



REPUBLIC OF KENYA



National School-Based Deworming Programme

Year 6 Report (2017 - 2018)

MINISTRY OF EDUCATION & MINISTRY OF HEALTH

Message from the Ministry of Education



Education is one of the most important drivers of development. It helps people realise their full potential, and expand their connections with the world. The Government of Kenya (GoK), through the Ministry of Education (MOE), is focused on ensuring that every Kenyan child has access to quality education. This is an extension of the Kenya Constitution (2010), chapter four, that guarantees all Kenyans their socio-cultural and economic rights, including the right to education, health, and decent livelihoods.

Consequently, the MOE has established policies to help achieve its goals, including the 2nd Kenya School Health Policy (2018) implemented in collaboration with the Ministry of Health (MOH). This policy defines an approach through the Comprehensive School Health Programme that provides targeted school-based health services to at-risk school-age children. The National School-Based Deworming (NSBD) programme is one such initiative that aims to improve children's health so as to achieve access and equity in education.

The NSBD programme plays a critical role in ensuring the health of children as an important contribution to their educational outcomes and has treated children for parasitic worms annually since 2012. Evidence shows that deworming improves children's educational outcomes by reducing absenteeism and, consequently, is synergistic to Kenya's Free Primary Education initiative.

The programme serves as a global model of school-based deworming and successfully treated 6.3 million children in over 18,000 primary schools across 161 sub-counties in its sixth year. The collaboration between the MOE and MOH exemplifies the benefits of strengthening inter-ministerial approaches to interventions that change lives in our communities. There remains a need to sustain the existing gains and ensure that worms are no longer a public health problem for children in Kenya. We will continue to support the partnership in the seventh year and beyond through collaborative MOE personnel at all levels of government and in communities, providing training venues, and pursuing our vision of increased financial ownership and coordination support.

The success we see today would not be possible without support from the School Health Nutrition and Meals Unit, regional coordinators, County and Sub county Directors of Education, ward level officers and teachers, and technical support provided by the MOH at national and county levels. I wish to encourage this collaboration and ask the Director, Primary Education and his officers to further support continued deworming in schools.

Our sincere gratitude goes to our partners: The END Fund, GiveWell, and the Epic Foundation for the financial support, GlaxoSmithKline, Merck, and World Health Organization (WHO) for the drug donations, Evidence Action for their technical assistance and fiscal management of the programme - all of which ensures the programme reaches children at risk of worm infection each year.

We look forward to continued partnership and programme successes through the coming years, to a time when children no longer miss school due to preventable worm infections.

KWA AFYA NA ELIMU BORA, TUANGAMIZE MINYOO!

Dr. Belio R. Kipsang, CBS
Principal Secretary, State Department of Early Learning and Basic Education
Ministry of Education

Message from the Ministry of Health



The burden of soil-transmitted helminths (STH) and schistosomiasis is highest among pre-school and schoolage children. The effect of worm infection among these cohorts can be chronic and may cause malnutrition, anaemia, and increased susceptibility to other illnesses. Worm infection is indeed a public health problem that the MOH is committed to managing through collaborations between the Neonatal, Child & Adolescent Health Unit (NCAHU), Neglected Tropical Diseases (NTD) Unit, Health Promotion Unit, and the Division of Environmental Health. Control of these worms, among other diseases, is guided by the 2nd Kenya School Health Policy (2018), and the 2nd Kenya National Strategic Plan for the Control of NTDs (2016-2020).

Health of our citizens has a direct effect on the social and economic indicators of a nation; it determines the potential of individuals to contribute significantly to the economy. School-age children make up about 42% of our total population, and ill health is an impediment to achievement of their full potential.

The global burden of worm infection prompted World Health Assembly resolutions to scale up interventions against NTDs. These resolutions were domesticated in Africa during the June 2012 Accra Urgent Call to Action petition for accelerated efforts to eliminate targeted NTDs.

The importance of deworming cannot be overemphasized; it has been prioritized as one of the key performance indicators (KPIs) of the Ministry. It is in our performance contract that we will effectively provide deworming tablets to our children in schools. We take pride that this cost-effective intervention not only improves children's health, but also their educational outcomes. We know that we are contributing to the development of human capital for our economic growth.

The Ministry is delighted to celebrate, with partners, the successful completion of the sixth annual round of treatment and to release the results of the same. We are grateful for the unique relationship that we have with the MOE. This intervention must continue to be embedded in the structures of the Ministries under the Comprehensive School Health Programme.

Our gratitude extends to Merck, GlaxoSmithKline, WHO, and Kenya Medical Supplies Authority (KEMSA) for providing drugs, KEMRI for providing support in research, monitoring and evaluation and Evidence Action for technical, fiscal, and administrative support. We also appreciate our funding partners; The END Fund, GiveWell, and Epic Foundation. It is through the hard work and dedication of the ministry officers and partners at all levels, that help maintain impact of this important intervention.

KWA AFYA NA ELIMU BORA, TUANGAMIZE MINYOO!

Ms. Susan Mochache, CBS
Principal Secretary
Ministry of Health



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Abbreviations

BIU.	Blood in Urine
CHA.	Community Health Assistant
CHEW.	Community Health Extension Worker
CHV.	Community Health Volunteer
CSO.	Curriculum Support Officer
ECD.	Early Childhood Development
GoK.	Government of Kenya
KEMRI.	Kenya Medical Research Institute
KEMSA.	Kenya Medical Supplies Authority
MDA.	Mass Drug Administration
MOE.	Ministry of Education
MOH.	Ministry of Health
NCAHU.	Neonatal Child and Adolescent Health Unit
NSBD.	National School-Based Deworming
NTD.	Neglected Tropical Diseases
SCDE.	Sub County Director of Education
SCMOH.	Sub County Medical Officer of Health
STH.	Soil Transmitted Helminths
WASH.	Water Sanitation and Hygiene
WHO.	World Health Organization

Overview of the programme

Over six million school-age children in Kenya are at risk of intestinal parasitic worm infection, including soil transmitted helminths and schistosomes, which have a negative impact on their health and education. The government recognises that the health and education of its children is key to sustainable development. Deworming is, therefore, a national priority through the NSBD programme and forms a critical part in the performance contracts for two Principal Secretaries (Education and Health).

Kenya's NSBD is a government-led programme co-implemented by the MOE and MOH in 27 counties. The programme is implemented with technical and logistical assistance from the Deworm the World Initiative at Evidence Action which supports governments to launch, strengthen, and sustain school-based deworming programmes. The programme's main goal is to eliminate worms as a public health problem for Kenyan children, both enrolled and non-enrolled, by treating at least six million children each year. Trained teachers provide treatment in both public and private schools across all areas endemic for parasitic worms, where children aged 2-14 have been dewormed annually since 2012. Prior to the start of the programme, treatment areas were selected according to globally recognized World Health Organization criteria.

Deworming children regularly through schools is a proven, cost-effective, and safe treatment strategy that leverages the readily available and extensive infrastructure of education systems. WHO has certified the safety of teachers administering deworming tablets after simple training, and in Kenya this approach is both practical and highly efficient by leveraging the local health system.

Successes, challenges, & lessons learned

Over its six years, the NSBD programme has achieved numerous successes and generated valuable lessons. These outcomes not only inform improvements in each additional year of implementation, but can also be applied to other health and education programmes.

Successes

- In Year 6, the NSBD programme dewormed 6,360,900 children surpassing its annual target of 6 million
- Consistent and reliable funding allowed implementers to deliver the programme with confidence across all at-risk counties.
- Intentional planning sessions with county and national decision-makers ensured that coinciding activities or holidays, such as Ramadhan, did not interfere with treatment.
- A new database of hard-to-reach areas improved systematization and accuracy of budgeting and mitigated anticipated logistical challenges.
- Technical officers from MOH, MOE, KEMSA, KEMRI, and Evidence Action met regularly in monthly Management Team meetings convened by NCAHU to plan, troubleshoot, and resolve implementation issues.
- KEMSA played an active role in implementation, attending county meetings and helping to redistribute leftover drugs in the field in between treatment waves.
- County and sub county teams submitted financial accountability documents in good time, accounting for 98% of all funds within five months of treatment.
- Partners' collaboration, innovation, and commitment to success for the programme were showcased by efforts to advocate for, obtain, and redistribute drugs among sub counties for the impromptu third wave of treatment.

Challenges

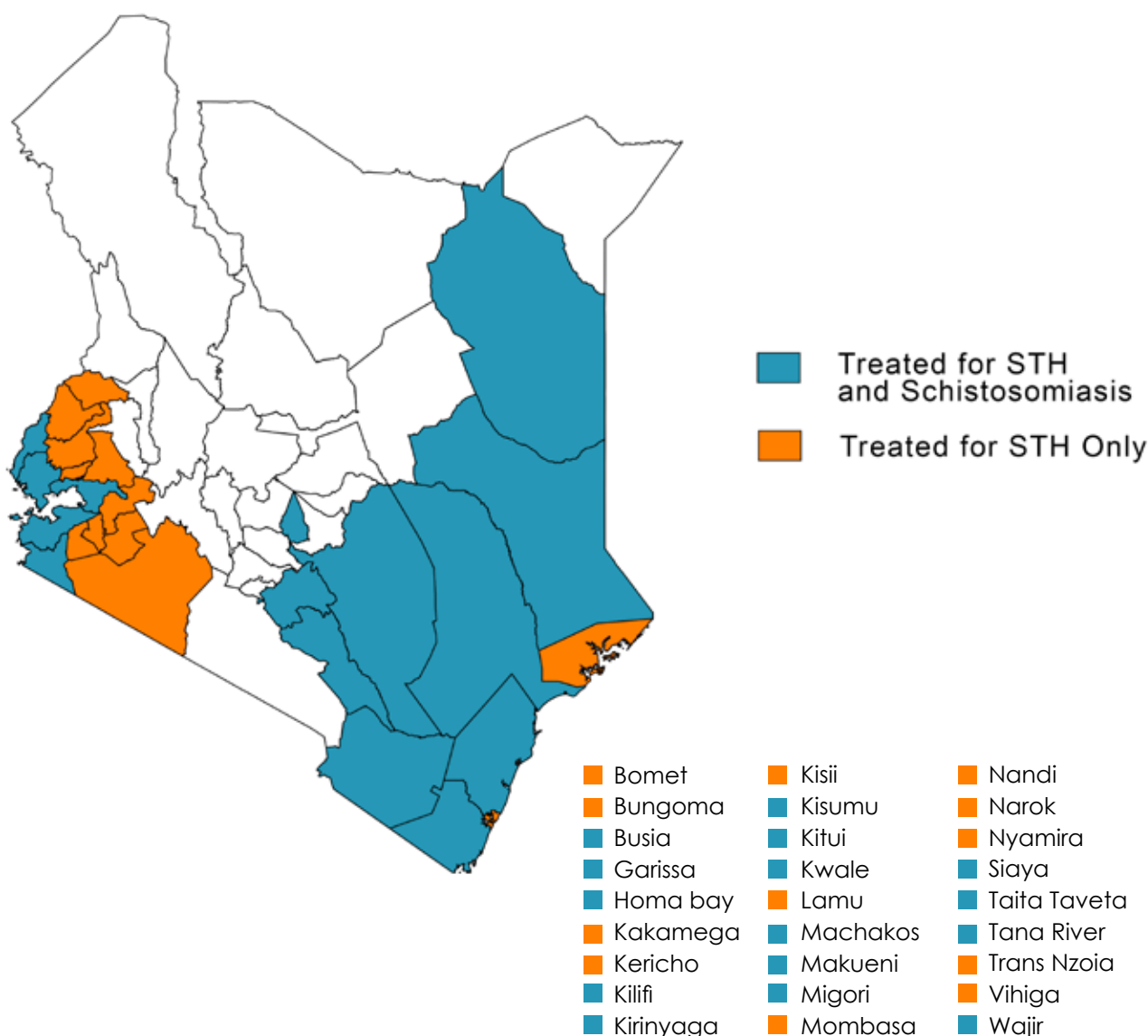
- To meet its targets, the programme had to implement a third wave due to insufficient drug supply at the time when waves one and two were undertaken, resulting in suboptimal resource coordination that overstretched the annual budget.
- The Steering Committee was not convened on a quarterly basis as planned, but instead only met twice within the programme year, resulting in some missed opportunities for proactive strategic leadership, an example being the unresolved drug sourcing for year 6 and beyond.
- At the sub county level, some school planning figures on Form P were inflated, which led to excess resource allocation. However, sub counties properly accounted for the required funds used and returned the surplus.
- Training participants struggled with punctuality: 32% of teachers and 28% of sub county participants arrived late to trainings, negatively affecting coverage of the training programme.

- NSBD agreement documents reflect GoK's goal for increased responsibility in programme management and implementation; however, it has been challenging to transition roles because of capacity and resource constraints as well as competing priorities within the ministries' full workloads.

Lessons learned.

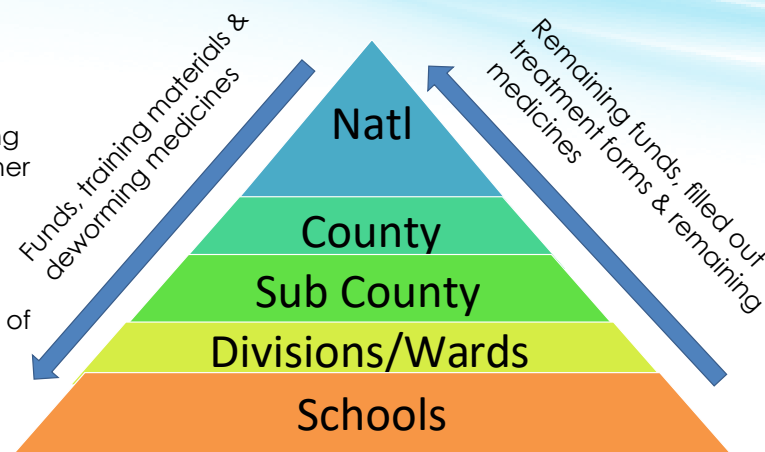
- Annual training sessions are critical to sustain relevant knowledge and skills for MDA: pre- and post-test scores showed that programme trainings increased sub county participants' knowledge from 80% to 100% of required information for STH and from 50% to 98% for schistosomiasis; teachers' average scores increased from 66% to 95% for STH and from 45% to 90% for schistosomiasis.
- Context-specific strategies for hard-to-reach areas enable proper planning and implementation; these can be further developed in future years to steadily increase coverage of underserved or marginalized population groups.
- Trainers should be encouraged to cover all prescribed topics thoroughly, as some important areas were only covered partially, such as filling in the treatment forms.
- Pending operational and costing analyses, NSBD may be able to adopt electronic data collection methods to halve the time taken to receive data from the field.

Coverage Map



Cascade Overview

The NSBD programme uses a cascade implementation model that efficiently and cost-effectively delivers training, deworming medicine, monitoring forms, funds, and other programme materials and resources from the national level to schools. The cascade brings together personnel from the MOE and MOH for collaborative leadership in planning, implementation, and monitoring of programme activities at all levels



1- County Planning and Sensitization Meetings

County Directors of Education and Health convene sensitization meetings on the programme and relevant managerial roles. This allows the programme to gain buy-in and build partnerships with county level leaders. Participants in these meetings include County Health Records and Information Officers (CHRIOs), County Pharmacists, County Public Health Officers (CPHOs), County Quality Assurance & Standards Officers (CQASOs), County Directors of Teachers' Service Commission, Sub County Directors of Education (SCDEs), and Sub County Medical Officers of Health (SCMOHs).

County level responsibilities include managing finances, activity schedules, material distribution, and high-level communication and coordination. These officials manage budgets for county level activities, lead the county school health coordinating sub committees to plan and review the programme activities, execute county level community sensitisation and mobilization, provide supportive supervision, and monitor teacher trainings and deworming day. They also receive medicines from the KEMSA stores and oversee distribution to sub counties, alongside training, community sensitisation, and monitoring materials. Finally, they serve as programme spokespeople by responding to questions from partners, media and communities.

2 - Sub county Training

After an induction training, 132 master trainers, nominated from MOH and MOE personnel in implementing counties, are deployed to train sub county and ward / division level personnel on managing and implementing the programme across 161 sub-counties. During the training, SCMOHs and SCDEs work together to finalize their list of targeted schools and enrollment figures. Community Health Extension Workers (CHEWs) / Community Health Assistants (CHAs) also attend this training to support in community mobilization and management of any potential severe adverse events.

Participants are trained on their responsibilities, including managing budgets for teacher training and deworming day, overseeing drug distribution to teacher training sites, and returning any unused funds and drugs through the reverse cascade. They also manage distribution of training booklets, community sensitisation materials, and monitoring tools from the county to the teacher trainings, and the return of completed reporting forms through the reverse cascade. Following sub county trainings, the trained officials play a key role in coordinating and monitoring teacher trainings, and overseeing community sensitisation and deworming day.

3 - Teacher Training

Teachers are critical to the programme's success; building on the trust they have earned within communities, they treat at-risk children in more than 18,000 schools. Head teachers and health teachers are trained to sensitize children and the community, administer deworming medicine, and properly fill and submit reporting forms after deworming day.

4 - Community Sensitisation & Mobilization

Immediately following teacher trainings, community sensitisation and mobilization activities begin. Health workers and teachers share key messages with children, parents, and local leaders, encouraging community members to bring their children for deworming. Posters are put up in schools and strategic community locations to emphasize the importance of deworming, how to prevent infections, and the date and location of treatment.

5 - Deworming Day

On designated county deworming days, teachers administer deworming tablets to children aged 2-14 years, including those enrolled in public and private primary schools, in nearby Early Childhood Development (ECD) Centres, and children from the community who are non-enrolled. Teachers fill in monitoring forms to record the number of children treated. MOH personnel visit schools to monitor drug administration and manage any adverse events.

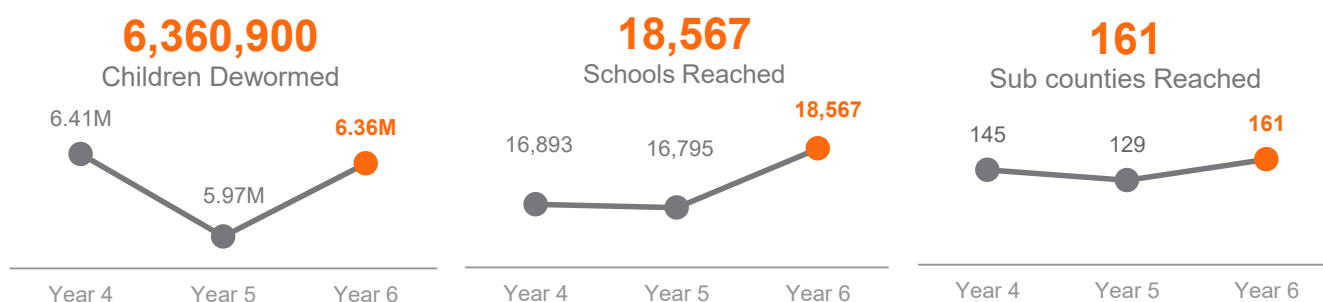
6 - Reverse Cascade

After deworming day, head teachers send completed treatment forms to their ward / division level Curriculum Support Officers (CSOs), who compile and send the data to the SCDEs for sub county level summary. The SCDEs share the data with SCMOHs and respective county heads. Data forms and financial accountability documents are forwarded to the national level for data analysis and financial reconciliation.

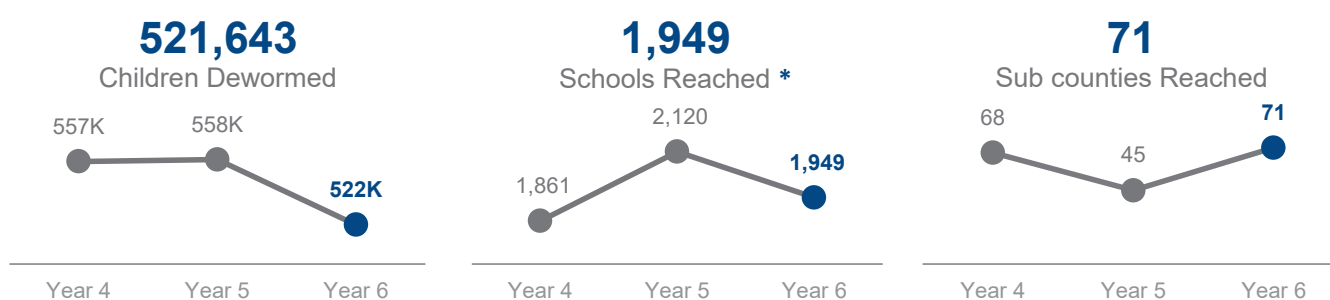
Any deworming medicine remaining at schools is taken to the CSOs along with summary data from each school. The CSOs forward this information to SCDEs, who forward to SCMOHs to fill tracking forms that indicate the number of unused medicines in the sub county. All remaining unopened tins of medicines are kept safely at sub county stores for the next round of deworming. For opened tins, the SCMOHs confirm quantities and redistribute the medicine to health facilities. The SCMOHs submit records to the national level indicating the amount of unused medicine, expiry dates, and where they have been redistributed. The reverse cascade is critical for the overall success of the programme, as it tracks the number of children treated and quantities of medicines used.

Year 6 (2017-2018) National Programme Results

SOIL-TRANSMITTED HELMINTHS (STH) TREATMENT SUMMARY

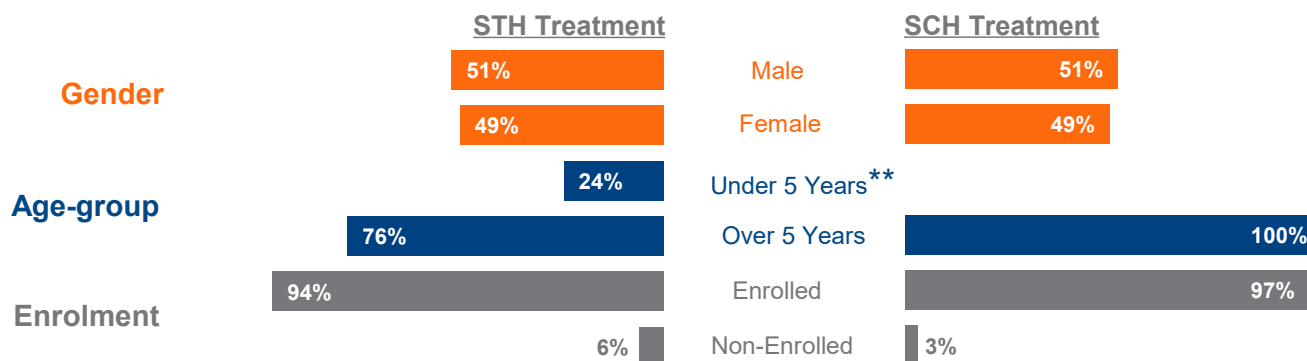


SCHISTOSOMIASIS (SCH) TREATMENT SUMMARY



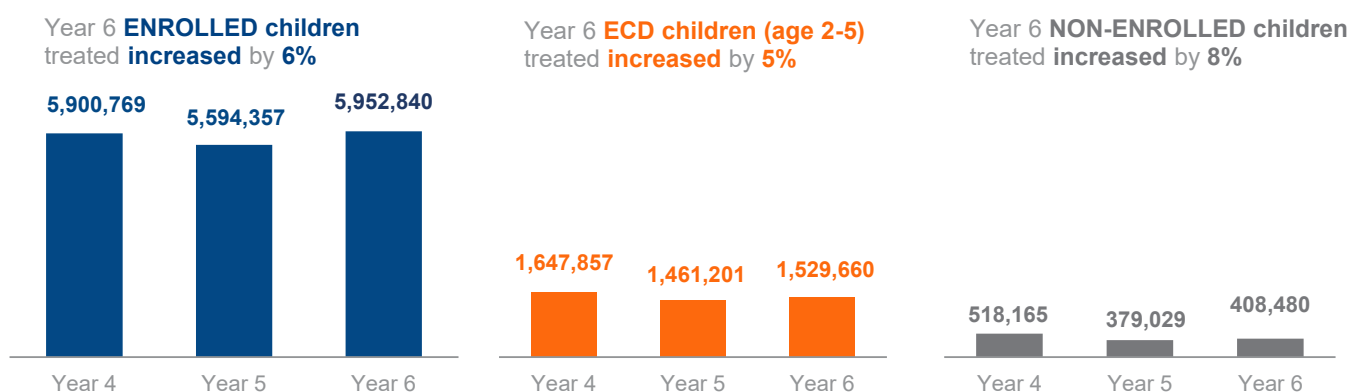
* Fewer schools were treated in Year 6 due to the programme's treatment strategy which indicates MDA only on alternating years in some places

COMPARISON OF TREATMENTS BY GENDER, AGE GROUP AND ENROLMENT STATUS



** Only children over 5 years treated for schistosomiasis

TREATMENT TRENDS FOR SOIL TRANSMITTED HELMINTHS



Y6 Treatment Results by County

County	Sub County	Children Targeted (STH)	Children Dewormed (STH)	% Children Treated (STH)	Children Targeted (SCH)	Children Dewormed (SCH)	% Children Treated (SCH)
Bomet	Bomet Central	53,059	41,531	78%			
	Bomet East	56,992	43,479	76%			
	Chepalungu	83,069	72,903	88%			
	Konoin	55,514	53,142	96%			
	Sotik	77,820	78,590	101%			
Bungoma	Bumula	106,075	85,237	80%			
	Bungoma Central	73,397	69,124	94%			
	Bungoma East	53,361	46,777	88%			
	Bungoma North	99,478	86,795	87%			
	Bungoma South	109,626	90,480	83%			
	Bungoma West	63,507	49,843	78%			
	Cheptais	68,028	54,263	80%			
	Kimilili Bungoma	67,883	60,153	89%			
	Mt Elgon	41,232	35,769	87%			
	Webuye West	64,167	55,949	87%			
Busia	Bunyala	30,514	25,335	83%	22,506	18,125	81%
	Busia	54,247	46,259	85%	9,976	8,402	84%
	Butula	65,719	54,179	82%			
	Nambale	41,322	41,758	101%			
	Samia	42,731	39,587	93%	7,833	5,830	74%
	Teso North	54,552	49,472	91%			
Garissa	Teso South	69,679	67,126	96%			
	Balambala	3,329	355	11%	3,329	349	10%
	Dadaab	1,643	1,065	65%	1,643	-	-
	Fafi	5,211	1,406	27%	5,211	641	12%
	Garissa	6,516	4,879	75%	6,516	2,672	41%
	Hulugho	666	184	28%	666	132	20%
	Ijara	3,450	2,520	73%	3,450	2,204	64%
	Lagdera	550	212	39%	550	-	-
	Homa Bay	44,955	39,136	87%	10,180	8,050	79%
	Mbita	57,946	50,965	88%	24,529	20,480	83%
Homa bay	Ndhiwa	95,666	82,583	86%	10,052	6,710	67%
	Rachuonyo East	51,988	46,516	89%			
	Rachuonyo North	72,307	61,163	85%	47,362	31,279	66%
	Rachuonyo South	55,825	48,353	87%	2,772	2,358	85%
	Rangwe	54,496	47,264	87%	2,243	2,072	92%
	Suba	54,765	45,637	83%	18,718	11,496	61%
	Butere	72,538	61,292	84%			
	Kakamega Central (Lurambi)	74,002	57,080	77%			
	Kakamega East (Shinyalu)	77,729	64,316	83%			
	Kakamega North (Malava)	118,725	88,963	75%			
Kakamega	Kakamega South (Ikolomani)	53,259	40,958	77%			
	Khwisero	49,967	39,353	79%			
	Likuyani	61,594	59,890	97%			
	Lugari	62,486	60,733	97%			
	Matete	38,617	28,434	74%			
	Matungu	88,023	68,683	78%			
	Mumias East	51,050	43,861	86%			
	Mumias West	61,554	46,605	76%			
	Navakholo	80,693	60,557	75%			
	Belgut	49,967	47,495	95%			
Kericho	Buret	72,213	65,512	91%			
	Kericho	56,084	49,387	88%			
	Kipkelion East	52,288	47,481	91%			
	Kipkelion West	47,945	42,503	89%			
	Soin / Sigowet	48,207	45,320	94%			
	Ganze	74,232	50,781	68%	9,008	6,791	75%
Kilifi*	Kaloleni	77,946	61,509	79%	22,453	17,624	78%
	Kilifi North	43,703	38,807	89%			
	Kilifi South	100,898	64,827	64%	20,626	5,327	26%
	Magarini	80,780	59,555	74%	12,105	8,355	69%
	Malindi	105,300	74,411	71%	3,110	2,298	74%
	Rabai	32,542	27,121	83%	7,340	6,938	95%
Kirinyaga	Mwea East	33,135	27,321	82%	25,336	20,480	81%
	Mwea West	27,103	24,678	91%	21,504	19,814	92%
Kisii	Gucha	35,983	31,724	88%			
	Gucha South	78,792	66,902	85%			
	Kenyenya	57,192	48,507	85%			
	Kisii Central	84,667	75,068	89%			
	Kisii South	57,521	56,055	97%			
	Kitutu Central	35,831	28,107	78%			
	Marani	50,182	45,808	91%			
	Masaba South	45,461	44,231	97%			
	Nyamache	51,244	46,231	90%			
	Sameta	24,747	25,234	102%			
Kisumu	Kisumu Central	62,529	53,321	85%	21,272	11,756	55%
	Kisumu East	52,940	39,268	74%	31,252	23,372	75%
	Kisumu West	78,193	44,892	57%	25,308	13,621	54%
	Muhoroni	66,588	52,799	79%	27,330	7,770	28%
	Nyakach	91,984	56,567	61%	32,505	9,297	29%
	Nyando	67,249	55,522	83%	29,712	17,771	60%
	Seme	50,756	40,432	80%	24,831	18,748	76%
	Kitui Central	1,065	999	94%	1,065	826	78%
Kitui	Matinyani	597	414	69%	597	367	61%

Y6 Treatment Results by County

County	Sub County	Children Targeted (STH)	Children Dewormed (STH)	% Children Treated (STH)	Children Targeted (SCH)	Children Dewormed (SCH)	% Children Treated (SCH)
Kwale*	Kinango	51,003	34,279	67%	22,624	16,422	73%
	Kwale/Matuga	66,540	39,675	60%	20,940	15,654	75%
	Lunga Lunga	51,053	39,275	77%	28,950	18,652	64%
	Msambweni	52,550	34,077	65%	10,281	9,650	94%
	Samburu	42,470	40,711	96%	16,676	14,260	86%
Lamu	Lamu East	6,592	5,501	83%			
	Lamu West	35,828	31,409	88%			
Machakos	Kalama	-	299	-	-	258	-
	Kangundo	1,801	1,317	73%	1,801	1,070	59%
	Kathiani	257	203	79%	257	174	68%
	Machakos	433	89	21%	433	94	22%
	Matungulu	1,720	1,530	89%	1,720	1,394	81%
	Mwala	378	282	75%	378	230	61%
	Yatta	814	776	95%	814	878	108%
Makueni	Kibwezi	1,172	1,172	100%	1,172	-	-
	Kilungu	814	776	95%	814	1,265	155%
	Makindu	237	251	106%	237	217	91%
	Makueni	555	486	88%	555	443	80%
	Mbooni East	695	530	76%	695	386	56%
	Mbooni West	372	1,111	298%	372	795	213%
	Mukaa	446	411	92%	446	310	69%
	Nzau	598	725	121%	598	612	102%
	Awendo	60,327	52,424	87%			
Migori	Kuria East	40,892	38,096	93%			
	Kuria West	98,738	110,421	112%			
	Nyatike	88,945	61,900	70%	49,805	25,672	52%
	Rongo	57,611	46,949	81%			
	Suna East	58,029	46,910	81%			
	Suna West	69,967	47,089	67%	3,078	234	8%
	Uri	60,760	50,978	84%			
Mombasa	Changamwe	42,185	25,993	62%			
	Jomvu	53,797	35,631	66%			
	Kisauni	123,074	51,815	42%			
	Likoni	78,530	53,741	68%			
	Mvita	45,566	29,684	65%			
	Nyali	82,093	63,567	77%			
Nandi	Nandi East	40,740	42,208	104%			
	Nandi South	61,480	56,633	92%			
	Tinderet	43,897	35,314	80%			
Narok	Trans Mara East	59,235	48,980	83%			
	Trans Mara West	98,760	74,582	76%			
Nyamira	Borabu	29,179	26,391	90%			
	Manga	39,268	34,185	87%			
	Masaba North	43,062	34,312	80%			
	Nyamira North	68,934	60,188	87%			
	Nyamira South	66,330	54,403	82%			
Siaya*	Bondo	72,496	52,703	73%	19,758	16,348	83%
	Gem	69,669	58,086	83%			
	Rarieda	60,995	48,954	80%	44,781	35,778	80%
	Siaya	81,293	73,093	90%	6,820	4,648	68%
	Ugenya	59,941	45,831	76%			
Taita Taveta	Ugunja	42,139	37,076	88%			
	Mwatate	22,097	20,820	94%			
	Taita	14,269	13,897	97%			
	Taveta	26,778	23,987	90%	9,226	8,571	93%
	Voi	30,086	28,186	94%			
Tana River	Bura/Tana North	33,576	22,682	68%	8,182	4,989	61%
	Tana Delta	46,218	27,841	60%	33,942	19,773	58%
	Tana River	33,241	24,459	74%	7,050	4,137	59%
Trans Nzoia	Endebess	52,142	38,216	73%			
	Kiminini	105,107	78,316	75%			
	Kwanza	97,952	58,104	59%			
	Trans Nzoia East / Cherengany	100,864	93,571	93%			
	Trans Nzoia West / Saboti	100,414	66,375	66%			
Vihiga	Emuhaya	40,133	20,195	50%			
	Hamisi	70,838	60,593	86%			
	Luanda	43,405	36,601	84%			
	Sabatia	59,952	33,329	56%			
	Vihiga	38,449	33,706	88%			
Wajir	Buna	2,284	817	36%	2,284	638	28%
	Eldas	1,259	1,819	144%	1,259	1,506	120%
	Habaswein	888	154	17%	888	141	16%
	Tarbaj	1,980	411	21%	1,980	532	27%
	Wajir East	3,266	966	30%	3,266	923	28%
	Wajir North	2,706	693	26%	2,706	548	20%
	Wajir South	6,809	2,102	31%	6,809	2,035	30%
	Wajir West	5,346	535	10%	5,346	451	8%
		7,881,705	6,360,900	81%	809,830	521,643	64%

* An additional 392,010 children were treated by MAP International as indicated

Siaya 143,613

Kwale 96,560

Kilifi 151,837

Treatment coverage for SCH at 64%. Estimated number of children to be treated per county is calculated from the aggregated enrollment numbers on Form P divided by a county's NER (Net Enrollment Rate).

Programme Monitoring and Evaluation

Process Monitoring and Coverage Validation: Evidence Action

On behalf of and together with GoK, Evidence Action annually monitors a random sample of activities within Kenya's NSBD programme to ensure effective implementation of MDA activities and identify areas for improvement in future rounds. This process monitoring data highlights elements of the programme that are moving smoothly and in line with its evidence-based plans, as well as those which are not running as planned and may therefore be inefficient or ineffective. Findings are routinely shared with GoK implementers through reports and discussions about opportunities to improve the overall quality of NSBD. Process monitoring includes observation of sub county and teacher trainings, school preparedness, mass drug administration (MDA) procedures, and community sensitization, as well as interviews with children, government personnel, and parents in targeted areas.

In Year 6, monitoring revealed that key training materials (booklets, posters, forms and tablet poles) were distributed in 81% of sub county trainings and 93% of teacher trainings. These trainings were also found to effectively transfer knowledge to implementers based on a quiz administered before and after training: before sub county trainings, participants correctly answered an average of 80% of questions related to STH, increasing to 100% after training. The same participants correctly answered 50% of questions related to schistosomiasis before training, and 98% after training. Similarly, teachers' average scores for STH-related questions increased from 66% to 95%, and their scores for schistosomiasis increased from 45% to 90%. Community interviews prior to deworming day found that up to 96% of parents of enrolled children and 91% of parents of non-enrolled children planned to send their children for deworming. This suggests that the programme's varied sensitization strategies were effective in creating awareness and mobilizing community members. On Deworming Day, monitors observed MDA procedures and found that teachers administered the correct dosage of medicines, had sufficient recording forms and drugs available.

Coverage validation was done within a week of the MDA in sampled counties, using WHO guidelines, to confirm that reported treatment figures were likely to be accurate. The coverage validation survey for STH indicated that 90% of targeted children were offered albendazole, and of these children, 78% swallowed the tablet based on validated reports compiled by head teachers. For schistosomiasis, the survey indicated that 85% of targeted children were offered praziquantel. Based on validated head teacher reports, 75% of children offered the drugs swallowed the tablets. With the validated reported coverage for both STH and schistosomiasis meeting the minimum recommended WHO threshold of 75%, partners can be confident that the Year 6 deworming exercise met its targets.

Impact assessment: KEMRI

The Kenya Medical Research Institute (KEMRI) is the national body responsible for carrying out health research in Kenya, and is a key partner in the NSBD Programme. Through its renowned international experts in STH and schistosomiasis, KEMRI provides support in mapping, parasitological analysis, and impact evaluation. Results from this work guide programme decisions and help NSBD maintain its evidence-based approach.

At the outset of NSBD in 2009, KEMRI scientists determined that the prevalence and intensity of STH in Western, Nyanza, Coast and parts of Rift Valley regions justified large-scale MDA. Each year, parasitological analyses have further informed decisions on programme targeting. For instance:

- In Year 2, the programme added high-risk areas in Eastern, Central and North Eastern regions for schistosomiasis treatment due to results from parasitology surveys
- In Year 3, KEMRI conducted schistosomiasis mapping in North Eastern region to reconfirm BIU findings, ultimately reducing the number of targeted counties and schools to maintain an evidence-based treatment strategy
- In Year 6, through additional funding from Evidence Action, parasitological monitoring included both sites that had received routine monitoring for five years (i.e. 16 counties) as well as sites that had not been assessed since baseline (i.e. 4 counties) to provide a programmatic assessment of the reductions in disease attributable to deworming, since each of these sites commenced in the NSBD.

Impact Assessment Strategy

Each year since 2012, KEMRI's Eastern and Southern Africa Centre of International Parasite Control (ESACIPAC) has conducted repeat cross-sectional school-level surveys assessing prevalence and intensity for three types of STH (hookworm, whipworm—specifically *Trichuris trichiura*, and roundworm—specifically *Ascaris lumbricoides*) and schistosome infections (*Schistosoma mansoni* and *S. haematobium*) in school-age children.

These surveys provide a programmatic assessment of the impact of deworming over time. In Year 6, the surveys included 100 schools drawn from 20 counties (approximately 5 schools per county) in Western, Nyanza, Rift Valley, Coast, Eastern and North Eastern regions. Across these 100 schools, KEMRI analyzed stool samples of 9,801 children prior to deworming to determine prevalence and intensity of infection. In 40 schools in eight counties endemic for urinary schistosomiasis, urine samples were analysed to determine *Schistosoma haematobium* prevalence and intensity of infection. Strategic distribution of sampling sites allows surveys to establish an accurate measurement of infection across the NSBD program area.

Impact Monitoring Results

This section summarizes Year 6 evaluation results compared to the Year 1 baseline survey. The detailed report of KEMRI's monitoring will be publicly available through a published paper. Table 1 summarizes the number of schools and children sampled per county, median age of children in school, and the school level prevalence range in each county.

Table 1: Number of schools and children examined by county, and school prevalence range (min - max), among school children in Kenya in Year 6

County	Schools (children)	Median age in years (min-max)	School range STH prevalence (min-max)	School range <i>S. mansoni</i> prevalence (min-max)	School range <i>S. haematobium</i> prevalence (min-max)
Bomet	5 (541)	10.0 (3-18)	13.0-39.80	-0	-
Bungoma5	(519)	9.5 (4-15)	0.9-9.30	-0	-
Busia	5 (540)	11.0 (4-17)	0.9-56.50	-41.7-	-
Garissa	5 (197)	10.0 (4-14)	0-00	-0	0-3.4
Homa Bay	5 (535)	10.0 (5-15)	16.7-35.20	-15.3-	-
Kakamega	5 (539)	10.0 (5-16)	17.6-38.90	-31.5-	-
Kericho	5 (540)	9.0 (1-16)	13.0-22.20	-0	-
Kilifi	5 (507)	10.0 (4-17)	1.0-19.30	-0	0-0.9
Kisii	5 (532)	9.0 (4-16)	9.3-37.00	-0	-
Kisumu	5 (540)	10.0 (5-16)	0-8.30	-13.9-	-
Kitui5	(540)	10.0 (2-18)	0-0.90	-2.8	0-0
Kwale5	(522)	9.0 (4-16)	0.9-11.10	-1.9	0-5.7
Makueni	5 (522)	10.0 (4-14)	0-1.90	-13.90	-0
Wajir	5 (112)	9.5 (3-14)	0-00	-0	0-0
Migori5	(539)	10.0 (4-19)	0.9-4.60	-0	-
Mombasa5	(526)	10.0 (4-16)	0-5.60	-0.9	0-0.9
Narok	5 (516)	10.0 (4-21)	12.0-33.70	-0	-
Nyamira	5 (511)	10.0 (3-14)	0-39.80	-0	-
Taita Taveta5	(491)	9.0 (3-15)	0-0.90	-0.9	0-0
Vihiga	5 (532)	10.0 (1-14)	12.1-49.50	-1.9	-
Total1	00 (9,801)	10.0 (1-21)	0-56.50	-41.70	-5.7

Table 2 gives the overall prevalence, average intensity and relative reductions (RR) of the infections. Overall prevalence of any STH was 12.9% at Year 6 compared to a Year 1 baseline of 33.6%. Species-specific prevalence in Year 6 showed that *A. lumbricoides* continues to be the most common STH, followed by *T. trichiura* then hookworms. The overall *S. mansoni* prevalence was 2.2% compared to baseline prevalence of 2.4%. Similarly, overall *S. haematobium* prevalence was 0.3% compared to baseline prevalence of 18.0%.

-Indicates counties which were not surveyed for *S. haematobium*

Table 2: Overall prevalence %, average intensity (epg) of infections and relative reductions (RR) % (p-value) among school children in Kenya

Survey	STH Combined	HookwormA	<i>A. lumbricoides</i>	<i>T. trichiura</i>	<i>S. mansoni</i>	<i>S. haematobium</i>
Prevalence, %						
Y1 Baseline*	33.6	15.2	20.7	6.3	2.4	18.0
Y3 Midterm*	18.6	2.4	13.8	5.0	1.7	7.9
Y5 Endline*	15.2	1.3	11.1	4.6	2.0	3.9
Y6 Evaluation\$	12.9	1.0	9.7	3.62	.20	.3
RR (Y1 Baseline – Y6 Evaluation)	61.7 (p<0.001)	93.6 (p<0.001)	52.9 (p<0.001)	42.7 (p=0.006)	7.9 (p=0.779)	98.5 (p<0.001)
Average Intensity, epg						
Y1 Baseline*	2012	62	1914	36	14	20
Y3 Midterm*	1141	9	1113	19	6	7
Y5 Endline*	1088	11	1059	18	5	4
Y6 Evaluation\$	762	6	741	15	12	0
RR (Y1 Baseline – Y6 Evaluation)	62.0 (p<0.001)	90.7 (p<0.001)	61.1 (p<0.001)	58.3 (p=0.201)	13.4 (p=0.821)	99.3 (p<0.001)

*Indicates surveys done under CIFF funding and included 172 schools in four regions

\$Indicates surveys done with END Fund funding and included 100 schools in six regions

Figures 1 and 2 below provide the STH and schistosome prevalence distribution in all the surveyed counties after five years of MDA. Figure 1 shows that only a pocket of schools concentrated in western Kenya had any STH prevalence above 20%. All schools in Eastern and North Eastern regions had STH prevalence below 1%. Figure 2 shows that nearly all the surveyed schools had both *S. mansoni* and *S. haematobium* prevalence below 1% with only a few schools, also in western Kenya, registering a prevalence of *S. mansoni* above 10%.

Figure 1: STH Prevalence Distribution after Five Years of Deworming

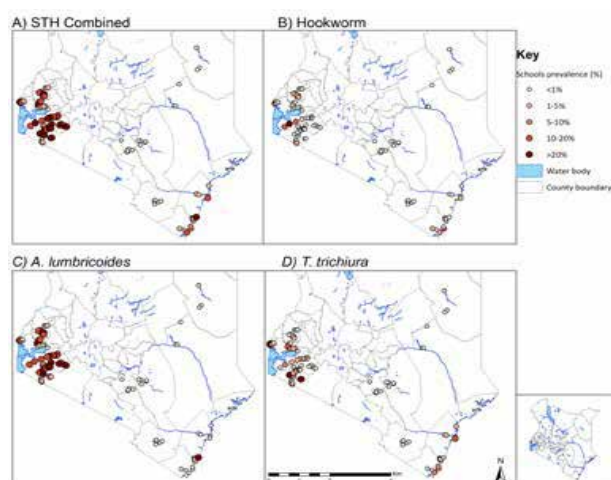
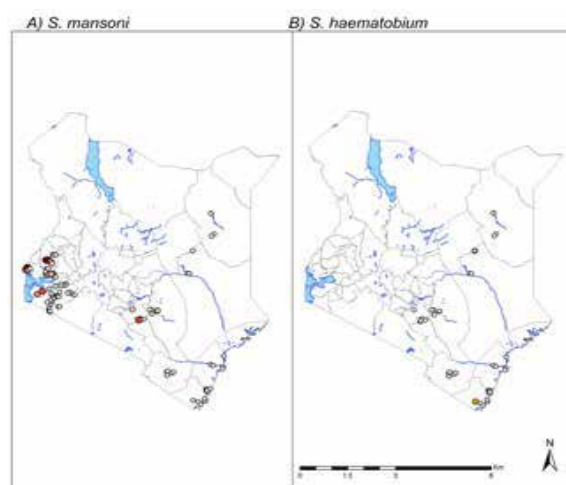


Figure 2: Schistosomiasis Prevalence Distribution after Five Years of Deworming



Interpretation and Recommendations

Across the NSBD programme area, there are low levels of both STH and schistosome infections after six years of treatment, suggesting that the programme has been successful in driving significant decreases in prevalence and intensity. Heterogeneity in infection levels was observed across counties, ranging from seven counties having less than 5% prevalence of STH, to eight counties continuing to show prevalence greater than 20%; a similar picture was seen for schistosomiasis. Wajir showed zero prevalence for STH and schistosome infections, an indication that there may not be ongoing biological transmission of infections in the northern region. However, at a national level, infections are not yet to a level where they are no longer a public health concern.

Based on the findings, KEMRI recommends that:

- 1) There be further analysis of the last 6 years' of NSBD survey data, to investigate the correlations between county-level disease distribution, treatment coverage, and WASH factors, and trend analysis over time
- 2) Following these analyses, recommendations should be made that are likely to include
 - (a) development of criteria for potential treatment scale-down in counties with zero or low prevalence of STH and/or schistosomiasis,
 - (b) treatment frequency based on WHO guidelines be adopted at county level, and
 - (c) schools, communities, and counties incorporate integrated control approaches emphasizing health education and WASH interventions at all levels.

Programme Partners

Kenya's National School-Based Deworming is implemented with the support and technical assistance of several partner organizations.

Evidence Action scales proven development solutions to benefit hundreds of millions of people, seeking to approach the challenges of poverty on the same scale at which they exist across the globe. Our approach fills the gap between research on "what works" and implementing solutions for those in need. We implement cost-effective interventions whose efficacy is backed by substantial rigorous evidence; our current programmes range from global health to safe water access to micro-financing. 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's Deworm the World Initiative envisions a world where all at-risk children have improved health, increased access to education, and better livelihoods potential as a result of being free of intestinal worms. Evidence Action's Deworm the World Initiative currently supports governments in Kenya, India, Ethiopia, Nigeria, Vietnam, and Pakistan. Learn more about our work at www.evidenceaction.org.



The END Fund is the only private philanthropic initiative solely dedicated to ending the most common neglected tropical diseases (NTDs). It focuses on delivering NTD treatments to those in need by growing and engaging a community of activist-philanthropists, managing high-impact strategic investments, and working in collaboration with government, NGO, pharmaceutical, and academic partners. The END Fund aims to take a systems approach to understanding, engaging with, and influencing the broad ecosystem of stakeholders working on ending NTDs. For more information, visit <https://end.org>



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NATIONAL SCHOOL-BASED DEWORMING PROGRAMME