

# The Prevalence and Impact on Growth of Intestinal Parasites in Preschool Children in the Mangochi District of Malawi

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MEDICINE



# Conflicts of Interest

- None

# *Introduction*

- Human Enteropathogens exert a significant morbidity and mortality.
- Diarrhoeal diseases reported as the 6<sup>th</sup> leading cause of death in Malawi
- Helminth infection is associated with poor growth, anaemia and delayed development in school aged children.
- Correlation between parasitic infection in causing poor growth in Preschool Children has been less extensively investigated

# *Aims*

- To measure the prevalence of helminth and intestinal protozoal carriage in preschool children in the Mangochi district of Malawi
- To measure the prevalence of underweight, stunted and wasted children in the area.
- To examine any association between carriage and growth restriction or anaemia in preschool children

# Study Setting

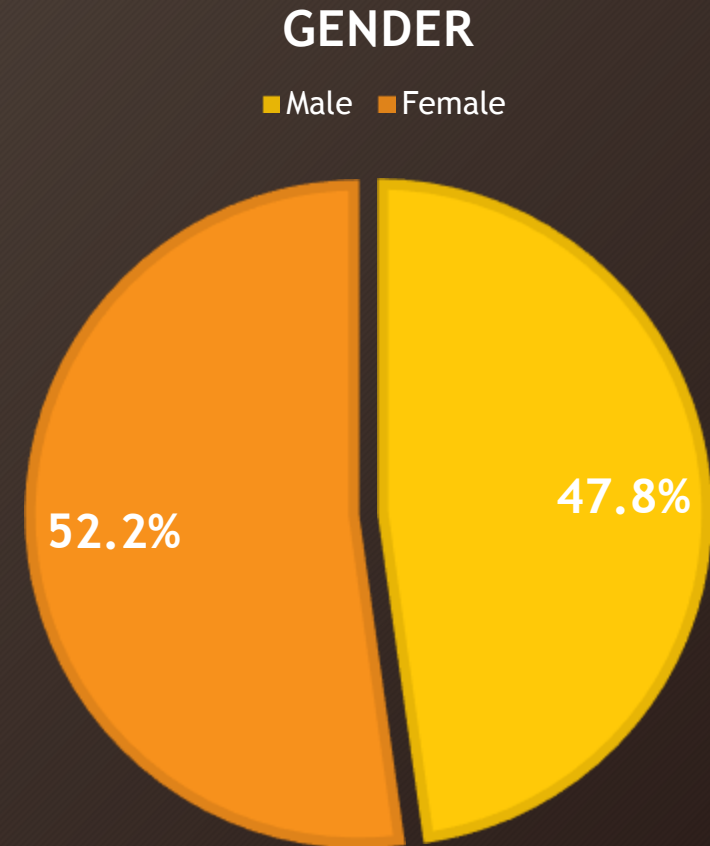
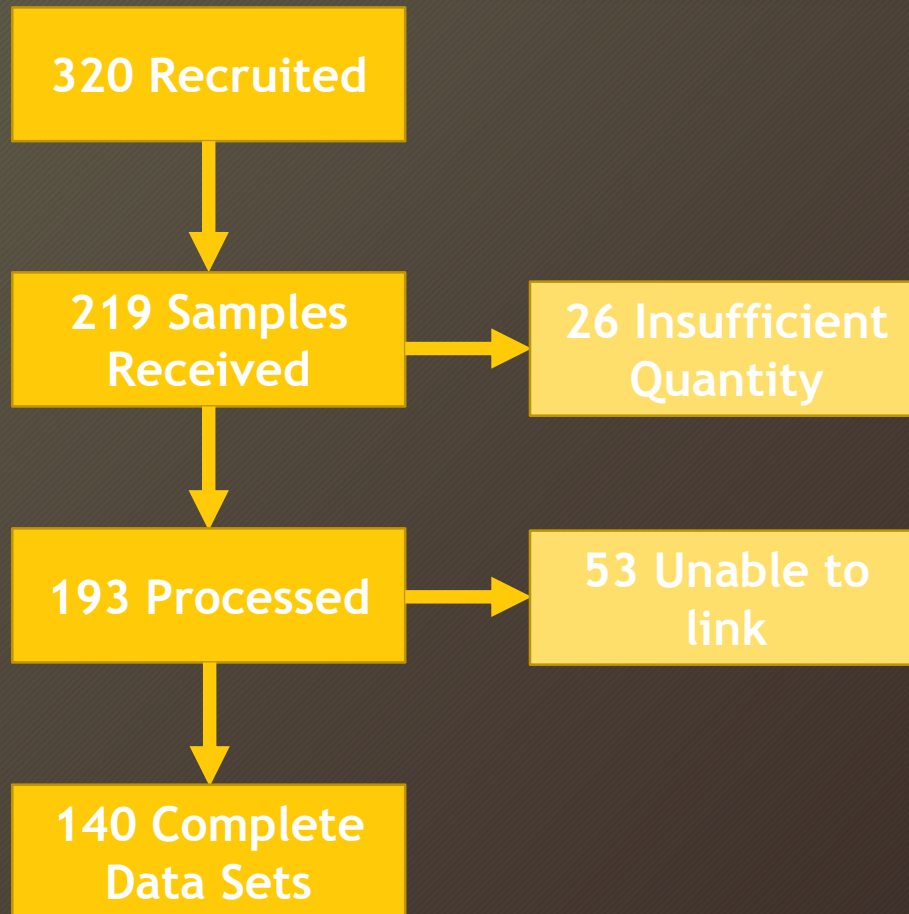
- Malawi is considered one of the poorest countries in the world.
- Mangochi district has a greater proportion of people living in poverty and higher under-five mortality.
- Mangochi also lags in school attendance, use of contraception and attendance of health professionals at delivery.
- There is a significant Malaria burden and HIV infection in fishing villages.



# *Methods*

- Design: A cross-sectional cluster survey of the stool carriage of children aged 1-72 months in the Mangochi district of Malawi between June and July 2016
- 40 children were randomly selected from census of 8 rural villages
- Stool was examined under direct microscopy after formol ether concentration.
- Haemoglobin concentration was measured using Hemocue Analyser
- Trained anthropometrists measured height, weight, MUAC and head circumference.

# Results



# Enteroparasite Prevalence

<i>Parasite</i>	<i>Total (n = 193)</i>	<i>Prevalence (%)</i>
<i>Hookworm sp.</i>	7	3.6
<i>Taenia sp.</i>	4	2.1
<i>A. lumbricoides</i>	2	1.0
<i>Hymenolepsis sp.</i>	2	1.0
<i>T. trichura</i>	1	0.5
<i>Strongyloides</i>	1	0.5
<b>Any Helminth</b>	<b>17</b>	<b>8.8</b>
<i>G. lamblia</i>	24	12.4
<i>E. coli</i>	20	10.4
<i>E. histolytica/dispar</i>	7	3.6
<i>E. hartmanni</i>	3	1.6
<i>I. butschlii</i>	1	0.5
<b>Any Protozoa</b>	<b>55</b>	<b>28.5</b>
<b>Total</b>	<b>72</b>	<b>37.3</b>



# - Prevalence of Infection between Age Groups

		Any Parasite			Any Helminth			Any Protozoa		
Age (years)	Total	% (n)	OR [95% CI]	p	% (n)	OR [95% CI]	p	% (n)	OR [95% CI]	p
0-1	17	17.7 (3)	1.00	-	5.9 (1)	1.00	-	11.8 (2)	1.00	-
1-2	22	27.3 (6)	1.75 [0.35 - 8.59]	0.48	4.6 (1)	0.76 [0.04 - 13.64]	0.85	22.7 (5)	2.21 [0.35 - 13.64]	0.38
2-3	36	36.1 (13)	2.63 [0.61 - 11.35]	0.17	16.7 (6)	3.20 [0.33 - 30.31]	0.28	19.4 (7)	1.81 [0.32 - 10.06]	0.49
3-4	32	34.3 (11)	2.44 [0.55 - 10.77]	0.22	9.4 (3)	1.65 [0.15 - 17.75]	0.87	25.0 (8)	2.50 [0.44 - 13.92]	0.27
4-5	26	46.2 (12)	4.00 [0.84 - 18.86]	0.06	3.9 (1)	0.64 [0.03 - 11.38]	0.75	42.3 (11)	5.50 [0.92 - 32.76]	0.04
5-6	7	57.1 (4)	6.22 [0.71 - 54.29]	0.06	0 (0)	-	-	57.1 (4)	10.0 [0.87 - 114.9]	0.02
<b>Total</b>	<b>140</b>	<b>49</b>	<b>Trend 0.0237</b>		<b>12</b>	<b>Trend 0.63</b>		<b>37</b>	<b>Trend 0.006</b>	

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## - Nutritional Status

- 47.8% of children were stunted
- 12.9% of children were underweight
- 5% of children were wasted

Age (Years)	Underweight			Stunting			Wasting		
	N	%	OR [95% CI]	N	%	OR [95% CI]	N	%	OR [95% CI]
0-1	2/17	11.8	1	6/17	35.3	1	3/17	17.7	1
1-2	5/22	22.7	2.21 [0.35-13.65]	12/22	54.6	2.20 [0.57-8.43]	3/22	13.6	0.74 [0.13-4.32]
2-3	4/36	11.1	0.94 [0.15-5.79]	18/36	50.0	1.83 [0.55-6.17]	1/36	2.8	0.133 [0.01 – 1.55]
3-4	4/32	12.5	1.07 [0.17 – 6.67]	16/32	50.0	1.83 [0.53-6.31]	0/32	0.0	0
4-5	3/26	11.5	0.97 [0.14-6.71]	12/26	46.2	1.57 [0.44-5.66]	0/26	0.0	0
5-6	0/4	0.0	0	3/7	42.9	1.38 [0.22-8.66]	0/7	0.0	0
<i>Total</i>	18/140	12.9		67/140	47.8		7/140	5.0	

# Relationship between Nutritional Status and Parasite carriage

- There was a trend for association between giardia carriage and:
  - Stunting - OR 1.43 [95% CI 0.52 - 3.88]
  - Underweight - OR 1.43 [95% CI 0.20 - 16.94]
- The mean haemoglobin of the cohort was 10.84 g/dL
- A weak association was found between raised haemoglobin and infection with any helminth ( $p=0.079$ )

# Discussion

- Overall prevalence of helminthic infections was less than 10%

**77.4%** - Patterns of helminth infection and relationship to BCG vaccination in Karonga District, northern Malawi. Transactions of the Royal Society of Tropical Medicine and Hygiene. 2002  
Randall AE, Perez MA, Floyd S, Black GF, Crampin AC, Ngwira B, et al.

**1.8%** - A national survey of the prevalence of schistosomiasis and soil transmitted helminths in Malawi. BMC Infectious Diseases. 2004.  
Bowie C, Purcell B, Shaba B, Makaula P, Perez M.

- Prevalence of stunting has not decreased over this time period. (47.5% v 47.8%) (Malawi Demographic and Health Survey 2000)
- Significant proportion of children revealed carriage of Protozoa (28.5%)

# *Discussion*

- The study did not find a significant association between carriage and poor growth
- Lower prevalence likely to represent low worm burden in each individual
- Two years of poor harvest have affected Malawi causing food insecurity
- Data on dietary intake, maternal literacy, concurrent infections, size and income of the family was not collected

# *Conclusions*

- Preschool Helminthic worms prevalence in Mangochi District is generally low.
- Prevalence of stunting has not reduced in the District
- There is a significant prevalence of intestinal protozoal infections.
- Further larger studies would be beneficial to clarify the significance of association.



# Acknowledgements

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