approaches. There were complaints that APOC did not share programme data readily with countries.

12. The financial support from participating countries was in the end, a major disappointment for APOC. Original plans called for initial majority from APOC funding followed by a phasing out of financial support. However while many countries made commitments, there were only some made actual allocations, other than salary support of staff. Obtaining records from countries for expenditure of APOC funds was difficult. With the switch to elimination from control, the costs for some countries went up as funds transferred from APOC declined. In some countries this was related to a lack of leadership and weak governance of national programmes.

13. A lost opportunity with consequences occurred with the shift from control to elimination. This could have been a time to do a comprehensive examination of the management, human resource, laboratory, and material costs of this paradigm shift. Alternative treatment strategies should have been considered and the tasks involved in additional mapping assessed. This was a time that several countries were developing their elimination plans and capacities. A reordering of program structure to a more horizontal, collaborative and decentralized programme structure, utilizing the developing regional resources could have been a good step to have been implemented then. But without this, the current resources were inadequate to meet the elimination agenda, and this is likely to be more so for the future ESPEN entity. It is very probable that some countries

will not meet an elimination goal by 2025, either from lack of resources or lack of will.

14. Cross-border transmission zones become more important with the switch from control to elimination, especially if little mass treatment was being carried out on one side. Multiple high-level meetings were convened on cross-border issues, resolutions by AFRO, and extensive discussion at the JAF, but in the end, little on the ground was achieved. Cross-border transmission threatens several areas of Chad, Uganda and Malawi which are approaching cessation of MDA.

15. APOC finishes on somewhat of a sad note. There seems to be inadequate appreciation for what has been achieved by dedicated and hardworking scientists and programme managers. It was expensive for what it tried to do, to a substantial extent because of its capacity building, logistical support, research and health systems strengthening activities.

16. The lack of a smooth transition process to the follow-on ESPEN will most likely result some in loss of progress toward elimination of onchocerciasis. Some countries will not probably distribute ivermectin in 2015 or 2016 or both. The loss of institutional memory, scientific and large scale management capacity, and uncertain data continuity will likely be a substantial handicap for ESPEN, which will take time to overcome.

7.2 Key recommendations

7.2.1. A recommendation for the entire onchocerciasis and NTD community

1. Several Countries are on the cusp of stopping ivermectin treatment, and some other countries have foci which are likely ready to stop. This needs to be addressed soon and celebrate these successes, which will encourage everyone. Getting ready to do this will require further refinement of the surveillance methods and a commitment to sustain a robust surveillance system with the resources required.

7.2.2. Recommendations for NTD endemic countries

2. Increasingly, national NTD programs will need to mobilize their own resources, and the promotion of a coalition of NTD donors, public and private for individual countries is a country capacity needing to be built. As funding is now more integrated with other NTDs, it is important that adequate funds are available for onchocerciasis as part NTD programming. With movement toward elimination, the costs for mapping, epidemiological and entomological surveys will be increasing in frequency and costs for the onchocerciasis component. There will be considerable costs for Post Treatment Surveillance (PTS), but this may be partly offset by reduction in costs associated with stopping treatment. Irregular funding will lead to irregular treatment which will delay elimination and may increase the risk of suboptimal responding parasites emerging.

3. Other national related sectors such as water and sanitation, education have a potential role to play in the NTD national plans, and should linked where this is appropriate to programming.

4. All countries should be encouraged to develop an onchocerciasis elimination plan, following the examples of Uganda, Ethiopia, and Nigeria, even if elimination seems some years off. This plan should involve a careful costing of required measures following a standard and comparable approach. Guidance in developing these should be provided to countries by ESPEN to ensure they follow the appropriate standard methods consistent with WHO certification of elimination procedures. Alternative treatment strategies should be encouraged, and localized vector control could still be considered an option in some locations and may assist in mopping up transmission in particular areas. This development of the elimination pathway can include other NTDs as appropriate. A solid onchocerciasis elimination strategy and policies are a critical next step.

5. Support must continue for integrated national NTD plans and programmes where these are developed help with their creation elsewhere. WHO country offices should have the position of NTD officer to provide ministries with additional assistance as required, as many already do.

6. Countries should continue to promote national NGDO coalitions for NTDs. In some countries where there are tensions between government and civil society organizations this may be difficult. Support from the NGDOs for ivermectin MDA could decline as the indirect costs supplement from APOC ceases. NGDOs are a key component in successful community programs, and there is a concern for the annual refresher training of CDDs, especially in locations previous funded by APOC. Building a coalition of donors to work with NGDOs for particular countries should also be promoted. ESPEN and WHO country offices can support NGDOs in strengthening partnerships with governments, where these are weak.

7. There is now an excellent opportunity to share sub-regional laboratory facilities and human capacities to train, perhaps under the guidance and reference laboratory capacity of the MDSC, if this continues to exist. Several countries have developed excellent ELISA facilities for Ov16 and PCR for pool fly testing as well as having the skilled technicians and entomologists. Shared resources could be used to help complete integrated NTD mapping where required and assist with other vector borne NTDs. As new analysis methods are introduced a regional laboratory approach will help disseminate these quickly.

8. Integrated monitoring and supervision systems for NTDs should be part of all national NTD programmes.

9. The matter of recognition for CDDs should be continuously reviewed, as the complexity of work for CDDs in increasing with multiple interventions. In some places certificates of badges may be adequate, but some countries may choose to follow the examples of Cameroon and Chad that had allocations from the national budget to pay CDDs.

10. There is a need for endemic countries to have high level decision-making leadership participation in key programme discussion at regional meetings. Their involvement, commitment and voice in the decision-making sessions is critical. This was not consistently done at the JAF meetings during APOC, and hampered decision making.

11. There is a necessity to reinforce the fora of consultation among stakeholders at the national level. This would allow exchange of information on planning, implementation and sharing of

lessons learned and addressing collaboration issues, under the leadership of the ministries of health of endemic countries.

7.2.3. Recommendations for NGDOs

12. Maintaining a strong coalition within and across countries is important. With the preliminary outlook for an ESPEN at AFRO level to be light in technical depth, the NGDOs may have to take on additional technical responsibilities and capacity building, especially as countries are moving toward elimination. NGDOs have shown themselves capable of assuming this role.
13. NGDOs will continue to play a major role in assisting ivermectin distribution at the community level, as this is where many government services are the weakest. This work continues to be critical for the success in the control and elimination of onchocerciasis.
14. NGDOs may need to take a larger role in resource mobilization. This will be necessary where there is uneven or inconsistent donor or AFRO support for specific countries.
15. Where there are expanded NGDO roles, it is important to work closely with MoH NTD programs, as suspicions of NGDO having separate agendas and not being fully supportive are widespread in ministries. Clear memoranda of understanding with government can assist.

7.2.4. Recommendations for WHO, NTD stakeholders and donors

16. A careful assessment of the requirements for elimination of onchocerciasis in Africa should be conducted. This would include human, financial resources and organizational as well as political will. The recommendations would need to include changes in the approaches needed for elimination rather than just ramping up MDA. This may exceed the transitional capacity of ESPEN, so an alternative approach may be needed.
17. Trust funds will continue to be an important funding mechanism for onchocerciasis and NTD programming. With the changes in the World Bank trust fund policies, the option of basing this fund at WHO HQ should be investigated.
18. In encouraging countries to provide financial contributions to programme implementation, a counterpart, conditionality funding approach might be considered or other alternative approaches to financing. This could be clearly mentioned in the memorandum of understanding with countries and enforced where implemented. Donors should be encouraged to support the integrated package of NTDs, however disease-specific programming needs will continue to exist in some countries.
19. Considering all APOC's many financial, technical, and logistic contributions to disease control, over the last two decades, there are many concerns among national programs regarding the future of onchocerciasis control. National programme managers should be sensitized on the upcoming ESPEN and communicated their shared responsibility to support control and elimination activities, with a clear understanding about what can be and cannot be expected from ESPEN.

20. Development of novel approaches for mass drug administration and interventions against NTDs in urban areas should be encouraged. This is relevant for The Republic of Congo (Brazzaville) where urban transmission occurs, and where there is an influx of migrants with onchocerciasis symptomatic or not, but who could help sustain infection moving back and forth into foci where control is being achieved.

21. WHO country offices should continue making National Professional Officers available to national and provincial NTD offices to help build capacities in programme management, where there are needs.

7.2.5. Recommendations for ESPEN

22. ESPEN should begin with a detailed country-by country situational analysis of onchocerciasis. Maps still used in some countries are 20 year old REMO morbidity maps and do not consider the substantial population movements in places, and ecological changes which have occurred in subsequent years. Based on this situational analysis, realistic efforts can be made to address treatment priorities, assistance priorities and research needs. Ex-OCP countries should be included.

23. Building on these data, ESPEN should establish a result-based management approach with the capacity to measure outcomes in the way APOC could not.

24. At the same time, a careful inventory of country and regional level technical resources for onchocerciasis elimination needs urgently doing. Hopefully many of the assets created by APOC can be captured.

25. ESPEN should follow the APOC practice of strengthening health services including human resources, rather than just utilizing existing health services for delivery of MDA. To do otherwise would be unethical.

26. ESPEN should promote the sub-regional pooling of technical regional resources for epidemiological and entomological evaluation and for decision making to support field activities. Building of multi-country and multidisciplinary research teams focusing on operations research can inform regional implementation. This may address some of the cross-border issues which have eluded APOC. Sub-regional teams have the option of capturing some of the human capacity created by APOC. Linkage with existing regional bodies is important for this including the African Union new African Centres for Disease Control and Prevention. Links with regional economic bodies may facilitate a better understanding of the socioeconomic impacts on onchocerciasis along with the other NTDs.

27. Governance structures must include both management and technical review capacities. Adequate representation from countries, donors, NGDOs and communities is important. The regular governance functions of APOC were widely appreciated and should be continued as relevant. The partnerships developed through APOC should be maintained and enhanced were possible and appropriate.

28. Loiasis is a complex issue that will prevent some countries and zones from achieving elimination in a timely manner, but was managed carefully by APOC. The difficult decision making and careful attention to data must not be discarded by ESPEN in pursuit of a light and flexible structure. To do so will put persons at risk of serious events. There are many difficult decisions required in this and other aspects of ivermectin MDA which requires considered judgement by pooled expertise.

29. Cross-border treatment and transmission issues will need to be addressed more aggressively not only for onchocerciasis but for other NTDs as well.

30. APOC was creator and repository of much of the history of onchocerciasis in Africa. There is still an important need to capture the decades of data from OCP and APOC. It is unlikely that all will be digitized by the end of APOC and special provisions should be made for this activity to continue in Ouagadougou until the work is complete. There is also a library of specimens to be archived in an accessible manner.

31. Fragile and conflict-affected states endemic for onchocerciasis continue as a problem in the region. ESPEN should examine innovative approaches for sus-taining MDA in unstable states and among populations displaced by conflict from these regions.

Annexes

ANNEX 1: Key APOC indicators

Table 6. List of APOC Directors, and years they served

APOC Directors	Years they served	
Dr Roungou Jean-Baptiste	26/04/2013	04/08/2015
Dr Paul-Samson Lusamba-Dikassa	23/04/2011	31/12/2012
Dr Uche Veronica Amazigo	01/12/2005	31/03/2011
Dr Azodoga Seketeli	01/09/1999	30/05/2005
Dr Kofi Yakum Dadzie *	01/05/1995	30/06/1999

* For (OCP and APOC)

Table 7. Information of populations at risk by country and dates when any changes or updates were done

Country	Estimated in 2013	Estimated in 2006
Angola	2'540'933	3'263'850
Burundi	1'526'788	976'115
Cameroon	8'753'217	3'636'041
CAR	2'107'828	932'404
Chad	2'514'704	620'277
Congo	1'427'670	604'579
DRC	42'394'937	24'407'020
Equatorial Guinea	85'805	63'889
Ethiopia	11'858'617	7'292'235
Gabon	82'764	7'894
Liberia	3'092'730	1'128'798
Malawi	2'215'041	926'866
Mozambique	64'868	
Nigeria	50'124'539	32'899'901
South Sudan	6'806'792	8'375'877
Sudan	435'419	--
Tanzania	3'437'030	3'357'564
Uganda	4'313'818	3'221'691
Grand Total	**143'783'500**	**91'715'001**

Table 8. Training by country and by year by CDTIs

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Angola	--	--	--	--	--	405	540	1'129	2'084	3'037	2'198	4'081	1'337	3'819	--
Burundi	--	--	--	--	--	--	1'417	8'250	10'278	9'898	8'828	8'872	9'078	9'251	1'862
Cameroon	3'261	3'388	4'458	2'466	3'698	12'645	22'885	24'660	30'613	27'950	39'355	39'402	44'800	36'420	45'390
CAR	4'453	5'014	4'594	4'682	4'682	4'835	4'425	4'001	3'407	3'763	4'431	5'612	6'501	6'920	--
Chad	2'574	2'546	2'881	2'881	2'881	798	422	6'821	2'732	4'311	4'209	4'879	4'132	1'610	1'412
Congo	--	--	1'123	1'424	2'055	1'938	2'022	1'854	1'865	1'766	1'668	1'646	1'602	2'595	1'825
DRC	--	--	3'431	8'276	19'138	24'359	21'012	65'254	63'769	90'345	95'199	102'740	115'218	103'265	117'575
Eq. Guinea	40	140	140	194	--	234	--	--	387	141	104	204	0	--	204
Ethiopia	--	--	934	2'424	5'609	34'979	32'626	51'428	51'808	55'488	64'893	66'623	65'105	98'324	98'546
Gabon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Liberia	--	1'831	5'738	6'925	--	556	2'252	13'330	16'987	10'346	7'648	9'573	8'204	11'166	10'082
Malawi	1'238	1'899	2'166	2'640	2'640	5'027	4'375	6'055	7'217	10'493	14'147	14'678	15'484	15'129	16'179
Nigeria	19'543	48'945	57'253	59'145	56'984	57'463	56'665	62'168	91'544	110'215	163'303	188'012	210'358	192'698	166'842
South Sudan	--	332	559	660	--	--	1'943	3'281	3'108	6'403	9'268	12'204	16'467	15'150	9'611
Sudan	722	1'568	687	1'012	253	1'406	1'080	1'150	2'060	925	2'911	3'201	3'270	1'265	2'720
Tanzania	1'377	1'869	4'149	5'743	6'546	8'113	7'706	9'630	11'029	10'644	11'816	13'292	11'639	14'087	13'395
Uganda	10'747	17'707	29'338	34'735	35'168	41'179	33'403	24'988	39'390	75'177	83'106	63'808	64'616	102'436	31'869
Total general	**43'955**	**85'239**	**117'451**	**133'207**	**139'654**	**193'937**	**192'773**	**283'999**	**338'278**	**420'902**	**513'084**	**538'827**	**577'811**	**614'135**	**517'512**

Table 9. Training by country and by year by Local health workers in short courses

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Angola	--	--	--	--	--	168	168	108	184	310	275	437	102	346	
Burundi	--	--	--	--	--	--	52	119	205	235	241	214	258	183	225
Cameroon	488	348	1'156	526	1'298	1'572	2'347	2'391	2'645	2'585	2'239	2'908	4'877	3'646	3'055
CAR	430	451	451	488	0	0	28	352	467	467	467	468	692	890	
Chad	79	178	195	201	201	14	61	239	201	272	229	220	209	262	291
Congo	--	--	113	58	123	237	212	180	177	163	159	198	178	206	267
DRC	--	--	268	974	1'671	2'971	2'312	5'007	3'258	6'134	6'546	6'740	9'176	7'198	7'942
Eq. Guinea	12	12	12	12		18			16	20	20	20	0	--	20
Ethiopia	--	--	135	203	493	1'230	1'132	1'582	2'275	3'051	3'390	4'681	8'983	18'603	9'090
Gabon	--	--	--	10	10	--	--	--	--	--	--	--	--	--	--
Liberia	--	79	104	104	--	19	--	707	317	741	536	707	1'008	627	652
Malawi	205	786	172	478	293	925	1'183	1'705	1'612	2'648	2'787	2'895	2'338	2'597	3'547
Nigeria	1'489	8'755	10'510	9'216	10'219	8'616	9'841	12'301	22'015	20'433	22'123	28'067	34'231	32'645	39'250
South Sudan	48	116	60	--	--	194	606	472	488	1'094	982	983	0	571	--
Sudan	120	80	64	60	16	63	37	46		0	0	0	4'274	1'871	3'336
Tanzania	138	178	192	321	263	428	353	504	583	645	1'105	1'037	1'519	1'828	1'635
Uganda	460	685	787	510	572	5'619	3'285	1'359	1'445	1'697	894	1'718	14'110	9'413	7'840
Total général	**3'421**	**11'600**	**14'275**	**13'221**	**15'159**	**21'880**	**21'205**	**27'206**	**35'872**	**39'889**	**42'105**	**51'292**	**82'938**	**80'315**	**77'721**

Table 10. Masters level training

Institutions	Student Name		Country	Observations	Years	Function / Position after Master Degree
University of Witwatersrand South Africa	**1.**	Dr Abuya Nancy A. Lorna	Kenya	Master/MPH	2009 - 2011	?
	2.	Dr Mwagomba Lydia Beatrice	Malawi	Master/MPH	2009 - 2011	NTD Programme Officer
	3.	Dr Julio Assa Cuamba	Mozambique	Waiver		?
Malawi	**4.**	Mrs Veronica Nkukumila	Malawi	Master/MPH	2009 - 2011	MoH
	5.	Dr ABAKAR Haguy Sylvie	CAR	Master/MPH	2009 - 2011	Director of Community Health
	6.	Dr TAMBWE Mangala Jean Paul	DRC	Master/MPH	2009 - 2011	NTD and Onchocerciasis Supervisor NOCP/Kinshasa & Bas Congo
	7.	Dr GINA Engumba Ntela	DRC	Master Epidemiology	2009 - 2011	Epidemiologist and Supervisor NOCP
	8.	Dr Nicayenzi Dieudonné	Burundi	Master/MPH	2009 - 2011	Director General of Planning/MoH and RSS/GAVI, Project Coordinator
	9.	Dr Hassan Asmini	Burundi	Master/MPH	2009 - 2011	Director Department of Health Information System
	10.	Mlle Nkwidjan Henriette	Cameroun	Master/MPH	2012 - 2013	NDGO Coordinator
	11.	Dr GAMBA Eddy- Patrick	CAR	Master Epidemiology	2009 - 2011	Officer in charge of Nutrition, UNICEF/CAR
IRSP/Benin	**12.**	M Koundika Jean Richard	Congo	Master/MPH	2009 - 2011	?
	13.	Mme Salamata Gody Ibrahim	Chad	Master/MPH	2009 - 2011	MoH
	14.	Dr KENMOGNE Kouam Marc	Cameroon	Master Entomology	2010 - 2012	Researcher/Centre de recherche sur la filariose et les autres maladies tropicales (CRFilMT)
	15.	Dr YEO Souleymane	Côte d'Ivoire	Master/MPH	2012 - 2013	Chargé d'études au PNLO, Côte d'Ivoire
IRSP/Benin	**16.**	Dr GAUNEFET Christel Eddith	CAR	Master/MPH	2012 - 2013	Gynécologue
	17.	Dr N. GUENDOKO Yolande	CAR	Master/MPH	2012 - 2013	Chef de service de la santé de la reproduction
	18.	Dr MANYA Kitoto Léonie	DRC	Master Epidemiology	2012 - 2013	Epidemiologist, Direction of Disease Control
	19.	Dr MUTEBA KOLONGO Daniel	DRC	Master/MPH	2012 - 2013	Onchocerciasis Supervisor, in charge of SAE, NOCP
	20.	Dr NENODJI MBAIRO	Chad	Master/MPH	2012 - 2013	MoH
Centre de Formation en Santé Publique – (CFSP) Lomé- Togo	**21.**	Mme Touadé Halimé Angèle	Chad	Bachelor Degree Public Health	2009 - 2010	MoH
	22.	Mme Gambaye Christine	Chad	Bachelor Degree Public Health	2012 - 2013	MoH
Uganda Martyrs University	**23.**	Dr Rhona Barusya	Ouganda	Master/MPH	2009 - 2010	?

Table 11. Resources expended, APOC funding summary by country

Country	Capital equipment (USD)	Amount released for field activities (USD)	Amount released for specifics activities (USD)	Technical, Administrative & Financial support (USD)	Amount approved for overhead (USD)	Total General (USD)	Fiscal year
Angola	883'656.33	2'086'275.31	670'274.41	1'233'863.00	53'790.00	4'927'859.05	2003–2014
Benin	1'573.00	32'799.00	62'092.15	0	0	96'464.15	2006–2013
Burkina Faso	0	8'747.00	88'161.96	0	0	96'908.96	2007–2014
Burundi	646'148.60	1'203'229.53	397'102.08	181'424.95	6'627.58	2'434'532.74	2001–2014
Cameroon	2'216'082.86	6'241'369.25	1'986'578.90	650'319.00	346'502.44	11'440'852.45	1998–2014
CAR	720'549.62	922'557.00	619'340.39	819'293.57	12'559.07	3'094'299.65	1999–2014
Chad	1'079'419.69	1'598'181.83	967'031.39	682'617.86	85'257.07	4'412'507.84	1998–2014
Congo	173'249.29	182'196.83	552'346.63	0	54'026.88	961'819.63	2000–2014
Cote d'Ivoire	174'554.39	722'865.02	289'506.14	0	0	1'186'925.55	2008–2014
DRC	2'653'045.94	12'609'369.92	3'827'869.46	2'533'838.00	103'362.52	21'727'485.84	1999–2014
Equatorial Guinea	2'584'555.00	14'531.74	202'648.43	0	16'294.00	2'818'029.17	1998–2014
Ethiopia	1'934'018.86	2'140'886.04	640'942.08	176'477.00	110'560.00	5'002'883.98	2000–2014
Gabon	48'636.00	25'000.00	119'176.00	0	0	192'812.00	1999–2014
Ghana	46'009.65	399'692.00	148'617.59	0	0	594'319.24	2007–2013
Guinea	42'939.00	0	8'570.02	0	0	51'509.02	1999–2014
Guinea Bissau	49'556.72	79'327.14	168'562.89	714'178.02	0	1'011'624.77	2008–2014

Table 11. Resources expended, APOC funding summary by country (continued)

Country	Capital equipment (USD)	Amount released for field activities (USD)	Amount released for specifics activities (USD)	Technical, Administrative & Financial support (USD)	Amount approved for overhead (USD)	Total General (USD)	Fiscal year
Kenya	0	0	17'521.47	18'000.00	0	35'521.47	2004–2008
Liberia	553'627.96	1'353'483.00	336'789.00	842'451.87	27'156.76	3'113'508.59	1999–2014
Malawi	314'607.71	306'269.63	1'220'421.75	0	116'667.07	1'957'966.16	1997–2014
Mali	0	5'095.00	49'812.98	0	0	54'907.98	2000–2014
Mozambique	0	0	52'000.00	0	0	52'000.00	2001
Niger	0	9'278.00	67'163.34	0	0	76'441.34	2010–2014
Nigeria	3'275'186.00	12'250'179.69	4'573'828.59	689'567.43	527'268.39	21'316'030.10	1997–2014
Rwanda	0	0	11'720.00	0	0	11'720.00	1999
Senegal	0	0	18'799.00	0	0	18'799.00	2014
Sierra Leone	168'657.41	871'509.79	38'992.70	0	0	1'079'159.90	1997–2014
Sudan	949'619.06	4'959'066.59	772'320.03	1'295'250.13	66'324.00	8'042'579.81	1997–2014
Sudan	0	0	0	0	0	0	A supprimer
Tanzania, United Republic	1'968'087.46	6'078'169.00	1'243'732.13	810'086.74	223'626.21	10'323'701.54	1997–2014
Togo	0	0	13'574.75	0	0	13'574.75	2012–2013
Uganda	875'357.58	2'008'950.91	586'858.84	88'951.00	161'562.60	3'721'680.93	1997–2014
Total	**21'359'138,13**	**56'109'029,22**	**19'752'355,10**	**10'736'318,57**	**1'911'584,59**	**109'868'425,61**	

Table 12. APOC funding summary by year

Fiscal Year	Capital equipment (USD)	Amount released for field activities (USD)	Amount released for specifics activities (USD)	Technical, Administrative & Financial support (USD)	Amount approved for Overhead (USD)	Total General (USD)
1996	0	0	0	0	0	0
1997	757'245.00	356'763.00	132'364.00	30'000.00	0	1'276'372.00
1998	993'632.00	1'402'682.00	146'839.00	30'000.00	334'185.00	2'907'338.00
1999	874'488.00	2'413'094.00	230'392.40	30'000.00	289'736.00	3'837'710.40
2000	784'980.00	3'799'980.00	639'450.51	80'160.00	236'544.00	5'541'114.51
2001	362'774.00	3'187'882.00	714'769.75	79'666.00	180'309.00	4'525'400.75
2002	990'194.00	3'047'560.00	431'431.39	74'976.00	181'570.00	4'725'731.39
2003	1'063'538.00	1'747'820.00	793'677.23	89'666.00	40'639.00	3'735'340.23
2004	1'701'273.00	1'910'302.00	1'059'855.86	142'772.00	95'723.00	4'909'925.86
2005	592'800.00	1'878'530.00	1'065'170.96	236'713.00	19'588.00	3'792'801.96
2006	601'961.00	3'339'163.00	1'502'653.97	202'535.00	67'414.00	5'713'726.97
2007	4'696'378.09	3'031'865.00	1'076'851.84	204'121.00	67'393.00	9'076'608.93
2008	938'281.00	3'622'183.45	1'397'429.30	575'742.04	71'623.00	6'605'258.79
2009	2'388'800.00	4'484'239.80	948'743.74	943'112.29	0	8'764'895.83
2010	1'490'284.18	5'739'665.99	1'677'476.95	1'355'028.73	0	10'262'455.85
2011	1'291'629.00	5'703'007.87	2'363'920.46	1'627'189.15	150'364.30	11'136'110.78
2012	426'820.49	2'656'115.58	2'186'843.95	1'818'810.73	88'253.31	7'176'844.06
2013	312'744.67	3'086'085.32	1'573'677.00	1'553'592.59	88'242.98	6'614'342.56
2014	1'091'315.70	4'702'090.21	1'810'806.79	1'662'234.04	0	9'266'446.74
2015	0	0	0	0	0	0
Total general	**21'359'138.13**	**56'109'029.22**	**19'752'355.10**	**10'736'318.57**	**1'911'584.59**	**109'868'425.61**

Table 13. Equipment provided by APOC

Pays	Vehicles	Moto	Bicycles	Desktop	Laptop	Electronic items	Printers	Scanners
Angola	13	39	125	14	7	6	13	1
Burundi	6	15	180	10	7	3	11	1
Cameroun	37	280	237	38	17	1	37	3
Congo	4	31	0	2	3	2	4	1
Ethiopie	25	105	0	20	13	22	26	1
Liberia	4	55	3	3	2	3	2	0
Malawi	4	36	355	13	12	2	15	1
Nigeria	87	777	4'154	96	62	57	95	1
Ouganda	6	50	852	25	2	2	20	1
Rca	6	31	120	17	8	5	14	1
Rdc	43	209	2'213	56	54	28	62	26
Soudan	17	54	1048	19	5	5	11	7
Tanzanie	24	63	498	15	23	0	25	19
Tchad	6	44	15	428	24	4	25	2
Total	**282**	**1789**	**9'800**	**756**	**239**	**140**	**360**	**65**

Table 14. List of NPOs/SSA in countries (FIELD APOC NPO AND SSA STAFF)

N°	Full name	Staff number	Duty station	Contract type	Grade	Current contract start date	Current contract end date
Cameroun							
1	Dr Nnomzo'o Etienne		Yaounde	SSA	NOB	15/10/2014	15/04/2015
2	Dr Wang Hubert		Yaounde	SSA	NOB	01/11/2014	30/04/2015
Democratic republic of congo							
3	Mr Tambwe Mangala Jean Pau		Goma	SSA	NOB	Recruitment has been cancelled	
4	Mr Tepage Tedende Floribert		Kisangani	SSA	NOB	idem	
5	Mr Engumba Ntela Gina		Mbandaka	SSA	NOB	idem	
6	Mr Mpoma Mikobi Peter		Kananga	SSA	NOB	idem	
7	Mr Loka Wonga Wotsho Adrien		Katanga	SSA	NOB	idem	
Ethiopia							
8	Dr Manaye Nigus		SNNP	SSA	NOB	01/10/2014	31/03/2015
9	Dr Kibret Fitsum		OROMIA	SSA	NOB	01/10/2014	31/03/2015
Nigeria							
10	Mr Ibrahim Luka		Bauchi	SSA	NOA	20/08/2014	19/08/2015
11	Mr Nwanja Henry		Oyo	SSA	NOA	04/08/2014	03/08/2015
12	Mr Okudo Ifeanyi Chinedu		Abuja	SSA	NOB	14/10/2014	13/04/2015
13	Mr Suleima Aliyu Usman		Kaduna	SSA	NOB	16/03/2014	15/03/2015
14	Ahiaba Gedeon		Abuja	C	NOB	01/11/2012	31/08/2026
Burundi							
15	Baza Disma		Bumjumbura	FT	NOC	15/01/2009	31/12/2015
Tanzania							
16	Nanai Alphoncina		Dar-es-Salam	FT	NOC	15/06/2010	30/06/2015
Angola							
17	Katondi Nzuzi		Luanda	FT	NOC	01/05/2012	31/12/2015

Table 15. Country evaluations carried out by country and by year

Countries	Evaluation areas	Nb
Burundi	Cibitoke Bubanza	**1**
Cameroon	Adamawa II	**8**
	Centre 1	
	Littoral 2	
	North Tchollire	
	North Toubouro	
	South West I	
	South West II	
	Western Province	
CAR	Basse-Kotto	**3**
	Ouaham Pende	
	Ouaka	
Chad	Logon Occidental	**5**
	Logone Oriental	
	Mayo Kebbi East	
	Mayo Kebbi West	
	Moyen-Chari	
Congo	Bouenza	**2**
	Pool	
DRC	Bas-Congo	**3**
	Sankuru	
	Uélé	
Ethiopia	Kafa, Shekka, Bench Maji	**2**
	North Gondar	
Liberia	Lofa, Bong, Nimba	**1**
Malawi	Malawi Extension	**2**
	Thyolo Mwanza	
Nigeria	Adamawa	**17**
	Cross river	
	Ebonyi	
	Edo, Ondo	
	Ekiti	
	Enugu, Anambra	
	FCT	
	Kaduna	
	Kano	
	Kebbi	
	Kwara	
	Niger	
	Osun	
	Oyo	
	Plateau Nassarawa	
	Taraba	
	Zamfara	

Countries	Evaluation areas	Nb
Tanzania	Kilosa	**7**
	Mahenge	
	Morogoro	
	Ruvuma	
	Tanga	
	Tukuyu	
	Tunduru	
Uganda	Kasese (Phase 1)	**3**
	Arua Nebbie (Phase 3)	
	Adjumani Mojo (Phase 4)	

Table 16. Combined epidemiological evaluation results for 1B

Country	Evaluation area	Number
Burundi	Bururi	**3**
	Cibitoke Bubanza	
	Rutana	
Chad	Logon Occidental	**7**
	Logon Oriental	
	Mandoul	
	Mayo Kebbi East	
	Mayo Kebbi West	
	Moyen-Chari	
	Tandjile	
Ethiopia	North Gondar	**2**
Malawi	Malawi Extension	**2**
	Thyolo Muanza	
Nigeria	Cross River	**3**
	Ebonyi	
	Enugu Anambra	
	Kaduna	
Tanzania	Tanga	**3**
	Tukuyu	
	Tunduru	
Uganda	Adjumani Mojo (Phase 4)	**2**
	Kasese(Phase 1)	
Total		**22**

Table 17. Rapid Epidemiological Mapping of Onchocerciasis (REMO), using nodule palpation

Country	Until 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Angola	0		237	331	56		35		55			51		765
Burundi	0	43	21	48		38								150
Cameroon	406			191	97	85	24							803
CAR	1 010	68												1'078
Chad	484													484
Congo	290			94										384
DRC	795	826	375	188	114	1 758	276			55	16			4'403
Eq. Guinea	88		75						48					211
Ethiopia	284	3										512	86	885
Gabon	65													65
Kenya	94													94
Liberia	90													90
Malawi	296													296
Mozambique	0	195						97						292
Nigeria	2 554		72	57								38		2'721
Rwanda	90													90
Sudan	721			59		9			113					902
Tanzania	234				64		35						1	334
Uganda	406								51					457
Total	**7'907**	**1'135**	**780**	**968**	**331**	**1'890**	**370**	**97**	**267**	**55**	**16**	**601**	**87**	**14'504**

Table 18. Delineation mapping, using skin biopsy

Country	2012	2013	2014	2015	Total
Angola	--	--	--	15	**15**
Burundi	--	40	--	--	**40**
Cameroon	--	40	--	--	**40**
Chad	--	23	12	6	**41**
Congo	--	--	28	16	**44**
Côte d'Ivoire	--	--	37	--	**37**
DRC	--	--	66	--	**66**
Equatorial Guinea	--	40	--	26	**66**
Ethiopia	45	--	81	--	**126**
Gabon	--	--	28	67	**95**
Tanzania	--	--	9	--	**9**
Total	**45**	**143**	**261**	**130**	**579**

Table 19. Rapid epidemiological assessment of Loa loa (RAPLOA)

Country	2002	2003	2004	2005	2006	2008	2009	2010	2011	2014	Total
Angola	--	42	108	--	--	72	--	--	114	--	**336**
Cameroon	--	175	277	62	--	--	29	269	--	--	**812**
Car	--	--	--	--	--	--	--	173	--	--	**173**
Chad	--	--	--	--	--	--	--	111	--	--	**111**
Congo	--	--	40	--	--	--	--	155	--	--	**195**
Drc	--	--	187	1'771	281	--	55	222	--	--	**2'516**
Eq. Guinea	--	--	--	--	--	84	--	--	--	--	**84**
Ethiopia	13	15	--	--	--	--	--	--	--	--	**28**
Gabon	--	--	--	--	--	--	--	65	--	--	**65**
Nigeria	13	63	37	--	--	--	--	268	--	238	**619**
Sudan	--	--	--	93	--	118	--	--	--	--	**211**
Total	**26**	**295**	**649**	**1'926**	**281**	**274**	**84**	**1'263**	**114**	**238**	**5'150**

ANNEX 2: Research activities conducted by TDR and APOC

Research supported by APOC

APOC, as OCP before it, considered ongoing research an integral part of the programme to overcome obstacles which CDTI project areas, endemic countries and APOC as a whole were facing for achieving their objectives or to optimize CDTI implementation.

APOC supported research in different ways:

1. Financial support for and, in some cases facilitation of, research addressing programme-wide needs. These were identified and/or endorsed by the TCC and managed by the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR).
2. Funding of operational research proposed to APOC by institutions in the endemic countries and addressing needs identified within the country.
3. Advice to researchers who approached APOC for input. They were typically invited to participate in TCC meetings to present their projects and discuss their questions with the TCC.
4. Collaboration with external institutions in the implementation of operational research funded by major research funding agencies.

APOC supported research managed by TDR addressing programme-wide needs

APOC provided a total of US$ 11,159,860 to TDR. This amount was complemented by funds provided to TDR by its donors or raised by TDR through grant applications. Investigators were selected based on evaluation of their research proposals by committees of TDR nominated external experts. The research conducted can broadly be categorized as follows:

2. CDTI for control of onchocerciasis as a public health problem (sustainability, recording and reporting at the community level, compliance, monitoring and evaluation, effect on skin disease and ocular symptoms, DEC patch to detect residual active infection)

2. Safe implementation of CDTI (development of method for mapping of areas co-endemic for loiasis (RAPLOA), safety in loiasis co-endemic areas, clinical evaluation of drug regimen to lower *Loa loa* microfilaraemia, outcome of pregnancies of women exposed to ivermectin during pregnancy)

3. Search for ivermectin regimens, drugs or drug combinations with higher effect on *O. volvulus* than annual ivermectin treatment (discovery of new compounds, clinical trials of the efficacy and safety of ivermectin administered at higher doses or higher frequency than during annual CDTI, combinations of ivermectin with other drugs, new drug candidates)

4. Potential emergence of ivermectin resistance (clinical evaluation of 'sub-optimal responders', assays for detecting ivermectin resistance, modelling of the impact of presence of 'sub-optimal responders' on effectiveness of CDTI. This research was initiated already in 1995 in collaboration with OCP and was continued with APOC support - with interruptions - to date)

5. Use of the CDTI approach to address other major health problems (community directed interventions)
6. Elimination of onchocerciasis with CDTI (Feasibility/proof-of concept of elimination of transmission of *O. volvulus* with CDTI, delineation of transmission zones to support decisions to stop CDTI).
7. Beyond onchocerciasis (long term effect of albendazole-DEC treatment of Indian children with LF)

APOC supported operational research addressing challenges encountered within or across CDTI projects

APOC provided a total of US$ 478,995 (through 2012) for research projects submitted by investigators with endorsement of the National Onchocerciasis Control Programmes and approved by the TCC (55 funded/163 submitted projects). The research conducted addressed the following issues:

1. CDTI sustainability at the national / sub-national level (engagement of stakeholders, commitment of the health system at all different levels)
2. CDTI sustainability at the CDTI project level (mechanisms to increase the number of community drug distributors (CDD), CDD motivation and retention, role of and type of incentives, involvement of women, community ownership)
3. CDTI monitoring and evaluation (community self-monitoring, methods for assessing reported coverage relative to actual coverage)
4. CDTI compliance (impact of severe and serious adverse reactions to ivermectin in *Loa loa* co-endemic areas, characteristics of systematic non-compliers, methods for quantifying compliance).

ANNEX 3: Profiles countries visited

The countries visited present mostly similarities about the onchocerciasis control activities such as the process of integration of other diseases, the MTN in particular. But also some specificities underlined in the following summaries.

DEMOCRATIC REPUBLIC OF CONGO

1. The CDTI activities are moving well enough in this country with high demand of the Mectizan. The onchocerciasis control activities are been integrated with the MTN. The CDTI activities are not easy in many areas because of the difficulty of access. For a while it was not possible to distribute in the communities in conflict zones. The geographic coverage declared to the team of evaluators is 100% and the therapeutic one is 80%. The coverages reported are not always reliable because the difficulty of recuperation of the reports from communities by the hierarchic level (access problem). Some project started only in 2010 and there is to continue the distribution during at least 10 years more.
2. There is an important problem of supervision in DRC:
   - Some projects cover more than one health district and there is no proximity supervision by district staff. The responsible of the project report directly to the central level.
   - The central level has difficulty to supervise all the projects during a year because of lack or financial resources. In fact, due to the big size of the country, the coordination of the Programme must take flight to visit the remoted areas. The budget of the supervision available every year is six thousand (6000) USD in average.
3. The motivation of the CDs varies from a community to another. In that visited there where more than 10 distributors. The declared that they are happy with the incentive given by some households in nature and are ready to continue the work till the elimination of the disease.
4. The high level decision makers met showed their interest to the onchocerciasis activities, the importance to build on the CDTI strategy and integrating those activities with MTN. At this moment APOC is closing the will create a budget line for onchocerciasis and the MTN.
5. The projects are supported by many NGDOs, but their number is not sufficient for the size of the country. So far, their coordination is week and there is not an appropriate coverage of the country ant it remains many "orphan" areas which need assistance.

The two Congo have trans-border transmission problem which need to be addressed appropriately and ASP.

REPUBLIC OF CAMEROON

1. Cameroun experienced the first *Loa loa* severe manifestations unfortunately with death. Despite this sad experience the Ivermectin is largely accepted though out the country and CDTI activities are been implemented without major difficulties. As in almost the countries there are some cases of non-acceptance of the administration of the Mectizan but the problems which need more attention is the incentive of the Community Distributors. The Government has taken a decision in this regard to pay 25F CFA by person treated but for years, this decision was not translated into action. The consequences are that some CD refuse to distribute the Ivermectin and keep the drug or they distribute but keep the report and do not send or release it for the

health centre. In some communities, the therapeutic coverage is still around 10%. The overall therapeutic coverage declared varies from 72-80% and the geographic coverage is almost 100%.

2. The Ministry of Health now has from the national budget 200 million of Francs CFA for the motivation of CDs. It remains the problems of running and the other field activities implementation cost of the Programme as supervision, epidemiological and entomological evaluations at this moment which the APOC funds decreased drastically and there is not resource from Government or from elsewhere. That raises the problem of continuity of the activities of onchocerciasis control and the MNT integrated the problem of conservation of the assets and the durability of the Programme. Some local initiatives facilitate the implementation of the activities. There is an interesting example in the Littoral Province where the beneficiary population mobilize funds for the Onchocerciasis and MTN activities.
3. There are NGDOs supporting the activities. They have a functioning coordination and some of them anticipated already by increasing their activity budget. But it is sure that it will not be sufficient and the efforts of the Government to include or increase in the national budget plan a line for the disease control is crucial. It is also crucial for the Programme staff, the national authorities and the NGDOs to initiate an active resources mobilization mechanism for the continuation of the Programme in good conditions. The country is not well covered by the NGDOs. A consensus mapping with the national leadership for a better covering of all the endemic zones is crucial to avoid "orphan" areas. Advocacy for development of new partnerships can be helpful.
4. Some stakeholders point out the weakness of APOC in operational research and wish that the new forthcoming entity must take this into account and put emphasis on it for better results of the activities in the field.

REPUBLIC OF CONGO

1. The CDTI is in implementation in all endemic and targeted population. CDTI activities are decentralized, integrated in the MTN activities as reported by the national management team. In the perspective of elimination of onchocerciasis, a mapping of the disease is carried out even in the hypo-endemic areas in September 2014. This mapping showed some areas in the hypo-endemic zones where the treatment must be extended. In this perspective, the treatment started since 2014 in some districts of those areas as the district of Kindamba in the Department (Province) of Pool. For the planning and the implementation of CDTI activities, the community the leaders as well as the CD are all involved. The high level actors as local political authorities are also involved, especially in the sensitization of the population. One of the most important challenges in Congo is the CDTI in the urban area (Brazzaville). The population living along the River Congo and Djoué, especially close to the "Rapids" are continuously exposed to a high biting rate of the Simulium. Unfortunately the distribution of Ivermectin to those highly at risk population is very problematic. Our investigations showed that some people have never hear about Ivermectin or its distribution. Some persons interviewed declared that the last distribution took place 3, 6 or 8 years ago. It was not possible to meet any CD. In the house of one of the heads of "zone" who are supposed to be the first supervisors of the CDTI, the wife of this Responsible of zone declared that since six years she is living there but she has never seen a distributor and has never taken the Mectizan. The average of CDTI coverage in the country is 100% for the geographic coverage

and around 80% for the therapeutic coverage. But there is often a large difference between therapeutic coverage declared or reported by the CDs and the health staff and those from evaluation in the field.

2. About the financing of community activities the rural communities are organized to take in charge the CDTI. The Congolese Government has started to allocate 20 million CFA per year for the onchocerciasis and MTN activities. This amount is decentralized within the different Provinces. From the discussion with the Cabinet of the MoH, this amount will be increased soon. The Country has also started to allocate running funds for the health districts since 2013.
3. The Programme of the Republic of Congo (Middle Income Country) does not have other partners apart WHO and Sight Savers International SSI trough "l'Organisation pour la Prévention de la Cécité" (OPC).
4. The capacities built by APOC are not sufficient. The staff trained for the entomological and epidemiological survey don't have material to carry out those activities.

REPUBLIC OF CHAD

Chad is an example of well performing countries for many reasons.

1. The CDTI progress is far on the way of elimination of the onchocerciasis in the country if the efforts are maintained and increased the next forthcoming years. The geographic and therapeutic coverage currently are 100% and 80-82%.
2. In the Community visited, the distributors don't claimed incentive but committed themselves to continue the distribution as longer as possible, aware that is for the wellbeing of all their community, including themselves.
3. The Program of the Republic of Chad does not have other partners apart WHO and BELAC (Bureau d'Etude et de Liaison des Actions Caritatives) which undertakes sensitization on their radio and mobilization activities in the areas of their 20 Health Centres trough out the country.
4. The Government allocates in average 100 million CFA (for onchocercerciasis and the MTN activities every year. The Country translates also into action its interest for onchocerciasis, MTN and other diseases control, by organizing a monthly meetings commonly called "Réunion du 24" every 24th or around 24th of each month for information of the Government on progress on health issues including onchocerciasis. The meetings are chaired by the President of the Republic himself with some seven Ministers or more at his side. All the results and problems presented are discussed and instructions are given by the President if necessary to Ministers concerned for immediate action. Currently Chad 15 000 trained CDs. The Government has decided to increase this number up to 40 000 to be involved in other health activities apart onchocerciasis. All of them will be paid regular salary.
5. The national authorities are really concerned by the trans-border transmission, for example in the district of Doba not far from Cameroun and RCA where the distribution is interrupted because of the conflicts and the district of Doba has registered already nearly 60 000 refugees and returnees, mostly from RCA. There is a fear of jeopardizing the good results obtained so far and the resurgence of the disease. The authorities are also concerned by the rehabilitation of the persons already blind.

NIGERIA

1. Distribution is very dependent on APOC funding and assistance at the LGA an State level on NGDOs. Much of the training and distribution activities are supported by the NGDOs, who may contribute as much as 30% to the costs involved with distribution in Nigeria.
2. The NGDO coalition meets twice yearly, and shares planning and resources for NTD control in Nigeria. Some NGDOs now will use only CDTI for all community programming.
3. Some areas in the SW that are known to be Loa endemic, but these have been receiving ivermectin for many years, without observed consequences.
4. There is a suspicion by some that the therapeutic coverage figures have been inflated.
5. The NTDs have been well integrated at the Federal level under an assistant director and each of the 5 NTDs has its own programme director. However the mapping for some of the NTDs is incomplete.
6. These is an active M&E section which tracks the reports from the various programmes. There is some skin snipping done and limited PCR. The PCR resources are located in Kano and sponsored by the Carter Center.
7. There is considerable historical data from programmes and treatment which is incomplete. It is hoped that these data can be obtained from APOC before closure.
7. The second meeting of the national onchocerciasis elimination committee has just had its yearly meeting, assisted by the Carter Center, with attendance from CDC and a representative from the Uganda Elimination Expert Advisory Committee.
8. APOC has trained entomology technicians in Nigeria. Nigeria has a number of fully trained entomologists available to onchocerciasis elimination activities and other vector-borne diseases.
9. The FMoH program personal lack vehicles and support to carry out any field supervision work.
10. It is the feeling of some in the FMoH that there are foci where there is no longer active transmission going on, however there have been no epidemiological surveys carried out. In other foci there has been ecological change and in migration, perhaps changing the characteristics of the entomology of onchocerciasis in these locations .

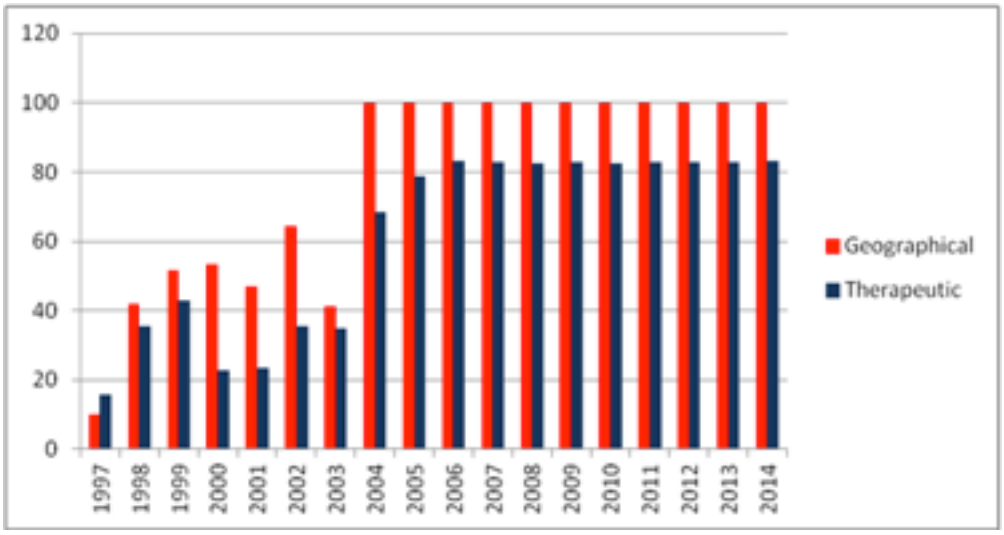
UGANDA

1. The pattern of onchocerciasis in Uganda has been complex with a mixture of Simulium naevi and *S. damnosum*. The focus at Jinja was eradicated in the 1950s with DDT, and more recently two naevi foci eliminated with insecticiding. Uganda has had an active entomological capacity stretching back decades.
2. Uganda was the first African country to develop an Onchocerciasis Elimination Expert Advisory Committee which has been meeting annually for a number of years. The elimination process has been carefully driven by evidence. The Carter Center has supported PCR and ELISA laboratory facilities, the training of technicians and their salary, even though nominally a MoH activity.
3. The onchocerciasis programme activities have been well integrated into a national NTS programme. Although it is still located in the vector control unit, there is a hope the laboratories will become part of a long awaited Uganda Public Health Laboratory.

4. A major problem remains the cross border issues with South Sudan and DR Congo. High level discussions have taken place with DR Congo, but ground level activities have not followed, owing to a lack of resources on the DR Congo side. For South Sudan, there has been an influx of refugees who have now returned, however instability has persisted on the South Sudan side, which has interfered MDA.
5. Ivermectin treatment in Uganda is now done twice yearly in all sites. This decision produced some tensions with APOC.

MALAWI

1. Malawi has had consistent high coverage of ivermectin through an aggressive CDTI programme. The CDTI programme is integrated into the district health system.
2. An advantage of the Malawi programme is the presence of Health Surveillance Assistance assigned to villages as part o health system. These HSAs act as supervisors from the health system, and connect the communities with the first line facilities. These HSAs are involved in mapping of populations and breeding sites. These HSAs contribute greatly to the elimination efforts, but their contributions have not been costed out.
3. Ivermectin treatment has been in place since 1990, and CDTI has been the national policy since 1997. Geographic coverage reached 100% in 1994, and therapeutic coverage has exceeded 80% since 2006.
4. A recent 1a assessment found only two persons with positive skin snips, one of whom had come across the border from Mozambique for the day. It is likely that Malawi will be able to stop treatment soon.
5. The Malawi government has been making regular contributions to the costs of onchocerciasis elimination. The Malawi government contributions were 2012-USD 240,698, 2013-USD 349,618 and 2014-USD 357,340.
6. In addition there were contributions from the Tea Association, as the major focus is located in the principal tea plantation area.
7. Malawi has a NTD master plan in place, and is awaiting approval of a position to direct a to-be-formed national NTD programme.



ETHIOPIA

1. Ethiopia has 12 million persons at risk of onchocerciasis in 17 zones in 9 states. Onchocerciasis has been part of the integrated LF programme in co-endemic areas since 2009.
2. At the Ormia state level CTDI program includes Malaria and Vitamin A programming as well.
3. Delineation mapping has been on going in previously excluded hypoendemic areas. In a number of these twice yearly ivermectin treatment has been started. Some of these are contiguous with areas under treatment for a number of years, which will extending treatment in the established foci for some years.
4. The Carter Center very involved in providing technical and financial assistance. It has PCR laboratory which could be scaled up as needed for PCR assessments. . Light for the World provides assistance in distribution. These are the two main NGDOs present
5. Ethiopia Public Health Institute is increasingly active in the epidemiology and entomology. There has been training by APOC and additional skills are available in Ethiopia for PTS where this is required.
6. Health Extension Workers are assigned 2 per village and they supervise the Health and Development Army workers.

ANNEX 4: Persons met

List of persons interviewed (group discussions were carried out with NGDOs representatives and CDDs)

CAMEROON	
Dr Roungou Jean-Baptiste	WHO Country Representative
Dr Nnomzo'o Etienne	NPO MTN - Bureau OMS
Dr Nko Ayissi Georges	S/Directeur en Charge du Paludisme et des MTN, Ministère de la Santé Publique
Dr Etoundi Mballa Alai	Directeur de la lutte contre la Maladie, les Epidémies et pandémies
Dr Didier Biholong	Coordonnateur du Programme National de Lutte contre l'Onchocercose
Njifendjou Jean Claude	NPOC Financial Assistant
Mr Ngara Bonguen Denis Dieudonné	Regional Onchocerciasis Coordinator, Centre Region
Nkwelle Patrice	IEF, Country Director President of the NGDO Coalition
Mbenda Behalal Georges	Perspective Country Director
Ivaha Itoumbou Ntan	Perspectives
Hendji Yoya	HKI Deputy Director
Engama Augustin	IEF, Finance Officer
Akongo Serge	SSI Programme officer
Prof Kamgno Joseph	CRFilMT Director
Biloa Jean Léandre	CDD village of Song Onana (Okola HD)
Onana Martin	COSADI President (Okola HD) Chief of the Song Onana village
CHAD	
Dr Yameogo Jean-Marie Vianny	WR WHO/Chad
Dr Djimrassengar Honoré	DPC WHO/CHAD
Dr Djebor Hamid	Directeur Général Adjoint des Activités Sanitaires
Dr Sherif Baladine	Directeur en Charge des Maladies Tropicales Négligées
M. Najilar Lokemla	Coordonateur National PLNO&LF
Faitchou Etienne	Governor, Logone Oriental Region
DEMOCRATIC REPUBLIC OF THE CONGO	
Dr Kupa Mukengeshai	Secretaire Général, MoH
Dr Déo Nshimirimana	WR-DRC
Dr Kobela	Directeur de la Lutte contre la Maladie
Dr Joseph Linguba	Directeur, PNFL
Dr Mukunda Faustin	Directeur, PNBI/PI Coordonnateur National MTN
Dr Loka Wonga Adrien	Directeur Adjoint/PNLO
Dr Awaca Uvon	Directeur PNLO
Dr Ndjemba	Point Focal Trachoma

DEMOCRATIC REPUBLIC OF THE CONGO	
Dr Marcel Bakajika	Gouverneur de District' Lions Club International
Dr Daniel Shungu	Directeur Exécutif, UFAR
M. Henry Limbaka	M&EO & Point Focal MTN, CBMI-DRC
Junior Kazadi	Point Focal MTN, WV-DRC
Dr Arthur Nondo Shamba	NTD Program Manager, IMA-DRC
Ms Evelyn Howatt	Senior Program Officer IMA-DRC
Dr Martin Ndombe	Représentant, RTI-DRC
Dr Diallo Nouhou	TA, WHO/APOC DRC
Dr Paul Lusamba Dikassa	Resource Person – Former Director APOC
Dr José Mavuna-N'keto	MCZ Ngidinga- MoH
Dr Michel Tambu	Coordonnateur- Projet Bas-Congo, PNLO
M. Pueata Kinkela	Point Focal-PNLO Bas Congo
Kabuiki-Masala	Superviseur SSP, BZS-DRC

REPUBLIC OF THE CONGO-BRAZZAVILLE	
Prof. Obengui	Director, DGELM
Dr Fatoumata Binta T. Diallo	WR-Congo
Dr Missamou François	Coordinator PNLO&LF ; ai Schistosomiasis & Geohelminthes
M. Hemilembolo Marlhand	Programme Officer, PNMTN
M. Mamfoumbi Serge	Programme Officer, PNLSCH
Dr. Ray Mankele	WHO/Congo –WRai Essential Drugs Management Officer
Dr Motikeba Prosper	WHO/Congo DPC
Dr Bassoumba Patrice Hilaire	Médecin Chef du Secteur Opérationnel N°10
Mme Bazolo Malanda Rosine Flore	Chef du Centre de Santé Intégré de Louingui
M. Mieri Léon	Directeur de Cabinet, du Sous-Préfet – District de Louingui
M. Fila Dominique	Distributeur Communautaire, Village Nkana
Dr Moeti Matshidiso	RD, WHO/AFRO
Dr Joseph Cabore	DPM, WHO/AFRO
Dr Daniel Kibunga	CDS ai, WHO/AFRO
Dr Impouma Benido	NTD Regional Adviser-WHO/AFRO
Dr Alexandre Tiendrebeogo	Medical Officer-CM NTD-WHO/AFRO
Michel Sapoulou	Attaché/Cabinet MSP
Atipo Ibara Blaise I	Conseiller/Cabinet MSP
Ossombo Benjamin	Conseiller administrative et juridique/Cabinet MSP

ETHIOPIA	
Dr Pierre M'Pele K	WR Ethiopia
Kadu Meribo	NTD program Officer/Onchocerciasis elimination focal person Under the Director of Disease Prevention and Control
Solomon Gadisa	Programme Officer. Light for the World
Dr Fitsumekibret	NPO, Oromia State
Mr Wasihun Edossa	Oromia State
Dr Mulugeta Abate	NTD program officer WHO
Aderajew Mphammed	Carter Center Deputy country rep
Esjetu Sata.	Carter Center M&E officer
Dr Tekole Endeshaw	Carter Center
GENEVA	
Jane Stewart	Chief Finance, Awards and Accounts, WHO
Xavier Danny	Senior Legal Officer, WHO
Tony Ukety	WHO, Onchocerciasis NGDO coordination
Dirk Engles	Director, Dept of Control of Neglected Tropical Diseases
Annette Kuesel	WHO/TDR
LONDON	
Carolyn Harper	CEO, Sightsavers
Simon Bush	Regional coordinator (Ghana), Sightsavers
Camilla Ducker	Health Advisor, DfID
John Gibb	Grants officer, DfID, Retired
Adrian Hopkins	Director, Mectizan Donation Program
MALAWI	
Dr Eugene Nyarko	WHO Representative, Malawi
Mr Laston Sitima	National Onchocerciasis coordinator
Dr Storn Kabuluzi	Director Preventive Health Services MoH
Mr Roy Huya	Country Director Sightsavers
Mr Loncy Sajemi	District NTD coordinator, Blantyre
Patrick Lazalu, William Mpata, Lameck Zidana, Boniface Bwanali, Locusm Makunganya, Sheillah Nanthuka, Zione Maguchu, Jessie Mtefula	Health surveillance Officers, Chileka
Chief Puli	Puli Village

NIGERIA	
Dr Bridget Okoeguale	Director, Department of Public Health FMoH
Dr Rex Mpazanje	Acting WHO representative, Nigeria
Dr Saka	Onchocerciasis Programme manager
Dr. Cephas Tsevende ITYON-ZUGHUL	NTD Officer WHO Abuja
Dr Mary Stephen	DPC WHO office, Nigeria
Dr Emmanuel Davies	Lymphatic filariasis programme manager, FMOH
MR Michael Igbe	Entomologist onchocerciasis programme FMoH
Mr Nwoye Augustine Nkemng	Programme officer Schistosomiasis/STH FMoH
Ms Monica Ebosele	Manager Trachoma programme, FMoH
National Onchocerciasis Elimination Committee	
Dr Ima Chima	Country Director for Helen Keller International
Dr Christopher S Ogoshi	Director HANDS (local partner of CBM)
Dr Abbas Dalhatu	Deputy Director for NTDs, FCTA
Dr Hadiza Valarabe	Public Health Director, FCTA
Dr Sunday Isiyaku	Country Director Sightsavers
Chief Kabusa	Chief of Kubusa chiefdom
Dr Ifeoma Anagbogu	National NTD coordinator FMoH
Dr Emmanuel S Miri	Carter Center Country Coordinator
UGANDA	
Hon Dr Elioda Tumwesigye	Minister of Health
Dr Edridah Tukahebwa	Assistant Commissioner, Health Services
Dr Wondimagegnehu Alemu	WHO Representative for Uganda
Dr Moses Katabarwa	Carter Center, Atlanta
Dr Johnson Ngorok	Country Director Sightsavers
Dr Ambrose Onapa	Country Director Envision RTI
Dr Narcis Kabatereine	Country Director Save the Children
Ms Peace Habomugisha	Uganda NTD office
Mr Ochleng Orukan	District Onchocerciasis coordinator Mbala district
Mr Ephraim Tukesiga	Senior Vector Control Officer, Itwara
Mr, Gabriel Matwale	LF Coordinator, Uganda
Dr Joseph Ruyomga	District Medical Officer, Hoima
Mr Fredrick Byemume	District onchocerciasis coordinator, Hoima
Mr Thomson Isingoma	District vector control officer, Hoima

USA	
Andy chi Tembon	World Bank
Emily Wainwright	USAID
Darien Evans	USAID
Bruce Benton	Retired
Frank Richards	Carter Center
APOC	
Dr Chris Mwikisa	Acting APOC Director
Dr. Daniel Boayke	Consultant entomologist
Dr Francois Sobela	APOC-Health Systems Strengthening
Pascal Soubaeiga	APOC- Archives and data
Yacouba Issaka	APOC-Information Officer
Grace Nebi Fobi	APOC-Sustainable Drug Distribution Unit

COSADI: Comité de Santé de District
DGELM: Direction Générale de l'Epidémiologie et de la Lutte contre la Maladie
PNLO: Programme National de Lutte contre l'Onchocercose
PNBI: Programme National de Lutte contre la Bilharziose et les Helminthiases intestinales
PNFL: Programme National de Lutte contre la Filariose Lymphatique
PNMTN: Programme National de Lutte contre les Maladies Tropicales Négligées
PNSCH: Programme National de Lutte contre la Schistosomiase
UFAR: United Front Against River Blindness
CBMI: Christian Blind Mission International
IMA: IMAWorld Health
MCZ: Medecin Chef de la Zone de Santé
TA: Technical Advisor
RTI: Research Triangle International
WR: WHO Country Representative
WVI: World Vision International
SSP: Soins de Santé Primaires

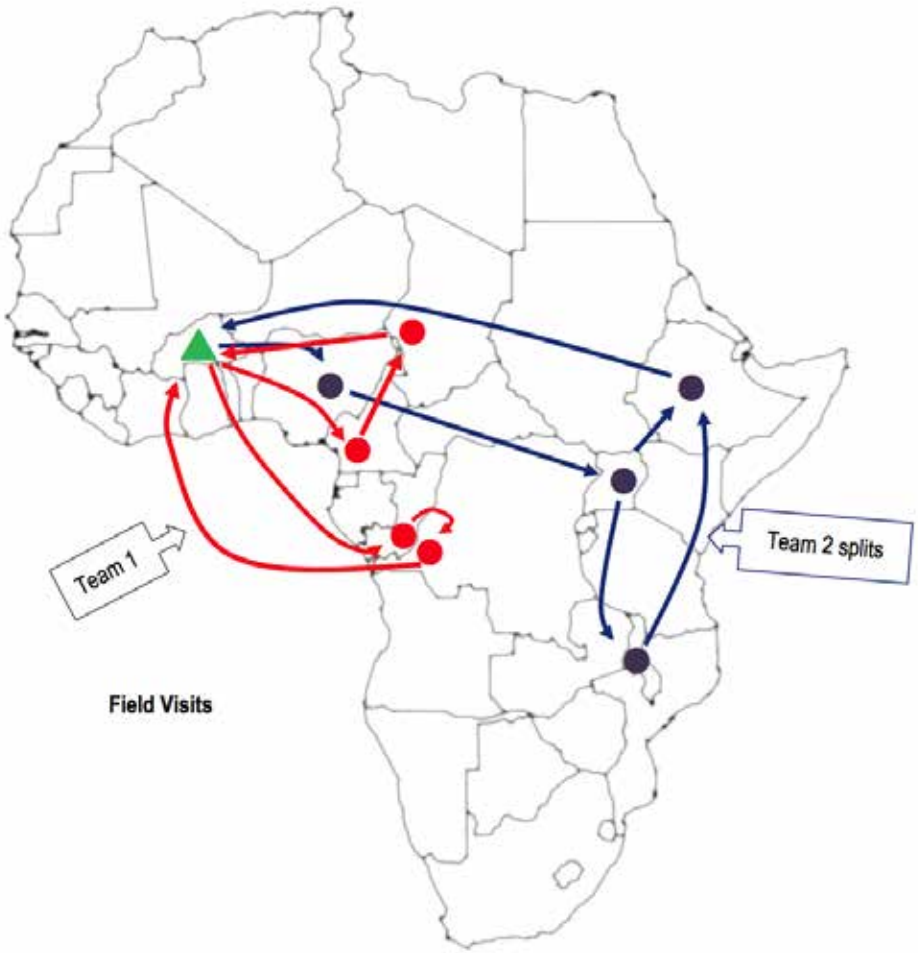
ANNEX 5: Evaluation team travels

List of persons interviewed (group discussions were carried out with NGDOs representatives and CDDs)

August						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
						GB leaves Washington
2	**3**	**4**	**5**	**6**	**7**	**8**
Travel (GB)	Travel to Ouaga	Ouaga Briefing	Ouaga Briefing	Ouaga Briefing- Inception note	Ouaga Briefing- Inception note	To DRC
						To Nigeria
9	**10**	**11**	**12**	**13**	**14**	**15**
DRC	DRC	DRC	DRC	Chad	Chad	Chad
Nigeria	Nigeria	Nigeria	Nigeria	To EBB	Uganda	Uganda
16	**17**	**18**	**19**	**20**	**21**	**22**
Chad	Chad	Cameroon	Cameroon	Cameroon	Cameroon	DLA to OUA
Uganda	Uganda	To Ethiopia	Ethiopia	Ethiopia	Ethiopia	ADD to OUA
	To Malawi	Malawi	To Ethiopia			
23	**24**	**25**	**26**	**27**	**28**	**29**
Ouaga Wrap-up	Ouaga Wrap-up	Travel	AFRO	AFRO	AFRO	Brazzaville
			writing	writing	writing	writing
30	**31**	**Sep 1**	**2**	**3**	**4**	**5**
Brazzaville	Brazzaville	Brazzaville	Brazzaville	Brazzaville	Brazzaville	Brazzaville
writing	writing	writing	writing	writing	writing	writing
6	**7**	**8**	**9**	**10**	**11**	**12**
Brazzaville	Brazzaville	Brazzaville	Travel	Preparation final draft	Preparation final draft	Preparation final draft
writing	writing	writing	writing			
13	**14**	**15**	**16**	**17**	**18**	**19**
	Preparation final draft	Preparation final draft	Preparation final draft	Preparation final draft	Preparation final draft	**Final report 10 days after CSA Comments**

Team 1	Innocent Takougang Komla Siamevi
Team 2	Sam Zaramba Gilbert Burnham

Figure 7. the map of travels



ANNEX 6: Inception report

Background

The control of onchocerciasis through mass drug administration began with the provision of Mectizan® by Merck & Co. in 1987. APOC was created in 1995 to establish country-led mass chemotherapy delivery to affected countries outside the OCP countries. The goal was to establish a self-sustaining program by the time of phase out. The World Bank served as the Fiscal agent and the World Health Organization the executive agent. The realization in 2009 that extended treatment could lead to the elimination of onchocerciasis, transmission, not just the public health consequences of infection changed the focus of the program. At the same time there was increasing interest in other "neglected" tropical diseases. The life of the APOC program was extended until December 2015, at which time it was envisioned a new entity would take responsibility for the onchocerciasis elimination interventions.

The nature, structure and financing of this new entity was the subject of considerable uncertainty. A working group in Johannesburg at the end of April 2015, reached a consensus of the framework which would provide technical support to countries in various programmatic areas to achieve 5PC-NTD control and elimination goals. The scope of the program, its governance and management structures, and its priorities were out set out at this meeting.[1] Specific trust funds are set aside for priority activities during the transitional period. APOC background information and plans for the program transition are well documented elsewhere.

Evaluation

As part of the phase out of APOC activities a program evaluation was planned.[2] The general and specific objectives from the terms of reference are set out below:

General objective of the evaluation

The general objective of this end of programme independent external evaluation is to assess the effectiveness; efficiency; impact; sustainability; and lessons learned from the conception, design, management of APOC Programme over the past years and make available to its stakeholders relevant data and information, which can inform the next projects / programme as there is now a paradigm shift from control to elimination of Onchocerciasis in particular and the Preventable Chemotherapy Neglected Tropical Diseases (5PC-NTD).[3]

Specific objectives of the evaluation are as follows:

1. To assess the effectiveness and the efficiency of the programme and the extent to which it has achieved planned or stated objectives as set out in APOC Programme document (Phase I) ; Phase II and Phasing out period 2008-2015 ; Addendum for the PAB 2008-2015.

1 Working Group Meeting on the Establishment of a New NTD Entity.28–30 April 2015.Johannesburg, South Africa

2 WHO African Program for Onchocerciasis Control Terms of Reference for the final evaluation of the African Programme for Onchocerciasis Control. Ouagadougou 2015.

3 Onchocerciasis, Lymphatic Filariasis, Trachoma, Schistosomiasis, Soil Transmitted Helminths (STH)

2. Analyze the Programme's wider impact and advise how lessons learnt from the programme could inform future programming.
3. To identify best practices and describe the most significant lessons learned from the success or failure of the operations undertaken in APOC areas relevant to the control and elimination of onchocerciasis or other disease control activities.
4. To formulate conclusions of the evaluation and recommendations to each stakeholder involved (Countries, WHO, donor community, NGDOs, etc.) which might be useful for any international public health partnership program.

Realizing the importance of continuity, there will be an emphasis on lessons learnt and practices developed during the APOC program which will strengthen the new 5PC-NTD entity. At the same time the functions and methods of the 20-year APOC programming will be carefully examined especially in regard to specific objective 1. The success in reducing the burden of disease from onchocerciasis is available from program data, mapping and transmission assessments. It is unlikely the team will chose to collect any primary data in this area. Assessment of the stakeholder needs will be particularly important, as their involvement in the maintenance of the achievements of APOC going forward.

The team began work on 2nd August, spending four days in Ouagadougou with briefings from APOC staff, review of reports and records from field data and creating the inception report. During this time the team developed an interview guide to cover key questions for the evaluation. Building on the Johannesburg meeting report, and in discussions with APOC staff the team will identify key areas important to the success of the new 5PC-NTD entity and the types of best practices important to continuing success. As the country NTD programmes will be critical to the future activities, discussions with them will be an important area of work for the evaluation team. There will be a particular interest in the levels of support required and received from APOC.

Field work will be done in pairs starting on day 5. The use of pairs allows information to be gathered from key informants by two persons with different perspectives. At other times it allows the team to split and supporting information can be gathered from several sources simultaneously, and records reviewed. The composition of the teams will build around regional expertise and language skills.

As the next phase of onchocerciasis anticipates supports from donors, and visits to them will help understand their perceptions of APOC. Donor-relations is an important part of this evaluation, and looking for lessons learnt and best practices which can provide recommendations for the emerging 5PC-NTD program activities and the transition phase. In all it is proposed spend 15 days in site visits working in two teams. It is clear that not all countries can be visited, and not even all the priority countries, give a limitation in time and resources. Field visits scheduling is complicated airplane connections. Listing the countries as priorities or having important best practices or possible lessons learnt and matching this with airline timetables, the map of travels shown in Figure 7 was created. The priority countries, with supporting information are listed in Table 18 next page.

Table 20. Evaluation team deployment

Team 1	
DRC	Large country program with many complexities in reaching sites; managing Loa infected sites a major challenge to elimination
Rep of Congo	Substantial burden of disease; problems with urban disease and challenges to adequate coverage in these areas
Angola	Substantial burden of disease in a country where onchocerciasis programming is not going particularly well. What are lessons learn from the problems with programming in this mineral-rich country.
Cameroon	Substantial amount of disease, and initially major complications from Loaisis, but good control still being achieved. Active research in onchocerciasis control on-going; what has this contributed to control and elimination strategies and achievements?
Chad	A well-functioning program with full support from stakeholders; what are the lessons to be learnt for moving countries with similar epidemiological patterns toward elimination?
Team 2	
Nigeria	Large complex program with many activities at various state levels. Good potential lessons on how to achieve commonalities in programming when there are many state and LGA actors implementing programs.
Uganda	Many foci of both S. naevi and S. damnosum, and an aggressive national elimination program which has lessons for other locations and their elimination planning.
Malawi	One of the first countries likely to stop treatment, perhaps in 2016; control achieved through consistent programming rather than Uganda-type elimination activities; potentially important lessons to be learned and practices to be recorded.
Ethiopia	Large burden of disease with remote locations. Aggressive programming underway; multiple challenges to programming

At the end of two weeks the teams will converge on Ouagadougou to consolidate information gained so far in the field activities. Because of schedules and national holidays, team one will then go on to DRC and Angola. However, information will have been already shared by email as the teams moved around countries. In Ouagadougou the writing responsibilities will be agreed for the evaluation report. The remaining information to be gathered will be outlined A preliminary debrief will be provided to APOC staff. From here GB will return to USA via Geneva and UK for key informant interviews in these locations. In USA he will follow up with interviews at the World Bank and USAID. It is anticipated a first draft will be ready in late September, which can be circulated for comments. The final report will be submitted within 10 days of receipt of comments. Two further activities will be the presentation of findings to the CSA in October and the JAF in December by GB.

Table 21. Matrix of the suggested approach to review of country activities in partnership with APOC

Issue	Question	Data sources
effectiveness	• What extent did the outputs (planned & unplanned) contribute to the Overall • Objectives? Why? Why not? • Capacities of project partners • Availability & use of resources • (develop matrix of planned objectives, outputs etc.) • Addressed in relationship with assistance from APOC • Relationship with APOC • Community effectiveness • NGDOs • Reports from country programs	Project Document Project Reports Partners & Beneficiaries Reports
Efficiency	• Were the resources efficiently managed and utilised? • Finances – procedures (reporting & budgeting); • Assets - use • Were the Outputs generated as expected (in quality and time)? • Were there any unforeseen problems, how well were they dealt with?	Project Document Project Reports Project Staff Partners
Relevance	• Establish whether or not the project design and approach was relevant in addressing • the identified needs, issues and challenges facing people, and the environment? • To what extent does the project contribute to overall Key Results and strategies of • APOC?	Situation Analysis Study (initial and updates) Project Document Intersessional Programme Project Staff Partner Organisations Key Stakeholder Groups
Impact	• What impacts did the project have on; • A) The people: • Income • Equity • Participation in decision making processes • B) The Environment: • Species and Ecosystem Health? • Were there any unintended positive or negative impacts arising from particular • outcomes?	Project Staff Staff Partner Organisations Beneficiaries
Sustainability	• Was the approach used likely to ensure a continued benefit and/or use of the outputs and • outcomes after the end of the project? Why/ Why not? • stablished structures, mechanisms, financial resources, materials, • Levels of stakeholder participation; • Levels of partners & stakeholder engagement;	Project Document Project Reports Partners and Beneficiaries Reports Project Staff Partners Key Stakeholder Groups

Table 21. (continued)

Issue	Question	Data sources
Lessons Learned	• Lessons learnt regarding the project structure: • Management structures (human resources, financial management etc)? • Decision making structures? • Processes used for monitoring, reporting and assessment? • Lessons learnt regarding project strategic approach: • Stakeholder involvement? • Partnerships formed? • Operational strategies used in implementation? • Lessons learnt regarding the initial assumptions and hypothesis made during project design: • Co-management • Another project was to be designed what would be done differently	Project Reports Project Staff Partners Key Stakeholder Groups
Issues going forward		

Table 22. Illustrative questions to be considered by the evaluation team (not exhaustive)

Category	Information to collect	Information source
Program inputs	Ivermectin tablets,	APOC Management, Logistic and Finance departments
	Equipment (vehicles, computers….)	
	Financial resources for field operations….	
	Human resources available for programme management and field operations	
Processes	The bulk of questions fall into this area	
	number of monitoring exercise carried out/ planned	APOC Management, Operations departments, Recent reports on APOC Operations
	outcome of epidemiologic evaluation	
	outcome of sustainability assessment/planned and carried out	
Program outputs	sustainable country programmes within 10 years of operation (target treatment coverage reached; sustainable funding, …)	APOC Management, Operations departments, Recent reports on mid-term and Other External evaluations
	number treatments administered, therapeutic coverage, geographic coverage	APOC Management, Operations departments, Recent (Latest) reports on APOC Operations
Lessons learned from APOC operations	Various studies on the use of the CDI approach for other health interventions,	Scientific reviewed literature
	Effect of CDTI implementation on the functioning of country health systems…).	

Table 23. APOC final evaluation (draft list of questions addressed to Key Stakeholders)

Item	Question	Who should answer
	What were the main achievements of APOC?	TCC , CSA Members and APOC Countries (Onchocerciasis National coordinators, official in charge of Disease Control).
	How did they align with the stated objectives?	TCC , CSA Members (NGDOs, donors Countries,) and APOC Countries
	Some observers state that APOC is on the verge of achieving elimination in about nine countries. Is this accurate?	CSA Members, APOC Countries, scientific literature
	How close do you think we are in achieving elimination in the other sub-Saharan countries?	TCC , CSA Members and APOC Countries, NGDOs, scientific literature
	Some observers have stated that the pursuit of elimination may have inhibited the achievement of sustainability for CDTI – another APOC objective – because it involves stopping treatment earlier than might otherwise have occurred. What is your opinion on this?	TCC , CSA Members and APOC Countries, NGDOs, scientific literature
	Has APOC succeeded in preventing transmission in its target areas?	TCC , CSA Members and APOC Countries, NGDOs, scientific literature, APOC Reports on programme achievements
	Are there gaps in transmission control which might lead to recrudescence in cleaned areas and elsewhere? (Probe for hypoendemic areas)	TCC , CSA Members and APOC Countries, NGDOs, scientific literature
	As APOC closes, how can we insure that the gaps in treatment and/or gaps in halting transmission is follow-up on ?	TCC , CSA Members and APOC Countries, NGDOs, scientific literature
	It is planed that NTD interventions post APOC will be country based. In your opinion, how can we insure that cross border issues are properly addressed?	TCC , CSA Members and APOC Countries
	How can we insure that the special needs of countries experiencing instability are accounted for, given that bilateral aid is limited or non-existent?	APOC Countries – (Onchocerciasis National coordinators, official in charge of Disease Control).
	Did the APOC partnership, including funding members, pharmaceutical companies, endemic countries and philanthropic function as intended?	Donors and Donor Countries –
	Have there been enough donor engagement, including concertation in the management of APOC activities?	Donors and Donor Countries –
	Has there been enough accountability for the funds that you disbursed by donors?	Donors and Donor Countries –
	Has there been any gaps in the justifications of the expenditures of funds disbursed by your institutions or others that you may know of?	Donors and Donor Countries –

Table 23. (Continued)

Item	Question	Who should answer
	What is your general appreciation of the way your contribution was managed and justified by APOC?	Donors and Donor Countries –
	Some observers stated the lack of Donor Conferences after 2004, a drop-off in bilateral visits to donors led by the World Bank created a loss in donors' engagement and sustained funding to APOC. What is your opinion about this?	Donors and Donor Countries –
	Have you ever perceived a gap between your contribution and your participation in shaping the evolution of APOC into a wider NTD entity.	APOC Countries (Onchocerciasis National coordinators, official in charge of Disease Control).
	What are the key partners that support the implementation of NTD control activities in the country (NGDO, Donors, Others, ..)	Onchocerciasis National coordinators, official in charge of Disease Control
	In your opinion, could this be a justification for the decline in donor funding for APOC operations? Can you explain further?	
	How has the rapid turn-over in programme management impacted on partners' involvement (countries, donors)?	
	Some observers have stated that the chairing of the CSA by WHO was– setting up a situation where the executing agency has been, in effect, reporting to itself. What is your perception of that? Could you explain further?	NGDO group, APOC Country, TCC members, CSA members
	Has community directed treatment continued to function as intended?	APOC Countries
	In your countries did the mass treatment for onchocerciasis continued as intended in the current year?	
	Are volunteer CDDs able to continue to do the job on a sustainable basis?	APOC Countries, NGDOs, scientific literature
	Are they capable of delivering medications for the other NTDs, in particular LF? What of other three PCT NTDs?	APOC Countries, NGDOs, scientific literature, communities
	Are the CDDs carrying out any other community health tasks? How does this further involvement affect the delivery of onchocerciasis treatments?	APOC Countries, NGDOs, scientific literature, communities
	Are the current government and NGDO inputs in terms of training and supervision at the community level adequate to achieve sustained community-directed treatment and eventually elimination of onchocerciasis?	APOC Countries, TCC members
	Is there a uniformity and consistency in government policies across the APOC countries to facilitate program operations?	TCC members

Table 23. (Continued)

Item	Question	Who should answer
	Have there been reports of inconstancies in government policies across APOC countries regarding program operations? (Mectizan supply, match up government contributions, NGDOs contributions, roll out of different program components, Programme resources management).	TCC Members – Members of CSA
	What resources financial does the country contribute for onchocerciasis control activities?	
	How has APOC financing in sustaining CDTI projects facilitate your participation in programme implementation?	NGDO
	How will your NGDO cope to fill the gap and follow-on country-based program, upon APOC closure?	NGDO
	What do you consider as the main achievements, that worked via the partnership, which may be relevant for the establishment the new NTD control entity which is planned to pick up when APOC closes in December 2015.	NGDOs, APOC Countries, members of TCC and CSA, Donors.
	What do you consider as the main drawbacks, that did not work via the partnership, which may be relevant for the establishment the new NTD control entity which is planned to pick up when APOC closes in December 2015.	NGDOs, APOC Countries, members of TCC and CSA.

The Evaluation Team

Wide ranging consultations were carried out to identify team members who would not only understand the role of APOC, but have specific technical skills and a good understanding of the context in which CDTI is being provided. Further, all needed to be able to commit the month of August for the field work and to be able to travel to various field sites. The members of the were selected from a number of candidates:

1. Innocent Takougang, Cameroon

- B.Sc. in Zoology (1983, M. S. in Animal Biology (1984)
  University of Yaounde, Faculty of Science
- M.S.P.H. - Parasitology (1986), Ph.D. in Parasitology (1990),
  Tulane University School of Public Health
- Foundation for Health Research & Development. Director (2005-
- Lecturer, Senior Lecturer, Associate Professor – Higher Teachers Training College (ENS), Faculty of Medicine & Biomedical Sciences (University of Yaoundé I) 1992-
- Coordinator of the Public Health Graduate Programme – Department of Public Health (FMBS).2009-.
- Technical Advisor for NTDs Christian Blind Mission International (CBMI). 2011-2013 .
- Consultant ENVISION Coordinator. IMAWorldHealth DRC- Country Office. 2015.

2. Samuel Musa Zaramba, Kampala, Uganda

- MBMS (1973), MMed 1978 Makerere University College of Medicine, Uganda
- Director of Health Services in charge of Clinical and Public Health Services (1995-2006).
- Director General of Health Services in the Ministry of Health of Uganda (2006}
- Chairperson of World Health Organization Executive Board for one year (2009-10)
- Vice-Chair of WHO African Partnership for Patient Safety (APPS)
- Board Member; Schistosomiasis Control Initiative (SCI) of Imperial College London.
- Chair, Monitoring and Evaluation Committee, WHO Neglected Tropical Diseases, Strategic Advisory Group (STAG).
- Chair, Transitional Task Force for APOC and Member of the Technical Consultative committee (TCC) of APOC.
- Member, Mectizan Expert Committee of Mectizan Donation Program.
- Co-chair of WHO Ebola Advisory Committee.

3. Siamevi Komla, Lome, Togo

- MD, MPH, epidemiology
- WR Gabon 2010-2012
- WR Cite d'Ivoire 2005-2010
- Chief, Planning, evaluation and Training OCP/APOC 2001-2002
- Director General, Togo Ministry of Health 1987-1994

4. Gilbert M Burnham, Baltimore, USA

- MD, Loma Linda University, California (1968) FACP (1980) MSc Tropical Medicine (1976), PhD tropical epidemiology (1988), London School of Hygiene and Tropical Medicine.
- Hospital Director, Malamulo Hospital, Malawi, 1976-1991.
- Mectizan Expert Committee (2000-present, with some breaks), currently chair
- Professor of International Health, The Johns Hopkins Bloomberg School of Public Health (1999)
- Team leader, Evaluation Red Cross Ebola control programmes, Guinea, Sierra Leone, Liberia.

The team has been in regular contact with exchange of documents and the review of various evaluation proposals. Consulting agreements between the team members will be executed by APOC.

Management plan

This evaluation will be managed by Prof Gilbert Burnham from the Johns Hopkins Bloomberg School of Public Health, Baltimore. He will be responsible as coordinator for this evaluation working closely with other members of the team. Liaison with APOC leadership for planning, technical and logistic support will be his responsibility. The submission of the draft and final reports in a timely manner as well as presenting findings to the CSA and the JAF are his responsibility. Other team members will be involved in making presentations as deemed appropriate.

Timelines

These are set out in the calendar of activities. The crucial point is the production of the final report. The team will endeavour to get the draft report completed as soon as possible after return from field data collections, and I believe that within one week we can have the major components together. The final report depends to a great degree on how quickly the comments on the draft can be received and incorporated.

Translation in to French

APOC has kindly agreed to oversee the translation into French. The French speaking members of the team will review this for fidelity of translation.

Publication

It is the general expectation of any activity undertaken by academic institutions such as JHU that publication of findings from reviews may be a result from this work. However, Dr Burnham recognizes that ownership of the data collected in this evaluation exercise rests with APOC and WHO. If it is deemed appropriate to pursue the idea of publication, this will be done in close cooperation with APOC, and those contributing from the APOC side will be recognized as authors in the final publication.

ANNEX 6: Bibliography

References reviews for the final evaluation

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