

REACH

Ending Child Hunger and Undernutrition

Acting at Scale: Intervention Guide

Deworming

February 2009

www.reach-partnership.org

Context

The following document is part of the REACH *Acting at Scale* set of materials

- The documents' aim is to provide highly condensed information and lessons learned for scaling up REACH-promoted interventions to support field practitioners and other interested parties
- They are intended to become a living set of materials, updated periodically by the REACH Global Interagency Team
- These materials are a first step towards a larger REACH Knowledge Sharing service, which will be developed over time

The full set of *Acting at Scale* materials includes

- *An Intervention Summary*
 - An overview document containing key facts for all of the 11 promoted interventions
- *Intervention Guides* for each of the interventions¹
 - Containing rationale, lessons learned, costs and further resource lists
- *Implementation Case Studies* for each of the interventions¹
 - Initial set of details and lessons learned from programs implemented at scale
- *Resource Lists*
 - Lists of key documents, organizations and programs at scale
 - Included at the back of each *Intervention Guide* and in Excel spreadsheets available from the REACH Global Interagency Team

These materials represent a preliminary version, to be validated and refined via additional consultations

- Prepared in Summer 2008 by the REACH Global Interagency Team, based on inputs from 56 practitioners and experts, as well as extensive desk research
- A revised Version 2 of these documents will be released in late 2008 or early 2009, incorporating feedback from initial recipients

If you have questions or feedback on these materials, please

- Contact the REACH Interagency Team at HQ.REACH@wfp.org or visit our website at www.reach-partnership.org

1. Breastfeeding and complementary feeding have been combined into a single document due to strong linkage in delivery

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Key messages

Worms affect 2 billion people worldwide, generating 4.6M DALYs each year

- 386M <5 children are at risk of morbidity as of 2007, with only 10.7% covered
- Worms deprive children of iron, vitamin A and other nutrients, creating under- and malnutrition that results in growth faltering, reduced learning capability and anemia

Deworming tablets offer a relatively simple solution to this large-scale health problem

- Highly effective, easy-to-distribute and inexpensive technology
- Low technology and limited adverse events risk enables delivery via staff that require only minimal training

Deworming is relatively simple to integrate into existing delivery channels, often with additive value to existing programs

- Given immediate, visible impact on children, deworming generates demand for other nutrition services
- Can be added to vitamin A, immunization, child health or other mass campaigns, or integrated management of childhood illness (IMCI) public health programs
- Programs for <5s and P&L women can be added as an extension to school feeding programs
 - Schools are the most common delivery channel, given the high exposure rates of school-aged children

Given safety of drugs and high probability of individual infection where prevalence rates are high, all children and P&L women should be treated

- No testing is required

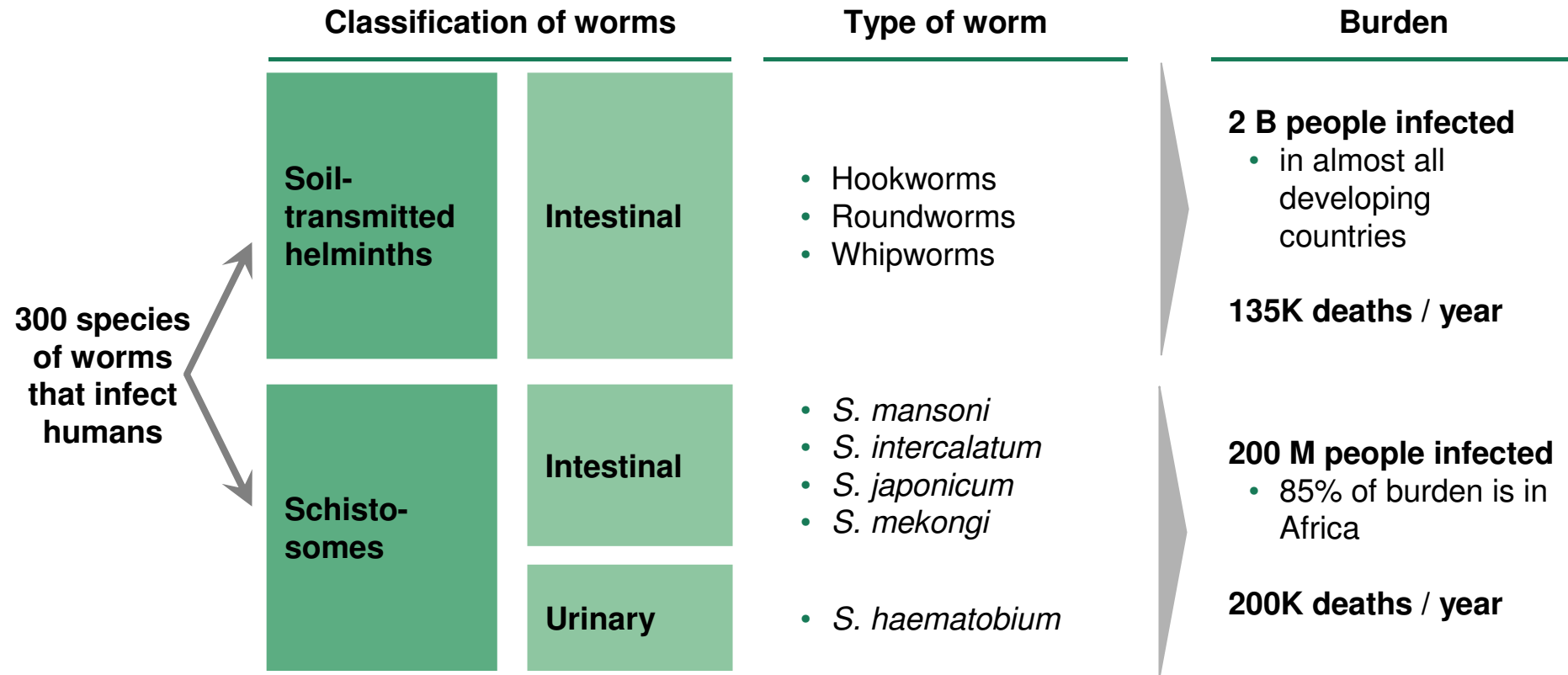
Sustainability of program is essential, given that treatment does not prevent reinfection

- Requires ongoing treatment programs, with associated funding and local capacity
- Results are more sustainable when prevention education supplements treatment
 - Simple and fun-to-use education materials create awareness and induce behavior change
- In long-term, programs that improve hygiene and sanitation reduce infection rates

M&E is relatively simple, as proven drug impact allows programs to focus mainly on coverage tracking via simple, easy-to-use tools

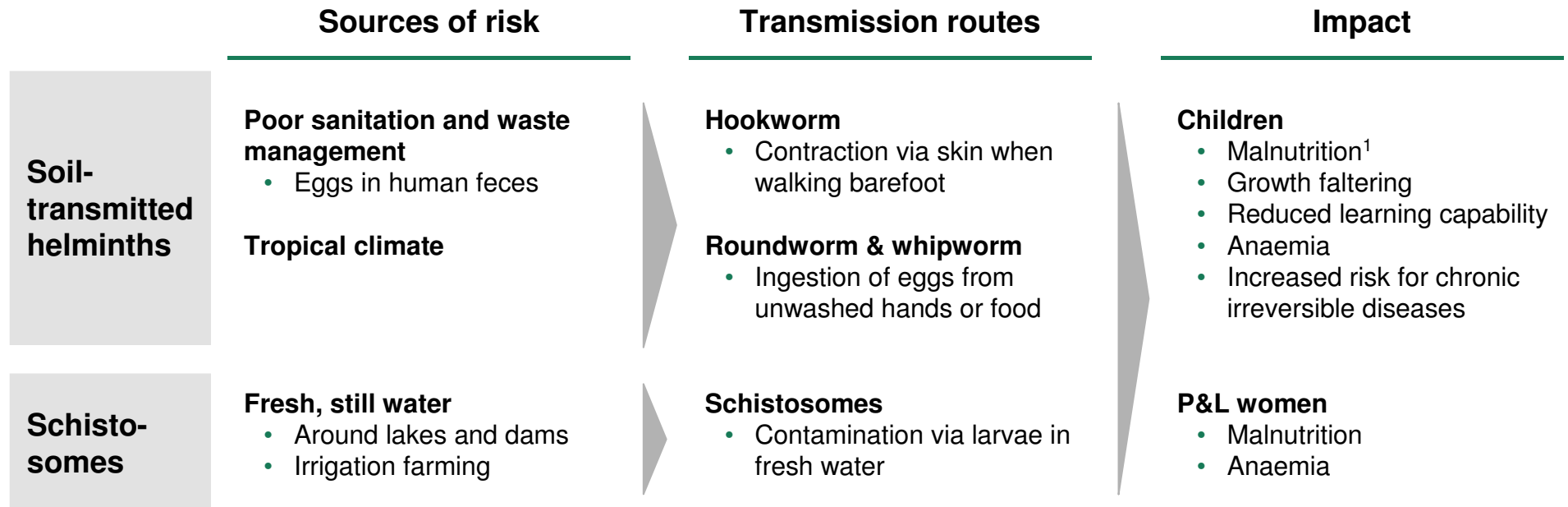
Why implement

Several types of worms threaten human health



While more people are infected with soil-transmitted helminths, more deaths are attributed to schistosomiasis

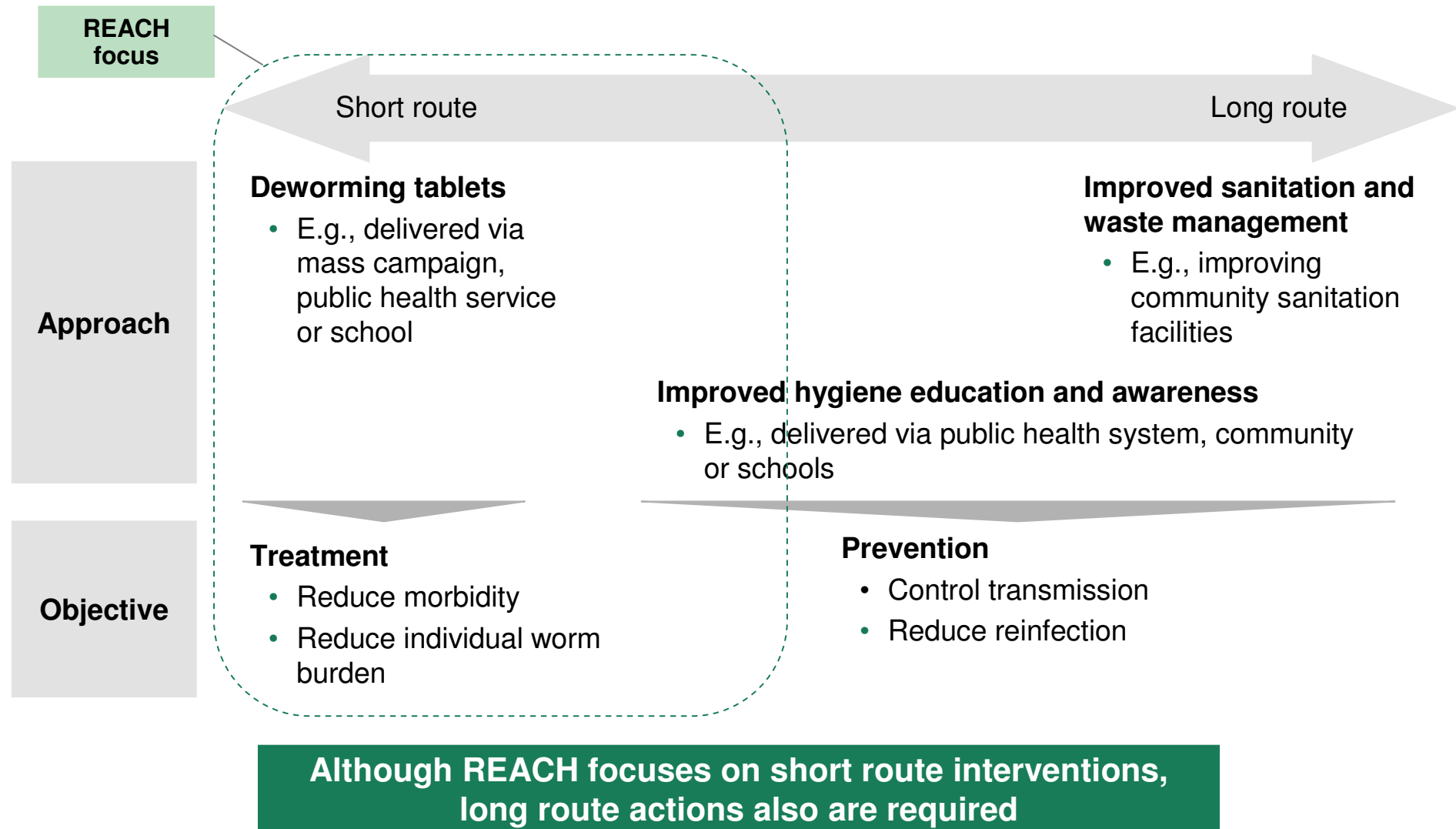
Worms found in unhygienic and tropical environments cause multiple nutrition-related impacts



1. Worms cause poor nutrient absorption
Source: "Action against worms. Issue 1." WHO, 2003

Two complementary means of addressing worms

Deworming offers short-route treatment; hygiene education can supplement when cost-effective



Preliminary

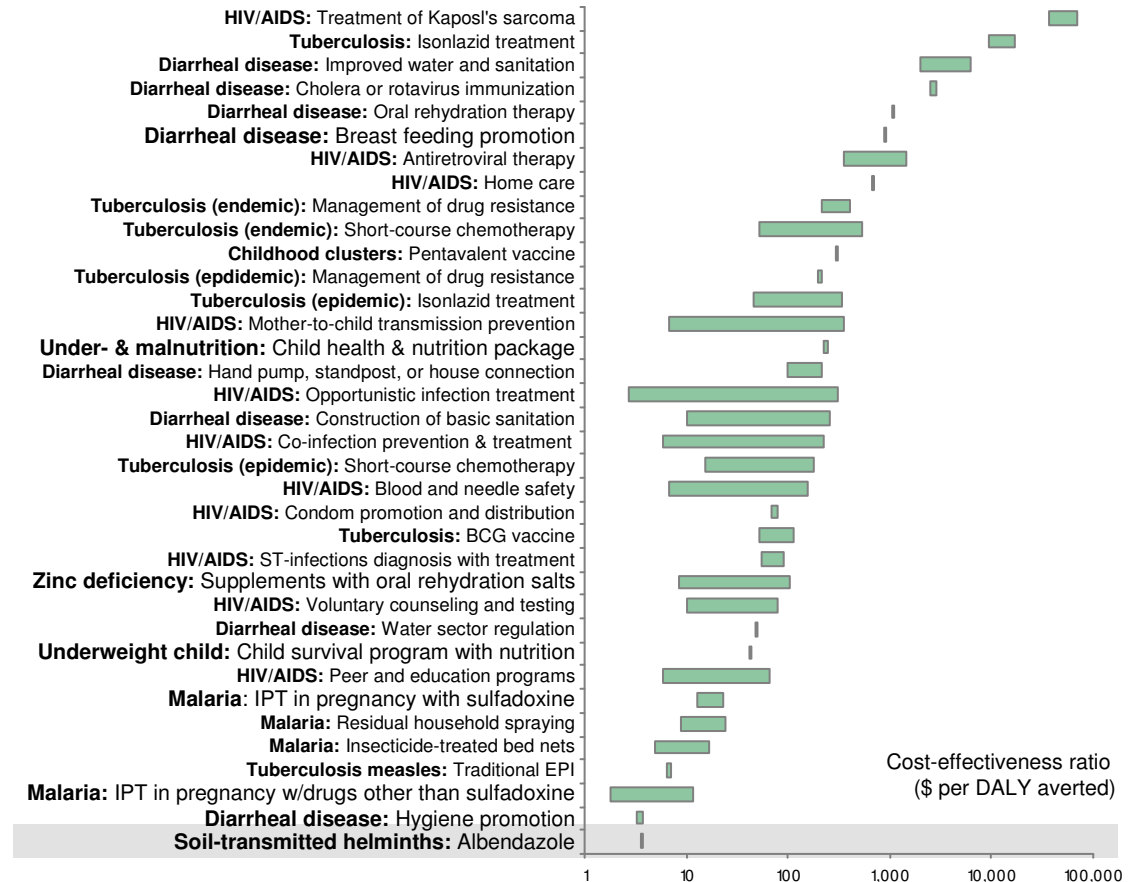
Helminth treatment is considered one of the most cost-effective interventions available

Treatment is cost-effective...

Albendazole treatment: US \$2-9/DALY averted

Combined albendazole/praziquantel treatment: US \$8-19/DALY averted

...relative to other low- and middle-income disease interventions

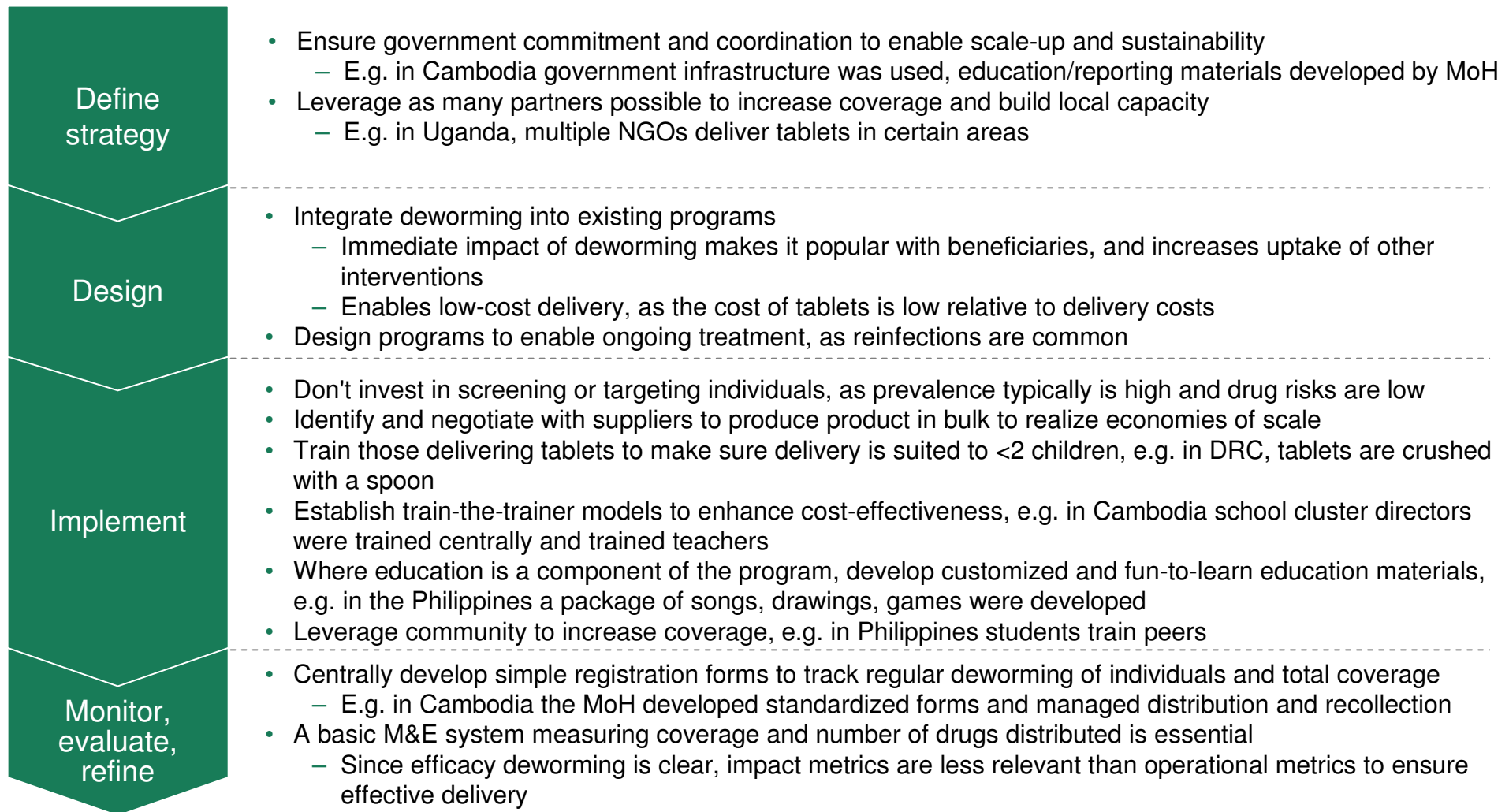


Source: Laxminarayan, et al. *Intervention Cost Effectiveness: Overview of Main Messages*. Disease Control Priorities in Developing Countries, 2nd edition, Chapter 2, 2006.

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How to implement at scale

Key lessons learned about implementing deworming programs at scale



Source: "Action against worms." WHO, several issues from 2003-2006.; expert interviews; literature review; REACH analysis

Program strategy influenced by the age of the target beneficiaries

Target group	Infection risk STH ¹	Infection risk SS ²	Treatment	Primary delivery channel	Training requirements
0-1 year			<ul style="list-style-type: none"> Not recommended due to low infection risk and unproven safety of drugs for this age group³ 	<ul style="list-style-type: none"> N/A 	
1-2 years ³	<p>Risk increases as children start to walk</p>		<ul style="list-style-type: none"> Sometimes excluded⁴ <ul style="list-style-type: none"> Less heavily infected Difficulty swallowing tablets Added complexity as Albendazole dosage is different⁵ 	<ul style="list-style-type: none"> Public health system or mass campaigns 	<p>Increased risk of vomiting and swallowing problems</p>
2-5 years		<p>Risk increases as children start to swim</p>	<ul style="list-style-type: none"> Treated for STH and SS 	<ul style="list-style-type: none"> Public health system or mass campaigns 	
5-15 years			<ul style="list-style-type: none"> Treated for STH and SS 	<ul style="list-style-type: none"> Schools 	
P&L women			<ul style="list-style-type: none"> Treated for STH and SS <ul style="list-style-type: none"> All drugs are safe for pregnant women 	<ul style="list-style-type: none"> Public health system or mass campaigns 	

REACH target beneficiaries
 No risk
 High risk

1. Soil transmitted helminths 2. Schistosomiasis 3. WHO recommendation 4. Especially for large-scale programs where tablets have to be delivered to many beneficiaries and the added complexity of serving 1-2 year olds slows the delivery and therefore reduces capacity 5. Half a tablet instead of a full tablet is given
 Source: WHO UNICEF, 2004: Joint Statement on Prevention and Control of Schistosomiasis and Soil-Transmitted Helminths; WHO, 2006: Action against Worms; WHO, 2002: Helminth Control in School-Age Children

Deworming is a relatively simple product to distribute

But sustainable solutions a challenge

Simple and cheap to use...

Low risk

- Very low skills required to provide pill to children >5
 - Some skill required to provide pills to children <5
- Limited risk of side effects or adverse events reduce risk of treating uninfected children and pregnant women

Simple distribution requirements

- Shelf life of up to four years
- Pills are heat-stable and require no cold chain
- Low space requirements

Low cost

- Cost of \$0.02 per soil-transmitted helminth treatment
- Cost of \$0.20 per schistosomiasis treatment

...yet difficult to sustain

Reinfection is common, especially if

- Treatment is not consistent
- Root causes are not addressed (e.g., lack of sanitation)

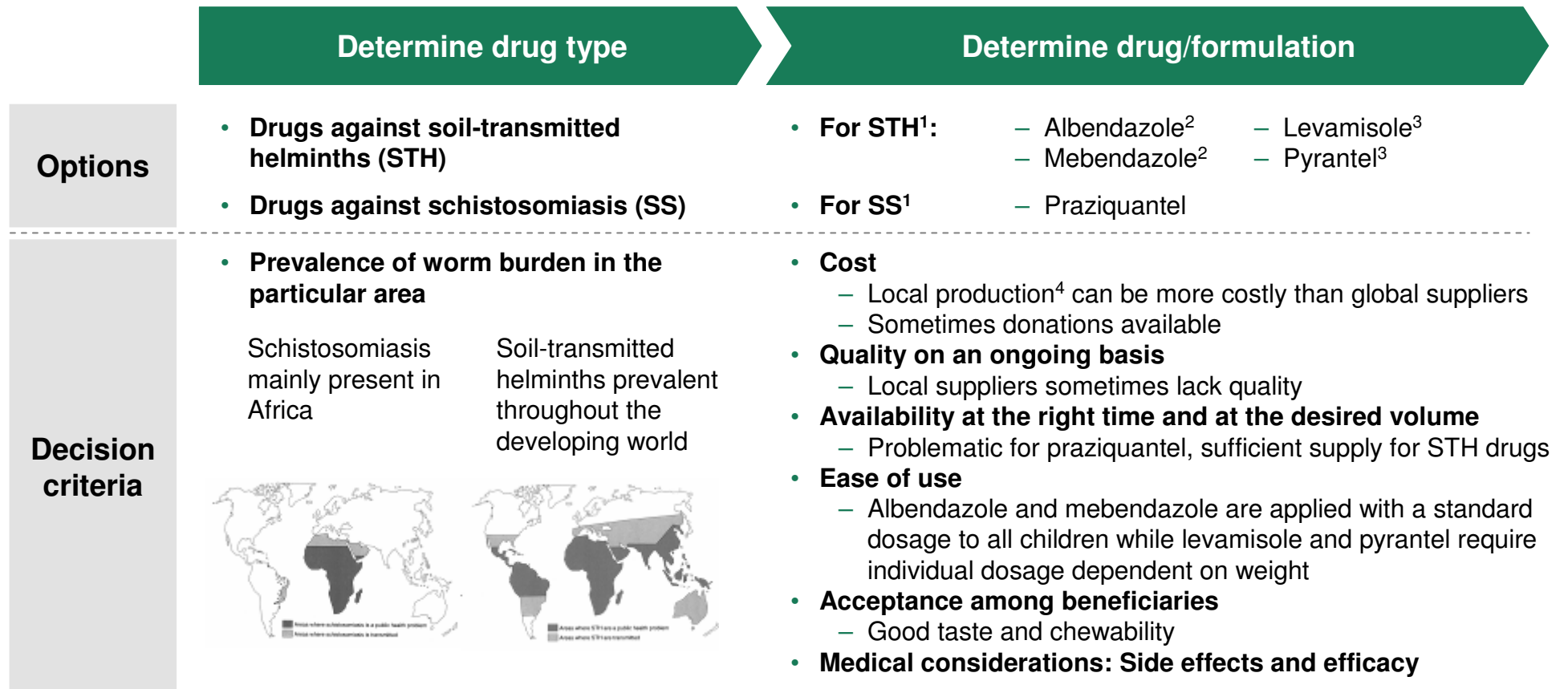
Multi-year funding is necessary, but difficult

- International funding often limited to a few years
- Despite low tablet costs, long-term deworming programs can overwhelm modest MoH budgets

Schistosomiasis tablets generally are imported

- Rarely produced domestically
- Limited global supply
- Logistics are complex, requiring a long order lead time
- Mark-up of 15% for sea transportation and 25% for air shipment

Deworming drug selection based on local worm prevalence and drug characteristics



For STH albendazole and mebendazole are mainly used because of their easy dosage requirements. For SS only praziquantel is used

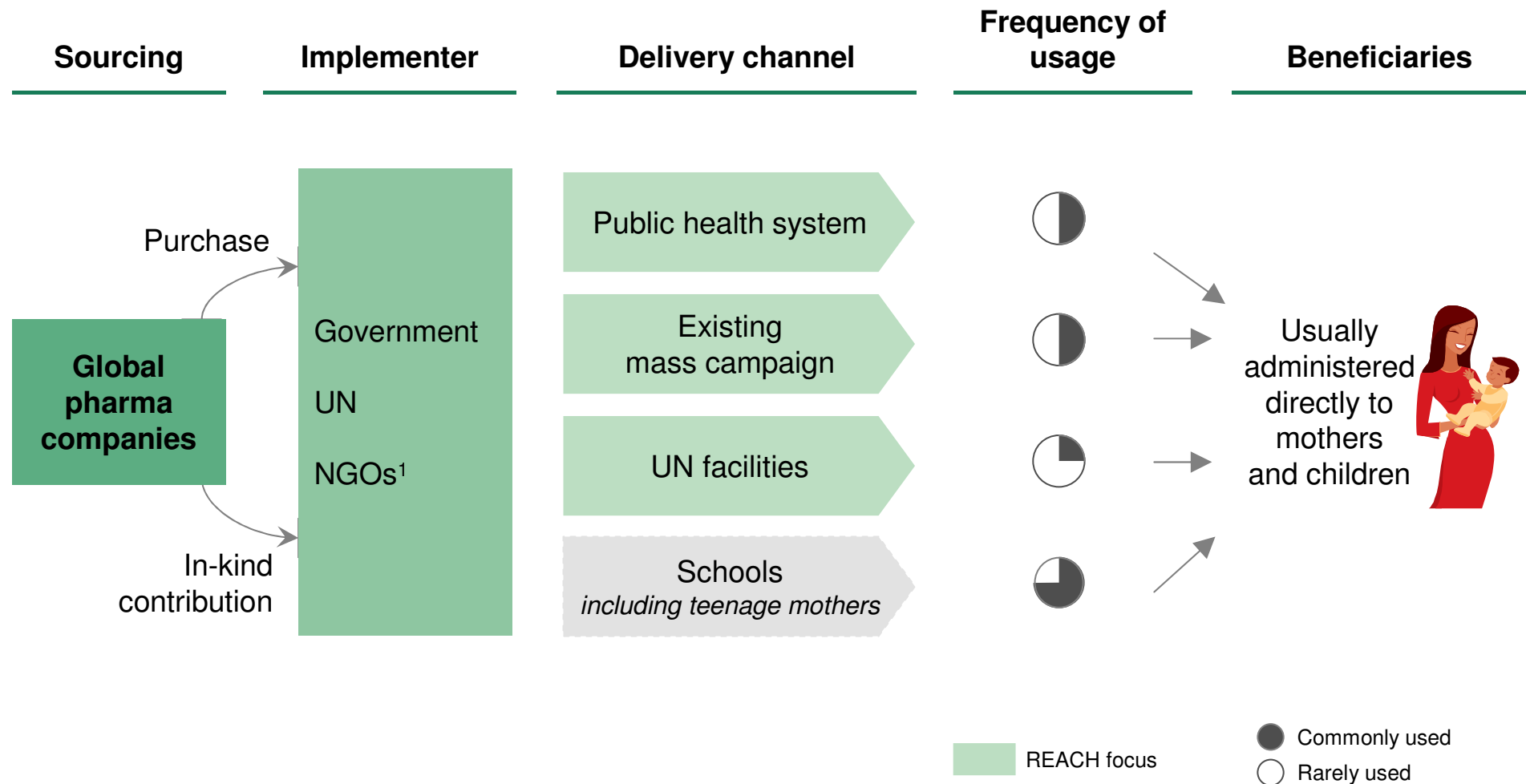
1. WHO recommended drugs 2. Both typically used as dosage is very simple; No major difference in terms of quality and cost between albendazole and mebendazole 3. Levamisole and pyrantel less often used as their dosage requirement is more complicated 4. Local production only for STH tablets, not for schistosomiasis
 Source: Expert interviews; "Action against worms." WHO, several issues from 2003-2006.

Dosage and treatment frequency are straightforward, easing complexity of delivery

	Category	Prevalence among school children	Action to be taken	
Soil-transmitted helminth^a	High-risk community	≥50%	Treat all school-age children (enrolled and not enrolled) twice each year ^B	Also treat: •Preschool children; •Women of childbearing age including pregnant women in the 2 nd and 3 rd trimesters and lactating women; •Adults at high risk in certain occupations (e.g. tea-pickers and miners)
	Low-risk community	≥20% and <50%	Treat all school-age children (enrolled and not enrolled once each year)	
Schistosomiasis	High-risk community	≥50% by parasitological methods (intestinal and urinary schistosomiasis) Or ≥30% by questionnaire for visible haematuria (urinary schistosomiasis)	Treat all school-age children (enrolled and not enrolled once a year)	Also treat adults considered to be at risk (from special groups to entire communities living in endemic areas)
	Moderate-risk community	≥10% but <50% by parasitological methods (intestinal and urinary schistosomiasis) or <30% by questionnaire for visible haematuria (urinary schistosomiasis)	Treat all school-age children (enrolled and not enrolled) once every 2 years	Also treat adults considered to be at risk Praziquantel should be available in dispensaries and clinics for treatment of suspected cases
	Low-risk community	<10% by parasitological methods (intestinal and urinary schiotomiasis)	Treat all school-age children (enrolled and not enrolled) twice during their primary schooling age (e.g. once on entry and once on exit)	

^aprevalence of any STH infection is less than 20%, large-scale preventive chemotherapy interventions are not recommended. Affected individuals should be dealt with on a case-by-case basis.
^B If resources are available, a third drug distribution intervention might be added. In this case the appropriate frequency of treatment would be every 4 months.
 Source: "Preventative chemotherapy in human helminthiasis." WHO, 2006.

Typical flow of deworming tablets to the child



1. Typically in support of mass campaigns to extend reach to more remote communities. 2. Only partly relevant for REACH
 Source: "Action against worms." WHO, several issues from 2003-2006.; expert interviews; REACH analysis

Deworming is often piggy-backed onto existing programs

Opportunities to leverage/expand existing programs

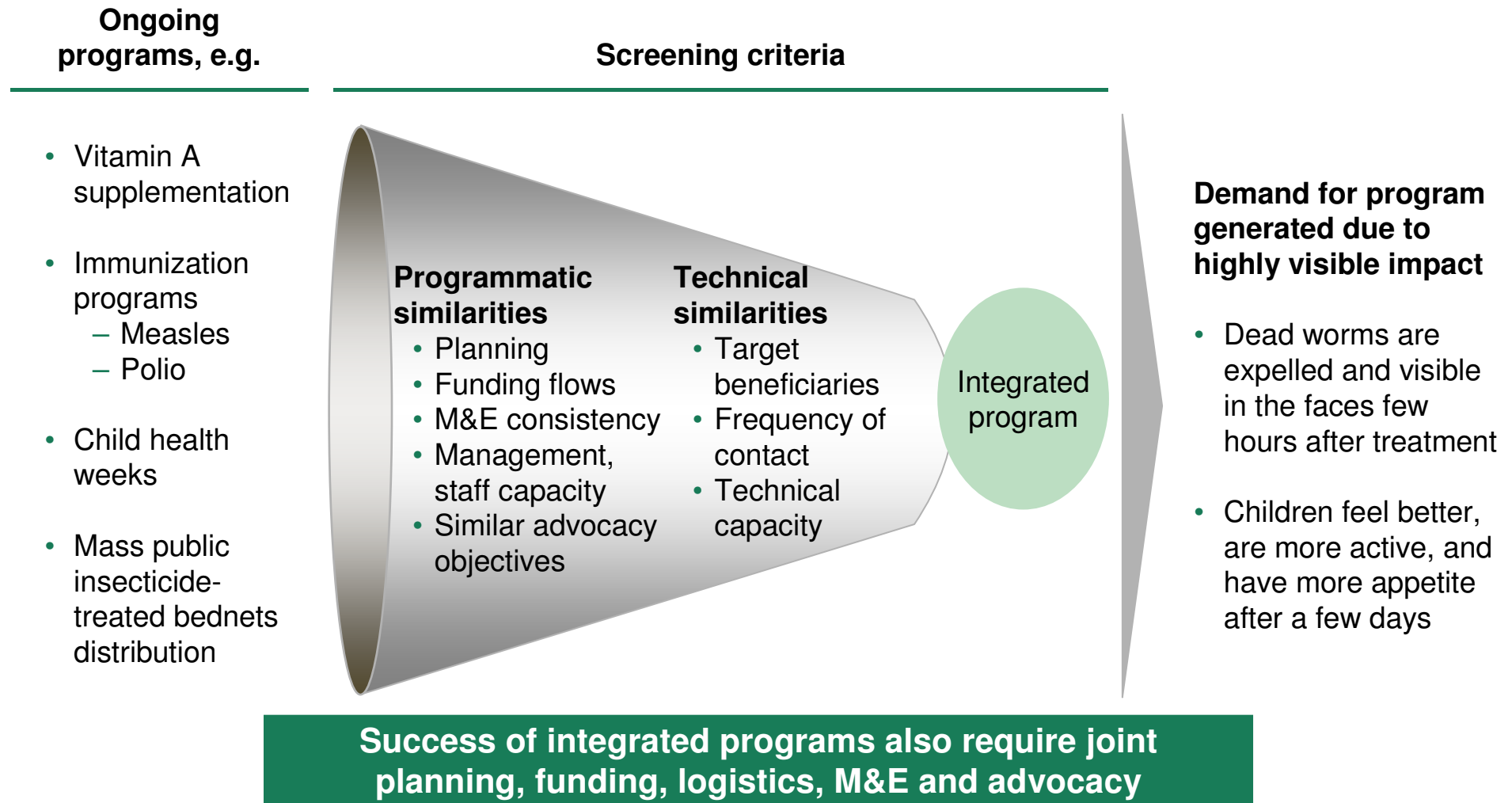
	Typical channels	Strengths	Challenges
Potentially standalone programs¹	Schools <ul style="list-style-type: none"> Provision to school children including teenage mothers 	<ul style="list-style-type: none"> Scalable² Very cost-effective Good outreach Effective education component Sustainable as capacity is built 	<ul style="list-style-type: none"> Only reaches school-age children Training teachers in delivering to children <5 is difficult due to high number of teachers
Typically integrated programs	Public health system <ul style="list-style-type: none"> As part of IMCI 	<ul style="list-style-type: none"> Scalable Low incremental cost Reaches all target beneficiaries Sustainable as capacity is built 	<ul style="list-style-type: none"> Often lack capacity Often limited outreach and coverage
	Existing mass campaign <ul style="list-style-type: none"> E.g., vitamin A supplementation, vaccination 	<ul style="list-style-type: none"> Scalable Low incremental cost Often high outreach Reaches all target beneficiaries 	<ul style="list-style-type: none"> Limited educational component Technical and programmatic fit with other interventions
	UN facilities <ul style="list-style-type: none"> E.g. in supplementary feeding centers 	<ul style="list-style-type: none"> Scalable Low incremental cost Reaches all target beneficiaries 	<ul style="list-style-type: none"> Sustainable only while UN funding Does not build ongoing local capacity

As the delivery requirements are low, many channels are suitable to deliver deworming tablets

1. Sometimes integrated into school feeding programs 2. One teacher can treat about 50-100 children per day
 Source: "Action against worms." WHO, several issues from 2003-2006.; expert interviews; REACH analysis

Deworming also can increase uptake of programs

Strong logic to integrate into existing delivery channels



Simple training guidelines, tailored for local norms, enable training of non-medical tablet providers

Sample provider training materials:

Guide for field staff from Congo



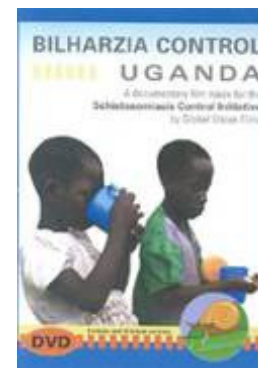
- Focus on essentials to make it usable in the field

Guide for district level managers from Kenya



- Detailed instructions as district managers further disseminate knowledge (multiplier)

Training video from Uganda



- Visualisation to make training more understandable and memorable

Book for teachers from Mauritania



- Detailed guidelines to structure a lesson

For children, prevention education is most effective when employing multiple tools that are fun to use

Sample educational materials:

Comic for children from Tanzania



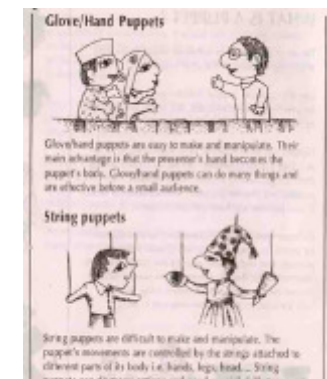
Poster from Ecuador



Card game from Laos



Teaching puppets from India



Radio spot from South Africa

Spot nr 1

Child Hello mother, what are you reading?
 Mother I am reading an interesting brochure on worm infection in people and that worms cause health problems
 Child Oh Juk!
 Mother It says here that to have worms is not natural but a sickness
 Child Can you take medicine to make you well again?
 Mother Yes, but it is better to PREVENT worm infection

Calendar pages from various countries



Exercise book from Congo



Simple registration forms enable low-cost tracking of overall coverage and individual continuous treatment

Control booklet from Ecuador

The image shows a 'control de control' booklet. It features a table with columns for 'Nombre', 'Parentesco', 'Edad', and 'Recibió Dosis'. The 'Recibió Dosis' column is a grid of colored boxes (blue, green, yellow, orange, red) representing different treatment stages. Below the table are six colored boxes labeled 'Dosis' 1 through 6.

Medical forms from Ecuador

The image shows two forms from the 'PROGRAMA DE DESPARASITACIÓN PARA NIÑOS DE 1 A 4 AÑOS Y SU FAMILIA (HERMANOS Y PADRES)'. The top form is a registration form with fields for 'Nombre', 'Apellido', 'Número de CD o Comunidad', 'Número de hijo en familia', 'Número de hermanos y/o padres de hermanos en familia', and 'Número de hijos en familia'. The bottom form is a 'FORMULARIO DE REGISTRO DE DESPARASITACIÓN' with fields for 'PREVINCIO', 'DISTRITO', 'PARROQUIA', 'Nombre del CD o comunidad', 'Número de hijo en familia', and 'Número del programa'. It includes a table for recording treatment dates and status.

Registration forms from Cambodia

The image shows a 'CAMBODIA: Form to fill by any organisation involved in de-worming'. It includes fields for 'Contact Name', 'Position', 'Organization', 'Address', 'Sex', and 'Mobile'. Below this is a section for 'Brief summary of your programme (including start and end dates, drugs used, forms used)'. The bottom section is a table for 'Where are you working, target criteria and targets' with columns for 'Admin Level 1', 'Admin Level 2', 'Tick where you work', 'What age group do you reach? (eg pre- or school aged children, women, communities)', and 'Number dewormed (approximate number and year)'. The table lists various locations like 'Kampong Cham', 'Kampong Speu', 'Kampong Speu', 'Kampong Speu', 'Kampong Speu', 'Kampong Speu', 'Kampong Speu', 'Kampong Speu', 'Kampong Speu', 'Kampong Speu'.

- Upper part used by health workers to track continuous treatment of individual child
- Lower part can be kept by child/mother to "visualize" treatment progress and success

The image shows a 'PROGRAMA DE DESPARASITACIÓN PARA NIÑOS DE 1 A 4 AÑOS Y SU FAMILIA (HERMANOS Y PADRES)'. It is a 'FORMULARIO DE REGISTRO DE DESPARASITACIÓN' with fields for 'PREVINCIO', 'DISTRITO', 'PARROQUIA', 'Nombre del CD o comunidad', 'Número de hijo en familia', and 'Número del programa'. It includes a table for recording treatment dates and status.

- Standardized form to report overall coverage of children according to district and age group
- Allows easy aggregation of data on a national level

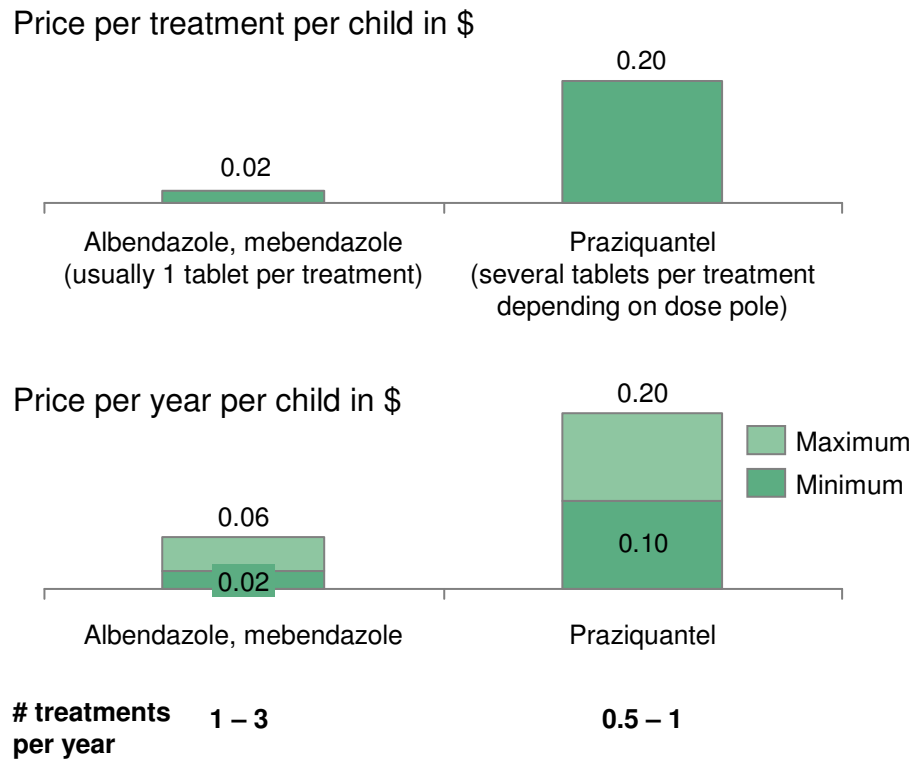
Treatment monitoring can be integrated into child health cards to minimize the number of forms that are in use

What it costs

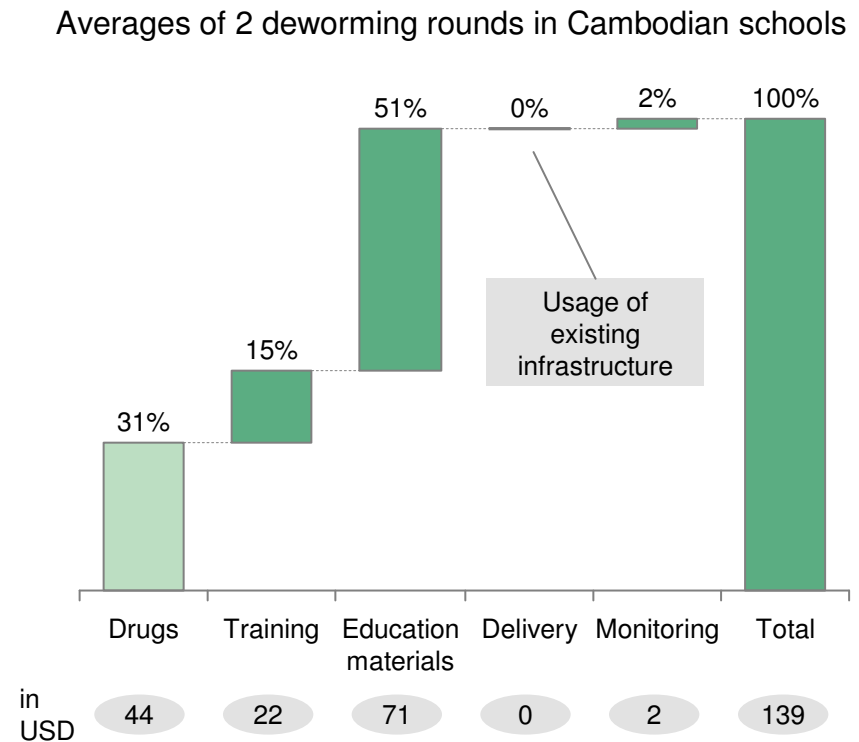
Preliminary

Deworming tablets are relatively minor element of cost structure

Tablet costs



Typical program cost structure



Low cost of drugs makes deworming strong candidate to link with other programs

1. A mark-up of 15% for sea or 25% for air transportation and a 5–10% buffer for loss and theft should be factored in
Source: "Action against worms." WHO, 2006; "School deworming. Joint statement." World Bank/WHO/UNICEF, 2003.; "Financial costs of deworming children in all primary schools in Cambodia." Sinuon et. al., 2004; REACH analysis

Centralized bulk purchasing reduces drug costs significantly

Especially important for high price praziquantel — less relevant for STH drugs

High SS drug prices ...

Production¹

- Complex synthesis process of the drug
- Polluting production process that incurs additional costs
- High transportation costs as 8 out of 10 manufacturers² are located in Asia
- Lack of capacity as the profit margin for manufacturers is low
- Low number of manufacturers

Purchase

- Absence of long-term funding impedes multi-year orders
- Relatively small quantities ordered for each program round

... create need for central purchasing ...

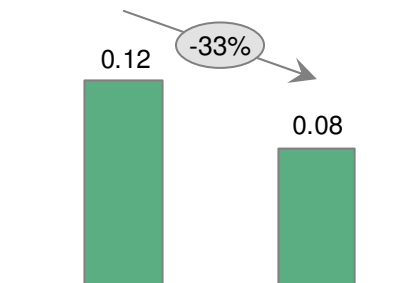
Available via WHO Web Buy or Schistosomiasis Control Initiative (SCI), which provide

- Quality assurance:
 - Prequalification of suppliers according to Good Manufacturing Practice (GMP)
 - Testing of batches
- Lower prices through
 - Bundling of volumes and bulk purchasing
 - Multi-year contracts with manufacturers
 - Consolidated demand forecasts provided to manufacturers
- Monitoring of delivery timing
- Higher price transparency

... which has multiple benefits

1 Lower cost per drug

Unit cost for praziquantel in US\$ (example from SCI program)



2 Assured drug quality

3 National program managers not burdened with complex procurement

1. Only applies to praziquantel 2. Manufacturers that conform with international standards
Source: "Action against worms. Issue7." WHO, 2006; REACH analysis

Where to go for further information

Key reference materials: Deworming

Normative guidance

- "Preventive chemotherapy in human helminthiasis. Coordinated use of anthelmintic drugs in control interventions: a manual for health professionals and program managers." WHO, 2006
- "Prevention and control of schistosomiasis and soil-transmitted helminthiasis. Joint Statement." WHO/UNICEF, 2004.
- "School deworming. Joint Statement." WHO/UNICEF/WB, 2003
- "Prevention and control of schistosomiasis and soil-transmitted helminths." WHO, 2002
- "Report of the WHO informal consultation on the use of praziquantel during pregnancy/lactation and albendazole/mebendazole in children under 24 months." WHO, 2002

Operational guidance

- "Helminth control in school-age children – A guide for managers of control programs." WHO, 2002
- "How to add deworming to vitamin A distribution." WHO/ UNICEF, 2004

Training materials

- Available from the Partner for Parasite Control webpage (www.who.int/wormcontrol/en)

In addition, the quarterly newsletter "Action against worms" by the Partners for Parasite Control (WHO) is a good source for practical tips

Organizations: Deworming (I)

Multilateral	Organization	Description	Key activities
	WHO - Partners for Parasite Control <ul style="list-style-type: none"> • www.who.int/wormcontrol 	<ul style="list-style-type: none"> • Joint initiative of UN agencies (hosted at WHO), academia and NGOs to fight schistosomiasis and STHs launched after the WHA in 2001 	<ul style="list-style-type: none"> • Advocacy • Global monitoring • Knowledge exchange
	UNICEF <ul style="list-style-type: none"> • www.unicef.org 	<ul style="list-style-type: none"> • UN Nations Childrens' Fund 	<ul style="list-style-type: none"> • Implement <ul style="list-style-type: none"> – Mainly for children <5
	WFP <ul style="list-style-type: none"> • www.wfp.org 	<ul style="list-style-type: none"> • Emergency food aid organization of the UN 	<ul style="list-style-type: none"> • Implement <ul style="list-style-type: none"> – Within school feeding
	UNHCR <ul style="list-style-type: none"> • www.unhcr.org 	<ul style="list-style-type: none"> • UN refugee agency 	<ul style="list-style-type: none"> • Implement <ul style="list-style-type: none"> – In refugee camps
	World Bank <ul style="list-style-type: none"> • www.worldbank.org 	<ul style="list-style-type: none"> • International development bank 	<ul style="list-style-type: none"> • Funding Implement <ul style="list-style-type: none"> – In FRESH school health programs

Organizations: Deworming (II)

	Organization	Description	Key activities
NGO	Schistosomiasis Control Initiative <ul style="list-style-type: none"> www.schisto.org 	<ul style="list-style-type: none"> Established at Imperial College London in 2002 through Gates funding 	<ul style="list-style-type: none"> Country assistance in implementation <ul style="list-style-type: none"> – Focus on Sub-Saharan Africa Secondary funding
	CARE <ul style="list-style-type: none"> www.care.org 	<ul style="list-style-type: none"> Humanitarian organization fighting global poverty 	<ul style="list-style-type: none"> Implement <ul style="list-style-type: none"> – In multiple countries
	Partnership for Child Development <ul style="list-style-type: none"> www.child-development.org 	<ul style="list-style-type: none"> NGO aimed at improving education, health and nutrition of school-age children in LICs 	<ul style="list-style-type: none"> Research Knowledge sharing Assistance in multiple country programs
Bilateral	Government of Japan <ul style="list-style-type: none"> www.mofa.go.jp 	<ul style="list-style-type: none"> Government invests and actively supports deworming through Hashimoto Initiative 	<ul style="list-style-type: none"> Funding Operates three regional training centres Runs technical training courses
	CIDA <ul style="list-style-type: none"> www.acdi-cida.gc.ca 	<ul style="list-style-type: none"> Development aid agency of Canada 	<ul style="list-style-type: none"> Funding for WFP deworming programs within school feeding

Organizations: Deworming (III)

	Organization	Description	Key activities
Foundation	Bill and Melinda Gates Foundation <ul style="list-style-type: none"> www.gatesfoundation.org 	<ul style="list-style-type: none"> Active in global health 	<ul style="list-style-type: none"> Funding of PPC, SCI and the Sabin Institute for their deworming work
	Danish Bilharzia Laboratory <ul style="list-style-type: none"> www.dblnet.dk 	<ul style="list-style-type: none"> Research institution specialized on bilharzia 	<ul style="list-style-type: none"> Research Provision of training, Implementation advice
Research	Johns Hopkins <ul style="list-style-type: none"> www.jhu.edu 	<ul style="list-style-type: none"> University, School of public health 	<ul style="list-style-type: none"> Research on drugs
	London School of Hygiene and Tropical Medicine <ul style="list-style-type: none"> www.lshtm.ac.uk 	<ul style="list-style-type: none"> University specialized in international public health and tropical medicine 	<ul style="list-style-type: none"> Research on drugs Training

Scaled-up programs: Deworming

Name/country	Implementing partners	Other information
Burkina Faso National Schistosomiasis and Soil-Transmitted Helminth Control Program (PNLSc)	Ministry of Health, Schistosomiasis Control Initiative	<ul style="list-style-type: none"> Over 1 M children had been treated
Cambodia school deworming program ¹	Ministry of Health with support from WHO and UNICEF	<ul style="list-style-type: none"> Distribution through existing MoH and education system infrastructure and staff 2.8M school children covered
Deworming integrated into Democratic Republic of Congo's national vitamin A campaign	Ministry of Health	<ul style="list-style-type: none"> Deworming fully integrated into mass campaign 10M children dewormed representing about 90% of the target group
National Control Program Guinea	Ministry of Health	<ul style="list-style-type: none"> >1M school children treated (coverage 50%) Presence of schistosomes detected by urine and blood tests on children dropped by 70%
Nepal integration of deworming into national vitamin A campaign	Ministry of Health, UNICEF	
Nepal school deworming program ¹	Ministry of Health and ministry of Education and WF	<ul style="list-style-type: none"> Deworming integrated into school feeding program ~512K tablets distributed with an estimated coverage of 91%
Vietnam school deworming program	Ministry of Health and ministry of Education	<ul style="list-style-type: none"> Existing infrastructure and staff used for delivery 2.7M children dewormed, coverage of about 95%

1. Initial case study provided

Appendix: experts consulted

Experts consulted during preparation of this document

Name	Organization and title	Area of expertise
Pramila Ghimire	WFP coordinator, Nepal	Implementation
Antonio Montresor	WHO, Focal point for helminth control in WPRO	Implementation, research