

# The prevalence of intestinal parasites and associated risk factors in school-going children from informal settlements in Nakuru town, Kenya

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Abstract Reference

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- ❖ Low prevalence of intestinal parasites in informal settlements of Nakuru town
- ❖ Low socioeconomic status and hygiene are among the most common risk factors to infection
- ❖ Intensive hygienic education, deworming of domestic animals and programs that support poverty eradication could facilitate long-term control of intestinal parasites in informal settlements.

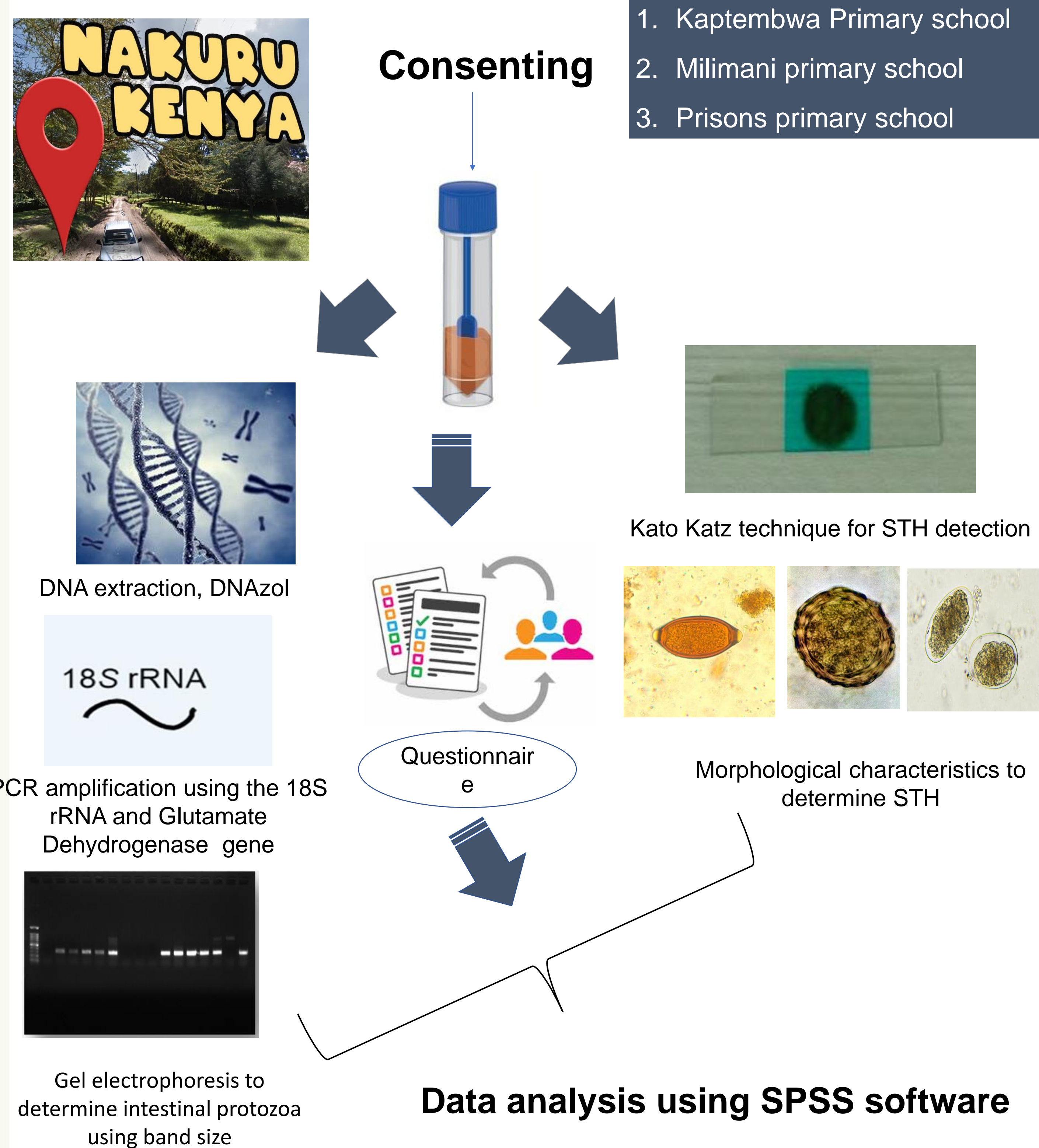
## BACKGROUND

Health and economic impact of intestinal parasitic diseases is huge. These diseases are prevalent in regions with poor or inadequate sanitation and sewerage facilities mainly in developing and underdeveloped countries. While most of rural areas have been the focus of national control strategies, urban informal centers have recently emerged as disease foci. However, transmission dynamics in these centers is different from rural foci, making deployment of standard control strategies of provision of clean water, sanitation, and hygiene (WASH) potentially inadequate. Consequently, understanding disease transmission dynamic in urban informal centers is important in deployment of appropriate control strategies

The objectives of this cross-sectional study were

- To determine the prevalence intestinal parasites in school going children from informal settlements of Nakuru county, Kenya
- To explore risk factors for intestinal parasitic infections in school going children from informal settlements of Nakuru county, Kenya
- To determine the co-infection rates of the different organisms in informal settlement of Nakuru.

## METHODS



## RESULTS

### Prevalence of intestinal parasites intensity of infection

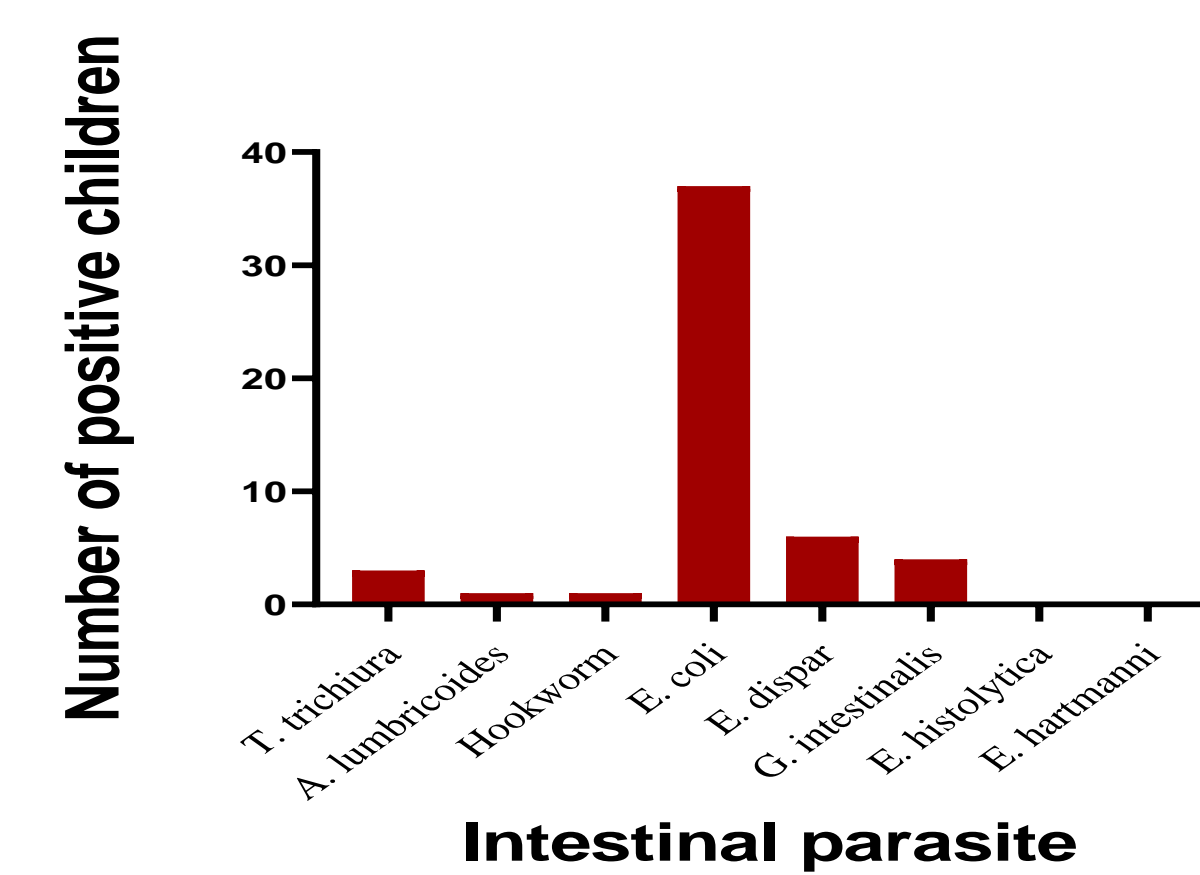


Figure 1: Prevalence of intestinal parasites

- ❖ Overall prevalence was 17.3% (43/248)
- ❖ Intestinal helminths (STH) prevalence was 1.2%
- ❖ Intestinal protozoa prevalence was 41.7%

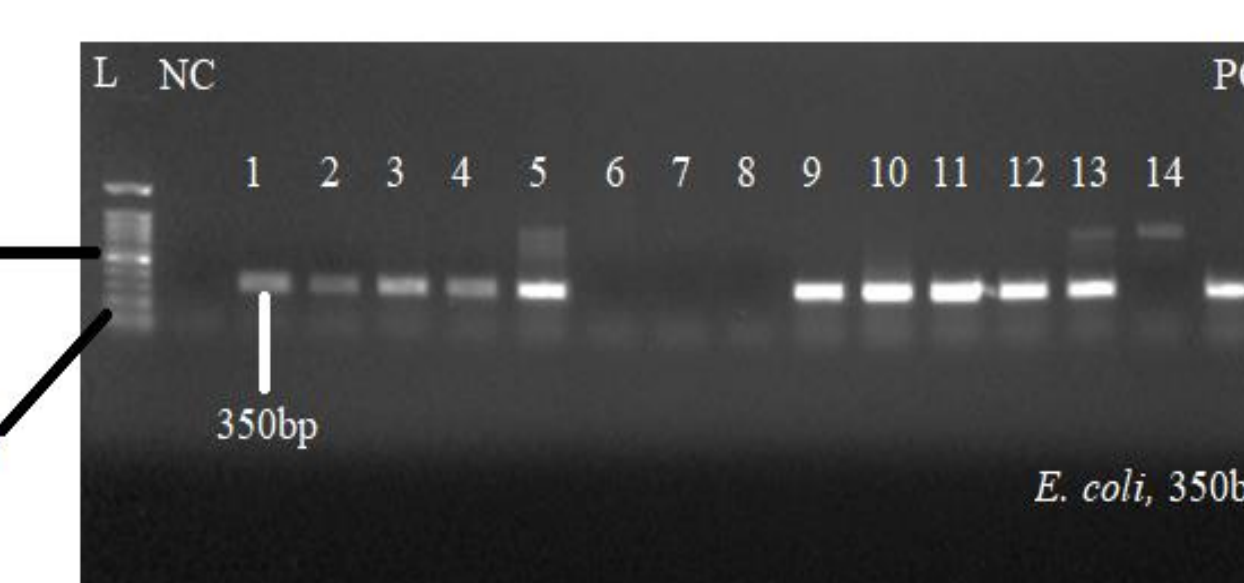


Figure 2: Gel image from *E. coli* amplification :

- ❖ The STH intensity of infections was light (<5000)
- ❖ No child tested positive for *Entamoeba histolytica* and *Entamoeba hartmanni*
- ❖ *Entamoeba coli* was the most common intestinal protozoa diagnosed

### Risk factors for infection

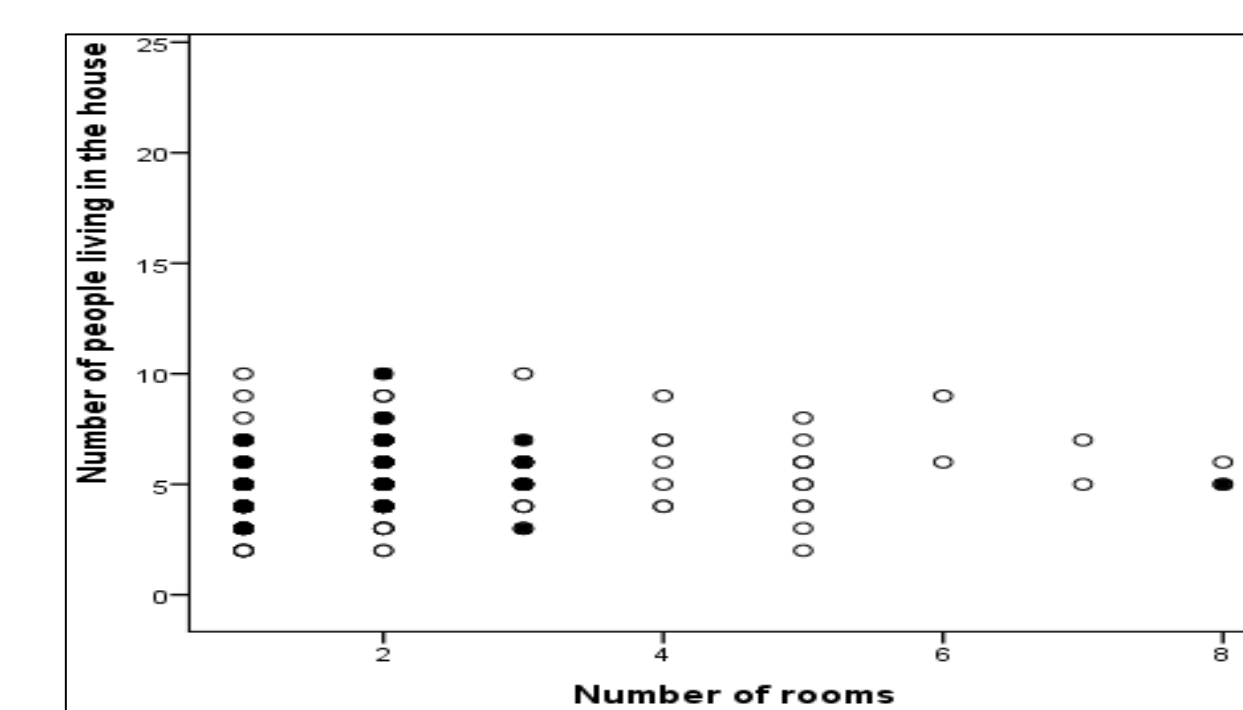
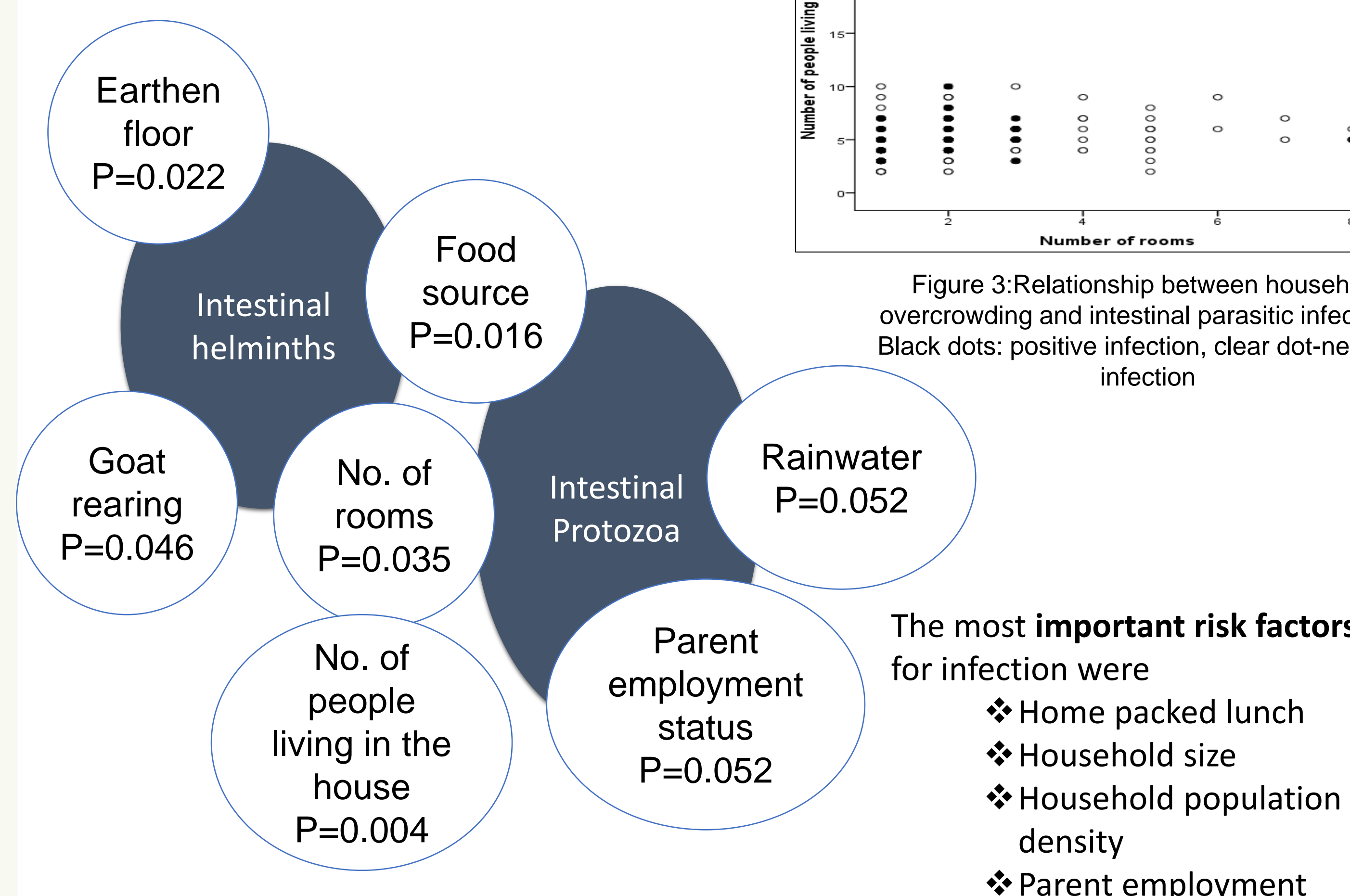


Figure 3: Relationship between household overcrowding and intestinal parasitic infections. Black dots: positive infection, clear dot: negative infection

### Demographic characteristics

Characteristic	n	(%)
<b>Age groups (years)</b>		
8-9	50	20.2
10-11	167	67.3
12-13	11	12.5
<b>Sex</b>		
Female	141	56.9
Male	107	43.1
<b>Occupation of the parent</b>		
Unemployed	39	15.73
Farmer	9	3.6
Formal employment	68	27.4
Businessman	76	30.7
Informal	41	16.5
<b>Source of water</b>		
Piped water indoors	43	17.3
Piped water outdoor	139	56.1
Wells	5	2.1
Water vendors	22	8.9
Rainwater	35	14.1

Table 1 & 2: Demographic characteristics of children from informal settlement of Nakuru

Characteristic	n	(%)
<b>Type of water used for drinking</b>		
Direct from source	14	5.7
Commercial treatment	139	56.1
Boiled water	85	34.3
Bottled water	1	0.4
<b>Means of garbage disposal</b>		
Backyard	53	21.4
Farm	19	7.7
Outside/public disposal	165	66.5
Collected by garbage collectors	10	4
<b>Means of faecal waste disposal</b>		
Private toilet	73	29.4
Shared toilet	159	64.1
Flying toilet	1	0.4
<b>Where the child ate</b>		
In school	171	69
Home-packed lunch	77	31

### Multiple Infections

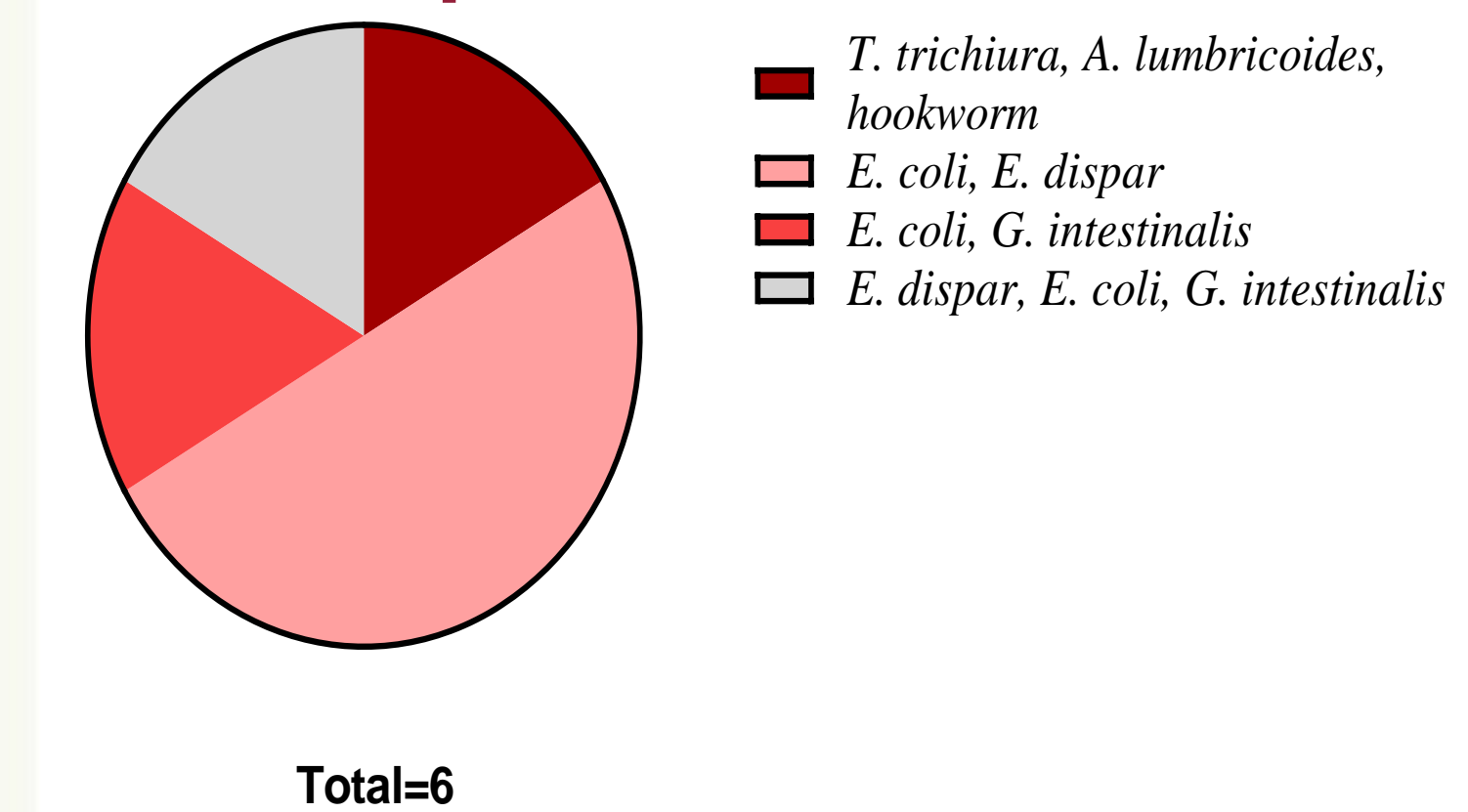


Figure 4: Occurrence of multiple infections

- ❖ Multiple STH infections were observed in one child (0.4%)
- ❖ Multiple infections caused by intestinal protozoan parasites were recorded in 5.2% of participants ( $n=5$ ) as shown in the figure 4

## CONCLUSIONS

- ❖ Low prevalence of intestinal parasites was reported as compared to similar settings of Nairobi<sup>1</sup> Thika<sup>2</sup> and Kisumu<sup>3</sup> due to differences in methods of detection, socio-economic activities along ecological and environmental differences
- ❖ Low levels of multiple infections were observed, and this was expected since our study population was asymptomatic. Other factors influencing appearance of symptoms include
  - the duration of infection and
  - the immune status of the child<sup>4</sup>.
- ❖ Food hygiene is an important factor in the transmission of intestinal parasites
- ❖ Low socioeconomic factors are evident risk factor for intestinal parasitic infections. Programs based on
  - reducing household overcrowding
  - minimize contact with animals
  - improve water supply of water may successfully minimize infections.
- Intensive hygienic education, deworming of domestic animals and programs that support poverty eradication could facilitate long-term control of intestinal parasites in informal settlements.

## ACKNOWLEDGEMENTS



KEMRI for funding this study



Department of Biochemistry and Molecular Biology for guidance and support provision



Nakuru county, Ministry of Education and Health for support to carry out this study

## MORE INFORMATION / REFERENCES

- Mbae CK, Nokes DJ, Mulinge E, Nyambura J, Waruru A, Kariuki S. Intestinal parasitic infections in children presenting with diarrhoea in outpatient and inpatient settings in an informal settlement of Nairobi, Kenya. *BMC Infect Dis.* 2013;13:243. doi: 10.1186/1471-2334-13-243.
- Ngonjo TW, Kihara JH, Gicheru M, Wanzala P, Njenga SM, Mwandawiro CS. Prevalence and intensity of intestinal parasites in school age children in Thika District, Kenya. *Afr J Health Sci.* 2012;21(3-4):153-60.
- Suchdev PS, Davis SM, Bartoces M, Ruth LJ, Worrell CM, Kanyi H, et al. Soil-transmitted helminth infection and nutritional status among urban slum children in Kenya. *Am J Trop Med Hyg.* 2014;90(2):299-305. doi: 10.4269/ajtmh.13-0560.
- Miller SA, Rosario CL, Rojas E, Scorza JV. Intestinal parasitic infection and associated symptoms in children attending day care centres in Trujillo, Venezuela. *Trop Med Int Health.* 2003;8(4):342-7. doi:10.1046/j.1365-3156.2003.01011.x.

This study can be accessed from DOI: [10.4314/mmj.v32i2.5](https://doi.org/10.4314/mmj.v32i2.5)

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Presented at the  
Inaugural ONE HEALTH Conference  
1 - 3 November 2021  
[sbs.co.za/AfricaCDC2021](http://sbs.co.za/AfricaCDC2021)

