

Introduction to rodent, bat and snail borne diseases



REDUCING DEATHS AND SUFFERING
FROM **TROPICAL DISEASES**





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Vectors - Flies

- Body Lice
 - Transmit typhus, louse-relapsing fever
- Ticks
 - Transmit bacterial (relapsing fever borreliosis)
- Fleas
 - Transmit bacteria (plague, rickettsia)



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Vectors - Flies

- **Tsetse Flies**

- Transmit African Sleeping sickness



- **Sandflies**

- Transmit Leishmaniasis



- **Black Flies**

- Transmit onchocerciasis



- **Filth Flies**

- Mechanically transmit trachoma, cholera, myiasis, and many other diseases



?Vectors / Reservoirs

- Rodents
 - Transmit hantavirus
- Rats
 - Transmit Lassa Fever
- Bats/ Monkeys?
 - Reservoirs:
Transmit Marburg, Ebola

Water Snails

Carry schistosomiasis



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Vector – Borne Diseases

Disease	Causative agent	Vector Species	Host
Malaria	<i>Plasmodium spp.</i>	<i>Anopheles</i> mosquitoes	Humans
Filariasis	<i>W. bancrofti</i> , <i>B. malayi</i> nematodes	Mosquitoes (<i>Culex</i> , <i>Aedes</i>)	Humans
Onchocerciasis	<i>O. volvulus</i> nematode	<i>Simulium spp.</i> black flies	Humans
Schistosomiasis	<i>Schistosoma spp.</i> trematode	Snail species	Humans/animals
African Sleeping Sickness	<i>Trypanosoma spp.</i> protozoa	Tsetse flies esp. <i>Glossina spp.</i>	Humans/large mammals
Leishmaniasis	<i>Leishmania spp.</i> protozoa	Sandflies (<i>Lutzomyia</i> , <i>phlebotomine spp</i>)	Humans/small mammals



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Vector – Borne Diseases

Disease	Causative agent	Vector species	Host
Dengue	Dengue virus	<i>Aedes</i> mosquitoes	Humans/small mammals
Chikungunya	CHIKV virus	<i>Aedes</i> mosquitoes	Humans
Zika	Zika virus	<i>Aedes</i> mosquitoes	Humans
Yellow Fever	Flavivirus	<i>Aedes</i> mosquitoes	Humans/ animals
Typhus, Rickettsia	Bacteria	Fleas, Body lice	Humans/ animals
Leptospirosis	<i>Leptospira</i> bacterium	Other animals urine-oral route	Humans/ Animals



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Vector – Borne Diseases

Disease	Causative agent	Vector species	Host
Hantavirus	RNA virus	<i>Rodents</i>	Humans/small mammals
Rift Valley Fever	RFV virus	<i>Livestock (via Aedes and culex)</i>	Humans/livestock
Loa Loa	Roundworms	<i>Chysops flies (Mango, deer flies)</i>	Humans
Chagas	T. Cruzei parasite	Triatomine bugs	Humans
Guinea Worm	<i>Dracunculus parasite</i>	Copepods	Humans/Animals



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ACTIVITY: IDENTIFYING VECTORS



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Viral Hemorrhagic Fevers (other than DHF and YF)

Others

- Marburg
- Ebola

Rodents

- Lassa
- Hanta



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Schistosomiasis



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Schistosomiasis

Schistosomiasis or bilharzia is a chronic, parasitic disease caused by blood flukes (trematode worms) of the genus *Schistosoma*.

5 Species of *Schistosoma*

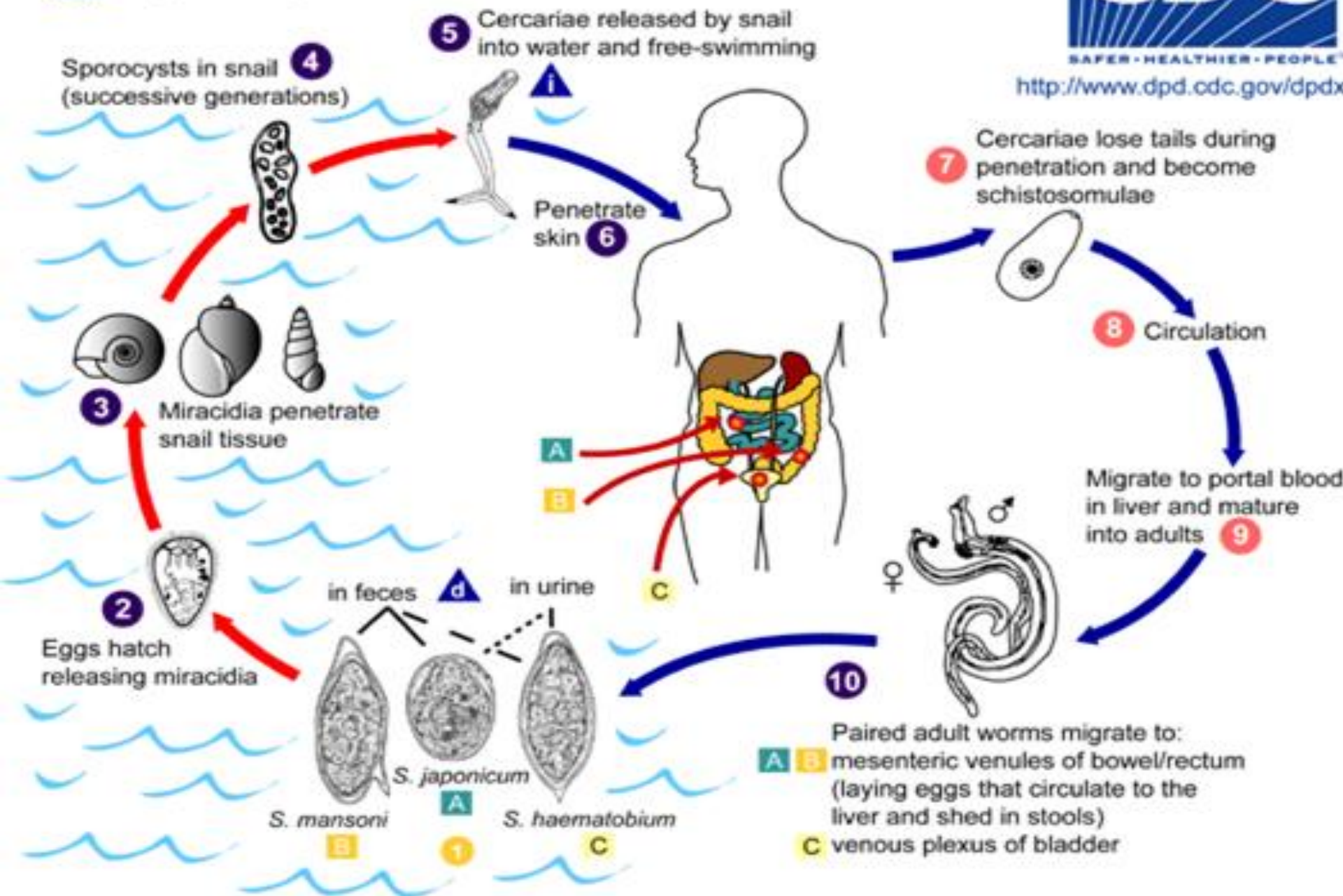
1. ***S. mansoni*** (present predominantly in South America and the Caribbean)
2. ***S. haematobium*** (Middle East, India, Portugal, Africa)
3. ***S. japonicum*** (China)
4. ***S. intercalatum*** (Africa)
5. ***S. mekongi*** (Mekon Basin in Asia)



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i = Infective Stage
d = Diagnostic Stage



Early Schistosomiasis

- Pruritic, papular rash hrs-1 day after exposure
 - More common in previously exposed



Epidemiology

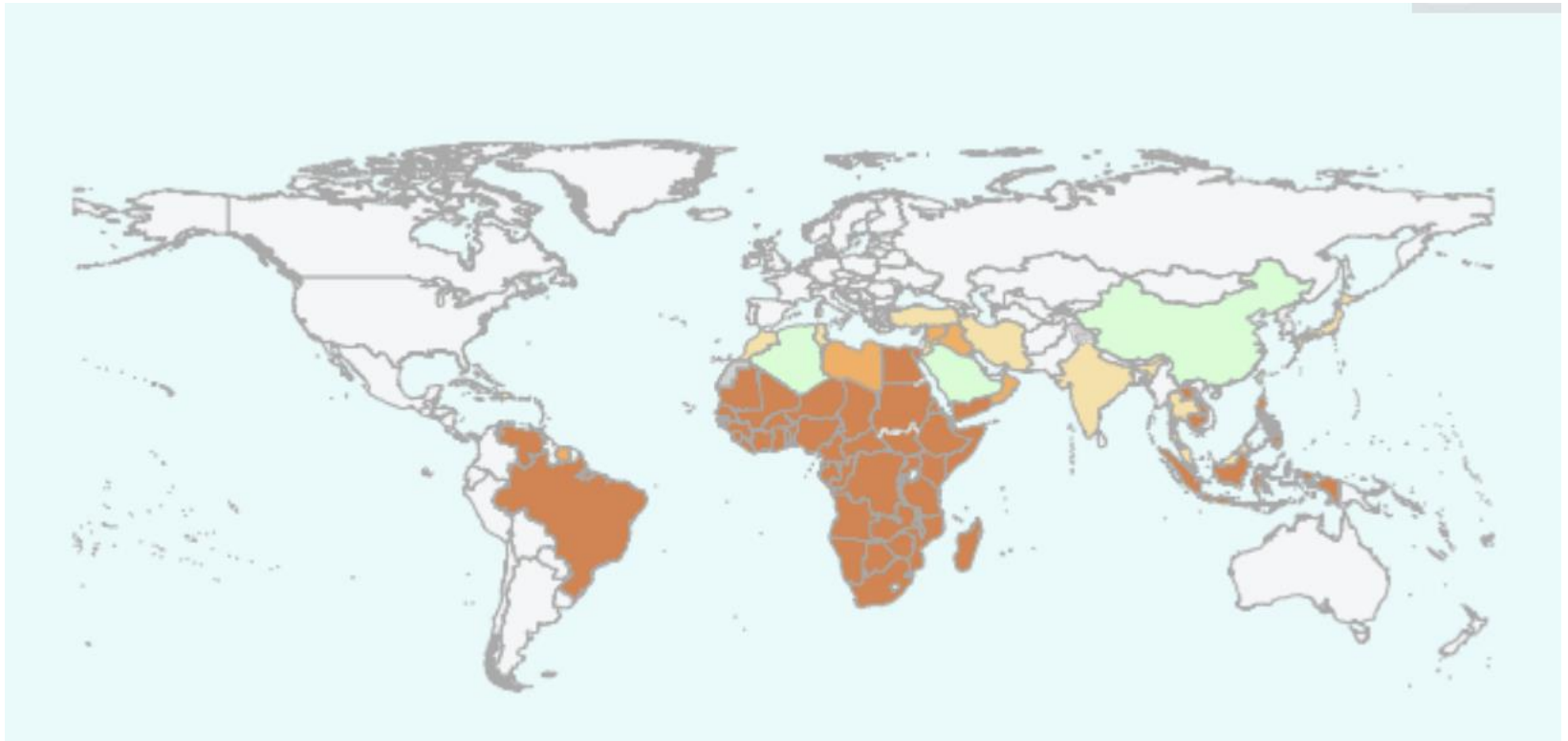
- 2 main clinical forms: intestinal, urinary
- Prevalent in poor communities without safe water or sanitation systems
- Up to 251.4 million people at risk
- > 75 million cases in 78 countries
- ~200,000 deaths/ yr in sub-Saharan Africa



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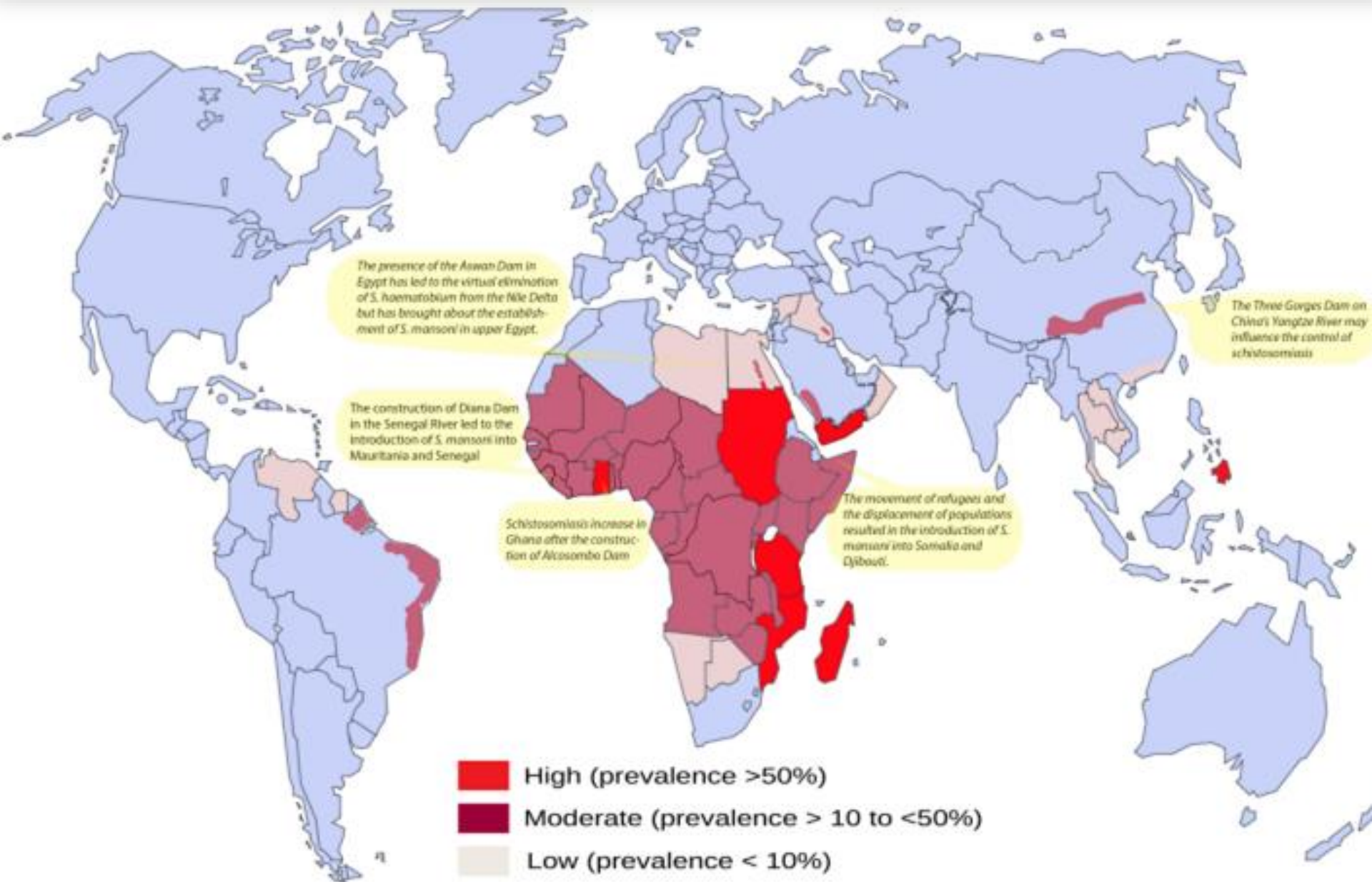
Global Distribution of Schistosomiasis (WHO 2024)



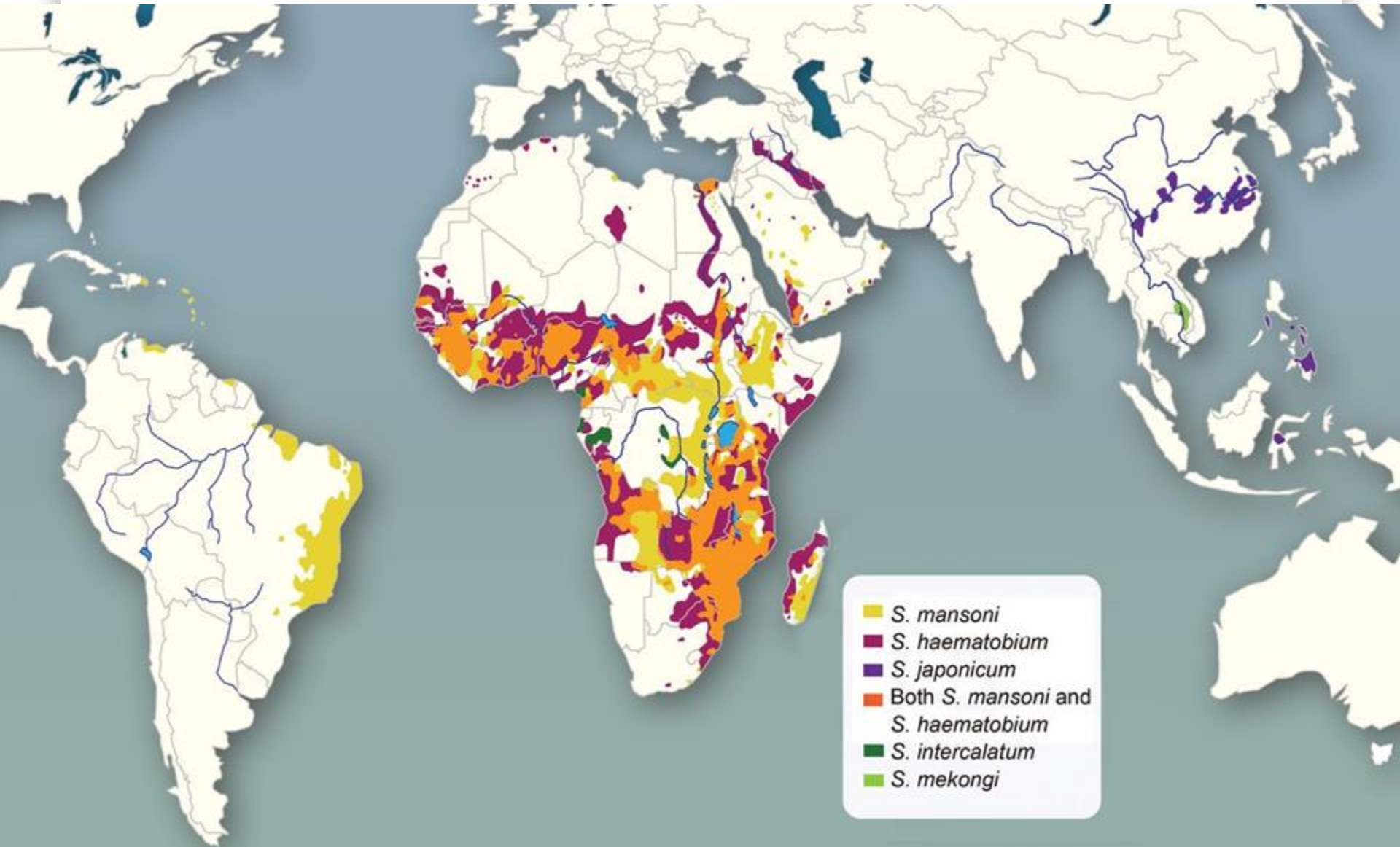
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Schistosomiasis prevalence 2020



Schistosomiasis – *Schistosoma* distribution (2015)



Prevalence of Parasitic Infections

Disease	At risk population	Estimated Cases	Annual Deaths
Malaria	3.3 billion	250 million	0.64 million
Schistosomiasis	251 million	>75 million	~200,000
Lymphatic Filariasis	50 million	51 million	?
African Trypanosomiasis	50 million	>3,500	~1360
Leishmaniasis	1 billion	~1.2 million	20,000 – 50,000
Onchocerciasis	180 million	7 million	?

The tip of the iceberg = The eyes of the hippopotamus

