3rd Annual Report

Integrated Control of Schistosomiasis and Intestinal Helminths in sub-Saharan Africa (ICOSA)

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Submitted by
The Schistosomiasis Control Initiative
in collaboration with
Centre for Neglected Tropical Diseases, Liverpool School of Tropical Medicine
Liverpool Associates in Tropical Health
Crown Agents

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ABBREVIATIONS and ACRONYMS

CCA	Circulating cathodic antigen
CHD	Child Health Day
CNTD	Centre for Neglected Tropical Diseases
DFID	Department for International Development
DRC	Democratic Republic of Congo
epg	Eggs per gram
EU	European Union
FY	Financial year
GAHI	Global Atlas of Helminth Infections
GSK	Glaxo SmithKline
HR	Human resources
ICOSA	Integrated Control of Schistosomiasis and Intestinal Helminths
IU	Implementation Unit
LATH	Liverpool Associates in Tropical Health
LCNTDR	London Centre for Neglected Tropical Disease Research
LF	Lymphatic Filariasis
M&E	Monitoring and Evaluation
MDA	Mass Drug Administration
MoH	Ministry of Health
NGDO	Non-governmental development organisation
NTD	Neglected Tropical Diseases
PZQ	Praziquantel
PCT	Preventive chemotherapy
RTI	Research Triangle International
SAC	School-aged children
SCH	Schistosomiasis
SCI	Schistosomiasis Control Initiative
SCORE	Schistosomiasis Consortium for Operational Research
STH	Soil-transmitted Helminths (intestinal helminths)
USAID	United States Agency for International Development
VFM	Value for money
WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation
WHO	World Health Organization
ZEST	Zanzibar Elimination for Schistosomiasis Transmission

Introduction

DFID is providing £25 million over five years to deliver treatments for schistosomiasis (SCH) and intestinal helminths (STH) in 8 countries in sub-Saharan Africa. Of the £25 million, £14.5 million was allocated to Crown Agents largely for the procurement of praziquantel (PZQ), with £10.5 million provided to the Schistosomiasis Control Initiative (SCI) to provide technical support to the national control programmes within the countries for the delivery of treatment through mass drug administration (MDA). Recipient countries are Cote d'Ivoire, Liberia and Malawi (Group one); Mozambique, Tanzania and Zambia (Group two); and Niger, Uganda and Zanzibar (Group three).

The project commenced in October 2010 and has now completed 36 (out of 60) months of operation. The project is currently half way through Financial Year 4 (FY4). This report covers the progress made specifically during the period 1st October 2012 – 30th September 2013.

During February 2013, a meeting between SCI and DFID was held to revise the logframe in light of the potential for further project investment outlined in the business case for Phase 2, taking into account any recommendations made at the last annual review in October 2012 and using the DFID updated logframe template.

Progress against Log Frame

IMPACT

The **impact** of the project will be to contribute to the achievement of the human-development-related MDGs, in particular MDG6, through the control and treatment of schistosomiasis (SCH) and soil-transmitted helminths (STH). There are two indicators at impact level:

IMPACT Indicator	Baseline by September 2013	Expected Milestone 2014
1. Mean intensity of infection in treated areas by country (CI – Confidence Interval)	Tanzania: Sm = 109 epg (CI 50 – 151) Sh = 18 eggs/10ml (CI 13 -23)	*Schistosoma mansoni* (Sm): 50-65% reduction from baseline *Schistosoma haematobium* (Sh): 65-80% reduction from baseline
	Liberia: Sm = 16.32 epg (CI 11.99 – 20.65) Sh = 42.36 eggs/10ml (CI 19.09 – 65.64)	
	Malawi: Sm = 1.83 epg (CI 0.02 – 3.65) Sh = 2.32 eggs/10ml (CI 0.53 – 4.11)	
	Niger: Sm = 9.18 epg Sh = 5.59 eggs/10ml	

Impact indicator 1 relates to the health impact of the project by measuring the reduction of intensity of infection over time. Intensity of schistosomiasis infection is an accepted proxy for

disease morbidity[1]; therefore regular collection of this data gives a direct measurement of the effects of treatment on the occurrence of infection and an indirect measurement of the effectiveness of treatment in improving health status[2]. Intensity is measured as the number of eggs per gram of faeces (epg) for *Schistosoma mansoni* and as the number of eggs per 10 ml of urine (eggs/10ml) for *Schistosoma haematobium*.

Intensity data are collected through longitudinal parasitological surveys from a cohort of school-aged children who are successively followed-up pre- (at baseline) and post treatment. The establishment of sentinel sites and subsequent baseline data collection occurs after mapping has been completed and prior to the commencement of treatment. Baseline data has been received as follows:

- Data complete and analysed -Malawi, Liberia, Zanzibar (see Annex 1).
- Data partially available – Tanzania, Mozambique (see Annex 1). Due to restrictions on data flow outside the country, intensity data has not been received and analysis will have to be conducted in country. The SCI biostatistician is working with the NTD Programme Manager in Tanzania and Mozambique to identify the optimal time to visit each country to undertake any necessary training and provide statistical support for existing MoH NTD staff. Mozambique will be scheduled during the last quarter of FY4. Tanzania is scheduled for April 2014 (due to the limited availability of the NTD Programme Manager who has specifically requested to be present).
- Data collected, currently being entered – Zambia, Uganda
- Data collection scheduled - Cote d'Ivoire (November 2013)
- Historical baseline data available – Niger

Follow-up surveys within sentinel sites are undertaken immediately prior to the next round of MDA. As determined by the treatment schedules within each country, the project will have follow-up data available from Mozambique, Liberia, Malawi and Zanzibar during 2014 to determine progress against the health impact milestone for end2014.

IMPACT Indicator	Baseline by September 2013	Expected Milestone 2014
Validated treatment coverage in school-aged children (5-14 years) (disaggregated by gender) by country	Zanzibar: Unguja 91.9% overall* Pemba 82.6% overall*	At least 70%
	Malawi: 75.9% female; 79.9% male	

*The Government of Zanzibar undertake their own coverage survey which currently does not disaggregate by gender or age. ICOSA is working with the MoH and SCORE partners to adapt the ICOSA coverage survey protocol for implementation after the next scheduled MDA in June 2014 which will provide the breakdown of coverage data by age and gender. Dr Steffi Knopp at the Natural History Museum is leading on the development of the adapted protocol with input from the SCI M&E team.

[1] Van der Werf et al (2003) Quantification of clinical morbidity associated with schistosome infection in sub-Saharan Africa. Acta Tropica 86:125-139

[2] Helminth Control in School-Aged Children, 2nd Edition, World Health Organization ISBN9789241548267.

Impact indicator 2 relates to the performance of the project whereby the impact of treatment at the population level will be maximised if more people are reached during drug distributions. The World Health Organization (WHO) recommends that reaching at least 75% of school-aged children (SAC) is the minimal coverage target for endemic countries. To date, Zanzibar and Malawi have undertaken coverage validation surveys, as distinct from reported coverage captured during routine reporting in all countries. During FY4, coverage surveys will be undertaken in Liberia, Uganda and Tanzania (December 2013) and Cote d'Ivoire (January 2014). This indicator is further refined in Output 3 to ensure that the coverage data can be disaggregated and realistic assessments made on the ability of the programmes to reach all target groups within age clusters e.g. non-enroled SAC.

The coverage validation work stream in countries was being led by the project Health Economist who resigned from SCI in May 2013. Imperial College has been unsuccessful to date in recruiting to this position which has affected planning in Liberia, Mozambique, Cote d'Ivoire and Zambia. The SCI Senior Monitoring & Evaluation (M&E) Manager, who guided the coverage validation in Malawi, has been working closely with the M&E Manager within CNTD to ensure that this work stream progresses through FY4, with a Liberia survey scheduled in December 2013 and Cote d'Ivoire for January 2014. Tanzania already has a coverage survey strategy in place in those geographical areas supported by USAID and will implement this strategy in DFID supported regions in December 2013, during the same month as Uganda.

OUTCOME

The **outcome** of the project will be to contribute to the global strategic plan for SCH (2012-2020) by providing a total of 75 million treatments.

OUTCOME Indicator	Milestone by 2012	Achieved by September 2013	Milestone 2014
Number of treatments delivered, in millions (cumulative)	14.25	13.94	43.98 (for current countries only)

The milestone for 2012 has not been met until 2013. PZQ only became available to the countries from January 2012 in part due to the necessary adherence to EU procurement regulations by the procurement agent alongside the essential quality control provided by the Expert Review Panel at the WHO. Treatment has now been delivered through MDA in all ICOSA supported countries (Table 1) and continues to scale-up in countries as mapping is completed and implementation units defined.

The project has delivered a total of 14.55 million treatments to date; 12.198 million by the end of FY3 and 2.349 million confirmed during the first six months of FY4. In addition, 1.4 million SAC have been targeted in Cote d'Ivoire and Tanzania during this same timeframe, with final numbers currently being compiled within the countries. A further 15.7 million individuals are targeted for treatment during the remaining months of FY4. The project therefore expects to reach approximately 31 million treatments by the end of the current financial year in March 2014 progressing towards the target to reach almost 44 million treatments within the current supported countries by the end of 2014. As programmes

continue to scale up and with further rounds of MDA occurring in the last quarter of the calendar year of 2014, this target is expected to be reached.

Table 1: Total number of treatments delivered by the end of FY3, delivered during the first half of FY4 and scheduled for delivery during the latter half FY4

Country	Total no SCH treatments delivered to end March 2013*	Total no treatments planned by end FY4 (according to FY4 workplan)	Total no treatments delivered 1 April 2013 – 30 Sept 2013	Total no treatments planned 1st October 2013 – 31st March 2014	Month(s) during FY4 when treatment was delivered/ is planned
Cote d'Ivoire	649,859	1,000,000	Target 350,000 (data still being received)*	650,000	August 2013 December 2013
Liberia	17,400	745,000	322,253	421,889	October 2013
Malawi	4,109,304	0†	0	0	NA
Mozambique	4,210,871	10,801,922	0	10,801,922	October 2013 February 2014
Tanzania	122,996	1,952,103	564,342 (data still being received)*	0	June 2013 September 2013
Zambia	19,800	1,739,729	0	1,739,729	October 2013
Niger	755,022	1,020,000	610,321	0	June 2013
Uganda	308,305	1,153,219	0	1,137,137	October 2013
Zanzibar	2,004,600	1,968,594	852,253	984,297	November 2013
TOTAL	**12,198,157**	**20,380,567**	**2,349,169 confirmed** **1,387,761 targeted**	**15,734,974**	

*Treatment delivered during June - September 2013 but treatment data is currently being received and compiled at central level

†Mapping results for Malawi indicate that biennial treatment is required in all implementation units. MDA was conducted in 2012 and the next MDA round will take place in April 2014 during the first month of FY5.

OUTPUTS

The revised five project **outputs** are:

1. 100% at-risk areas mapped in all supported sub-Saharan African countries
2. Over 500 million tablets will have been delivered to treat infections
3. National programmes will be implementing mass drug administration (MDA) in the most effective ways as a result of monitoring and evaluation activities
4. Strategies will have been identified to promote elimination of SCH in low endemic settings
5. Reduced costs of treatment as a result of efficient implementation

Output 1: Priority areas identified through mapping of infected populations (Group 1&2 countries)

Output Indicator	Milestone by December 2012	Achieved by September 2013	Milestone 2014
1.1 Number of country* specific mapping protocols available	6 available	6 available (complete by October 2012)	8 available (including Phase II countries)
Output Indicator	**Milestone by December 2012**	**Achieved by September 2013**	**Milestone 2014**
1.2 Target areas mapped for disease by country	100% Malawi	100% Malawi	100% all countries
	30% Liberia	66% Liberia (10 complete out of 15 counties)	
	20% Cote d'Ivoire	46% Cote d'Ivoire (38 out of 82 districts)	
	40% Zambia	100% Zambia	

*There are 8 countries: Group 1 countries are Malawi, Liberia, Cote d'Ivoire (Phase I) and Ethiopia, DRC (Phase II – to be incorporated if project expansion occurs); Group 2 countries are Tanzania, Mozambique, Zambia (Phase I)

The results of mapping continue to be used to define the treatment strategy within each of the target implementation units and as the basis for selection of sentinel evaluation sites prior to MDA. Mapping was complete in Tanzania and Mozambique prior to ICOSA and has been completed in Malawi and Zambia with ICOSA support. Mapping surveys are outstanding in both Liberia and Cote d'Ivoire, with both scheduled to complete during 2014. The project is on track to reach the end 2014 milestones.

Challenges

The goal of ICOSA's mapping approach is to advise countries on an evidence-based treatment strategy at the appropriate implementation level. Previous WHO draft mapping guidelines

suggest mapping at the level of "ecological zones" but treatment at the level of implementation units (IUs). In practice it has proved very difficult to define ecological zones, and it is also unclear how to convert prevalence estimates for ecological zones into treatment strategies for IUs, which are usually administrative units such as districts. The project considers the level at which one maps, and the level at which one subsequently treats, to be inextricably linked. The project's mapping strategy is guided by a desire to generate a SCH prevalence estimate for each IU so that they can be categorised into one of the recommended three control strategy bands (low, moderate and high prevalence), as outlined by the WHO.

The project is invested in the use of all existing data and is fully supportive of the WHO guidelines that aim to give countries scientifically validated practical guidance on mapping strategies that can be used in a range of field settings. SCI has followed the recommended WHO guidelines to date in the development of the ICOSA protocols, although has increased sample sizes to improve the accuracy of prevalence estimates in any given IU. WHO has recently drafted updated guidelines proposing purposive sampling at a small number of sites. However, SCI proposes that unbiased sampling with a slightly larger number of schools (as has been done by the project) is preferable. SCI, as part of the London Centre for NTD Research (LCNDTR) is currently drafting a response to WHO on refining the guidance on SCH mapping to achieve the key goal– to generate accurate prevalence estimates which minimizes the risk of missing endemic communities that need treatment and preventing over treating in communities which do not. The LCNTDR recently agreed with WHO to convene a workshop in the first quarter of FY5 surrounding how evidence (generated in part by ICOSA) gets incorporated into the development (and updating of) WHO guidelines.

Opportunities

Evidence: The challenge posed by developing clear mapping guidelines for SCH also provides an opportunity for ICOSA to contribute to the evidence base for this development. The sampling strategy used to date within ICOSA has allowed in depth analysis of the generated data to estimate misclassification of districts according to the number of schools surveyed. This evidence will guide discussion with WHO on the development of the optimal sampling strategy for mapping.

Data generation: As complete datasets from mapping surveys become available, countries continue to be encouraged to share their data with the Global Atlas of Helminth Infections (GAHI)[3], an open access information resource on the global distribution of SCH, STH and lymphatic filariasis (LF) (http://www.thiswormyworld.org/). ICOSA mapping data represents a significant contribution to the available global data for a number of countries including Cote d'Ivoire, Liberia and Zambia.

Integration: Within the ongoing mapping activities, efforts to integrate with other activities are being pursued where feasible. In Zambia, mapping was coordinated between SCH, STH and trachoma however with limited success due to the time required for parasitological data collection techniques required for the different infections. In Cote d'Ivoire, mapping during FY2 was cost-shared with LF-funding through CNTD to provide integrated mapping for LF,

[3]GAHI is supported by Wellcome Trust, Bill and Melinda Gates Foundation, The Partnership for Child Development, GSK and the Mectizan Donation Programme and is housed within the London School of Hygiene and Tropical Medicine.

SCH and STH. However, LF-funding for Cote d'Ivoire was not available during FY3 therefore only mapping for SCH and STH was feasible and the opportunity to continue integrated mapping was missed.

Cost-share: SCI is the recipient of a grant from the Vitol Foundation for Cote d'Ivoire which is providing a cost-share with ICOSA funding for the completion of mapping activities and the subsequent establishment of sentinel sites.

Output 2: Drugs procured and delivered

Output Indicator	Milestone by December 2012	Achieved by September 2013	Milestone 2014
2.1 No of tablets delivered to countries	35.6 million	99.99 million	143 million (including Phase I and Phase II)
2.2 No of countries implementing MDA according to their National Strategic Plans	4	8	8

To date, almost 100 million PZQ tablets have been procured and delivered to all ICOSA supported countries with the exception of Zanzibar who receive all their PZQ from the WHO donation programme (Table 2). By March 2014, this number will have increased to 117.2 million on delivery of the current orders to recipient countries. With funding not yet allocated for procurement for FY5 commencing in April 2014, ICOSA is on target to procure and deliver 143 million tablets by the end of 2014.

Table 2: Total number of tablets procured and delivered by September 2013 and scheduled for delivery by March 2014 by country.

Country	Total number of PZQ tablets procured and delivered by September 2013	Total number of PZQ tablets scheduled for delivery 1st October 2013 - 31st March 2014
Cote d'Ivoire	9,830,500	-
Liberia	4,875,500	-
Malawi	28,100,000	-
Mozambique	38,200,000	10,000,000
Niger	4,000,000	2,500,000
Uganda	4,110,000	-
Zambia	5,125,000	4,700,000
Tanzania	5,750,000	-
TOTAL	**99,991,000**	**17,200,000**

MDA Implementation

The strategic approach for MDA in all countries is a reflection of the target population with distribution through schools in all countries and community-based distribution occurring in those countries where the target population includes adults. The decision for this is made at country-level and is often based on strategies employed by the NTD programme for the delivery of drugs for other diseases particularly where integrated NTD control is being implemented.

The targeted population in all countries are SAC including enroled and non-enroled children. All countries are guided by the WHO in defining target populations and are encouraged to undertake community-wide treatment in areas of high risk. However, most countries have set strategic targets for SAC only within their NTD national strategic plans, prompted by the WHO coverage target as their primary indicator for success. In addition, the Merck KGaA donation of PZQ to WHO is directed at SAC and therefore to expand beyond this age group will require additional PZQ. The project is therefore working closely with the countries and advocating to ensure that strategies are expanded to include adults where feasible, both through the provision of additional PZQ and technical support in guiding approaches for this. Treatment is currently being expanded to the community in Malawi, Mozambique (in 13 out of 114 districts) and Zanzibar.

Challenges

PZQ Coordination: One of the key challenges in drug procurement for the project is the coordination between drugs procured and those donated through WHO. In recognition of this, PZQ coordination meetings are now held which include partner representatives from WHO, Merck KGaA, Crown Agents, SCI, RTI, DFID and USAID. At each meeting, forthcoming PZQ orders by SCI and RTI alongside the donated PZQ supply are discussed for each country with forecasting need in subsequent years. Data is updated and shared between all partners.

Political influences: The project is sensitive to political changes as a result of working directly with the Governments of supported countries.

- In Zambia the NTD Department has been moved from the Ministry of Health to the Ministry of Community Development, Mother and Child Health. The implications of this move for the project have been far reaching, given that the existing contract for ICOSA is with the MoH and funding for ICOSA has also been provided to the MoH. The impacts have been mitigated through high level meetings between ICOSA staff and senior Ministerial officials, which has ensured that funds have been released and project activities have progressed as planned.
- In Tanzania, key posts in the MoH were not in place between January 2012 until mid-September 2013 which delayed not only the contracting process but also the approvals required for the NTD programme to undertake implementation activities. Going forward, ICOSA will need high level advocacy meetings within the country to ensure appropriate priority is placed on project activities with stronger emphasis on more timely movements through the levels of bureaucracy.
- In Cote d'Ivoire, internal politics between the MoH NTD programme and the University of Abidjan (also subcontracted by the Swiss Tropical Institute and for SCORE Cote

d'Ivoire) has delayed progress with mapping. This issue has been resolved through increased communication between all parties and separation of financial processes. Independent contracts are now in place with each organisation and clear terms of reference in place for the scope of work required. Activities are progressing as planned.

Maintaining and improving relationships between senior Ministerial officials and both SCI and CNTD within countries remains a high priority to ensure their continuing engagement in NTD activities. ICOSA is therefore reviewing how it undertakes high level advocacy visits for the future.

Scale-up: The progression from the onset of a programme to implementation of treatment requires several steps to be undertaken; from an initial situation analysis, through mapping, development of appropriate materials, establishment of sentinel sites and baseline data collection, training, advocacy, sensitisation and social mobilisation to the resulting mass drug administration. For the project, the inclusion of countries at varying degrees along this sequential process was designed to ensure that programme implementation was undertaken swiftly. This resulted in a number of countries being MDA-ready quicker than others and as such they were prioritised for financial support to undertake their MDA. There has therefore been a skew in the number of treatments delivered by the project to date concentrated in a limited number of countries. ICOSA now needs to ensure that countries which have been supported through the initial stages of their programmes are now fully supported to also scale-up treatment and this will be addressed in the planning with countries for FY5.

Opportunities

SCH control activities rarely occur in isolation within countries. Collaboration with other implementing partners is actively sought in every country and the opportunities which have arisen within ICOSA to date are summarised in Table 3.

For example, the project aims to link with existing school-feeding programmes within countries as it is acknowledged that the inclusion of food during treatment increases the absorption of the drug and reduces side-effects.

ICOSA also provides an opportunity to add on operational research studies which could provide valuable information for future programme planning within countries where an integrated NTD platform has not yet been established, e.g. the co-administration of NTD drugs being tested in Malawi.

Integration with water and sanitation (WATSAN) is actively encouraged in all countries. Linkages from UK-based project staff with WATSAN implementers at the international and national levels have been established at numerous meetings (eg the UK Coalition for NTDs, the annual NGDO NTD Network meeting). These linkages are then actively encouraged along with knowledge transfer at country level to promote engagement with WATSAN activities.

Table 3: Enhanced opportunities within countries resulting from the MDA implementation supported by ICOSA

Opportunity	Country	Collaborating Agency	Timeline for Delivery
Integrated treatment for STH with albendazole	All	GSK	At a minimum where treatment for STH is not being provided by other means, e.g. through treatment for LF to the same target population
Integrated training and social mobilisation activities for all NTDs including SCH and STH	Tanzania Zambia Mozambique Niger Uganda Liberia	CNTD RTI Envision	In advance of each MDA campaign
Development of comprehensive IEC materials to include school deworming	Malawi	Save the Children	2014
Integration of deworming with an existing school-feeding platform	Malawi, Tanzania, Zanzibar	Mary's Meals Partnership for Child Development	During each MDA campaign
Operational research on the optimal delivery strategy for PCT drugs	Malawi	Comic Relief	Specific study during 2014 trialling triple therapy of PZQ with ivermectin and albendazole to determine the impact on coverage
Operational research on the additive benefits of PZQ administration on zoonotic diseases	Tanzania, Malawi	Bill and Melinda Gates Foundation	Specific study conducted between 2010-2014 to assess the safety and efficacy of PZQ distribution in areas co-endemic for SCH and cysticercosis, a tapeworm infection which causes neurocysticercosis (the leading cause of epilepsy, epileptic seizures and severe neurological symptoms in Africa) which can be successfully treated with PZQ.
Integration with WATSAN	Zambia	UNICEF	Throughout ICOSA delivery. The NTD programme is working to link the Water and Sanitation in Schools and the School Deworming programmes together such that NTDs will be used as an indicator as part of the WATSAN project evaluation
	Tanzania	In-country WATSAN	Throughout ICOSA delivery. The NTD programme, MoH and WATSAN

		stakeholders	implementers at country level are developing a joint objective of improved health of communities through WASH with 19 key activities to co-implement.

Output 3: National programmes using monitoring and evaluation results to refine strategies

Output Indicator	Milestone by December 2012	Achieved by September 2013	Milestone 2014
3.1 Percentage of targeted districts submitting reports 90 days after MDA	40%	Not yet formally evaluated – MDA recently completed (within previous 90 days) or not yet commenced for FY4	50%
3.2 Validated coverage of children not at school by gender	At least 50% in 1 country	Malawi: Males 15.49% (n=45, range 4%-27%) Females 14.76% (n=52, range 3%-26%)	At least 50% in 4 countries
3.3 Percentage of people with heavy infections in treated areas by country (Group 1 and 2 countries only)	None set	Tanzania baseline: Sh = 7%, Sm = 4.1% Liberia baseline: Sh = 9.3%, Sm = 0.2% Malawi baseline: Sh = 1.0%, Sm = 0.1%	Decline in percentage from baseline by 60% (Sh) and 40% (Sm)

The work stream for validating treatment coverage has been summarised in the Impact section of this report. The inclusion of indicator 3.2 in Output 3 allows disaggregation of the SAC to determine if high risk groups within this age class are being reached. Survey data from Malawi reported in the ICOSA mid-year report 2013 suggested that there is no differentiation by gender in accessing treatment. However, school enrolment plays a critical role in whether a child will be treated or not.

Using the results from Malawi in 2012, ICOSA has worked closely with the country programme to develop appropriate and targeted key messages for communities to increase sensitisation for the treatment campaign. Low coverage of children not at school during the 2012 campaign was attributed to communities not being aware that the programme was taking place. During FY4, a broader communication strategy has been planned and the public has been engaged already through radio messaging even though treatment is not scheduled until April 2014. Working with the country programme, ICOSA has also engaged with IU officials to determine the most appropriate strategy for reaching non-enroled SAC with the potential for increasing human resources during the treatment campaign to specifically encourage families with children not at school to seek treatment. Results from the forthcoming coverage surveys in other countries outlined earlier in this report will generate

similar information on the reach of the project to these groups and ensure appropriate planning is put in place for subsequent treatment rounds. SCI is also undertaking a resource planning exercise to determine if the necessary skill set of central level ICOSA staff to fulfil the technical requirements for social science support are being met.

The work stream for determining health impact has been summarised in the Impact section of this report. To date, sentinel sites have been established in Mozambique (23), Malawi (22), Liberia (38), Zambia (32) and Tanzania (10), with Cote d'Ivoire establishing 26 in November 2013.

Challenges

The establishment of sentinel sites is a time-constrained activity – they cannot be identified prior to the completion of mapping and must be established immediately prior to the treatment campaign for ethical reasons. Although delays in completion of mapping have resulted in a knock-on delay to the collection of baseline data, the key challenge for monitoring and evaluation has been data quality.

The project initially opted for in-country data entry to promote data ownership, encourage independent analysis and build data management capacity within countries. However, a number of problems have been encountered such as insufficient data back-up (resulting in loss of data files from computer corruption) and inconsistency in data entry personnel (data manager trained but moved to other programmes) which have influenced data quality. ICOSA has provided additional training support to relevant countries but has opted to outsource some components of data entry to an external company previously used by SCI to increase data quality by guaranteeing double-entered, cleaned datasets (in Cote d'Ivoire and Malawi). The project will review the success of data entry at country level to determine the most effective approach within each one, taking into account the HR resource available and technical support required. The databases developed for ICOSA for each country and translated to French and Portuguese as required will still be maintained for data input.

Protocol misinterpretation at the time of data collection has also played a role in the quality of the resulting data. In Mozambique, the programme manager opted to use a non-standard procedure for estimating prevalence and intensity which, although valid for Mozambique, will limit comparability between countries. In Malawi, urine volumes were not accurately recorded thus it is possible that data is indicating lower overall prevalence in sentinel sites. ICOSA will be undertaking further data analysis to quantify underestimates using mapping data from 2012 and baseline data in appropriate districts. The project has identified that additional technical support is required for data collection. Going forward, this has been addressed by creating Standard Operating Procedures for all diagnostic tests conducted during data collection to ensure comparability within programmes longitudinally and between programmes in different countries. Additional training will also be provided to all survey staff with appropriate supervision put in place (either by ICOSA staff or senior experienced technicians) during surveys to ensure that protocols are correctly interpreted.

Opportunities

As for mapping, the baseline and follow-up data generated within the sentinel sites will provide a wealth of data on the impact of treatment in numerous inter- and intra-country settings. Strategies for engaging adults and non-enroled SAC will be evaluated, encouraging countries to adopt similar approaches in matched settings.

In response to issues surrounding access to data raised in general within the NTD community, WHO is starting the development of a standardized database to compile all treatment and monitoring data for use by country programmes. Project staff are contributing to this development process in the expectation that the single format will serve the purpose of ICOSA and all other donor agencies for reporting and monitoring downstream. ICOSA is also in contact with the developers of the GAHI and Global Trachoma Atlas to align project databases with the format required for inputting information into these open-access tools in a streamlined way.

Output 4: Development of strategies for the elimination of SCH as a public health problem in Zanzibar, Niger and Uganda

Output Indicator	Milestone by December 2012	Achieved by September 2013	Milestone 2014
4.1 Transmission hotspots (areas with persistent transmission) treated with adjusted preventive chemotherapy (PCT)	30% hotspots treated by adjusted PCT	33% hotspots treated by adjusted PCT (100% within 1 country, Zanzibar)	70% hotspots treated by adjusted PCT
4.2 Percentage of heavily infected individuals in hotspots	None set	Baseline: 15.0% in Zanzibar	Decline in percentage by 25% (Sh and Sm)

Following the recognition of the long term health impact of disease elimination outlined in the World Health Assembly Resolution 66.12 in May 2013 (reference http://www.who.int/neglected_diseases/mediacentre/WHA_66.12_Eng.pdf) ICOSA is supporting the development of elimination strategies in Zanzibar, Uganda and Niger.

The **Zanzibar Elimination of Schistosomiasis Transmission (ZEST)** is the Government-endorsed strategy for eliminating schistosomiasis from Zanzibar. All drugs are provided through WHO (PZQ from Merck KGaA and albendazole from GSK). ICOSA finances the adjusted PCT, in this case bi-annual MDA to all eligible individuals, and provides technical guidance as requested, for example in the development of the registers used as part of the implementation campaign. The programme adopts a community-based approach by delivering drugs on a house to house basis. All evaluation activities are conducted by partners including the University of Georgia (SCORE), Swiss Tropical Institute, Natural History Museum London and CDC Atlanta. There is also interest from China to join this consortium, with linkages through the DFID China office. The baseline findings prior to the onset of the intervention have recently been published in open-access format in the Public Library of Science for NTDs.

The NTD programme in Zanzibar has recently completed the 3rd round of MDA. Although reported and validated community coverage remains high, the sentinel site data suggests that the bi-annual treatment has not had an impact on the prevalence of disease after the first year of implementation. Baseline prevalence levels in Unguja (4%, n=9760) and Pemba (9.2%, n=9398) have remained at similar levels post treatment (Unguja: 4.7%, n=6713; Pemba: 6.9%, n=6938). As changes in prevalence are not a good impact measure in the case of helminth infections, further analysis of intensity results is being conducted by SCORE to reveal any potential health impact. In addition, there has been a strategic shift to incorporate school-based drug distribution to increase coverage during the next MDA scheduled for November 2013. This will be validated using an adapted coverage survey protocol with independent enumerators.

The **Uganda** MoH has been annually treating for SCH on a national scale for 10 years with partner support. In the move to an integrated NTD programme in 2008, a number of counties with low endemicity (either through natural low transmission levels or as a result of successful suppression of transmission through MDA) have not qualified for MDA through the national programme. Uganda has embarked on a re-assessment of these low endemic counties to refine the treatment strategy further such that each one can be sub-divided to sub-country/district level and can be targeted for treatment according to WHO guidelines at a fine scale. 14 districts were reassessed in March 2013, with an additional 16 in June 2013. The NTD National Strategic Plan for Uganda was launched in October 2013 with treatment occurring in these districts as part of the Child Health Days during the same month. 26 further districts will be re-assessed in February 2014 with treatment during the next Child Health day in 2014, thus Uganda will reach the target of 100% hotspots treated by the end of 2014.

In **Niger,** a strategic plan for schistosomiasis 2012-2016 has been developed and is being implemented. ICOSA activities are focused in 7 low prevalence districts which takes the programme to 100% geographical coverage alongside the USAID support for NTDs. Hot-spot areas of transmission have been identified in these low prevalence districts as a result of the re-assessment surveys. ICOSA is now building capacity through the training of health staff in the community health centres in these areas. As part of this training, clinic staff have been provided with microscopes and taught how to report and diagnose SCH using an algorithm to ensure that all symptomatic cases are identified and treated.

Challenge and Opportunity

The evidence base for treatment strategies in countries where MDA has suppressed transmission and triggered a move towards adjusted PCT is limited. However, a few countries fall into this category and these countries are requesting technical support on how to refine their strategy going forward. The WHO recommends that countries move toward elimination after 5-10 years of PCT to control morbidity. Zanzibar, Uganda and Niger fall into this category and each has decided on an adjusted PCT strategy; Zanzibar is undertaking bi-annual treatment of the entire eligible population, Uganda is treating SAC annually in identified hotspot areas within low transmission settings and Niger is treating SAC annually in high transmission settings through MDA and providing clinic-based treatment as required in low transmission settings. The evidence generated from coverage and sentinel site data will contribute significantly to identifying the most effective ways of adjusting the PCT strategy as more countries move towards elimination in time. Mathematical models of schistosomiasis infection and transmission are being developed to investigate the most appropriate

elimination strategies in different settings. Data collected in these countries will be used to ensure these models are as accurate as possible, and that the outputs of the models have the broadest possible reach. This additional work is funded by the Children's Investment Fund Foundation (CIFF).

Output 5: Lower cost per treatment achieved

Initially, the project had planned an academic approach to measuring direct financial cost per treatment with a health economist undertaking planned visits to each country to review detailed expenditure at country level. This process was started during FY3 by the project Health Economist, leading to the reported treatment costs for Liberia, Cote d'Ivoire and Mozambique in the ICOSA Mid-Year 2013 report. Financial data on the cost per treatment is now available in 3 other countries (Malawi, Niger, and Uganda) with data currently being received from Tanzania on the recent MDA.

Output Indicator	Milestone by December 2012	Achieved by September 2013	Milestone 2014
5.1 Number of countries with financial cost per treatment determined	None set	6	Costs determined in 6 countries
5.2 Direct financial cost per treatment by country	None set	Liberia: £0.31 Cote d'Ivoire: £0.28 Malawi: £0.12 Mozambique: £0.04 Niger: £0.17 Uganda: £1.01	4 countries achieving cost per treatment reduced from baseline

Preliminary analysis provides indicative direct financial costs but it should be noted that some expenditure will be undertaking activities associated with treatment planned during FY4 rather than undertaken up to end FY3 (Table 3).

Table 3: Indicative financial costs per treatment incurred by end March 2013 with associated treatment delivery in country during the same timeframe against actual expenditure.

Country	Number of treatments	Total Expenditure (£)	Mapping Costs (£)	M&E Costs (£)	Cost per treatment (fully inclusive) (£)	Cost per treatment (excluding mapping and M&E activities) (£)
Malawi	4,109,304	497,222	59,243	105,286	£0.12	£0.08
Niger	755,022	130,912	21,149	0	£0.17	£0.14
Uganda	308,305	313,903	55,409	1,200	£1.01	£0.83

The range of treatment costs highlights the economies of scale which can be achieved when countries scale-up. Group One country programmes (Liberia and Cote d'Ivoire) have national programmes still in their infancy. During the first year of MDA implementation, costs are usually higher due to the establishment of the necessary infrastructure. This includes but is not limited to cascaded training of drug distributors, technicians, and MDA supervisors; the development and production of MDA materials including communication materials, treatment registers, height poles and the requirement for mapping surveys. Reductions are then observed over subsequent years after initial investments have been made; for example materials and registers can be re-used in future years and training may be provided as a shorter duration 'refresher' activity. Group Two countries can reach economies of scale as programmes increase their geographical coverage as observed by the low cost per treatment achieved in Mozambique. Group Three countries are expected to increase again due to the high investment in re-assessment as observed in Uganda. Here, the project re-assessed prevalence in areas of known low endemicity. As prevalence is already low (either naturally occurring or as a result of ongoing treatment), a sample must be taken from multiple lower administrative levels than the standard implementation unit in order to treat more focally. This provides prevalence information at the lowest sub-level which can guide an adapted treatment strategy to move towards elimination. As this target is achieved, it will become more costly to locate the final individuals who harbour infection and implement a strategic shift towards surveillance. It should also be noted that in Uganda, the subsequent treatments in the re-assessed areas are ongoing which will see the number of treatments delivered rise against little additional cost, which should reduce the cost per treatment to a value comparable to Niger. The combination of financial and health impact data will also enable additional analysis on the value for money on long term investment in elimination countries versus achieving a high, short-term health impact in untreated populations.

Challenge and Opportunity

Following the resignation of the health economist from SCI and the delay in recruitment to this position, it was clear that this work stream would not progress unless an alternative strategy was employed. The opportunity to review the financial procedures within the countries was taken and a revised accounting system developed from previous costing templates used by the health economist but streamlined for routine financial reporting at the country level. Routine financial reporting via a cashbook and bank statements provides details of all expenditure incurred on a monthly basis within each country. However, the addition of cost centre coding to all receipts aligned to the annual workplan budget now allows real-time expenditure to be allocated against original budgets for all activities. During July – September 2013, technical support to the financial department of SCI allowed the retrospective coding in Malawi, Uganda, Niger and Tanzania of all expenditure to date from the onset of the project. Additionally, training for the implementation of the new system of managers and their accounting staff at all levels in a practical manner to facilitate account and activity reconciliation has been undertaken during August and September 2013 in each of Malawi, Tanzania and Uganda with Cote d'Ivoire and Niger being trained in the last week of October 2013. The finance manager at SCI is working closely with LATH to review the systems of the Liverpool School of Tropical Medicine in which CNTD is embedded to determine the feasibility of implementing a similar system in the financial reporting there. SCI is also strengthening its regular auditing programme of overseas accounts.

Progress and Results

Summary of overall progress

The project has currently delivered a confirmed 14.55 million treatments by the end of September 2013 across all 8 ICOSA countries, with further treatment data still being reported. Although the 2012 target was missed, progress and scale-up within each country suggests that the 2014 target of 44 million treatments will be met.

Reported coverage rates have been above the WHO recommended threshold of reaching at least 75% in all countries and in the 2 countries where numbers have been validated, coverage in SAC still met this threshold (87.25% in Zanzibar, 78.1% in Malawi).

Each country has had a unique set of challenges in undertaking activities with ICOSA support. Many of these have been detailed in the previous sections of this report aligned to the outputs of ICOSA. It is clear that certain countries are proving more successful than others in initiating and scaling up their NTD activities and the project needs to harness the reasons for success to ensure they are translated across the project as a whole. ICOSA has undergone a recent mid-term review which has highlighted a number of key areas to address. The first step in addressing the recommendations is to undertake a country needs assessment to provide each country the opportunity to feedback how ICOSA support can be better delivered within their own context. The project will review these details and work to provide the elements essential to the countries which are felt will enable progress at the rate necessary to fulfil both ICOSA and WHO objectives on control and elimination.

Direct feedback from beneficiaries

No further feedback from beneficiaries has been conducted during the first 6 months of FY4. MDA is scheduled for implementation in countries during the last quarter of this calendar year and household surveys will be conducted alongside overage surveys in Liberia, Uganda and Tanzania (December 2013) and Cote d'Ivoire (January 2014).

Key challenges

Integration

Although integrated approaches to NTD control and elimination are promoted, the coordination of the complex scope of activities is often a challenge to timely implementation. District treatment schedules can differ according to the diseases present which can affect the ability to successfully plan for joint pre-MDA activities, particularly training and advocacy. If SCH treatment is occurring out of sync with other NTD interventions (often 6 month intervals between SCH control activities and other MDA activities), pre-MDA activities need to be repeated in the same districts involving additional financial resource and logistical planning. Integration can also hold back the progress which might otherwise be made if assessments are still required in any given IU for other NTDs before planning for that IU can be undertaken. In Tanzania, MDA has been delayed in the lake region (an area of high SCH transmission) because LF mapping (approach, survey and data analysis) still had to be

conducted. Guidance to the NTD Programme in Tanzania on how to undertake the LF mapping was required from WHO due to the specific circumstances within this area and thus the integrated programme would not move forward until the requirement for LF treatment was confirmed, despite the need in terms of SCH treatment. Going forward, increased communication between SCI and the country programmes is essential to advocate that ICOSA support (although primarily for SCH and STH treatment) forms an inclusive part of the NTD programmes in country and should not be dealt with in isolation. In addition, more regular dialogue with the countries will assist in identifying issues arising (such as that within Tanzania) as early as possible to allow mitigation of problems to occur and maintain the timelines of the project.

Technical

It has been identified that technical needs vary across each country depending on the skills and experience of the National Programme Manager, the human resource allocated to the programme and the progress each country has made in terms of implementation. In light of this, the country needs assessment scheduled for completion by the end of the calendar will determine the level of technical and management (including financial management) support required to deliver their programme objectives in the context of ICOSA going forward and tailor the support to each specific context.

Finance and Management

With the increased scope of the project, financial management and project planning systems require strengthening at the central level to increase accountability at all levels. SCI and Imperial College have engaged Deloitte to conduct an internal audit to assess the efficiency and effectiveness of key controls from an operational perspective. The audit will provide recommendations for improving financial procedures in light of the requirements set by Imperial College and the generation of data required by SCI to report on value for money.

SCI is also in discussion with Accenture Development Partnerships to assist with more effective resource planning and provide robust process and systems recommendations for planning and reporting with potential assistance for their establishment within the project.

Evidence and Evaluation

The data generated from ICOSA-supported mapping and sentinel sites will be invaluable in guiding the strategic approaches towards mapping and treatment delivery in countries which are currently engaged in or embarking on control of morbidity. For countries moving towards elimination, the data generated in Output 4 will similarly contribute vastly to the data available for analysis to determine approaches in these largely unknown situations. The Schistosomiasis Consortium for Operational Research and Evaluation (SCORE) has also awarded grants to SCI to undertake operational research in high and moderate endemic settings in Niger and Mozambique with additional studies being undertaken in Cote d'Ivoire and Zanzibar. Additional data collected as part of these SCORE studies now in their second year of operation will additionally contribute to the body of evidence on the impact of treatment and can inform best practice for each of the country programmes going forward. A grant from CIFF to SCI is also using the ICOSA-supported platform in Uganda and Liberia to

inform the optimal timeframe to reassess disease distribution in making potential strategic changes to implementation. SCI and WHO are engaged in frequent dialogue over optimal approaches for mapping, M&E and frequency of treatment which can inform policy and practice in the future. The Bill and Melinda Gates Foundation funded work also using the ICOSA platform will also contribute to the evidence base for integrating neglected zoonotic disease control into existing Schistosomiasis control programmes.

The low sensitivity of the gold standard diagnostic test (Kato Katz) in low endemic settings for SCH and STH has come to the fore of the operational research agenda as countries reach the prevalence thresholds to adjust their treatment strategies and move towards elimination. The most recent advance in diagnostic testing is the CCA test which is increasingly proving through research studies to be a more sensitive diagnostic to the standard Kato Katz technique which is known to underestimate prevalence in low endemic settings. ICOSA has undertaken surveys for the first time at large scale in a field setting using this test with validation data generated from a limited Kato Katz sample in both Uganda and Cote d'Ivoire. Results from these surveys should contribute significantly to the global knowledge on the suitability of the test for expanded use in programmatic settings whilst further operational research is on-going.

Risk

The programme risks have been most recently evaluated in the project Phase II business case.

PZQ supply: The primary risk to the successful implementation of the project is the continued availability of high quality PZQ at low cost. Crown Agents are seeking to expand the supply base from a single source, Microlabs, particularly in light of the potential increase in investment in the project. The WHO is also addressing the requirements to have suitable quality product available for SCH treatment alongside the rigorous pre-qualification process in an attempt to streamline the process and introduce new suppliers to the market.

Compliance during the MDAs within the countries continues to be a challenge to achieve not only high coverage rates in the first instance but to maintain the momentum of the programmes over subsequent years. Coverage and household surveys help to mitigate this risk and identify opportunities where improvements can be made and other avenues explored during implementation. The risk of negative media coverage has been successfully reduced in the past through improved sensitisation and widespread positive messaging. For example, Malawi and Tanzania have undertaken media awareness workshops whereby journalists attended a session facilitated by the NTD programme providing information about the disease, scale of the health impact and the importance of treatment. In Niger, the NTD programme embarked on a series of outdoor cinema events in each of the proposed treatment areas to increase awareness in the targeted communities. In addition, research opportunities to identify the reasons behind systematic non-compliance as a barrier to reaching the 2020 control and elimination targets, are being proposed by SCI as important inclusions for the Gates Foundation Operational Research grant (held by the Task Force for Global Health, Atlanta) and a submission by the London Centre for NTD Research to an open call for implementation research by DFID.

Integration of activities with other donors poses a great opportunity and maximizes the value for money achieved by the project. However, when funding from other sources are required to implement activities in a coordinated way, any delays within other organisations can result in activities being held back until full funding is available, for example the uncertainty in the annual USAID NTD programme budget. The project is mitigating this by managing the relationships with other donors to ensure that the current status of activities is known to all parties at the same time. Partner meetings are opportunistic and often attached to other meetings being attended by all partners (e.g. NNN meeting in Brighton, September 2013; ASTMH meeting in Washington, November 2013). Further risk mitigation is through the leverage of additional resources from new investors and identifying opportunities for cost-share. For example, SCI has received funding from Vitol for Cote d'Ivoire and from the END Fund for Liberia during FY4.

Financial risks are mitigated through the reporting procedures in place within the project at both the country level and the central level to ensure that funds are used appropriately. Where systems are reliable, robust and reasonably timely, funds are channelled through the Ministry of Health finance system, as these are routinely audited and have trained accounts staff. Where this is not a suitable option, funds are channelled through in-country Imperial College accounts or independent NGO's. SCI and CNTD are working together to ensure a comparable system with necessary checks is being implemented in countries supported by CNTD. Financial management systems have previously been reported in the ICOSA mid-year 20113 report and are under review as part of the internal audit of SCI by Deloittes. A series of recommendations will be provided from this review to strengthen financial management, auditing and reporting and will guide the implementation of more robust systems by SCI and CNTD going forward.

Value for Money

In terms of commercial practise by ICOSA and value for money (VFM), Crown Agents adhere to EU procurement regulations. It remains important that procurement of PZQ (valued at approximately 80% of the £14.5 million allocation to Crown Agents) is not only driven by low cost but balanced with quality and longevity of supply. In the short term, value for money has been reduced by the procurement of vehicles unsuitable for the terrain in Liberia. The vehicles procured have matched the specifications for other countries to undertake the same activities, but the condition of the infrastructure in Liberia was not adequately assessed in advance to provide suitable specifications. The procured vehicles are already at the end of their lifespan comparable to other countries where the same vehicles are still roadworthy, thus additional investment in this commodity will be required.

The key VFM measure in this project is the cost per treatment delivered over time. VFM is being achieved within the project not only through economies of scale in terms of treatment delivery but also by balancing the influencing factors on the success of drug delivery and ensuring integration of activities within each country takes place whenever possible, provided there is no risk to the quality and timeliness of the programmes. The recent implementation of the new accounting system which provides accurate expenditure against budget through routine reporting is allowing closer tracking of cost per treatment delivered. Actual expenditure information against activity budget will now be incorporated into planning for subsequent country activities to support more accurate forecasting of needs and improve

value for money through reduced cost per treatment where feasible. However, there is expected to be a threshold when countries are implementing at full national scale when additional cost savings cannot be made. As part of this planning process, central level cost data, namely human resource, will also be included to determine the overall value for money of the project.

Health impact as a key to effectiveness in the VFM equation will be incorporated as data becomes available through impact monitoring (health and coverage impact). This work stream will be progressed by the newly recruited health economist when available under the guidance of the Senior M&E Manager.

Key Cost drivers

The 2 key cost drivers of the ICOSA project are:

KEY COST DRIVERS	Expenditure Location	Budget Lines include:
1. Commodities	UK-based (by Crown Agents)	Procurement and delivery of Praziquantel (88% of budget)
		Vehicles
		IT equipment (desktop computers, scanners, printers)
		Laboratory Equipment (Microscopes, HemoCue machines)
		Laboratory Consumables (urine filters, microcuvettes, Kato Katz supplies)
2. Programme Expenses **(all MDA activities)**	Country-based (by recipient governments)	Training (Staff, teacher, volunteer, supervisor) (>50% budget)*
		Treatment delivery (>20% budget)*
		Information, Education and Communication (IEC) strategies
		Drug Logistics
		Supervision
		Social mobilisation

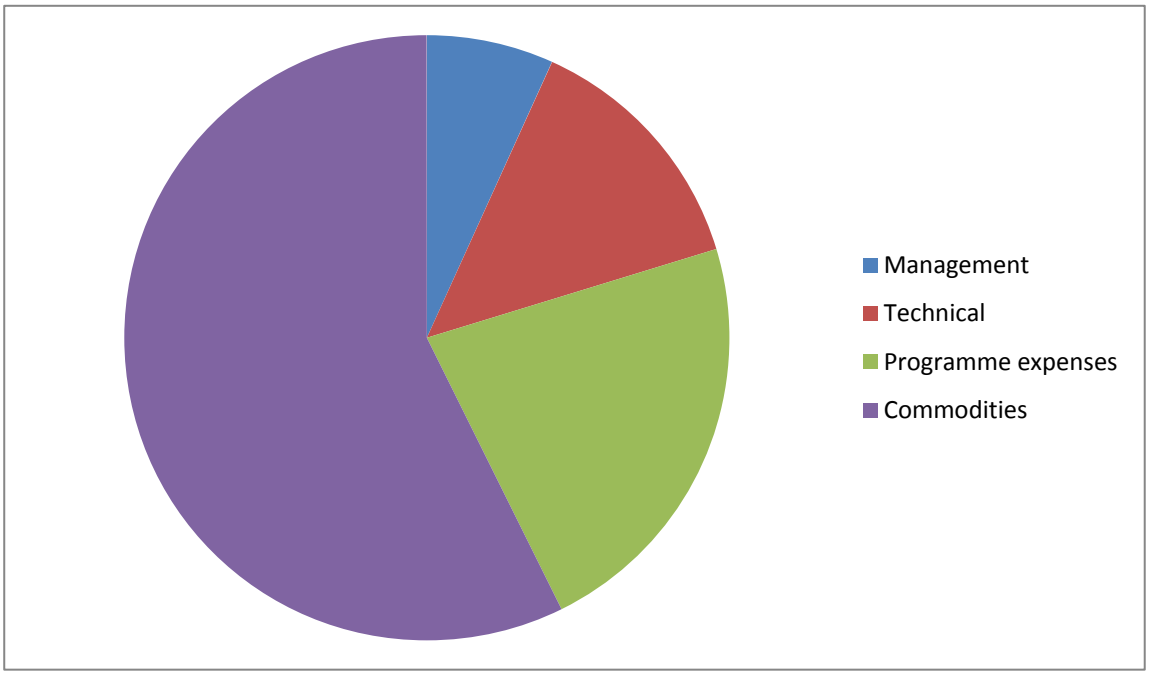
*Expenditure data from Cote d'Ivoire, Mozambique and Liberia (April 2011-March 2013)

Additional cost drivers are:

- Management (UK based expenditure by SCI and CNTD); which includes management personnel and associated project travel.
- Technical (UK and Country based expenditure by SCI and CNTD); which includes all technical assistance provided to countries through SCI and CNTD in addition to short-term support required as necessary to fulfill country objectives.

Figure 1 indicates the actual expenditure incurred across the key budget lines of the project between October 2010 and March 2013, the end of FY3.

Figure 1: Proportional allocation of actual expenditure incurred on key budget lines since project inception until end March 2013.



Annex 1: Data from baseline M&E surveys

These data represent exerts from comprehensive reports on the baseline findings within sentinel sites in each country:

Liberia

	Any schistosome infection	*S. haematobium*	*S. mansoni*	*Ascaris*	*Hookworm*	*Trichuris*
N pupils with data	4714	4714	4741	4741	4741	4740
N schools with data	**38**	**38**	**38**	**38**	**38**	**38**
Prevalence and 95% CI	**39.0%** (33.2, 45.0)	**20.2%** (15.1, 27.0)	**26.2%** (21.6, 31.0)	**12.8%** (9.8, 17.0)	**15.2%** (12.0, 19.0)	**0.65%** (0.46, 1.00)
Overall mean intensity and 95% CI	n/a	42.36 eggs/10ml (19.09, 65.64)	16.32 epg (11.99, 20.65)	4.32 epg (3.03, 5.60)	5.05 epg (3.66, 6.45)	0.15 epg (0.05, 0.25)
Proportion of schools with infection	97.4%	92.1%	97.4%	81.6%	97.4%	52.6%
School prevalence range	0-70%	0-59%	0-59%	0-33%	0-36%	0-2.4%
Proportion of pupils heavily infected		**9.26%** (5.75, 14.57)	**0.18%** (0.09, 0.38)	0	0	0

Malawi

Note: see report on potential underestimation of intensity values

	Any schistosome infection	*S. haematobium*	*S. mansoni*	*Ascaris*	*Hookworm*	*Trichuris*
N pupils with data	2626	2621	1109	1109	1109	1109
N schools with data	**22**	**22**	**9**	**9**	**9**	**9**
Prevalence and 95% CI	**10.51%** (6.59, 16.0)	**9.92%** (6.29, 15.00)	**1.89%** (0.59, 6.00)	**0.09%** (0.01, 1.00)	**0.18%** (0.03, 1.00)	0

Overall mean intensity and 95% CI	n/a	2.32 eggs/10ml (0.533, 4.106)	1.83 epg (0.016, 3.652)	0.085 epg	0.341 epg	n/a
Proportion of schools with infection	86%	82.0%	44%	11.0%	11.0%	0.0%
School prevalence range	0-36%	0-30%	0-9.6%	0-0.83%	0-1.7%	0
Proportion of pupils heavily infected		**0.95%** (0.44, 2.04)	**0.09%** (0.01, 0.64)	0	0	0

Mozambique

Data extracted from a PDF received from the country programme. Further analysis will have to be undertaken within country.

	Any schistosome infection	***S. haematobium***	***S. mansoni***	***Ascaris***	***Hookworm***	***Trichuris***
N pupils with data		2397	2875	2875	2875	2875
N schools with data	22	22	22	22	22	22
Prevalence and 95% CI		19%	3.8%	4.3%	3.6%	1%
Overall mean intensity and 95% CI						
Proportion of schools with infection						
School prevalence range						
Proportion of pupils heavily infected						

Zanzibar

See Knopp et al (2013) Elimination of Schistosomiasis Transmission in Zanzibar: Baseline findings before the onset of a randomized intervention trial. PLoS NTDs Volume 7, Issue 10, e2474.

Tanzania

Data analysis partially complete by in-country statistician

	Any schistosome infection	*S. haematobium*	*S. mansoni*	*Ascaris*	*Hookworm*	*Trichuris*
N pupils with data	1311	1311	1311	1311	1311	1311
N schools with data	**10**	**10**	**10**	**10**	**10**	**10**
Overall mean intensity and 95% CI	n/a	18 eggs/10ml (13, 53))	109 epg (50, 151)	0 epg	218 epg (178, 258)	0 epg
Proportion of schools with infection		40%	25%	0%	50%	5%