

Ministry of
Education, Science and
Technology



Ministry of
Health



Kenya National School-Based Deworming Programme

Year 3 (2014 / 2015) Results

Message from the Ministry of Education, Science and Technology



The Government of Kenya, through the Ministry of Education, Science and Technology is focused on ensuring that every Kenyan child has access to quality education. The ministry is keen on ensuring the fulfilment of the **Dakar Framework on Education for All** that aims to provide all children with education as a basic human right.

The Ministry has put in place robust policies in the education sector to help it achieve its goals. Among these policies is the National School Health Policy and its guidelines, implemented in collaboration with the Ministry of Health. This policy defines a holistic approach to improve children's health in order to achieve improvements in access, retention, inclusion and equity in education. The policy is intended to achieve sustainable development as part of a wider strategy towards the achievement of Kenya's Vision 2030, the National Education Sector Programme, and is aligned with the Constitution of Kenya 2010. The ministries of education and health are working together to review this policy and redefine school health programs in the country for the next five years.

The National School-Based Deworming Programme plays a major role in ensuring the health of children as an important contribution to their educational outcomes. The programme has treated children annually since 2012 against parasitic worms that cause ill health and interfere with school attendance. Evidence shows that deworming improves children's educational outcomes by reducing absenteeism where healthier children concentrate better in class, and consequently, is synergistic to Kenya's free primary education initiative.

The programme has succeeded in reaching its targets and reducing worm infection among children, and serves as a global model of school-based deworming. The programme was able to treat 6.17 million children in over 15,000 schools in its third year. The collaboration between the ministries of education and health has demonstrated the benefits our country can reap by strengthening inter-ministerial approaches to interventions that change lives in our schools and communities. We will endeavor to provide all the required resources, to ensure that the programme not only meets its objectives, but that it is institutionalized within the Ministry of Education, Science and Technology.

Now in its fourth year of implementation, there is a need to sustain the existing gains beyond the current programme's term, and ensure that the goal of eliminating worms as a public health problem in Kenya is achieved. As the end of the current funding period approaches, it is critical to begin the next stages of the programme's transition to long-term sustainability. The ministry will continue to work with the Ministry of Health to ensure the government fully funds the programme by 2022 and transition it successfully from our partners to public service delivery structures.

The success we see in this programme today would not be possible without the important collaboration, contribution and support provided by officers from the ministry- specifically the School Health Nutrition and Meals Unit, our County Directors of Education, DEOs, other officers at the counties and sub-counties and the teachers. I cannot forget the technical support provided by the Ministry of Health at both national and county levels. I wish to encourage this collaboration and ask the Assistant Director and his officers to further support the integration of deworming in schools within this Unit as we institutionalize the National School-Based Deworming Programme.

Each year, the ministry deploys thousands of its officers at the county, sub-county and school level to implement the programme. I wish to thank the county and sub-county teams for their excellent management of the programme to ensure that it is implemented in every school within the targeted treatment areas. I wish to also thank the teachers, who administer the medicines to the children, for their continued contribution and dedication to the programme.

I wish to thank our partners, the Children's Investment Fund Foundation, the END Fund, GlaxoSmithKline and Merck whose financial support and drug donations ensures the programme reaches millions of children at risk of worms each year. The ministry also recognizes Evidence Action for their technical assistance and fiscal management of the programme.

KWA AFYA NA ELIMU BORA, TUANGAMIZE MINYOO!

Ms. Leah Rotich, Director General, Education, Ministry of Education Science and Technology

Message from the Ministry of Health



The Ministry of Health seeks to ensure that all Kenyan children receive health services that improve their physical and cognitive growth in order to secure the future of our country. School-based deworming, a key pillar of the National School Health Policy, is a proven, cost-effective intervention that improves our children's health and educational attainment. Within the Ministry of Health, school-based deworming is one of our flagship programmes which contributes to the Key Performance Indicators of the Cabinet Secretary and Principal Secretary's performance contracts.

Kenya's National School-Based Deworming Programme is recognized internationally for its many achievements steered through the joint collaboration between the Ministry of Health and the Ministry of Education, Science and Technology. In its third year, the programme dewormed 6.17 million children for soil-transmitted helminths in over 15,000 primary schools, reaching 85% of targeted children. The sustained high treatment coverage of this programme over three years has successfully reduced the prevalence of soil transmitted helminthes (STH) in Kenya from 35% in 2012 to 17% in 2015.

The successes of school-based deworming in Kenya serve as useful best practices and lessons that other countries draw upon to implement their own national school-based deworming programmes. This is demonstrated by the implementation support the Kenya programme is providing to other countries in Africa - in Ethiopia, for example, I am aware that millions of children receive treatment due to collective efforts including collaborations with the Kenya programme.

The Ministry of Health, in collaboration with the Ministry of Education, Science and Technology, is currently focused on sustaining the programme to ensure that school-based deworming remains a priority in Kenya as long as worms are a public health problem. In the first and second years, we focused on launching and growing the programme to scale. The current focus is to institutionalize the programme in order to sustain the gains made so far and ensure continued treatment for all at-risk children. As part of the institutionalization process, the ministry is spearheading the integration of school-based deworming data into Health Management Information System. This will enhance data access for informed policy decision making within the government.

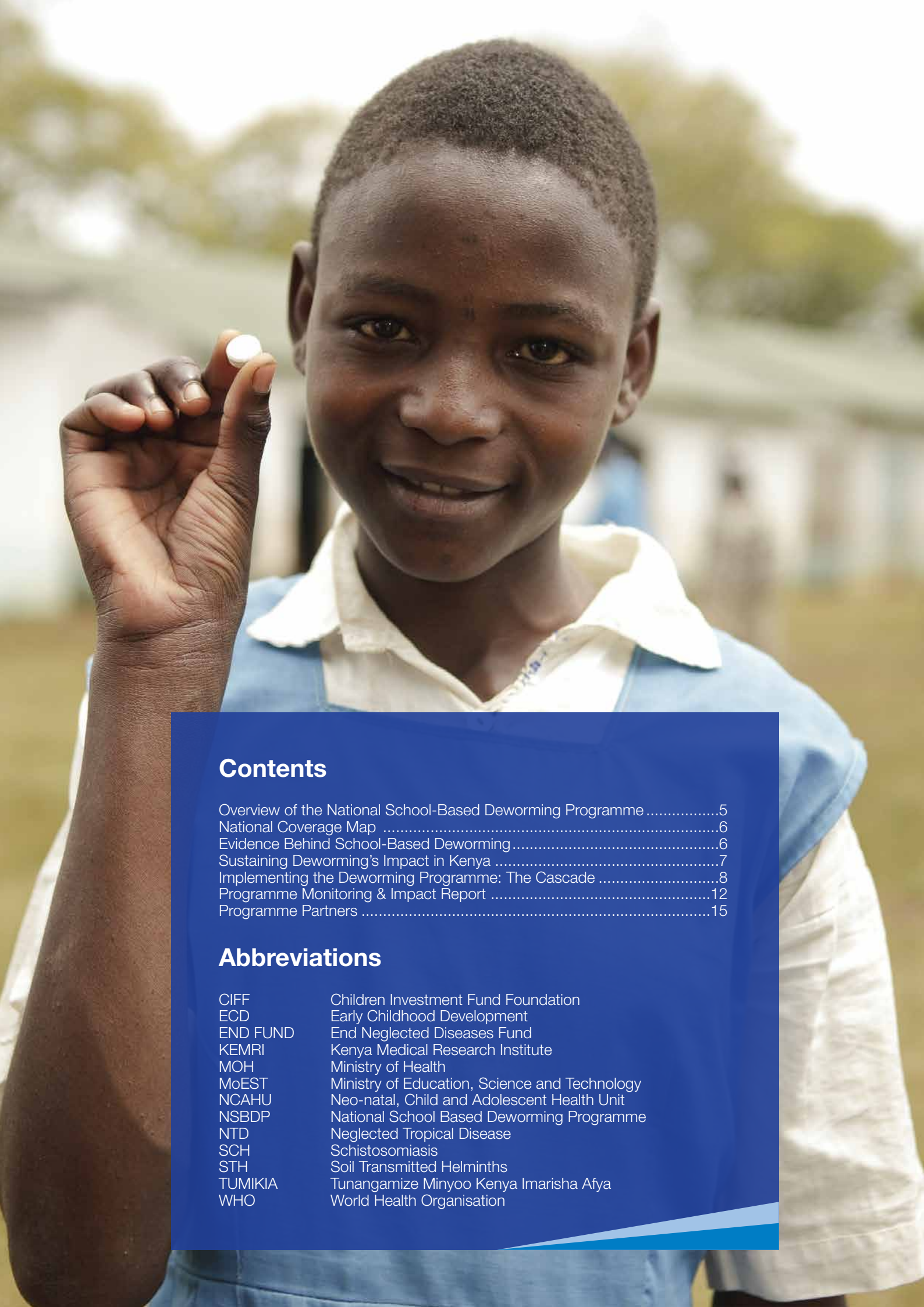
The Ministry of Health staff have been instrumental in the success of the programme and the ministry will continue to deploy staff as needed to support this programme. The Ministry of Health will continue working with the Ministry of Education Science and Technology to implement an integrated school health programme which will complement efforts of the deworming programme by improving sanitation and promoting healthier behaviors among children in schools.

I wish to recognize the Children's Investment Fund Foundation and the END Fund, who have so far financially supported the successful running of the programme, Evidence Action for programme technical assistance and fiscal management, World Health Organization (WHO), Kenya country office for the generous provision of deworming medicines from the WHO neglected tropical diseases medicines donation programme. I also wish to recognize Kenya Medical Research Institute (KEMRI) for monitoring and evaluation services provided to the programme, and staff within the Ministry who have put their time and effort for the continued success of the programme.

Thank you for ensuring that the problem of worms in Kenya is neglected no more!

"KWA AFYA NA ELIMU BORA, TUANGAMIZE MINYOO!"

Dr. Jackson Kioko, Ag. Director of Medical Services-Ministry of Health



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Abbreviations

CIFF	Children Investment Fund Foundation
ECD	Early Childhood Development
END FUND	End Neglected Diseases Fund
KEMRI	Kenya Medical Research Institute
MOH	Ministry of Health
MoEST	Ministry of Education, Science and Technology
NCAHU	Neo-natal, Child and Adolescent Health Unit
NSBDP	National School Based Deworming Programme
NTD	Neglected Tropical Disease
SCH	Schistosomiasis
STH	Soil Transmitted Helminths
TUMIKIA	Tunangamize Minyoo Kenya Imarisha Afya
WHO	World Health Organisation

Overview of the National School-Based Deworming Programme

In Kenya, more than five million school-age children are at risk of intestinal parasitic worms, including soil-transmitted helminths and schistosomes, which can negatively impact their health and education. The Government of Kenya recognizes that the health and education of its children are key in building a sustainable future. As such, they have made deworming a national priority through the National School-Based Deworming Programme.

The National School-Based Deworming Programme is a government programme implemented by the Ministry of Education, Science and Technology and the Ministry of Health. The goal of the programme is to remove parasitic worms as a public health problem for children in Kenya. The programme aims to treat at least five million Kenyan children each year for five years (2012-2017). All children aged 2-14 years in at-risk sub-counties, whether enrolled or not enrolled in school, are targeted for treatment at primary schools.

The deworming programme has operated successfully since 2009, wherein 3.6 million children were dewormed. Following the success of the first round of implementation, the programme was expanded to a national programme in 2011 and has since dewormed 5.9 million, 6.4 million and 6.17 million children in 2012-2013, 2013-2014 and 2014-2015 respectively.

Treatment takes place in schools across at-risk areas endemic for parasitic worms. Selection of these areas is determined according to World Health Organization (WHO) criteria.

Regularly providing deworming tablets to children through schools is a proven cost-effective and safe treatment strategy due to the readily available, extensive and sustained educational infrastructure. The World Health Organization has certified the safety of administering deworming tablets by teachers, with support from the local health system. While initiated and managed at the national level, the National School-Based Deworming Programme is implemented at the county level where Ministry of Education and Ministry of Health officials play a joint leadership role in ensuring that all children at risk of parasitic worms are treated at schools.

The programme is embedded in existing policies of the Government of Kenya that guides its alignment with national priorities. These policies include the National School Health Policy and Guidelines (2009), which prioritizes deworming under the thematic area on disease prevention and control; and the National-Multi-Year Strategic Plan for the Control of Neglected Tropical Diseases (2011-2015), which identifies school-based deworming as one of the treatment strategies for the control of soil transmitted helminthes and schistosomiasis. These policy documents are currently under review and will inform future school based deworming activities. Along with these policies, the programme is also a model programme under the National School Health Programme which illustrates impact of inter-ministerial collaboration at the health and education docket, in order to promote the health and educational development of school going children and their communities.

The programme is implemented with technical and coordination support from Evidence Action, a non-governmental organization that advocates for school-based deworming among policymakers and provides technical assistance to launch, strengthen and sustain school-based deworming programmes globally.

Financial support for the programme has been provided by the Children's Investment Fund Foundation (CIFF) and The END Fund. The deworming medicines are part of WHO's international drug donation programme that provides deworming medicines for school-age children free to the Ministry of Health through GlaxoSmithKline (albendazole) and Merck (praziquantel).

Critical success factors of the National School-Based Deworming Programme

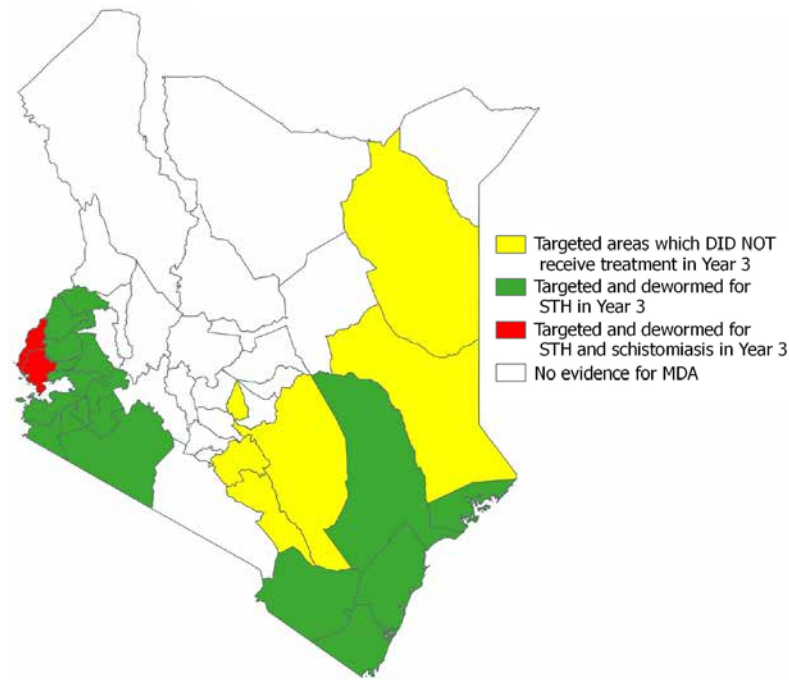
The National School-Based Deworming Program is a unified national programme coordinated at national level with coordinated and collaborative participation of ministries of health and education and their partners. This catalytic partnership has resulted in a strong programme partnership agreement involving MOEST, MOH, CIFF, END Fund, WHO, Kenya Medical Research Institute (KEMRI) and Evidence Action. These partners have facilitated and overseen three consecutive annual mass deworming rounds that target all at-risk school-age and pre-school-age children. The evidence-based programme's design is informed by results from continuous process monitoring, treatment data management, and annual prevalence and intensity surveys conducted pre- and post-deworming to understand changes in infection patterns.

Targeting children through schools effectively reaches over 80% of the target population in all at risk geographies in the country. Through the school-based programme, trained and trusted primary school teachers administer deworming medicines to children from an early age of 2 years; the programme leverages the existing and extensive infrastructure of schools where children are easily accessed and managed. Deworming medicines are safe, available and easy to administer by trained teachers. Children who are not enrolled in school are encouraged to participate in the deworming exercise through various community mobilization channels including interpersonal communication, mass media and information, education, communication materials targeting parents, teachers and children.

The government of Kenya has demonstrated leadership and ownership of the programme by participating in various governance structures and there is a very strong political will for the programme.

National Coverage Map

The coverage areas of the National School-Based Deworming Programme include 143 sub-counties within the following 27 counties: Nyanza, Western, Rift Valley, Coast, North Eastern, Eastern, and Central regions in Kenya as depicted in the map below. Implementation counties include: Bomet, Bungoma, Busia, Garissa, Homa Bay, Kakamega, Kericho, Kilifi, Kirinyaga, Kisii, Kisumu, Kitui, Kwale, Lamu, Machakos, Makueni, Migori, Mombasa, Nandi, Narok, Nyamira, Siaya, Taita Taveta, Tana River, Trans Nzoia, Vihiga and Wajir.



Working Towards the Elimination of Worms in Kenya – the TUMIKIA Project

Building on the success of the National School-Based Deworming Programme the Government of Kenya is keen to reach other members of the community also infected with worms and wants to learn whether combining school- and community-based deworming is a more effective method of controlling and ultimately eliminating soil transmitted helminthes in Kenya compared to school-based deworming alone.

This hypothesis is being investigated through the TUMIKIA Project (Tuangamize Minyoo Kenya Imarisha Afya, which loosely translates to “Let us eradicate worms in Kenya to improve health” in Swahili), a trial conducted by The Kenya Medical Research Institute (KEMRI) in collaboration with the Ministry of Health, Ministry of Education, Science and Technology, the London School of Hygiene & Tropical Medicine alongside Evidence Action. The trial will strengthen the evidence base surrounding STH control and eventual elimination.

This is a two-year study leveraging on the school-based deworming programme and is being implemented in coastal and western Kenya. To learn more about the TUMIKIA Project, please visit <http://www.thiswormyworld.org/tumikia-project>.

Extending Deworming Beyond Kenya

Mounting on the success of Kenya’s National School-Based Deworming Programme, Evidence Action provides light technical assistance to other governments in Africa and Asia to launch their school based deworming programmes. In Ethiopia, where the light technical assistance model was piloted in early 2015, support includes policy development, budgeting, community sensitization strategies, and independent monitoring. Support from Evidence Action is driven by best practices and lessons learned from Kenya’s deworming programme, as well as collaboration between the Government of Ethiopia (via the Federal Ministries of Health and Education and the Ethiopian Public Health Institute) and the Government of Kenya (via the Ministries of Health and Education and KEMRI). Evidence Action is proud to have a role in facilitating productive, strong relationships between the implementing government ministries in Kenya and Ethiopia.

Evidence Behind School-Based Deworming

The National School-Based Deworming Programme is based on rigorous evidence that deworming has a significant impact on children’s health and education.

THE PROBLEM

What are Worms?

Worms, or minyoo in Swahili, are parasites that live in the human intestines and bladder for survival. There are two types of worms treated by the Kenya school based deworming programme: soil-transmitted helminths (STH, or common worms) and schistosomes (which cause schistosomiasis, also known as bilharzia). Worm infection is a chronic condition that can cause anemia and malnutrition, impairing children’s mental and physical development and posing a serious threat to their health, education, and productivity. Children infected with worms can become too sick or tired to concentrate at school, or to even attend school at all.

THE SOLUTION

Why Deworming?

Deworming children helps them grow and stay healthy and also improves their educational attainment. The benefits of deworming are immediate and it positively impacts the children who receive treatment as well as their siblings and other children who live nearby.

Why School-Based Deworming?

School-age children typically have the highest intensity of worm infection of any age group. School-based deworming reaches children where they are – at school. Schools offer a readily available, extensive and sustained infrastructure that makes the programme cost-effective and operationally feasible.

THE IMPACT

How Does School-Based Deworming Benefit Children?

Results from rigorous, long-term studies conducted in Kenya evaluating school-based deworming demonstrate the long-lasting benefits of deworming on school participation, future earnings, and cognition. Some key findings include:

- ✓ Experimental evaluation in Western Kenya found a 25% reduction in student absenteeism at treatment schools. (Miguel and Kremmer, 2004)
- ✓ A long-run study based on the Western Kenya deworming finds that among females, deworming increased the rate of passing the national primary school exit exam by 9.5 percentage points (Baird and colleagues’)
- ✓ In Kenya, adult men who were treated as children worked 3.4 more hours per week, spent more time in entrepreneurial activities, and were more likely to work in higher-wage manufacturing jobs. This long-term impact study in Kenya calculates a rate of return for governments who invest in deworming of 32-52%.
- ✓ A study suggests that reduced exposure to worm infections may improve cognition for children less than one year of age. The young children in the catchment area of treatment schools showed large gains on cognitive tests approximately ten years later. (Ozier)

For more evidence on the impact of deworming, please visit <http://www.evidenceaction.org/dewormtheworld>.

Sustaining Deworming’s Impact in Kenya

In order to achieve the goal of eliminating parasitic worms as a public health problem for children in Kenya, the current successes and impact of the National School-Based Deworming Programme need to be sustained beyond the current five-year implementation period (2012-2017). Sustainability can be achieved through the institutionalization of programme components within existing governmental structures - organized, resourced, and coordinated at the national level and implemented locally by the counties.

What is the vision for a sustained deworming programme in Kenya?

By 2022, Kenya’s National School-Based Deworming Programme continues to run in an effective, evidence-informed manner, and is largely financed and implemented by the Government of Kenya at the national level. The well-designed implementation cascade will be maintained as it is simple, upholds cost-effectiveness, scalable, replicable and manageable.

- ✓ **Funding:** the government finances and resources up to 80% of the programme through the existing government structures, with complementary support from the private sector and the donor community.
- ✓ **Implementation:** A programme management unit is established within the Ministry of Education, Science and Technology to ensure that the programme is planned and coordinated at national level for better linkages and economies of scale, with the Ministry of Health coordinating the sourcing and distribution of deworming tablets.
- ✓ **Impact:** As a result of the collaborative partnership between the two ministries, the tablets and materials are cascaded down to schools efficiently, and the programme continues to treat all at-risk school-age children through schools. In addition, by providing impact data and information on the programme, the public is sensitized on the importance of deworming, resulting in a strong demand for deworming by local communities; local, county, and national leaders; and the private sector.

The success of institutionalizing this program is dependent on the sustained collaboration between the ministry of health and the ministry of education during the transition process. This will ensure each program component contributes to the vision of Kenya eliminating worms as a public health problem to its children.

Implementing the Deworming Programme: The Cascade

The National School-Based Deworming Programme uses a cascade implementation model that efficiently and cost-effectively delivers training materials, deworming tablets, monitoring forms, funds, trainings and other programme materials and resources from the national level to schools. The cascade brings together personnel from the ministries of education and health through collaborative leadership responsibilities for the planning, implementation and monitoring of programme activities at all levels.

At the national level, government officials train teams of “Master Trainers” drawn from the two ministries at the county-level. The programme governance structures are responsible for ensuring medicines are available each year for deworming in schools and that these medicines reach schools in good time. Further, implementation strategies, training materials and monitoring tools are developed at the national level and cascaded down as described below:

1

County Planning and Sensitization Meeting

Before implementation takes place within each county, the County Director of Education and the County Director of Health convene a meeting, facilitated by the national programme team, where county and sub-county-level personnel are sensitized on the programme and their managerial roles during implementation. This is a critical meeting, as the programme gains buy-in and builds partnerships by engaging with the recently created county-level structures in Kenya. County level responsibilities include coordination of county-based master trainers, management of deworming tablets and programme materials, planning and reviewing cascade activities at the county level and financial management. Further, the county directors serve as the programme’s spokespersons at the county.

2

Sub-County Training

County-based Master Trainers are deployed to train sub-county and division level personnel on managing and implementing the programme, including training teachers on how to implement a successful Deworming Day. During the training, SCMOHs and SCDEs work together to finalize the list of schools to be dewormed and update enrollment figures as part of planning for implementation. Further, the sub-county personnel manage activity budgets and funds, organize teacher training sessions, distribute deworming tablets to teachers and collect remaining tablets after deworming, manage distribution of programme materials for training, monitoring and community sensitization and oversee implementation of programme activities including sub-county training, CHEW forums, and teacher training sessions. Personnel also learn about their key responsibilities for programme implementation during this training.

3

Teacher Training & Community Health Assistant Forum

Teacher Training: Trained division-level personnel train primary school head and health teachers, with oversight from sub-county officials, on their key roles for implementing a successful Deworming Day.

Community Health Assistant Forum: During this meeting, Community Health Assistants are sensitized on their roles, including engaging community health volunteers to conduct community-level community sensitization & mobilization and monitoring schools on Deworming Day.

Immediately after Teacher Trainings, the community sensitization and mobilization timeframe officially begins where community-level health workers, alongside teachers share key messages with community members, including children, parents, village elders, and community-based organizations prior to treatment. The aim is to encourage community members to bring their children for deworming, particularly non-enrolled children. Posters sharing messages on a) the importance of deworming, b) ways to prevent worm infections, and c) the date and location of Deworming Day are also posted in strategic places around the community by teachers and community health workers.

4

Deworming Day

On a designated county Deworming Day, teachers administer deworming tablets to children in schools within programme coverage areas. Tablets are given to all children aged 2-14 years, including those enrolled in primary schools, in nearby Early Childhood Development (ECD) Centers, and those from the surrounding community who are not enrolled in school. Teachers also fill in monitoring forms to record the number of children dewormed.

Ministry of Health personnel visit schools to monitor treatment to ensure proper administration and manage any occurring serious adverse events should they arise. Personnel from both ministries are available during Deworming Day to provide necessary support to teachers.

5

Reverse Cascade

After Deworming Day, schools send their filled in monitoring forms to their division-level Area Education Officer (AEO), who then compiles division-level data and sends it to the SCDE for sub-county-level summarization. The SCDE shares the data with the SCMOH and County personnel and returns the forms, along with financial accountability documentation to the National Secretariat for data analysis and financial management.

Any remaining deworming tablets at the schools are collected by the AEOs and then given to the division-level Public Health Officers who then fill a tablet tracking form. This shows the number of unused tablets and distribution channel to the local health facilities for use in community deworming (after approval by the SCMOH). The tracking form is shared with the SCDE and County personnel, and returned, along with financial accountability documentation, to the National Secretariat for data analysis, donor reporting and financial management. Ultimately, the Reverse Cascade process is critical for the calculation of the number of children treated, the quantities of tablets used and redistributed to the community, and ultimately, the success of the programme.

Reverse Cascade

After deworming, monitoring forms are returned to the National Secretariat for data analysis and unused tablets are distributed to health facilities within the county for use within the community.

Year 3, 2014-15 National Programme Results

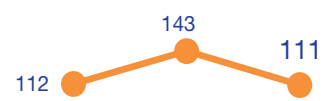
Children Dewormed STH
6,167,847



Schools Reached
15,790



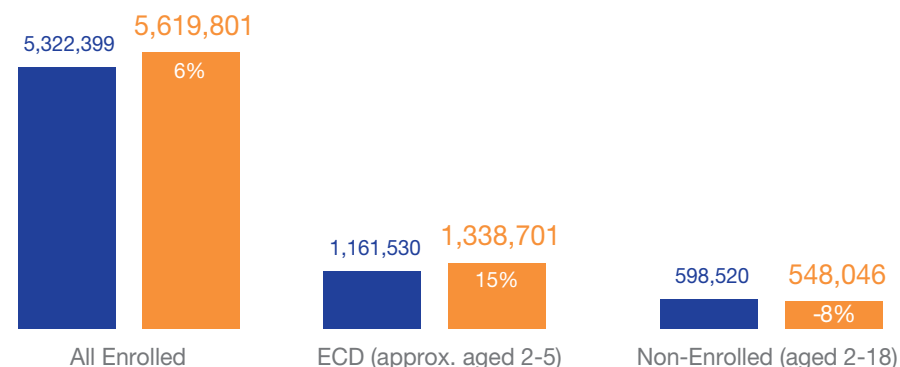
Sub-Counties Reached
111



In Year 3, the NSBDP focused on increasing treatment coverage. This resulted in larger treatment figures for the 111 Sub-Counties involved in both Year 2 and Year 3 as depicted below: -

Treatment trends in 111 sub-counties dewormed for STH in both Year 2 & 3

■ Year 2 ■ Year 3

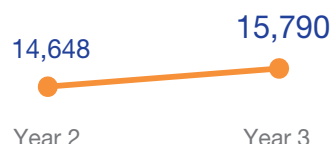


The number of enrolled children treated, increased by 6% in year 3 for the 111 sub-counties involved in both year 2 and 3. Treatment of ECD increased by 15%. Treatment of non-enrolled, decreased by 8%.

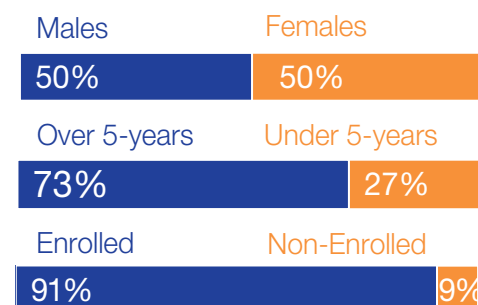
15% increase in teachers trained



8% increase in schools

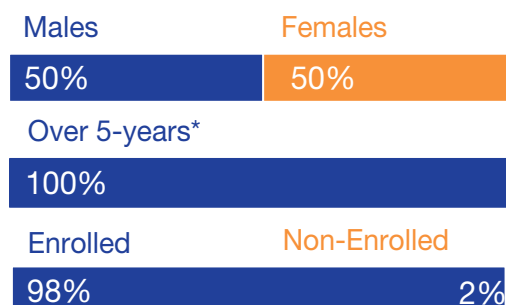


Soil Transmitted Helminthes



79,038 children were treated for SCH in Year 3 across 6 Sub-counties

Schistosomiasis



*SCH treatment is only for children over 5.

Year 3 National Programme Results: County Breakdown

Total of 111 Sub-Counties in 21 counties and deworming 6,167,847 children at 15,790 schools

County breakdown of Soil Transmitted Helminthes treatment and school coverage

County	Sub County	Children	Schools	County	Sub County	Children	Schools	County	Sub County	Children	Schools
Bomet 294,892	Bomet	93,300	285	Kericho 288,407	Belgut	77,170	219	Mombasa 194,814	Changamwe	54,633	195
	Chepalungu	74,197	251		Buret	63,770	203		Kisauni	66,126	200
	Konoin	54,842	162		Kericho	64,536	195		Likoni	42,759	133
	Sotik	82,270	257		Kipkelion	41,105	120		Mvita	28,746	83
Bungoma 549,108	Bumula	79,222	138	Kilifi 381,057	Londiani	45,803	125	Nandi 146,460	Nandi East	47,391	120
	Bungoma Central	68,020	142		Ganze	55,844	129		Nandi South	64,046	195
	Bungoma East	106,490	231		Kaloleni	59,533	100		Tinderet	38,726	127
	Bungoma North	89,278	172		Kilifi	102,900	199		Narok	Trans Mara East	44,984
Bungoma South	99,098	178	Magarini	60,948	142	113,713	Trans Mara West	69,580	207		
Bungoma West	51,978	134	Malindi	76,184	164	Nyamira	Borabu	27,859	96		
Cheptais	56,306	140	Rabai	33,196	55	211,543	Manga	33,380	118		
Kimilili	52,194	86	Kisii 460,807	Gucha	33,665	90	Nyamira 64,596	Masaba North	39,760	127	
Bungoma	36,958	89		Gucha South	64,899	198		Nyamira North	60,458	172	
Mt. Elgon	27,420	55		Kenya	55,350	153		Nyamira South	54,622	167	
Busia 317,736	Bunyala	49,175		68	Kisii Central 307,758	Kisii Central		101,304	314	Siaya 307,758	Bondo
	Butula	62,267	101	Kisii South		45,939	166	Gem	57,681		135
	Nambale	38,647	74	Marani		43,496	169	Rarieda	50,450		134
	Samia	37,612	82	Masaba South		43,286	124	Siaya	67,489		141
Teso North	52,482	134	Nyamache	55,325	152	Ugenya	48,740	110			
Teso South	61,135	118	Sameta	22,977	62	Ugunja	32,244	81			
Homa Bay 391,476	Homa Bay	85,286	252	Kisumu 276,393	Kisumu Central	50,755	73	Taita Taveta 87,027	Mwatate	22,073	70
	Mbita	46,029	224		Kisumu East	32,650	74		Taita	14,704	53
	Ndhiwa	77,817	252		Kisumu West	45,561	119		Taveta	24,145	56
	Rachuonyo North	61,346	225		Muhoroni	50,391	140		Voi	28,138	91
Rachuonyo South	88,208	257	Nyakach	58,585	217	Tana River 64,596	Tana Delta	28,273	75		
Suba	43,714	166	Nyando	47,760	119		Tana North	19,675	70		
Kakamega 676,865	Butere	60,706	120	Seme	38,269		119	Tana River	20,740	58	
	Kakamega Central	54,864	112	Kwale 220,861	Kinango		83,643	171	Trans Nzoia 313,499	Kwanza	107,040
	Kakamega East	64,753	125		Kwale	55,296	135	Trans Nzoia East		78,652	179
	Kakamega North	90,731	235		Msambweni	89,943	205	Trans Nzoia West		141,986	269
Kakamega South	41,751	91	Lamu		6,207	24	Vihiga	Emuhaya		64,530	124
Khwisero	39,826	81	Lamu 33,912	Lamu West	28,625	113	207,768	Hamisi	62,278	150	
Likuyani	57,000	128		Migori 383,525	Awendo	43,762		143	Sabatia	50,492	121
Lugari	41,716	88			Kuria East	35,236		105	Vihiga	34,336	87
Matete	28,044	74			Kuria West	69,158		156			
Matungu	60,022	86	Migori		88,014	264					
Mumias	87,007	127	Nyatike	61,500	207						
Navakholo	58,104	98	Rongo	44,938	147						
			Uri	44,807	128						

Counties breakdown of Schistosomiasis treatment and school coverage*

County	Sub County	Children	Schools
Busia	Bunyala	21,351	54
	Butula	8,437	14
	Samia	9,658	26
Siaya	Bondo	15,518	61
	Rarieda	17,527	57
	Siaya	6,547	22

*Due to praziquantel stock outs in the country, we reached only 2 counties for schistosomiasis treatment in Year 3.

According to planned population and enrollment figures, in 2014-15, the Kenya National School-Based Deworming Program reached 83% of "at-risk" children across 111 Sub-Counties, exceeding the target of 75% set by the World Health Organization.

Programme Monitoring & Evaluation



The Kenya Medical Research Institute (KEMRI), the national body responsible for carrying out health research in Kenya, is a key partner of the school-based deworming programme as it helps the programme maintain its evidence-based targeting approach. Its internationally-renowned experts in STH and Schistosomiasis mapping provide technical epidemiological and parasitology support towards the programme's monitoring and evaluation activities. Further, the parasitology evidence generated by KEMRI is fundamental for decisions on programme treatment targeting.

Programme Targeting

Scientists from KEMRI help define the programme's targeted geographies. In 2009, they defined the initial target geographies when they determined that the prevalence and intensity of worm infection in sub-counties in Western, Nyanza, Coast and parts of Rift Valley regions justified treating every child in identified areas through a mass drug administration campaign. Each year, further parasitological analysis has informed programme expansion, including:

- In 2012-2013, parts of Central region were added to the programme's Schistosomiasis-treating regions
- In 2013-2014, the programme added areas in Eastern, Central and North Eastern regions for Schistosomiasis treatment based on school-based questionnaires assessing whether children had indicated blood in urine (BIU), and parasitology surveys
- In 2014-2015, KEMRI conducted parasitology mapping in North Eastern region to confirm BIU findings from this region. As a result of new evidence that did not support the BIU data, the programme refined its treatment targets in North Eastern, reducing the number of targeted counties and schools.

Programme Impact

Each year, KEMRI conducts school-level surveys capturing worm prevalence and intensity for all three types of STH (hookworm, whipworm, and roundworm) and *Schistosoma mansoni* and *Schistosoma haematobium* in school-age children. These surveys, which analyze the impact of deworming over time, take place before and after deworming in a randomized selection of 60 schools drawn from 20 sub-counties distributed across 16 Counties in Western, Nyanza, Rift Valley and Coast regions. In addition, 200 schools were surveyed in Y1 baseline and Y3 mid-term, to monitor long-term changes in worm infection at national level; this category will also be surveyed in Y5 end-term. A summary of the prevalence and impact trends based on 60 category of schools are found tables 1-2 and figures 1-2, whereas, summary for 200 category of schools are in table 3.

Programme Monitoring & Impact Report

During the third year of programme implementation, the KEMRI team analyzed samples of stool and urine from 21,111 children before deworming and 6,201 children after deworming in the 200 and 60 schools respectively to determine worm prevalence and intensity. Table 1 and 2 summarize the overall prevalence and mean intensity of STH and Schistosomiasis from Y1 through to the Y3 pre/post-MDA surveys. Table 3 gives the relative reductions for prevalence and mean intensity for 60 schools. Moreover, trends in prevalence and mean intensity for all STH since Y1 pre-MDA to Y3 post-MDA are summarized in Fig 1 and 2.

Table 1: Overall prevalence (%) of STHs and schistosomiasis: Y1 pre-MDA – Y3 post-MDA

(Based on 60 schools)

Infection	Y1 pre MDA	Y1 post-MDA	Y2 pre-MDA	Y2 post-MDA	Y3 pre-MDA	Y3 post-MDA
STH combined	33.4%	8.7 %	19.0%	6.0%	16.2%	6.3%
Hookworm	16.9%	3.2%	4.5%	2.2%	2.4%	1.8%
<i>A. lumbricoides</i>	19.2%	2.3%	12.5%	1.9%	12.7%	2.8%
<i>T. trichiura</i>	5.4%	4.3%	5.1%	2.7%	3.0%	2.3%
<i>S. mansoni</i>	1.8%	2.4%	2.7%	0.6%	1.7%	0.8%
<i>S. haematobium</i>	18.0%	8.3%	10.5%	7.6%	15.0%	5.8%

Table 2: Average intensity (epg) of STHs and schistosomiasis: Y1 pre-MDA – Y3 post-MDA (Based on 60 schools)

	Y1 pre-MDA	Y1 post-MDA	Y2 pre-MDA epg	Y2 post-MDA epg	Y3 pre-MDA epg	Y3 post-MDA epg
STH combined	1730	127	1110	90	922	128
Hookworm	65	7	18	4	6	6
<i>A. lumbricoides</i>	1656	108	1078	82	909	117
<i>T. trichiura</i>	10	12	14	5	8	6
<i>S. mansoni</i>	6	27	15	2	8	1
<i>S. haematobium</i>	14	7	5	4	9	1

Table 3: Relative reductions in prevalence (PR) and intensity of infection (IR)

Infections	Y3 post-MDA compared to Y3 pre-MDA (based on 60 schools)	Y3 pre-MDA compared to Y1 pre-MDA (based on 60 schools)
STH combined:		
PR	60.9% (p<0.001)	51.4% (p<0.001)
IR	86.1% (p<0.001)	46.7% (p<0.001)
Hookworm:		
PR	26.2% (p=0.032)	85.8% (p<0.001)
IR	5.5 % (p=0.879)	90.9% (p<0.001)
<i>A. lumbricoides</i> :		
PR	77.9% (p<0.001)	34.2% (p<0.001)
IR	87.1% (p<0.001)	45.1% (p<0.001)
<i>T. trichiura</i> :		
PR	23.6% (p=0.023)	44.1% (p<0.001)
IR	27.6% (p=0.294)	19.0% (p=0.290)
<i>S. mansoni</i> :		
PR	55.9% (p=0.192)	3.5% (p=0.812)
IR	85.7% (p=0.002)	Increase* (42.3%) (p=0.189)
<i>S. haematobium</i> :		
PR	35.7 (p=0.059)	16.7% (p=0.117)
IR	89.8% (p<0.001)	38.2% (p=0.373)

Year 3 treatments resulted in a significant reductions in prevalence for all STHs types as depicted in table 2 above. Immediate reductions in prevalence for both *schistosomes* were not significant partly because treatment for these parasites was not delivered in year 3 due to praziquantel stock-outs in the country.

As shown in table 2, prevalence of STH combined has in overall reduced by 51.4% and prevalence of *S. haematobium* reduced by 16.7% while *S. mansoni* prevalence insignificantly reduced by 3.5% partly because in year 1 treatment for *schistosomiasis* was not delivered in Western, Nyanza and Rift Valley regions, while in year 3 treatment was not delivered in all the programme areas.

Fig 1: Prevalence (%) of STHs Infections from Y1 pre-MDA to Y3 pre-MDA based on 60 schools

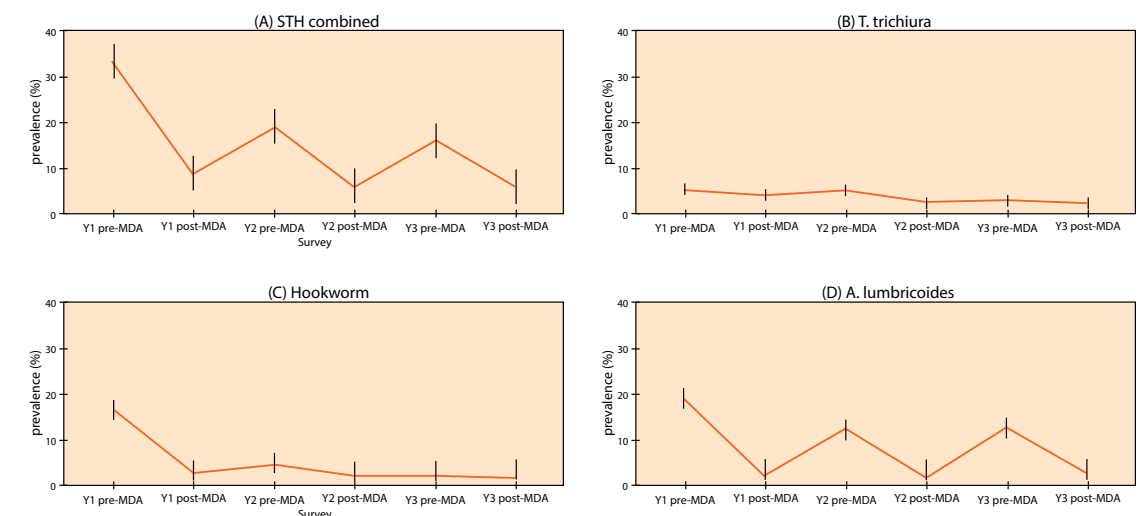
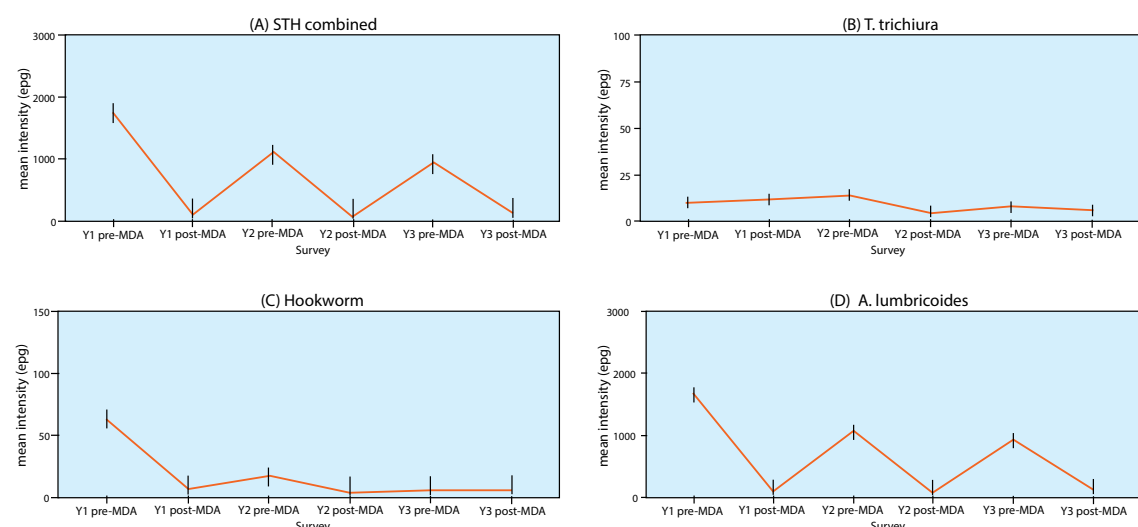


Fig 2: Average Intensity (epg) of STHs Infections from Y1 baseline to Y3 pre-MDA based on 60 schools



These results demonstrate that the overall STH prevalence observed following MDA in year 3 was lower than prevalence found in the year 1 after deworming. Additionally, the third round of deworming conducted by the National School-Based Deworming Programme has in overall achieved a significant reduction in prevalence for all three types of STHs but insignificant reduction were observed for *schistosomiasis mansoni* infection due to reasons explained above. Similar trends in relative reductions in prevalence and intensity are also observed in the 200 category of schools as shown table 3 below:

Table 3: Overall prevalence (%), average intensity (epg) and Relative Reductions of STHs and *schistosomiasis*: Y1 baseline – Y3 mid-term (based on 200 schools)

Infection	Y1 baseline (n=200)	Y3 Mid-term (n=200)	Relative Reductions (%) (p-value*)
STH combined	32.4%	16.3%	49.6% (p<0.001)
Hookworm	15.6%	2.3%	85.2% (p<0.001)
A. lumbricoides	18.0%	11.9%	66.1% (p<0.001)
T. trichiura	6.6%	4.5%	32.3% (p<0.001)
S. mansoni	2.1%	1.5%	28.8% (p=0.101)
S. haematobium	14.8%	6.8%	54.2% (p=0.002)
	epg	epg	
STH combined	1750	981	43.9% (p<0.001)
Hookworm	64	8	87.2% (p<0.001)
A. lumbricoides	1653	956	42.1% (p<0.001)
T. trichiura	33	17	49.6% (p=0.261)
S. mansoni	12	5	56.1% (p=0.002)
S. haematobium	16	7	58.3% (p=0.023)

*p-value: <0.05 significant

Contextualization of these results for program implementation

The prevalence and intensity of STH combined and species-specific infections decreased significantly between baseline and the Y3 mid-term survey conducted in both 200 and 60 schools categories after two rounds of MDA delivery. Similarly, the analysis of Y3 pre- and post-MDA showed significant immediate reductions in STH prevalence in the 60 category of schools. Quite notably, the immediate reductions in prevalence for both schistosomes were not significant.

The overall reduction in STH prevalence indicates albendazole efficacy for STH control. However, lack of treatment delivery for schistosomiasis in year 3 has greatly affected reductions in prevalence for both schistosome parasites.

A detailed analysis for year 3 report and a manuscript on monitoring and evaluation of the programme impact are currently in progress.

Programme Partners

The Kenya National School-Based Deworming Programme is implemented with the support and technical assistance of several partner organizations:

Evidence Action scales proven development solutions to benefit millions of people around the world. We fill the gap between knowing “what works” and having impact at scale. We implement cost-effective interventions whose efficacy is backed by substantial rigorous evidence. We identify innovative, appropriate financing mechanisms and build best practice operational models. We voraciously self-evaluate, learn, and improve our models for scaling with a commitment to transparency on progress, impact, and value for money.

Evidence Action helps translate evidence into widespread practice by advocating for school-based deworming to policymakers and providing technical assistance to launch, strengthen and sustain school-based deworming programmes. We work directly with governments to rapidly scale programmes targeting all at-risk school-age children. We work with state and national governments to institutionalize programmes and to set the course for the eventual elimination of parasitic worms as a public health challenge. Evidence Action’s Deworm the World Initiative currently supports governments in Kenya, India, Ethiopia, and Vietnam. Learn more about our work at www.evidenceaction.org.



The **Children’s Investment Fund Foundation** (CIFF) is an independent philanthropic organisation, headquartered in London. CIFF works to transform the lives of poor and vulnerable children in developing countries. CIFF has a child-focused portfolio of investments, targeting challenges that need urgent attention. That’s why we invest in improving children’s health and nutrition, ensuring quality education, and supporting actions to reduce climate change.

We place significant emphasis on quality data and evidence. Before making an investment and during implementation, we work with partners to measure and evaluate progress. We aim to achieve large-scale and sustainable impact. Every child deserves to survive and thrive. For more information, please visit www.CIFF.org and follow us on Twitter @CIFFchild.



The **END Fund** was founded with a clear mission to control and eliminate the most prevalent neglected tropical diseases (NTDs) among the world’s poorest and most vulnerable people.

END Fund does this by: 1) mobilizing and directing resources to where they can have maximum impact, 2) advocating for innovative, integrated, and cost-effective NTD programmes; and 3) facilitating private sector engagement in the movement to address the devastating effects of NTDs.

In line with this strategy, one of the END Fund’s core competencies and activities is the ongoing mapping and assessment of the NTD landscape of partners, projects, national plans, programme implementing organizations, and Ministry of Health capacity across disease-endemic countries. END Fund proactively assesses where resource investment can most efficiently and effectively move forward the NTD control and elimination agenda. END Fund then make strategic investment recommendations to donors engaging in the cause. Where no existing qualified programme implementing partner exists, the END Fund at times implements direct NTD programmes in partnership with Ministries of Health. For more information, visit www.end.org.





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