

An introduction to the Neglected Tropical Diseases



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Global Health

Health / Disease of
populations

Millenium goals

Tropical diseases/
international travel

Public Health – clean water,
sanitation



Food & Water supplies

Medical workforce

Climate change

Cultural diversity

Refugee medicine

Anopheles mosquito - malaria



The Neglected Tropical Diseases

Core Group of 15 – MDA for 7

- Protozoan Infections
 - Human African Trypanosomiasis (HAT)
 - Chagas Disease
 - Leishmaniasis
- Bacterial Infections
 - Buruli Ulcer
 - Leprosy
 - **Trachoma**
- Helminth Infections
 - **Ascariasis**
 - **Hookworm Infection**
 - **Trichuriasis**
 - **Schistosomiasis**
 - **Lymphatic Filariasis**
 - **Onchocerciasis**
 - **Dracunculiasis**
 - **Cysticercosis**
 - **Podoconiosis**

**Question: How important are
these diseases**

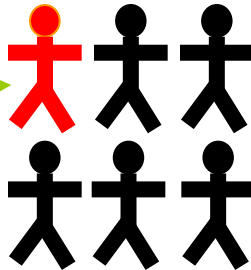
Answer:

If you are infected they are very important

So how many are infected ?

Over **ONE BILLION** people worldwide – one in six of the human population

Live on < £1 or \$2/day



For sure they all are infected with one or more parasites - promoting the cycle of poverty and disease



The parasitic burden in Africa is huge and unnecessary

An estimated 500 million people in Africa are infected with one or more parasitic infections, or with organisms which cause one or more of the Neglected Tropical Diseases.

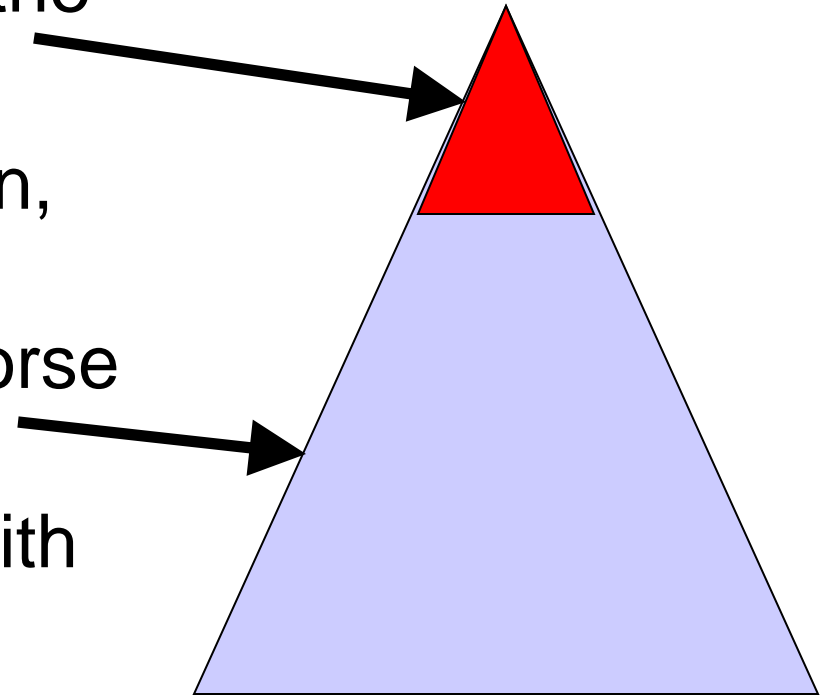
Safe and effective drugs exist which should make morbidity due to these diseases unnecessary – but those who need them cannot afford them

Sub-Saharan Africa has the Highest Prevalence of Nine Neglected Tropical Diseases

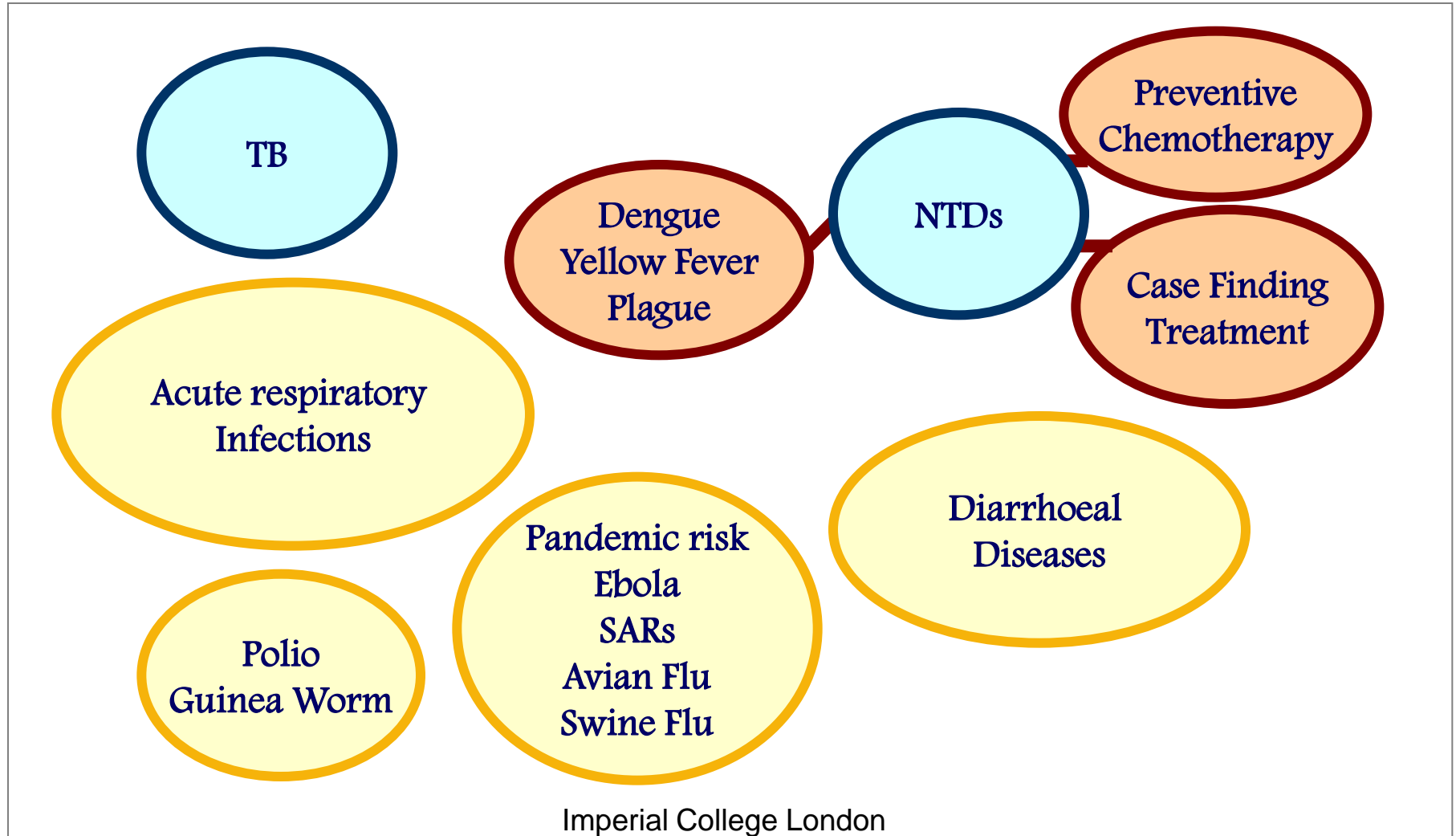
Condition	Cases in Africa	Proportion of Global Burden in Africa
Hookworm	198 million	27%-34%
Ascariasis	173 million	14%-22%
Schistosomiasis	166 million	89%
Trichuriasis	162 million	20%-26%
Trachoma	33 million	40%
Lymphatic Filariasis	46 million	38%
Onchocerciasis	18 million	99%
Trypanosomiasis	0.5 million	100%
Dracunculiasis	<0.1 million	100%

The Iceberg

- ‘Objective’ morbidity (hepatosplenomegaly, hematuria) is only the tip of the disease/disability iceberg
- Pain, diarrhea, undernutrition, and anemia are clearly associated with infection, worse with heavier infection, and reversible, at least in part, with specific therapy

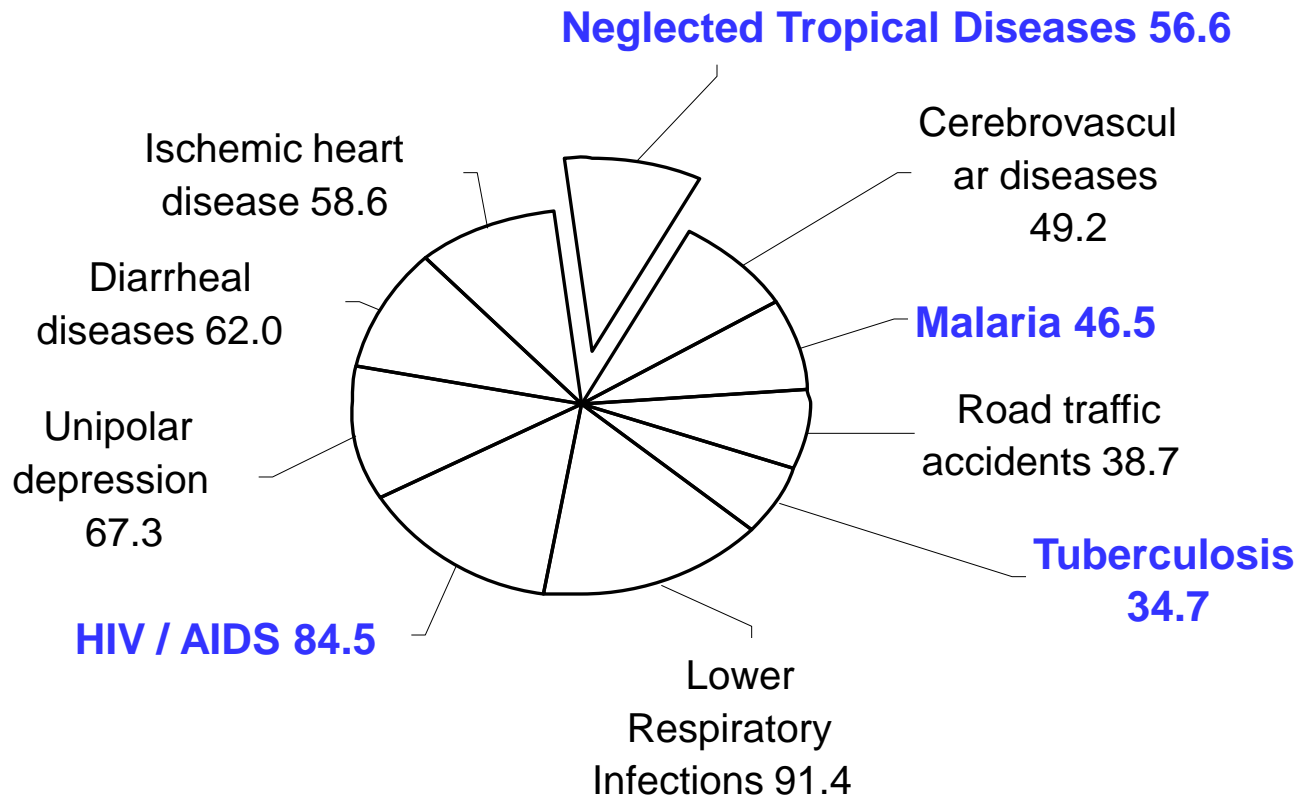


HIV/AIDS, malaria and TB are hugely important, but there are the “other diseases” of MDG 6



Estimated DALYs lost from NTDs compared to other conditions

DALYs (in millions)

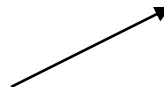


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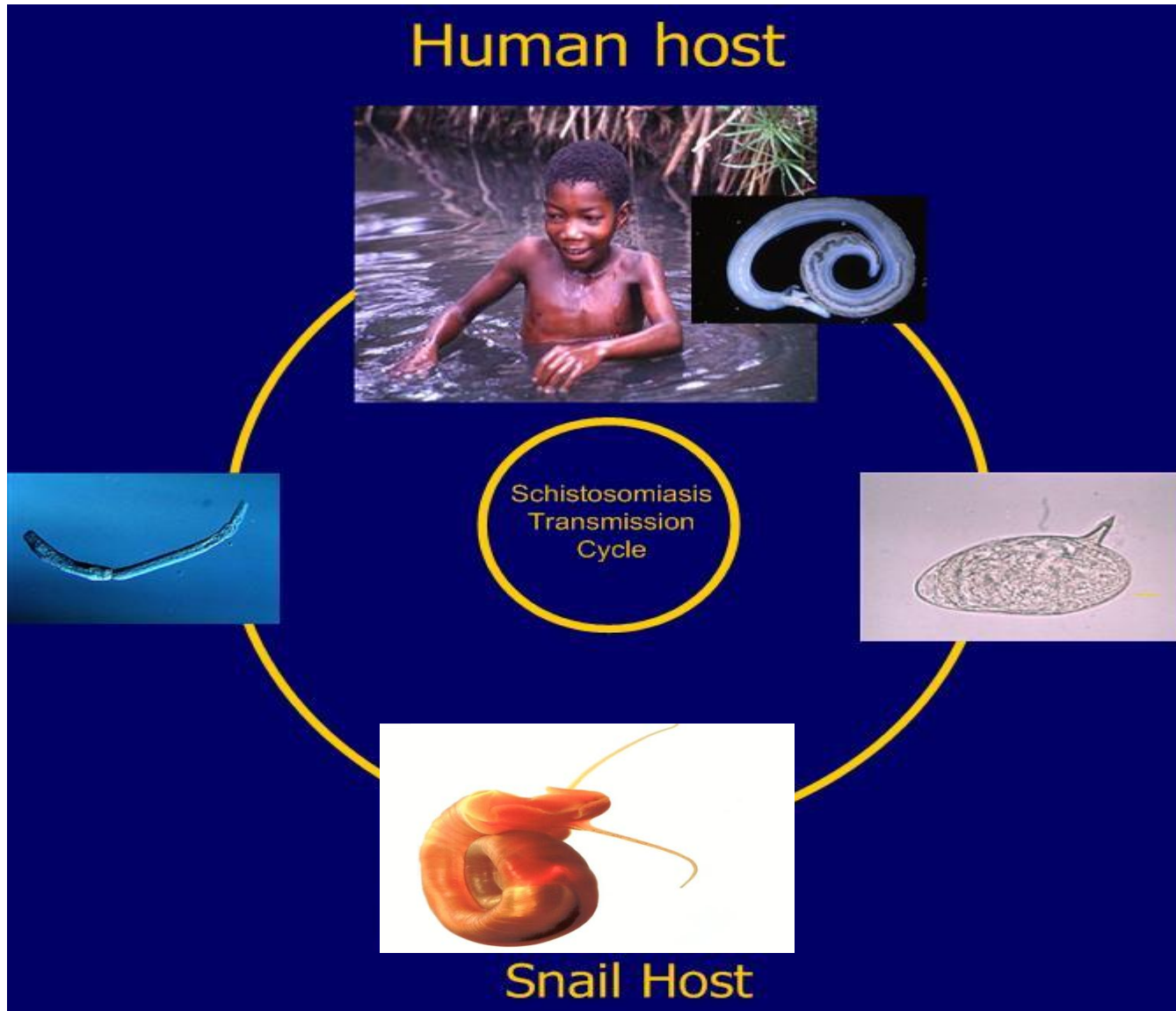
The United Nations Millennium Development Goals (MDGs) – we could speed progress towards most of the MDG's

1. Eradicate extreme poverty and hunger.
2. Achieve universal primary education.
3. Promote gender equality and empower women.
4. Reduce child mortality.
5. Improve maternal health.
6. Combat HIV/AIDS, malaria and other diseases.
7. Ensure environmental sustainability.
8. Develop a global partnership for development.

NTDs are included
in “other diseases”



Schistosomiasis Transmission

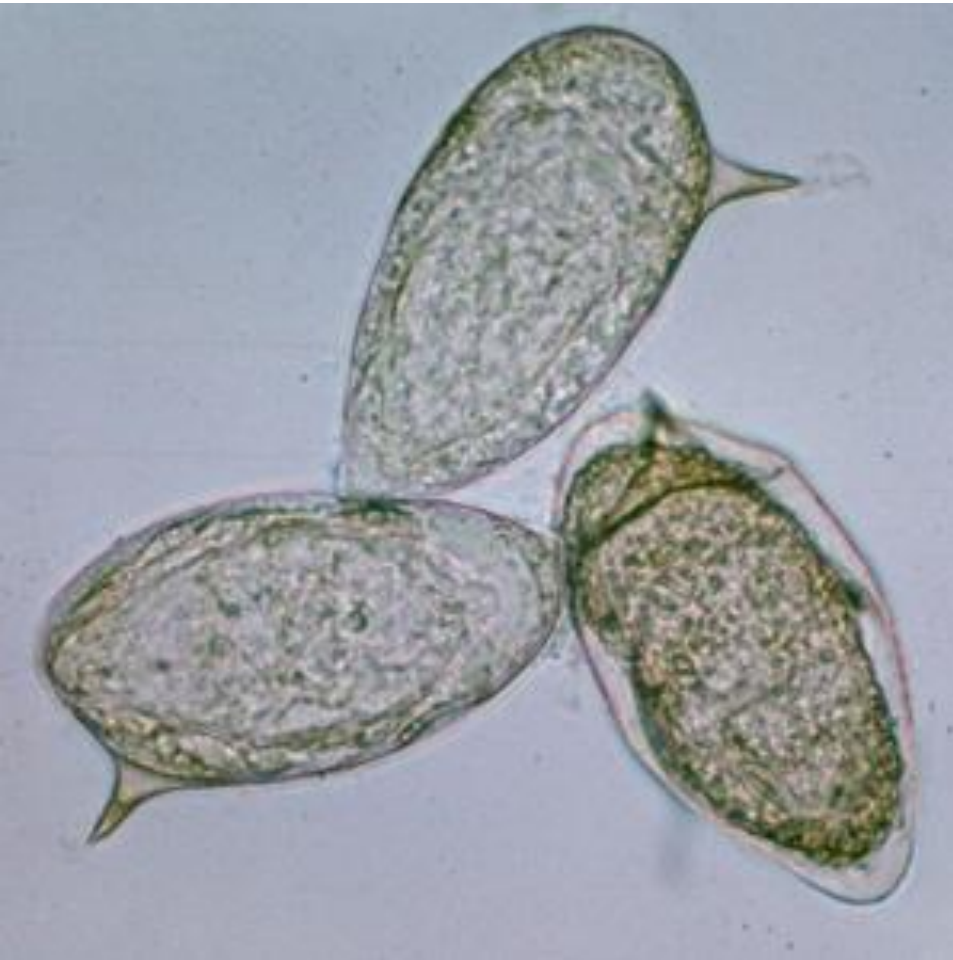


The extent of the problem

- 5 species, two dominate in Africa
- Still endemic in 70 tropical and sub-tropical countries
 - It affects the poorest of the poor
 - Exacerbated by man-made changes in surface water – dams and irrigation schemes



S. mansoni and *S. haematobium* eggs



Children in Niger

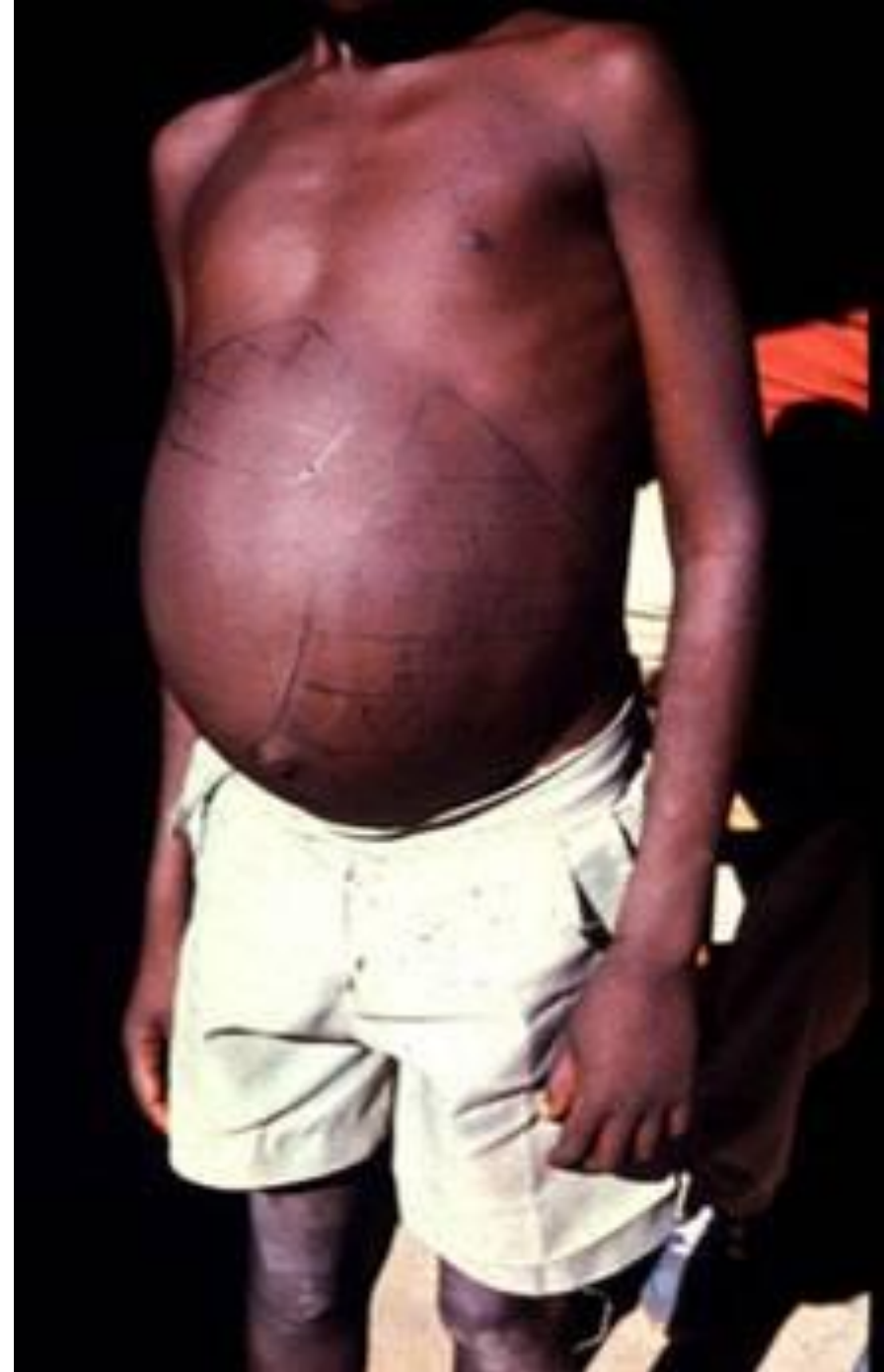


An
extreme
case
in
Uganda

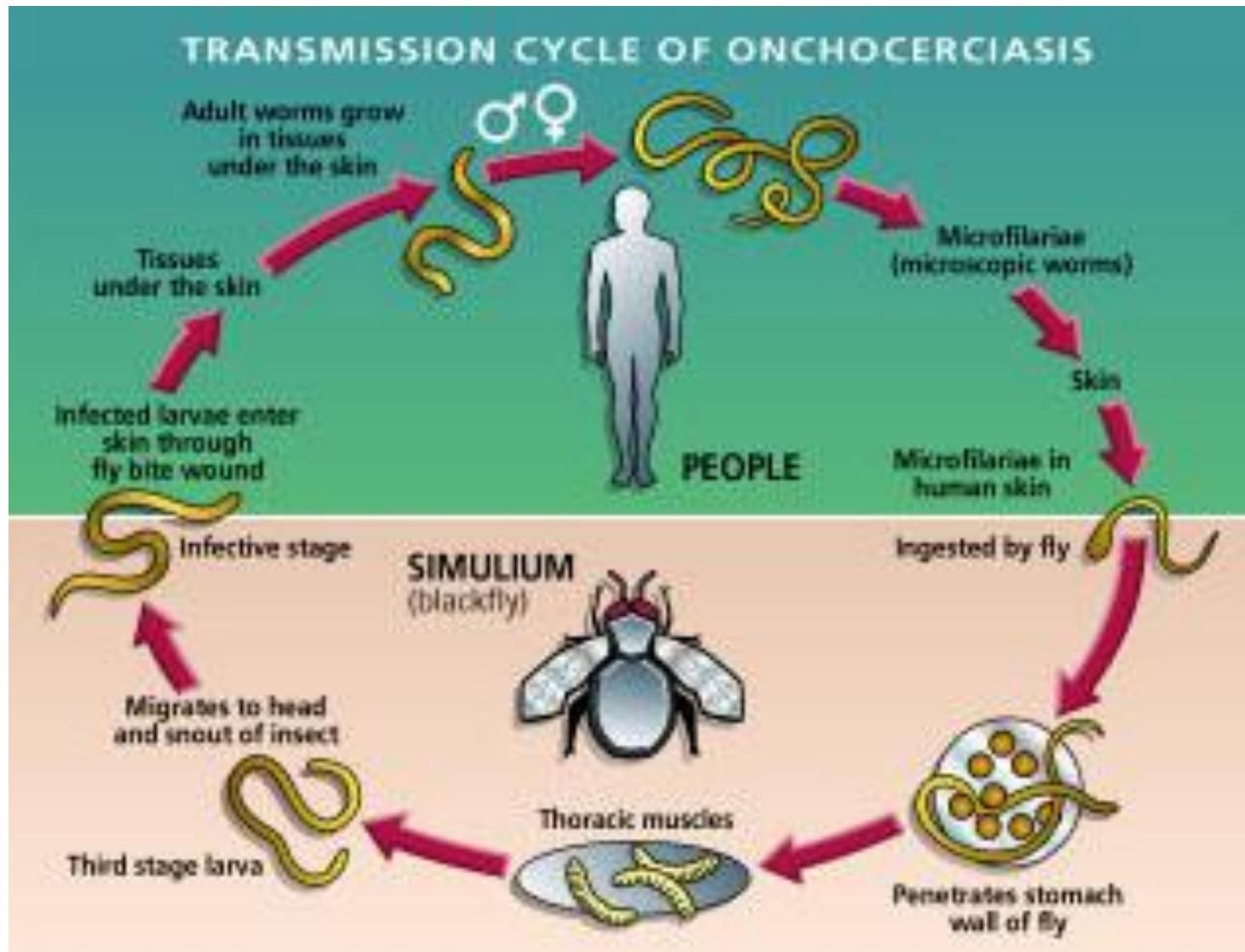


Schistosomiasis numbers

- **Estimated over 200 million infected**
- **85% or more in sub Saharan Africa**
- **Estimated 280,000 deaths annually**
- **10% treated annually since 2006**



The Onchocerciasis Life Cycle



Onchocerciasis (River Blindness)

- 37 million infected
- Over 99% of those infected live in Africa
- Causes blindness and severe skin disease



Head of a simuliid blackfly a vector for the onchocerciasis parasite

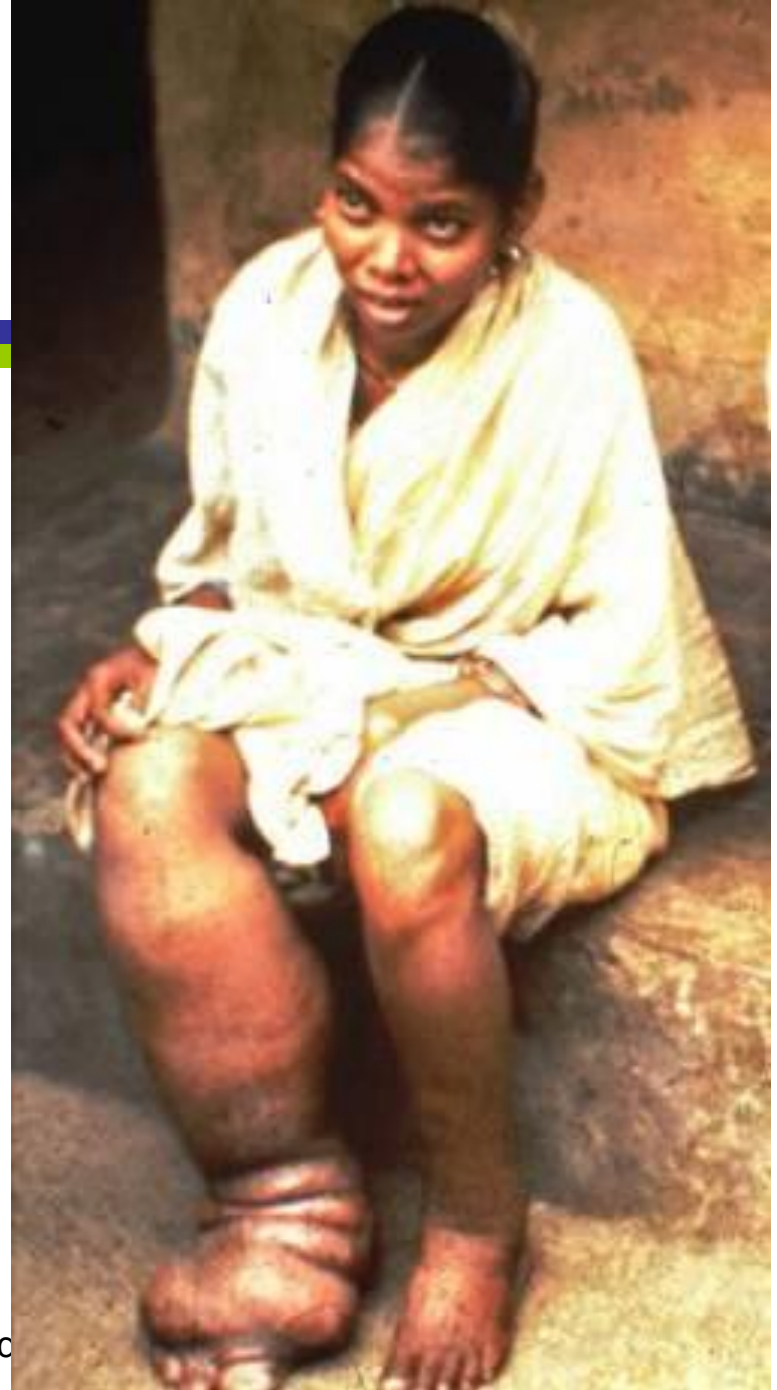


Filarial worm transmitted by mosquitoes



Lymphatic Filariasis

- **\$1.5 billion in lost productivity per year in India alone**
- **120 million infected**
- **40 million suffering with symptoms**



Lymphatic filariasis



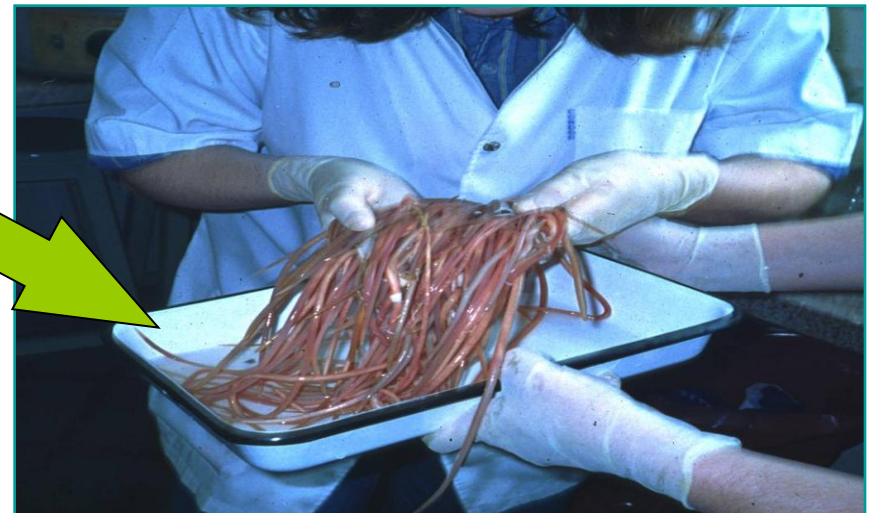
LF is an evil disease



Soil Transmitted Helminth Infections “Worms”

Ascariasis, Trichuriasis, Hookworm

Lets treat this girl with
ONE TABLET of
albendazole at a cost of
just 2 US cents or
1penny





Ascaris worms collected from 80 people



NO DIET - NO BATHS
NO EXERCISE!

FAT

the ENEMY that is shortening Your Life
BANISHED!



HOW?
with
SANITIZED
**TAPE
WORMS**

Jar Packed
"FRIENDS FOR A
FAIR FORM"

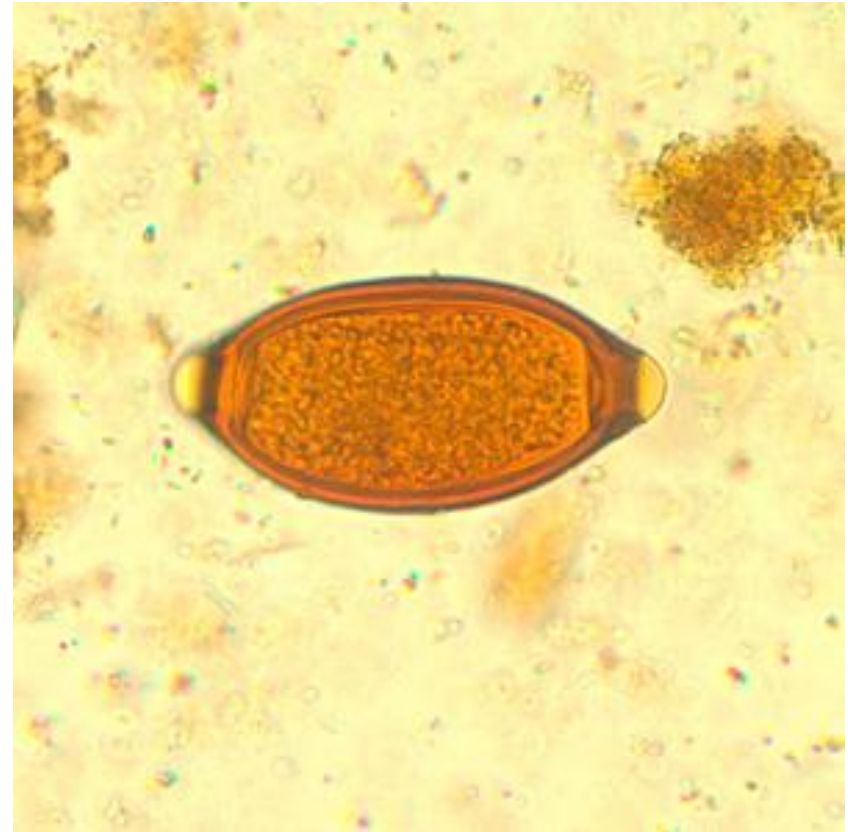
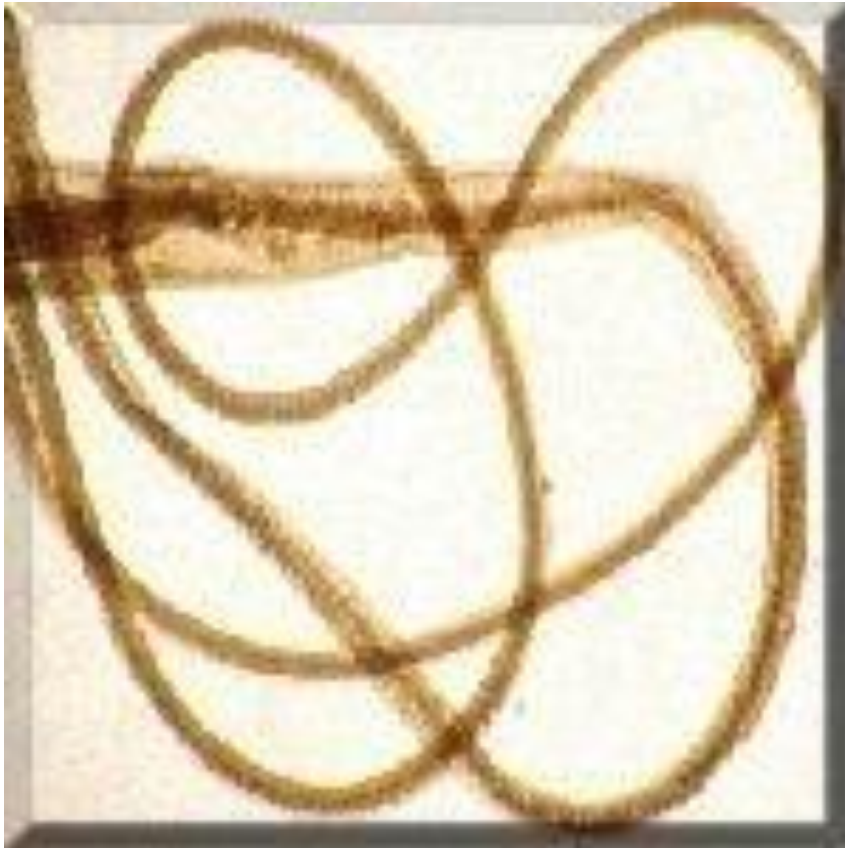
*Easy To
Swallow*

Prepared By
W. T.
BRIDGE, Oyster
New York

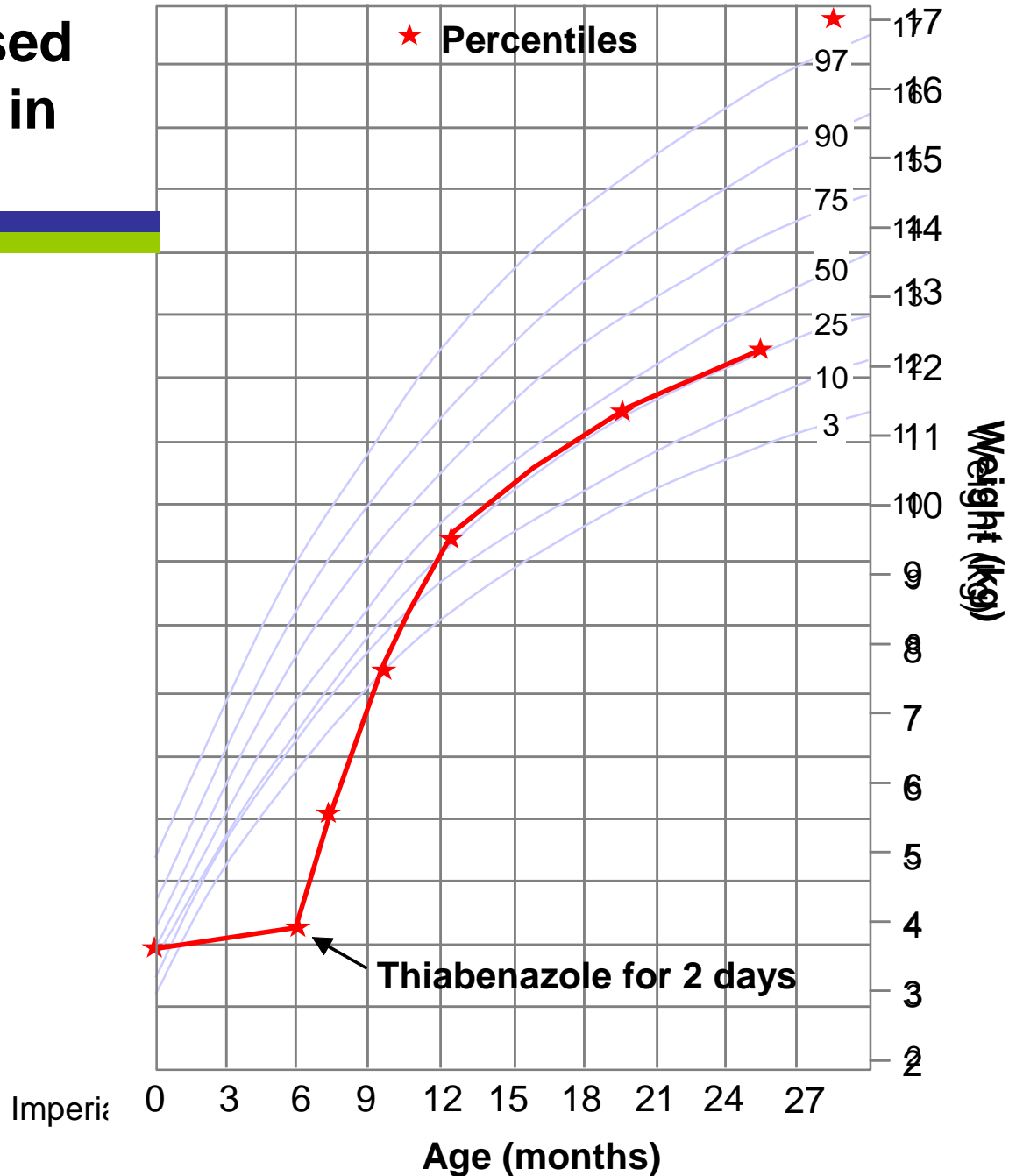
SEND NO
MONEY
PARTICULAR
MAILED
FREE.

*No Ill
Effects!*

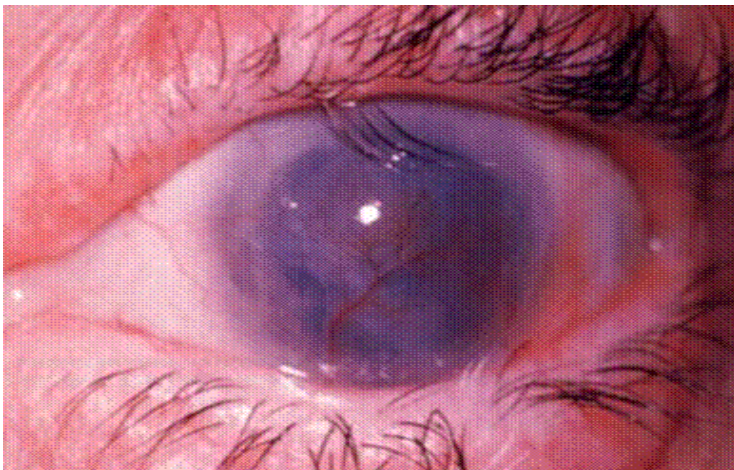
Trichuris worm and egg in stool



STHs Lead to Stunting and Decreased School Performance in Children



Blinding Trachoma



**World's leading cause
of preventable
blindness...**

- \$2.9 billion lost in productivity annually**
- 84 million infected**
- 8 million have visual impairment**

Treatments available

- Albendazole – helminths and LF
- Mebendazole - helminths
- Mectizan (Ivermectin) oncho and LF
- Praziquantel - schistosomiasis
- Mixed treatments against trypanosomiasis
- Combined therapy against leprosy
- Zithromax - trachoma

Strategies

Mass Drug Administration (MDA)

- For the intestinal helminths, LF schistosomiasis, onchocerciasis and trachoma, the WHO recommended strategy is MDA in areas where prevalence rates are above certain thresholds.
- Diagnosis and treatment is impossible because of diagnostic costs
- Drugs are safe and effective

Trigger levels to justify MDA

- For Schisto 10% - target school aged children
- For Schisto >50% treat everyone (MDA)
- For STH >50% MDA
- For trachoma >10% MDA
- For LF >1% MDA

The pharmaceutical industry has increased its contribution to global health



Merck & Co Inc – have reconfirmed their commitment to donate Mectizan for as long as needed for both onchocerciasis and filariasis in Africa



GlaxoSmithKline – have already donated almost 2 billion tablets of albendazole for lymphatic filariasis and will continue until elimination is achieved

In October 2010 GSK committed an additional 400 million tablets a year for 5 years to deworm school aged children in Africa



Johnson & Johnson – has for several years donated up to 50 million tablets mebendazole per year for intestinal worms – next year this will be increased to 200 million tablets per year

The pharmaceutical industry has increased its contribution to global health



Pfizer – originally committed to provide 120 million doses of azithromycin for trachoma
In 2009 alone they donated 50 million – in 2011 that number will reach 70 million



Novartis is continuing thier commitment to MDT for leprosy

EISAI

In October 2010, EISAI committed to provide 2 billion tablets of DEC for LF which is used with albendazole outside of Africa



Medpharm (generic manufacturer) and E. Merck have each donated some praziquantel. E. Merck have committed to 200 million tablets over 10 years

The pharmaceutical industry have contributed most of the drugs - but how will they get delivered to those who need them ?

So we have the drugs to treat 500 million people – we now need:

- Political will
- Advocacy tools
- Training
- Transport
- Community Drug Volunteers
- And approximately \$250 million per year to deliver these drugs

Some children were given treatment
by the Deputy Prime Minister

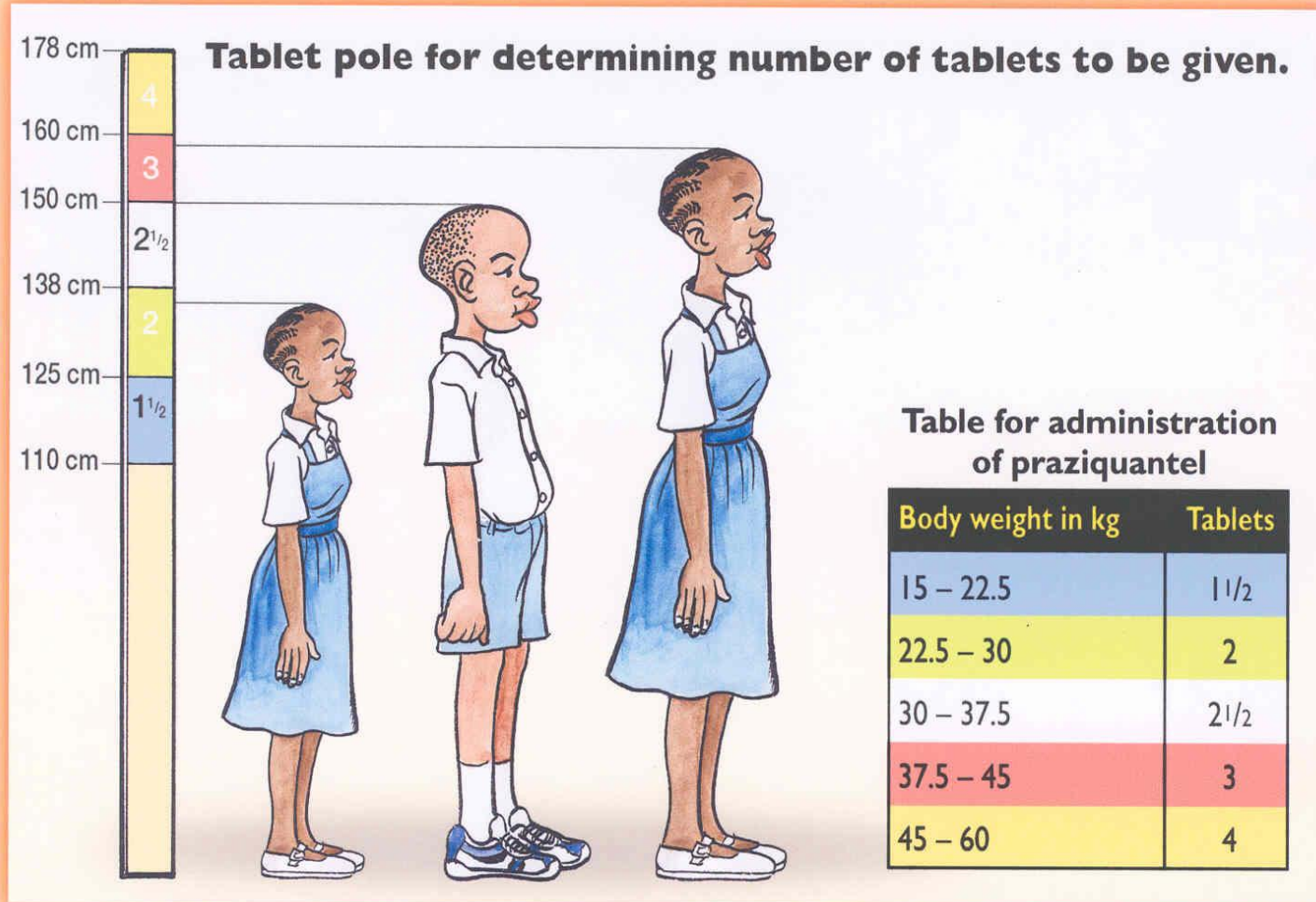


The politics of pricing

Praziquantel is now off-patent, with significant price cuts in 1990s

- In 1988 when praziquantel first came to market, the price was approximately \$1 per tablet (\$4 for an adult course)
- In 2008 several pharmaceutical companies sell praziquantel ex factory for about 7 cents a tablet
- That is 93% cheaper !!!!

The Dose Pole instead of weighing the children is a useful tool



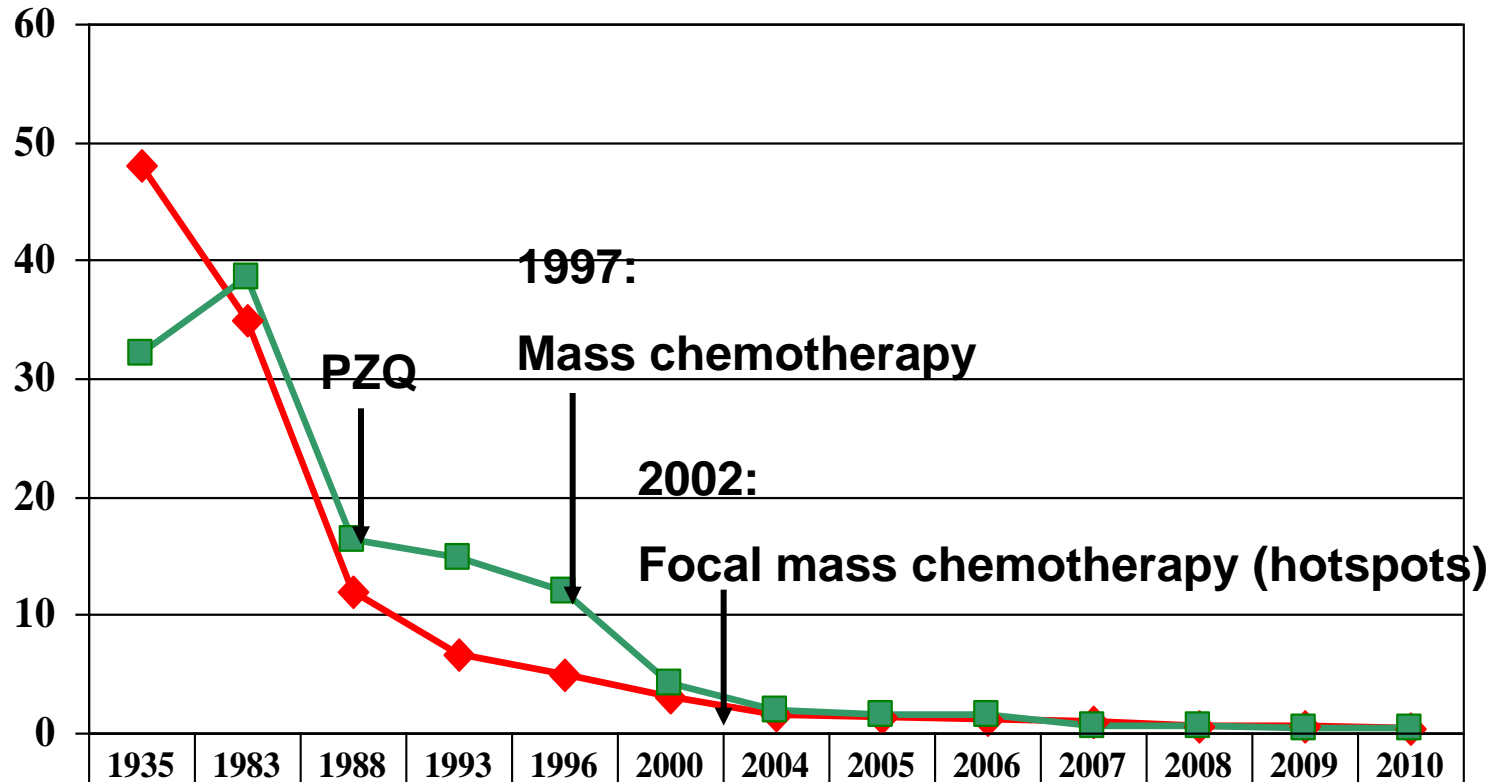
Treating school children is easy



School feeding helps with praziquantel treatment



Schistosomiasis control in Egypt



◆ <i>S. haematobium</i>	48	35	11.9	6.6	5	3	1.6	1.4	1.2	0.9	0.6	0.5	0.4
■ <i>S. mansoni</i>	32	38.6	16.4	14.8	11.9	4.2	1.9	1.6	1.5	0.6	0.6	0.4	0.3

The Schistosomiasis Control Initiative (SCI), Imperial College London



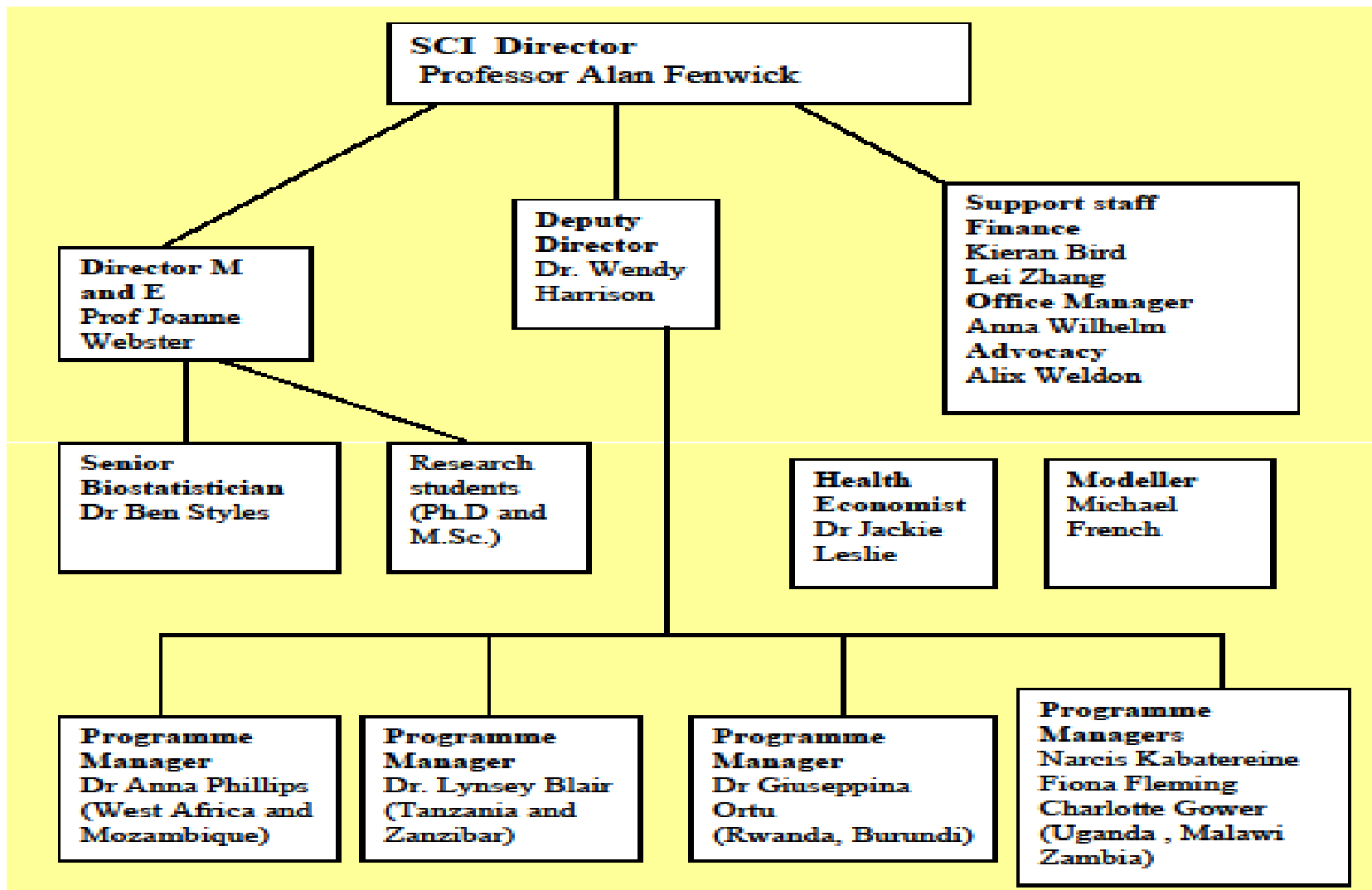
SCI was established in 2002 to assist countries implement schistosomiasis and intestinal helminth control. SCI has championed integrated control of Neglected Tropical Diseases and is now assisting 4 countries in achieving national coverage



**THE QUEEN'S
ANNIVERSARY PRIZES**
FOR HIGHER AND FURTHER EDUCATION

2008

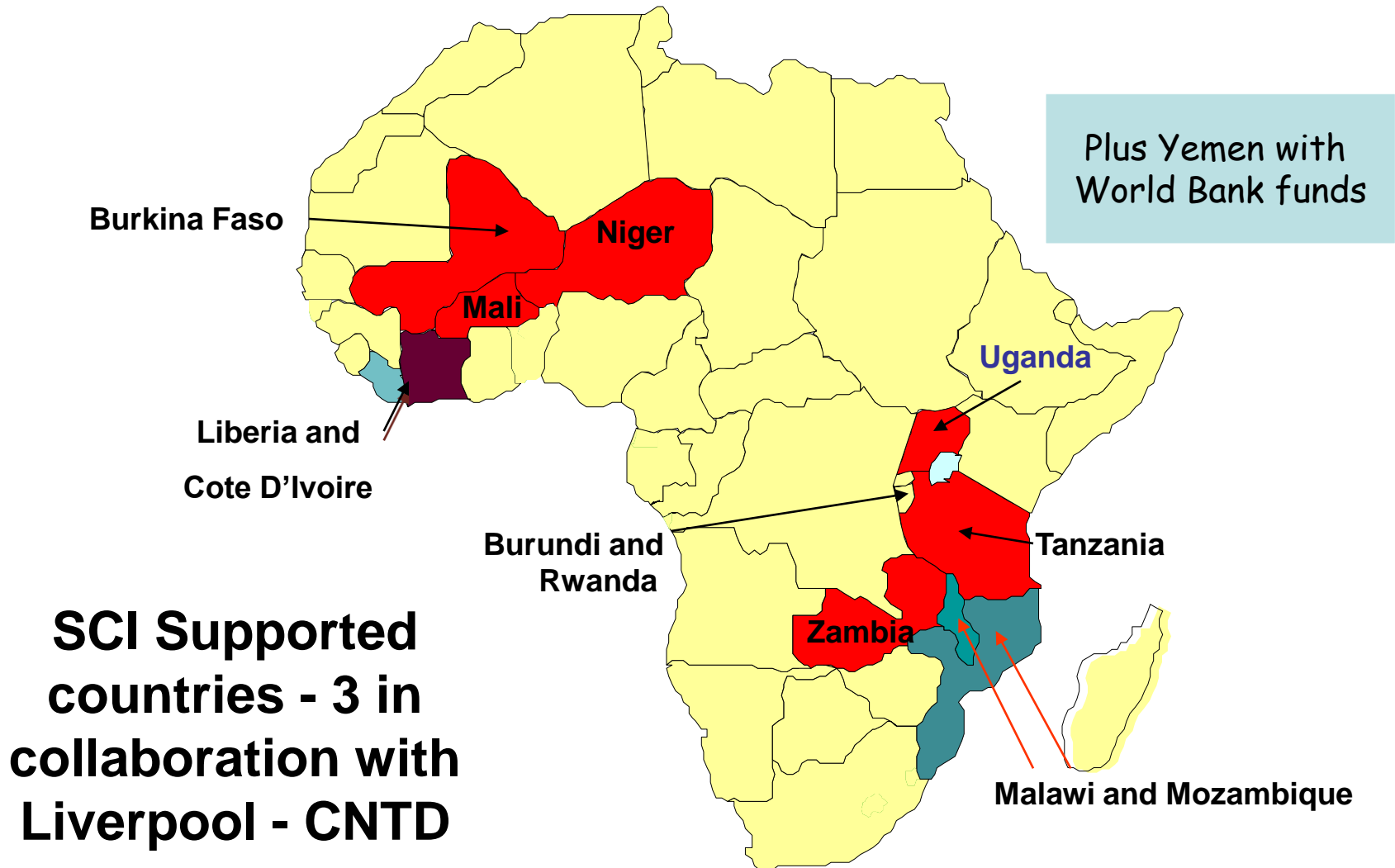
SCI Organogram



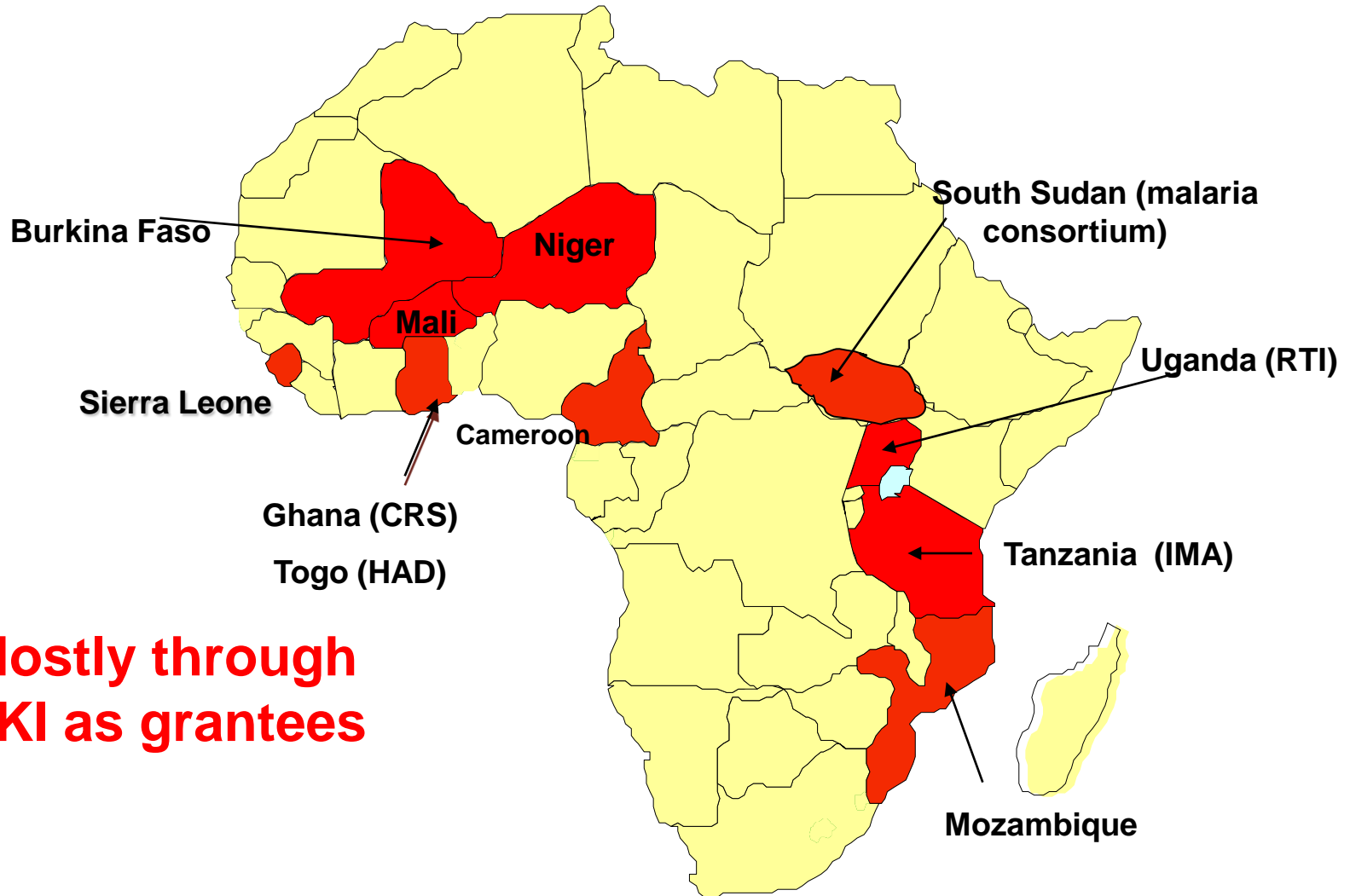
The SCI collaborative plan

- Programmes are country owned
- Mapping of disease distribution
- Advocacy at central and district levels
- Develop National Plans
- Procurement
- Training
- Drug delivery
- Monitoring and Evaluation
- Transfer of technology and building sustainability

12 Ministries of Health and Education have implemented control with Gates/Legatum/DFID and SCI assistance

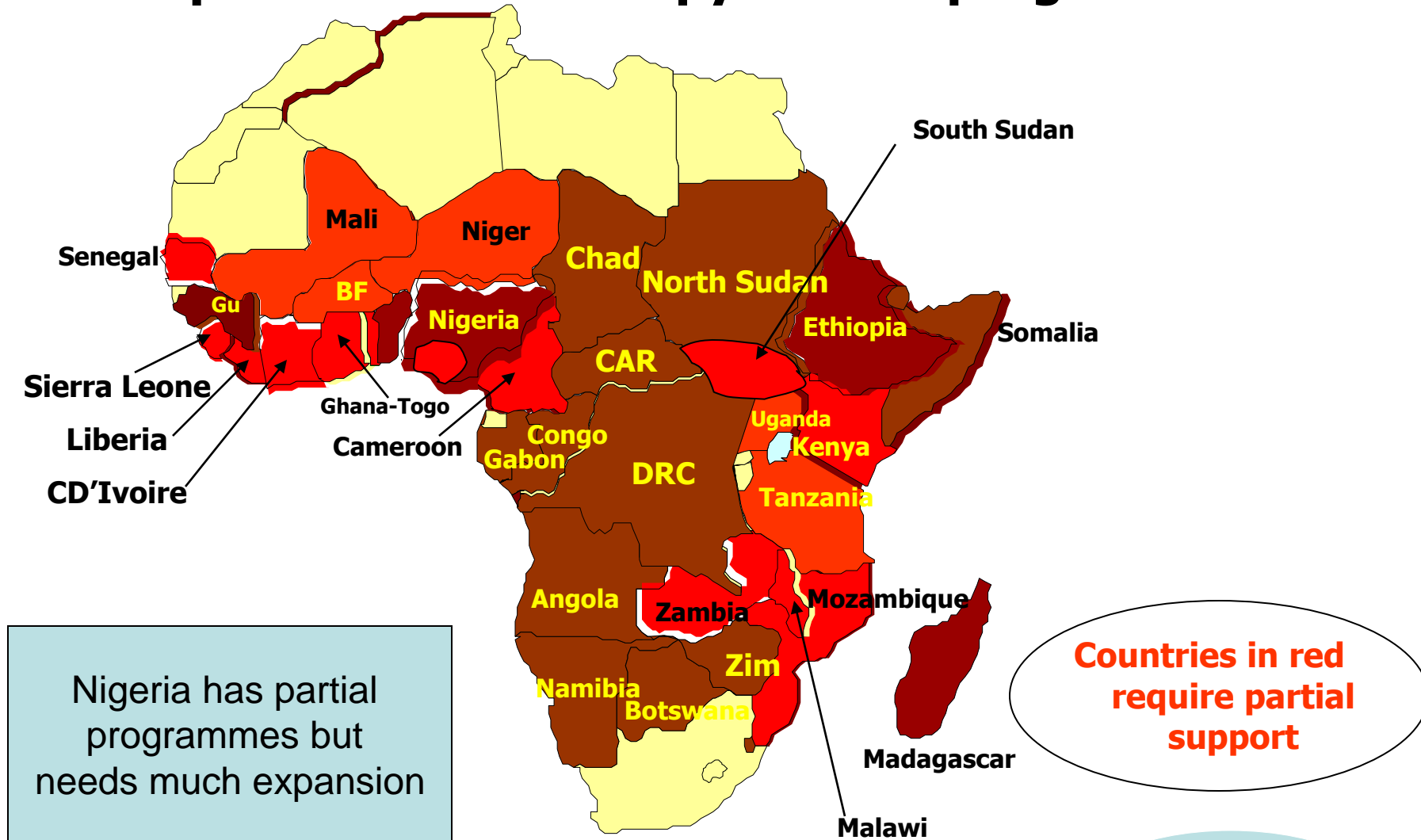


USAID/RTI/FHI are assisting 11 countries



**Mostly through
HKI as grantees**

Countries currently NOT implementing national or partial chemotherapy control programmes



Case management

- This man's hydrocele started 6 years ago – the operation costs \$50 – and the queue in Niger alone is over 8,000 men waiting for the treatment

BEFORE



AFTER

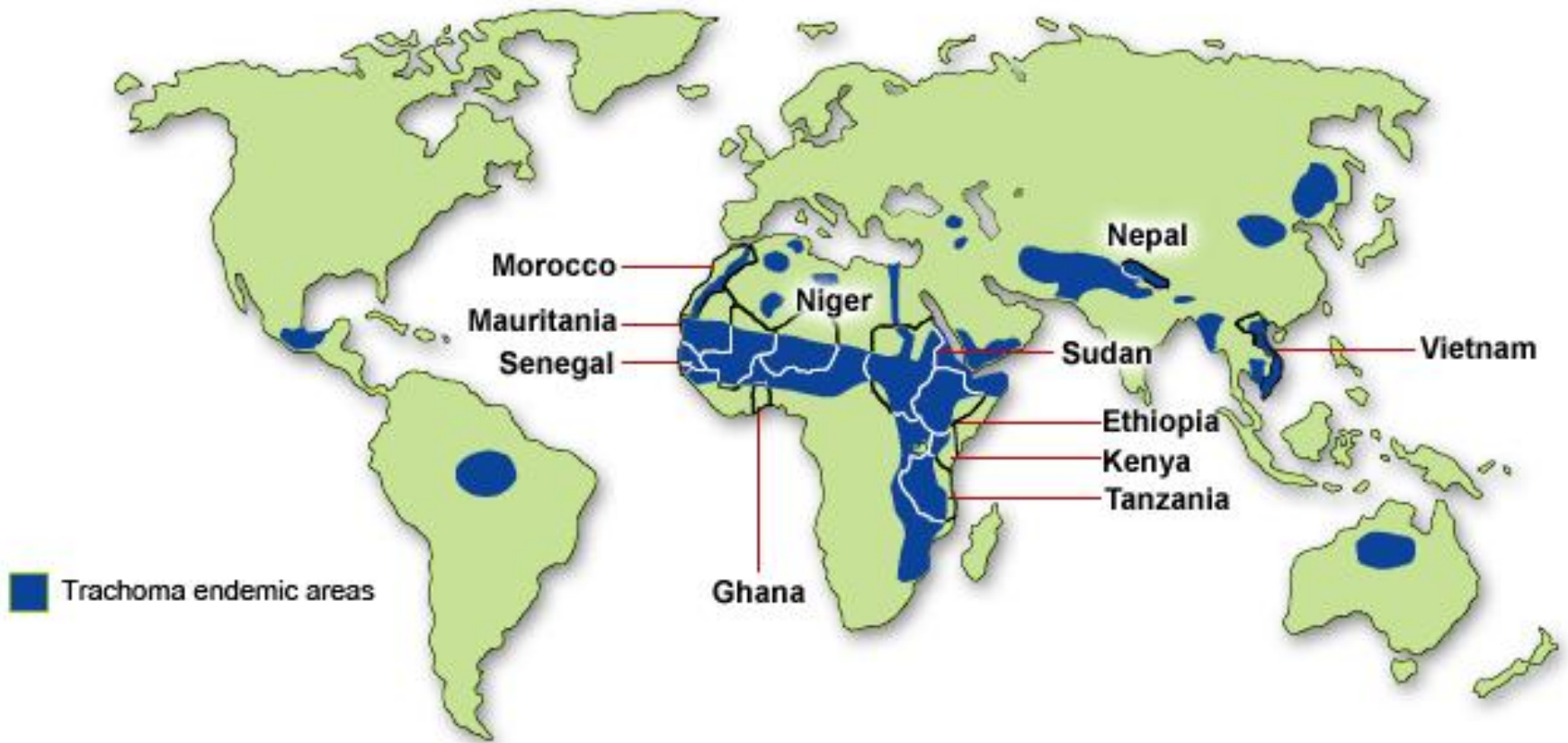


A reason to smile



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Trachoma control in 11 countries



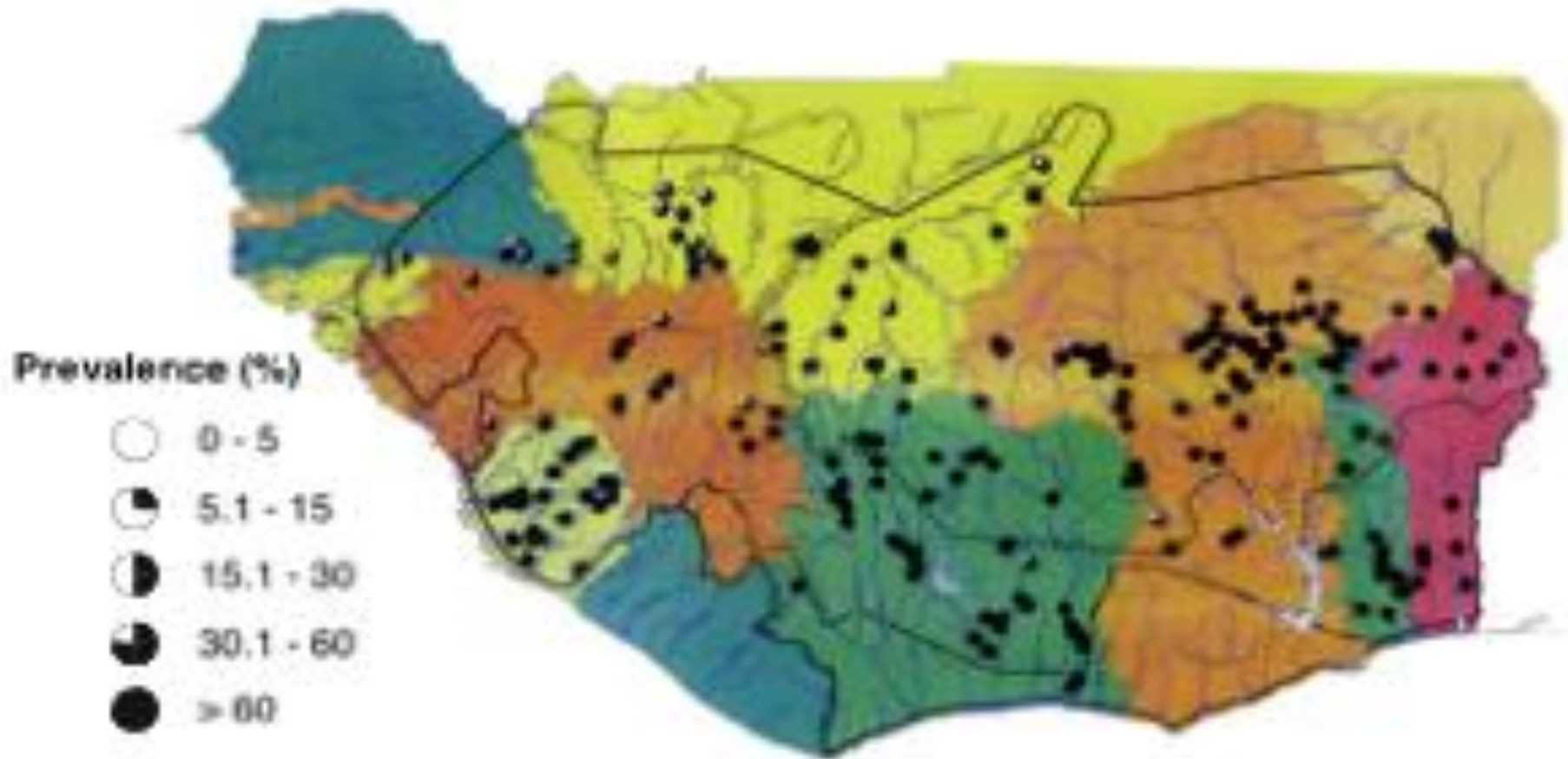
Onchocerciasis (River blindness)

In the 1970's control of the vector blackfly used initially DDT, and later more "acceptable" insecticides (OCP)

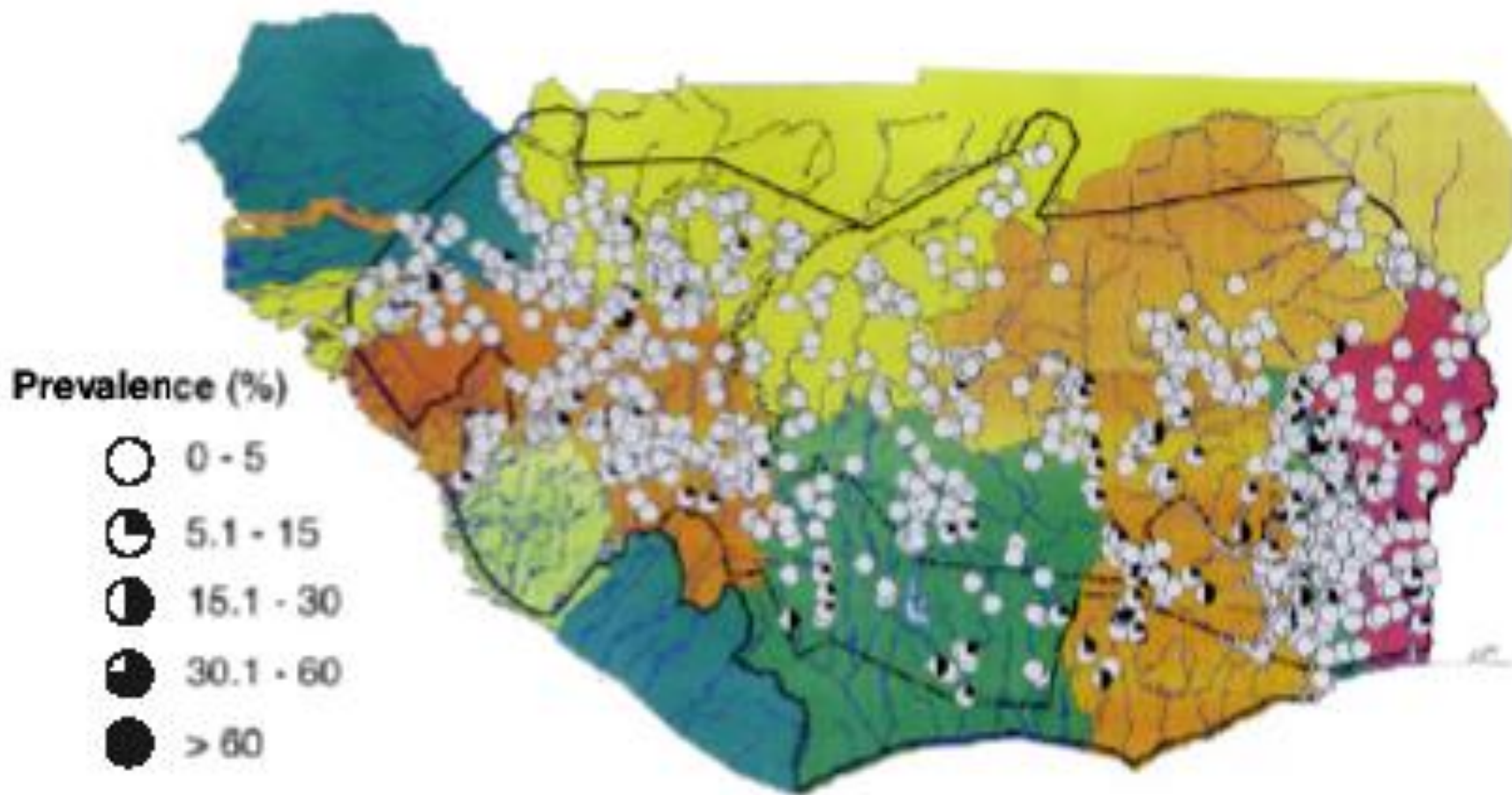
After 1985, treatment was with the donated Mectizan (courtesy of Merck)

20 years of river blindness control has been an outstanding success (OCP)

But expanded treatment is still required (APOC)

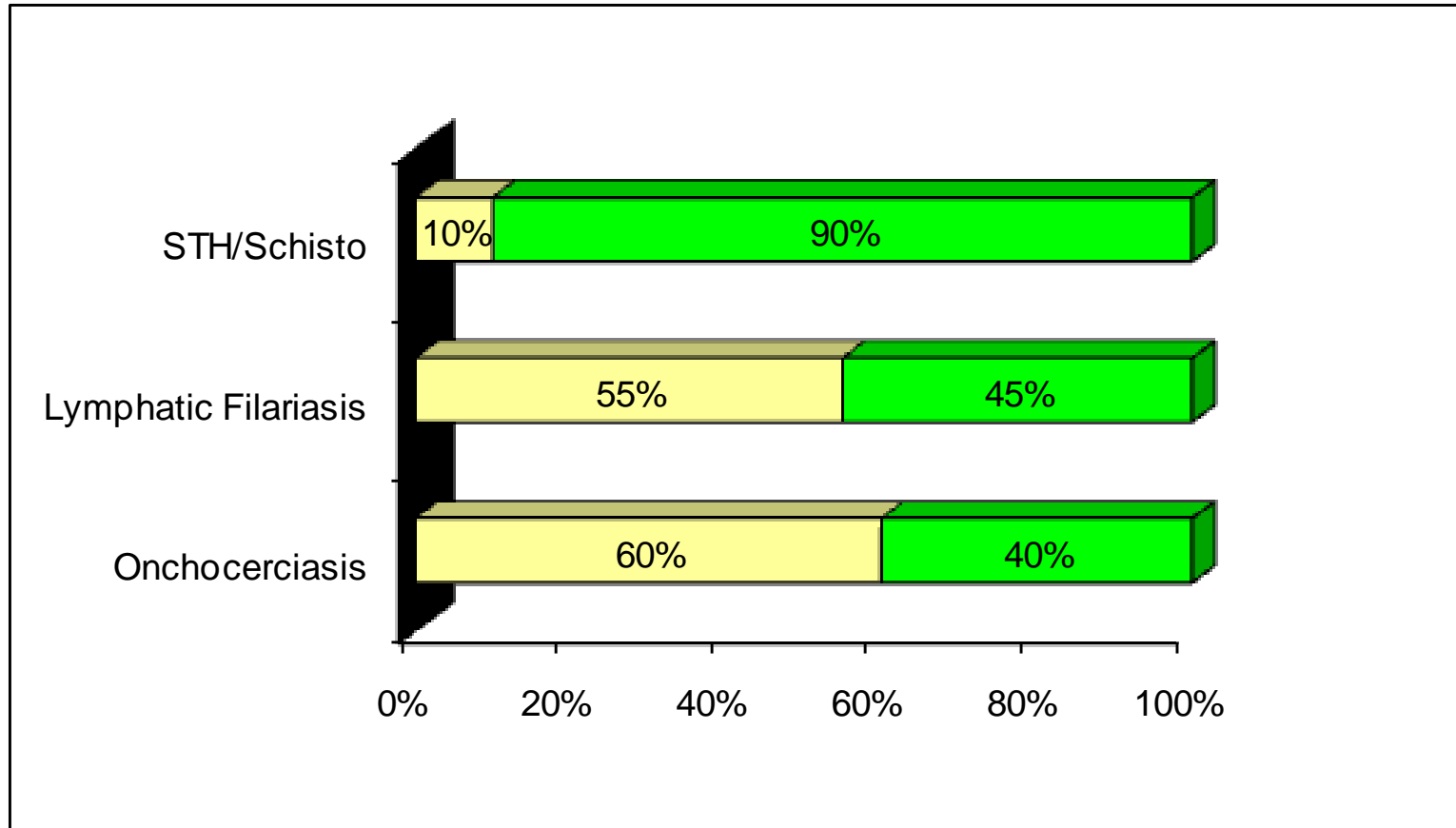


Onchocerciasis Prevalence 1974



Onchocerciasis Prevalence 2002

MDA Coverage 2009 (WHO data)



At risk population treated Untreated

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Drugs and vaccines for the future

Advanced purchasing ?

- The presentation would not be complete without mention of drug research and development and vaccine development
- Only pharmaceutical companies have the resources to develop new drugs and vaccines, but of course the resulting product may never find a market



USAID
FROM THE AMERICAN PEOPLE

Launched in 2006

USAID Neglected Tropical Diseases Cooperative Agreement

Initially \$100 million, then increased
announced in 2008 to \$350 million
and in 2010 to \$450 million



UKaid
from the Department for
International Development

DFID

Department for
International
Development

**Announced in 2008 £50 million
DFID Neglected Tropical Diseases**

Eventually released to:

CNTD Liverpool (LF)

APOC (Oncho)

WHO/Carter Center (Guinea Worm)

SCI (Schisto and STH)

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Bilateral Donors

USAID
(PEPFAR, PMI)

DFID

GTZ

Irishaid

CIDA

Noraid

NGOs

SCI,

Deworm the World

Save the Children

HKI

CBM

World Vision

Specialist Organisations

GNNTDC - advocacy for Gates

CDC – Center for Diseases Control

CARTER CENTRE

Drug Donation Programmes

Mectizan Donation Program –

handles mectizan for Merck

GSK – Albendazole donation
programme

International Trachoma Initiative

handles zithromax for Pfizer

Children Without Worms handles
mebendazole for Johnson and Johnson

Private donations

- Comic relief – how could we get to be a beneficiary - £73 million - ???
- The END Fund - \$100 million from HNW individuals
- Public donations – based on an independent recommendation

– www.givingwhatwecan.org

A great Opportunity

We are in a position to offer treatment and improve the quality of life for millions of school aged children in Sub Saharan Africa, and protect them for the future from the terrible consequences of the Neglected Tropical Diseases

Lets do it !!!!

Please visit

www.schisto.org

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Thank you