

**Innovation for the Neglected
Tropical Diseases : *The
Most Common Diseases in
the World's Most Unstable
Countries***

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The Neglected Tropical Diseases

Core Group

- **Protozoan Infections**
 - Human African Trypanosomiasis
 - Chagas Disease
 - Leishmaniasis
- **Bacterial & Viral Infections**
 - Buruli Ulcer
 - Dengue
 - Leprosy
 - Trachoma
- **Helminth Infections**
 - Ascariasis
 - Hookworm infection
 - Trichuriasis
 - Schistosomiasis
 - Lymphatic Filariasis
 - Onchocerciasis
 - Dracunculiasis

Neglected Tropical Diseases (NTDs)

- Most prevalent infections of poor people
- Over **ONE BILLION** people infected worldwide
- **Ascariasis** 807 million
- **Trichuriasis** 604 million
- **Hookworm** 576 million
- **Schistosomiasis** 207 million
- **Lymphatic Filariasis** 120 million
- **Trachoma** 84 million
- **Onchocerciasis** 37 million



Common Features of the NTDs

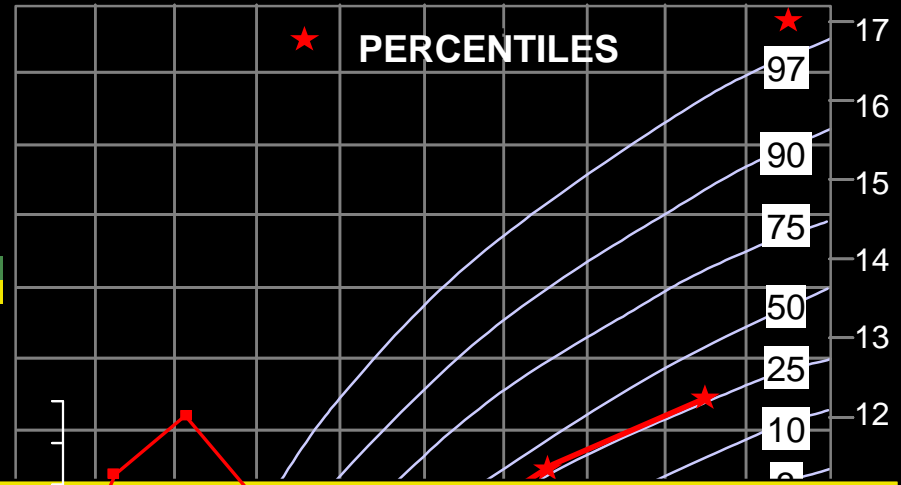
Chronic

Disfiguring

Stigmatizing

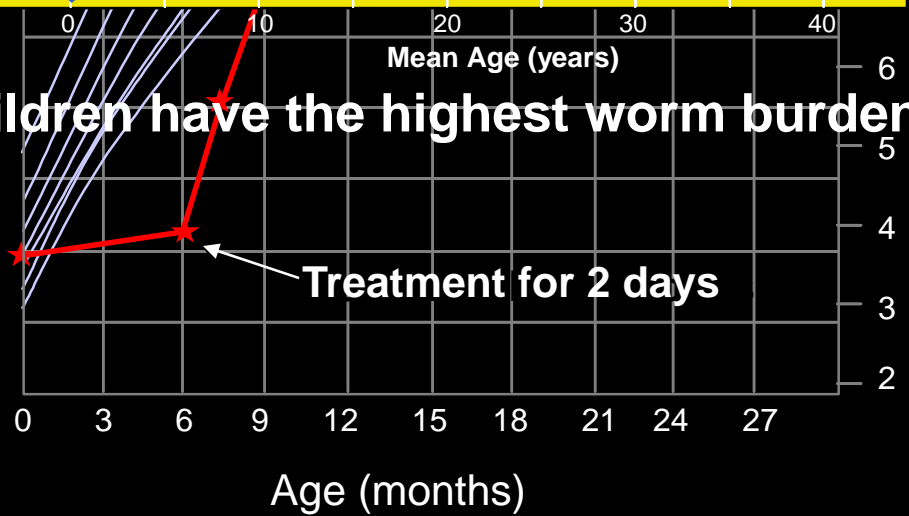


Impairment of child growth and development



Hookworm leads to 40% reduction in future wage earnings

Children have the highest worm burdens



Global Burden of NTDs



DISEASE

Lower Respiratory Infections

HIV/AIDS

Unipolar Depression

Diarrheal Disease

Ischemic Heart Disease

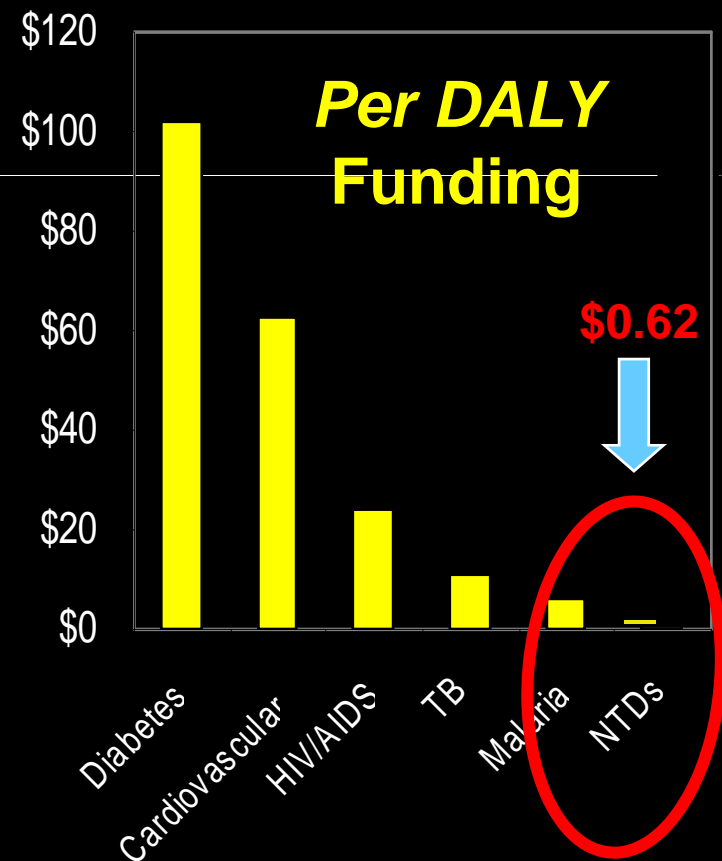
Neglected Tropical Diseases

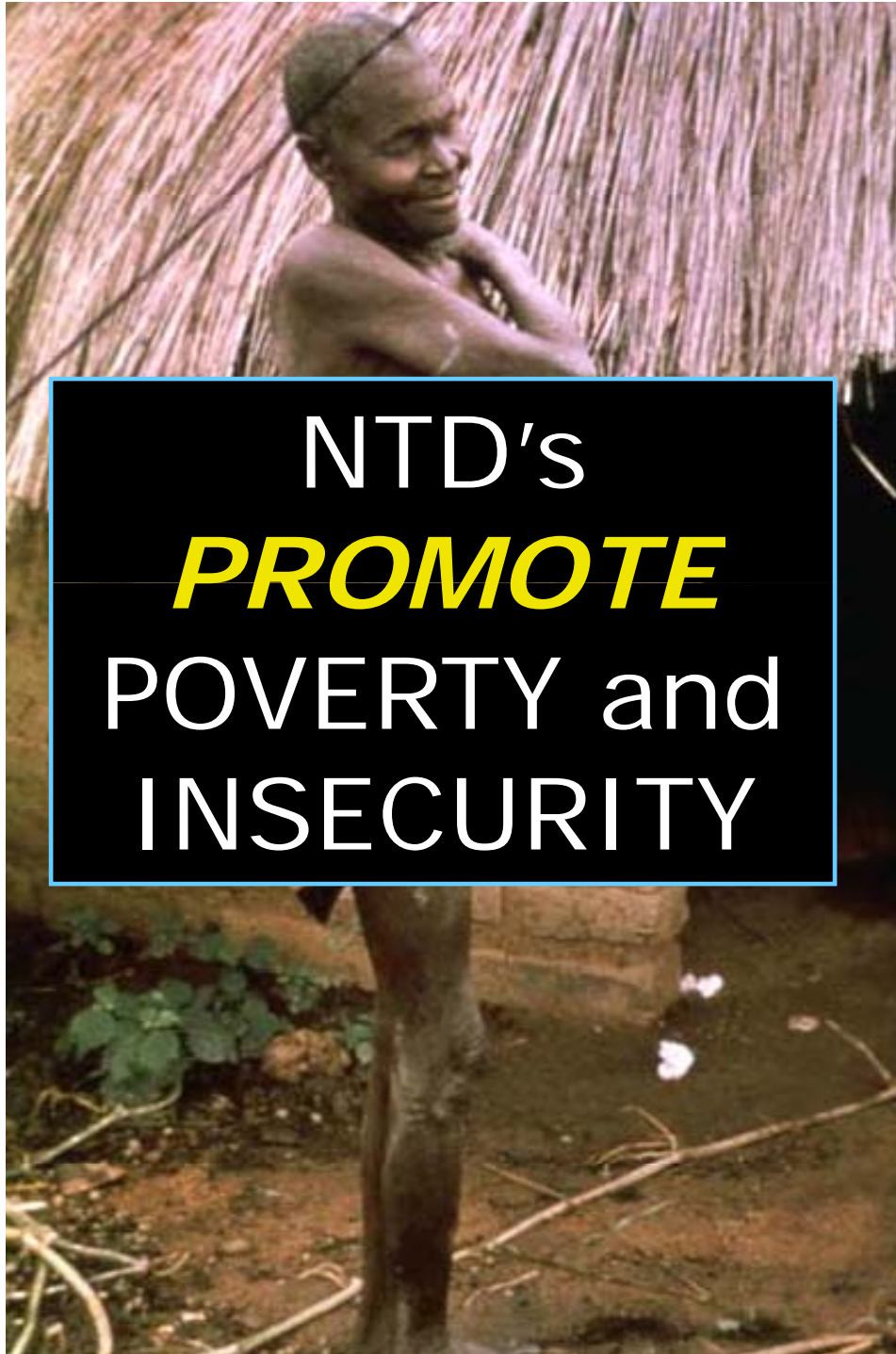
Cerebrovascular Diseases

Malaria

Road Traffic Accidents

Tuberculosis





NTD's
PROMOTE
POVERTY and
INSECURITY

NTDs and Poverty

NTDs and Conflict

- **Poverty Trap**
 - Impairment of intellectual and physical development in children
 - Adverse pregnancy outcome
 - Reduced productive capacity/worker productivity
- **Conflict Trap**
 - 73% of societies of the bottom billion in war
 - Halve the starting income and double the risk of civil war
 - 95% of global production of hard drugs conflict countries

The Neglected Tropical Diseases

The most common diseases in U.S. Diplomatic Hotspots

- Sub-Saharan Africa
 - Angola 11.3 million HOOKWORM / 6.1 million SCHISTOSOMIASIS
 - CAR 1.5 million HOOKWORM / 0.4 million SCHISTOSOMIASIS
 - DRC 31.0 million HOOKWORM / 14.9 million SCHISTOSOMIASIS
 - Somalia 1.6 million HOOKWORM / 1.8 million SCHISTOSOMIASIS
- Middle East
 - Iran 5.1 million ASCARIAIS / LEISHMANIASIS
- Asia
 - Burma > 2 million LF (ELEPHANTIASIS)
 - Cambodia 7.1 million HOOKWORM
 - N Korea 8.0 million ASCARIASIS / 1.3 million HOOKWORM
- Latin America & Caribbean
 - Colombia 3.0 million HOOKWORM / LEISHMANIASIS
 - Haiti 560,000 LF (ELEPHANTIASIS) (from Middle Passage)

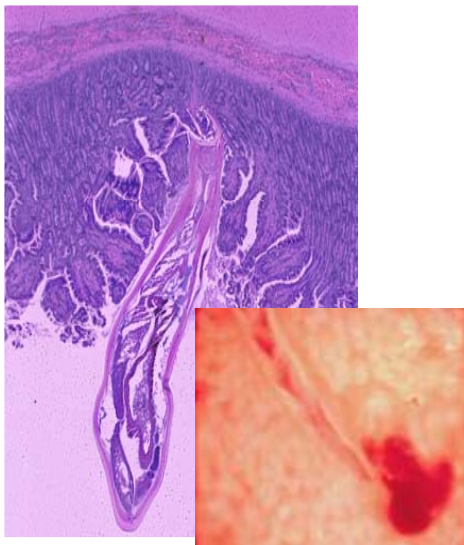
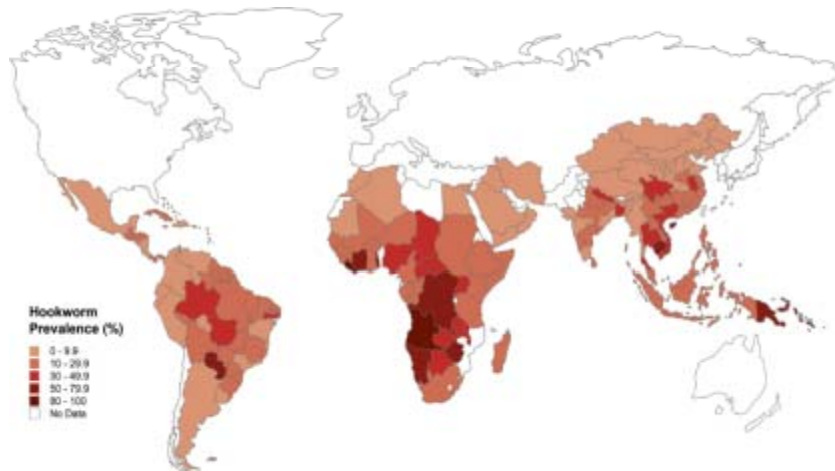
Destabilizing Elements of the NTDs

- The “Poverty Trap”
 - Reducing agricultural productivity
 - Abandonment of agricultural lands
 - Pivotal role in world’s food crisis
 - Reduces education and wage earning
 - Promoting ignorance
- Intimate relationship between NTDs and Conflict
 - LF among ethnic minorities in Burma
 - Leishmaniasis in guerilla areas of Colombia
 - Dracunculiasis in Sudan
 - Hookworm/Schistosomiasis/HAT/Onchocerciasis in Sudan, CAR, DRC, Angola

NEW TOOLS FOR DISEASE CONTROL

THE ANTIPOVERTY VACCINES

HUMAN HOOKWORM VACCINE INITIATIVE (HHVI): “Making a Vaccine for Peace”



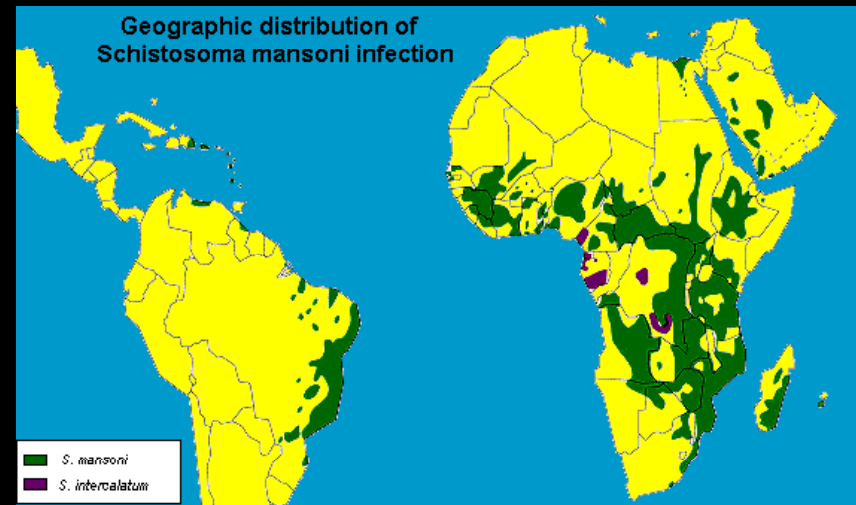
HHVI
Human Hookworm Vaccine Initiative

Product Development Partnership

Sabin Vaccine Institute
George Washington University
FIOCRUZ
Instituto Butantan
London School Hyg. Trop. Med.
Queensland Inst. Med. Res

Multivalent Vaccine to Combat Hookworm and Schistosomiasis

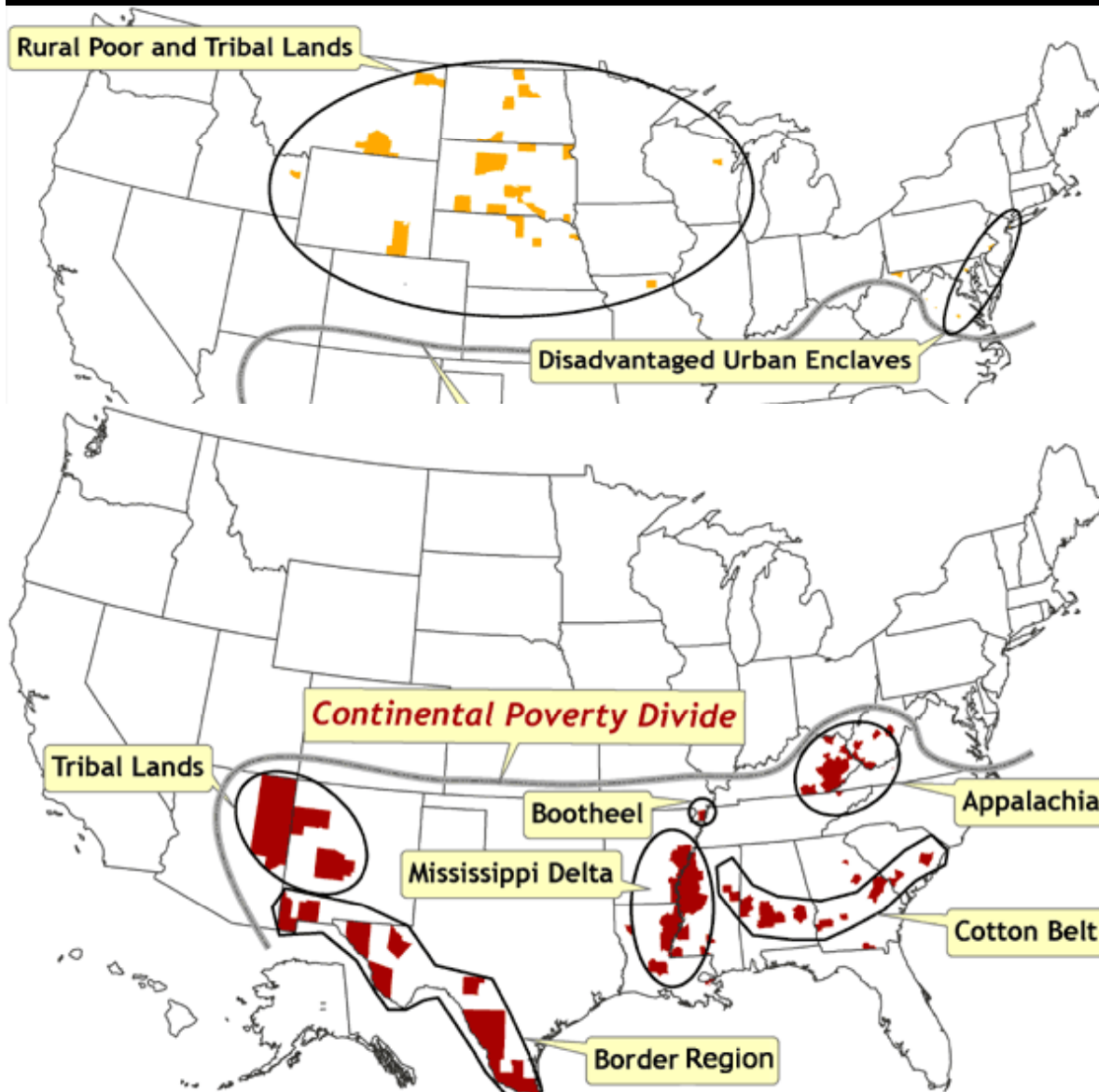
- A vaccine for the most prevalent serious infections of poor people and people living in conflict and instability
- An “ANTIPOVERTY VACCINE”
 - High rates of economic return
 - A Vaccine for Peace
 - A multilateral initiative



Geographic overlap of Hookworm And Schistosomiasis

*Waging Peace through Neglected Tropical Disease Control:
A U.S. Foreign Policy for the Bottom Billion*

Neglected Infections of Poverty in the U.S.



Chagas Disease
3,000-1,000,000 (Hispanics)

Congenital CMV
27,000 (50 X risk AfrAmer)

Cong Toxoplasmosis
4,000 (Hispanics/Afr Amer)

Trichomoniasis
884,000 (10 X risk AfrAmer)

Cysticercosis
41,000-169,000 (Hispanics)

Toxocariasis
1.3-2.8 million (>20% AfrAmer)

Hotez PLoS NTDs 2008