

# Association between *Schistosoma mansoni* infection intensity, praziquantel side effects, and drug efficacy, in Ugandan school-aged children

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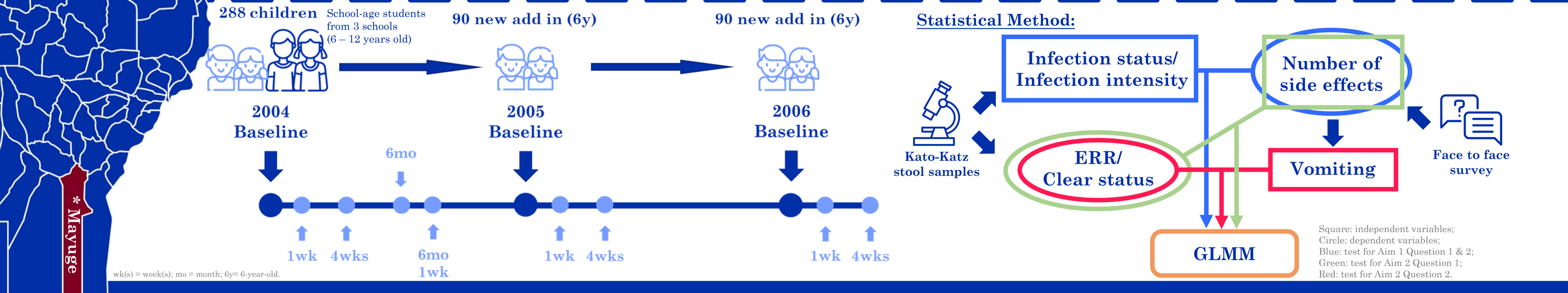
## Overview

**Schistosomiasis** is a debilitating parasitic disease infecting over 240-million people and is contracted through contact with contaminated freshwater. This project focuses on *Schistosoma mansoni*, the main cause of intestinal schistosomiasis. The World Health Organization's recommended control strategy is treatment with the **anthelmintic praziquantel**, administered by mass drug administration (MDA). However, praziquantel has **possible side effects including abdominal pain, diarrhoea, dizziness and vomiting**. Side effects have been reported as a reason for low treatment uptake during MDA campaigns.

## Aims

- Aim 1:** To examine whether *S. mansoni* infection prevalence and intensities are associated with side effects from treatment.
- Aim 2:** To examine whether the side effects of praziquantel treatment affect treatment success for *S. mansoni*.

## Methodology



## Results

Groups Name	Variance	Std. Dev.
CID	0.4084	0.639

Estimate	Std. Error	z-value	p-value	Significance <sup>a</sup>	
(Intercept)	0.13582	0.138	0.984	0.324901	
School					
Bwondha	-0.24592	0.14392	-1.709	0.087494	(.)
Musubi	0.29535	0.14589	2.025	0.042918	(*)
Year					
2005	-0.77637	0.15342	-5.06	4.18E-07	(***)
2006	-0.46889	0.152	-3.085	0.002037	(**)
Infection Status					
Infected	0.22524	0.09161	2.459	0.013945	(*)
Sex					
Female	0.01269	0.09148	0.139	0.889692	
School and Year					
Bwondha:2005	0.51801	0.21432	2.417	0.015652	(*)
Musubi:2005	0.2441	0.2032	1.201	0.229566	
Bwondha:2006	-0.71284	0.27183	-2.622	0.008732	(**)
Musubi:2006	0.6441	0.19259	3.344	0.000824	(***)

The infected students were **more likely** to experience side effects than the uninfected or undetectably infected students

Side effects were **not influenced** by infection intensity.

Groups Name	Variance	Std. Dev.
CID	6.569E-09	8.105E-05

Estimate	Std. Error	z-value	p-value	Significance <sup>a</sup>	
(Intercept)	-0.01677	0.41214	-0.041	0.9675	
School					
Bwondha	-0.22063	0.16601	-1.329	0.1838	
Musubi	0.24549	0.18106	1.356	0.1751	
Year					
2005	-0.7946	0.19016	-4.179	2.93E-05	(***)
2006	-0.47353	0.19364	-2.445	0.0145	(*)
Egg Count					
Before Treatment	0.1528	0.11101	1.376	0.1687	
Sex					
Female	0.01236	0.09039	0.137	0.8912	
School and Year					
Bwondha:2005	0.56876	0.26785	2.123	0.0337	(*)
Musubi:2005	0.2889	0.27084	1.067	0.2861	
Bwondha:2006	-0.75664	0.31971	-2.367	0.018	(*)
Musubi:2006	0.66797	0.28266	2.543	0.011	(*)

Students who experienced side effects had **better treatment efficacy** than students without side effects.

Groups Name	Variance	Std. Dev.
CID	4.276E-09	6.539E-05

Estimate	Std. Error	z-value	p-value	Significance <sup>a</sup>	
(Intercept)	0.49401	0.16785	2.943	0.00325	(**)
School					
Bwondha	-0.24081	0.21662	-1.112	0.26628	
Musubi	0.06855	0.21937	0.312	0.75468	
Year					
2005	-0.59179	0.21968	-2.694	0.00706	(**)
2006	-0.50633	0.22537	-2.247	0.02466	(*)
Side Effect					
Count of Every Child	0.09315	0.0348	2.677	0.00743	(**)
Sex					
Female	-0.15732	0.11102	-1.428	0.15339	
School and Year					
Bwondha:2005	0.30958	0.33203	0.932	0.35113	
Musubi:2005	-0.21178	0.311	-0.681	0.49589	
Bwondha:2006	0.73033	0.36362	2.063	0.03906	(*)
Musubi:2006	-0.37933	0.31571	-1.202	0.22955	

Groups Name	Variance	Std. Dev.
CID	365.20	19.11

Estimate	Std. Error	z-value	p-value	Significance <sup>a</sup>	
(Intercept)	-9.0827	1.4847	-6.1180	9.5E-10	(***)
Side Effect					
Vomiting	-0.6144	1.4235	-0.4320	0.6660	
Sex					
Females	-0.2360	1.2918	-0.1830	0.8550	
Year					
2005	-2.1391	1.3271	-1.6120	0.1070	
2006	-4.1628	2.1215	-1.9620	0.0497	(*)
School					
Bwondha	0.2397	1.8606	0.1290	0.8975	
Musubi	1.4493	1.4746	0.9830	0.3257	

Vomiting had **no negative influence** on the subsequent praziquantel efficacy.

## Conclusions

- *S. mansoni* infection prevalence is positively associated with side effects.
- The students who experienced side effects were more likely to clear infection.
  - The infection intensity did not explain the number of side effects
  - Vomiting did not affect treatment efficacy.