



***Intestinal Parasitic Infections During  
Pregnancy  
ENAT Learning***



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# Outline

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- Introduction
- ANC recommendations
- ENAT findings
- Learnings / Implications
- Limitations
- Conclusion

# Introduction

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- Soil-transmitted helminths (STH) is one of the major public health problems worldwide.
- Globally, approximately 1.5 billion people are affected by STH.
- Majority of women of reproductive age (WRA) including pregnant women are the most affected.
- WRA in Southeast Asian and African regions are responsible for 74.7% of all STH risk among WRA.
- Hookworm and whipworm (*Trichuris trichiura*) are the most common helminths among pregnant women.



# Introduction

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- Soil-transmitted helminth infections are among the most common infections in humans, caused by a group of parasites commonly referred to as worms, including roundworms, whipworms and hookworms.
- Those living in poverty are most vulnerable to infection which can impair nutritional status by causing:
  - internal bleeding which can lead to loss of iron and anaemia;
  - intestinal inflammation and obstruction;
  - diarrhoea; and
  - impairment of nutrient intake, digestion and absorption.



# Consequences of helminthic infection on maternal and child health

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- Pregnant women with intestinal parasitic infection are at increased risk of maternal complications and adverse perinatal outcomes such as
  - anemia,
  - low birth weight
  - Preterm birth, and
  - perinatal mortality

## IP during pregnancy

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- Globally, around 138.8 million pregnant and lactating women live in areas where these parasites are intensively transmitted and are in need of treatment and preventive interventions.
- Systematic reviews conducted in Ethiopia showed the overall prevalence of intestinal parasitic infections among pregnant women was 29-31.8%.
- The major categories of intestinal parasites during pregnancy include soil-transmitted helminths and protozoa.

# ANC recommendations

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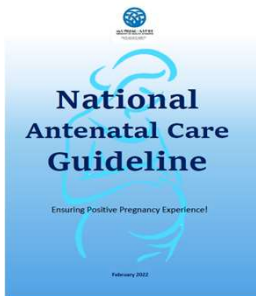
- The 2016 WHO ANC guideline includes 49 recommendations grouped into five topic areas
  - A. Nutritional interventions (14)
  - B. Maternal and fetal assessment (13)
  - C. Preventive measures (7)
  - D. Interventions for common physiological symptoms (6)
  - E. Health systems interventions to improve the utilization and quality of ANC (9)

# Deworming during pregnancy

Deworming is one of the strategies to reduce the burden of anemia among pregnant women



- Preventive chemotherapy using single-dose albendazole (400 mg) or mebendazole (500 mg) in pregnant women after the first trimester in areas where the prevalence of anaemia in pregnancy is 40% or higher and the baseline prevalence of hookworm and/or T, trichiura infection is 20% or higher



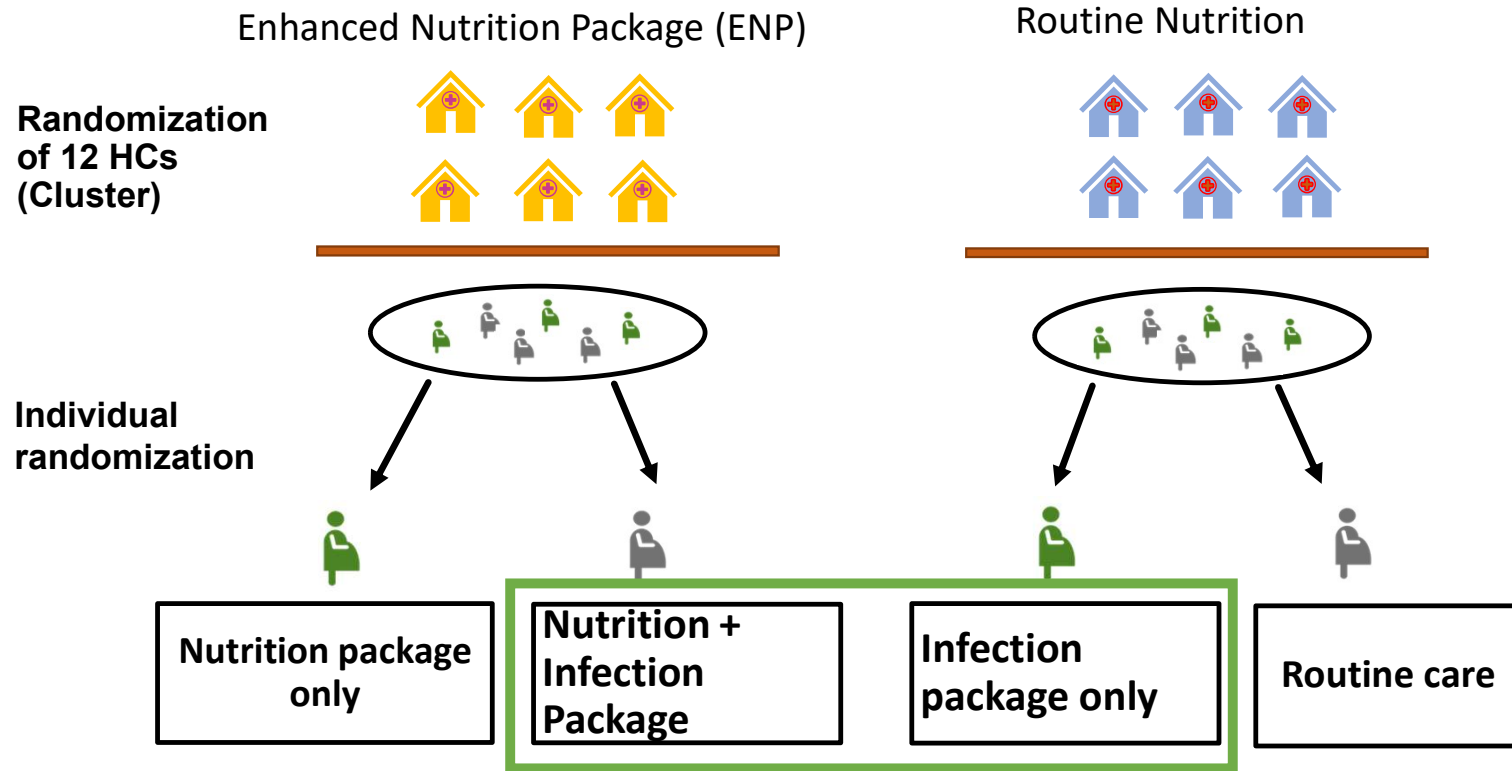
- Deworm all pregnant women with a single dose of albendazole (400 mg) or mebendazole (500 mg) after the first trimester.

- Promote personal hygiene and environmental sanitation
- However, there are no recommendations for protozoal intestinal infection prophylaxis



# ENAT Study Design

Open-label pragmatic comparative effectiveness study  
2x2 Factorial randomized controlled trial



# ENAT study protocol for IP infections treatment

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- At study initiation, mebendazole (500 mg) was provided two times in pregnancy consistent with WHO guidelines.
- September 2020 protocol was modified to a single presumptive deworming in the third trimester due to health provider concerns regarding medication package insert information contraindicating use in early pregnancy
- May 2021, with the adoption of new Ethiopian FMOH ANC guidelines allowing earlier provision of antihelminthics in pregnancy, the ENAT protocol was modified to provide presumptive deworming in the second trimester followed by a stool screening and treatment at least 4 weeks later using wet mount microscopy available.
- Women identified with parasitic infections are treated as per FMOH recommendations



# Findings from ENAT study

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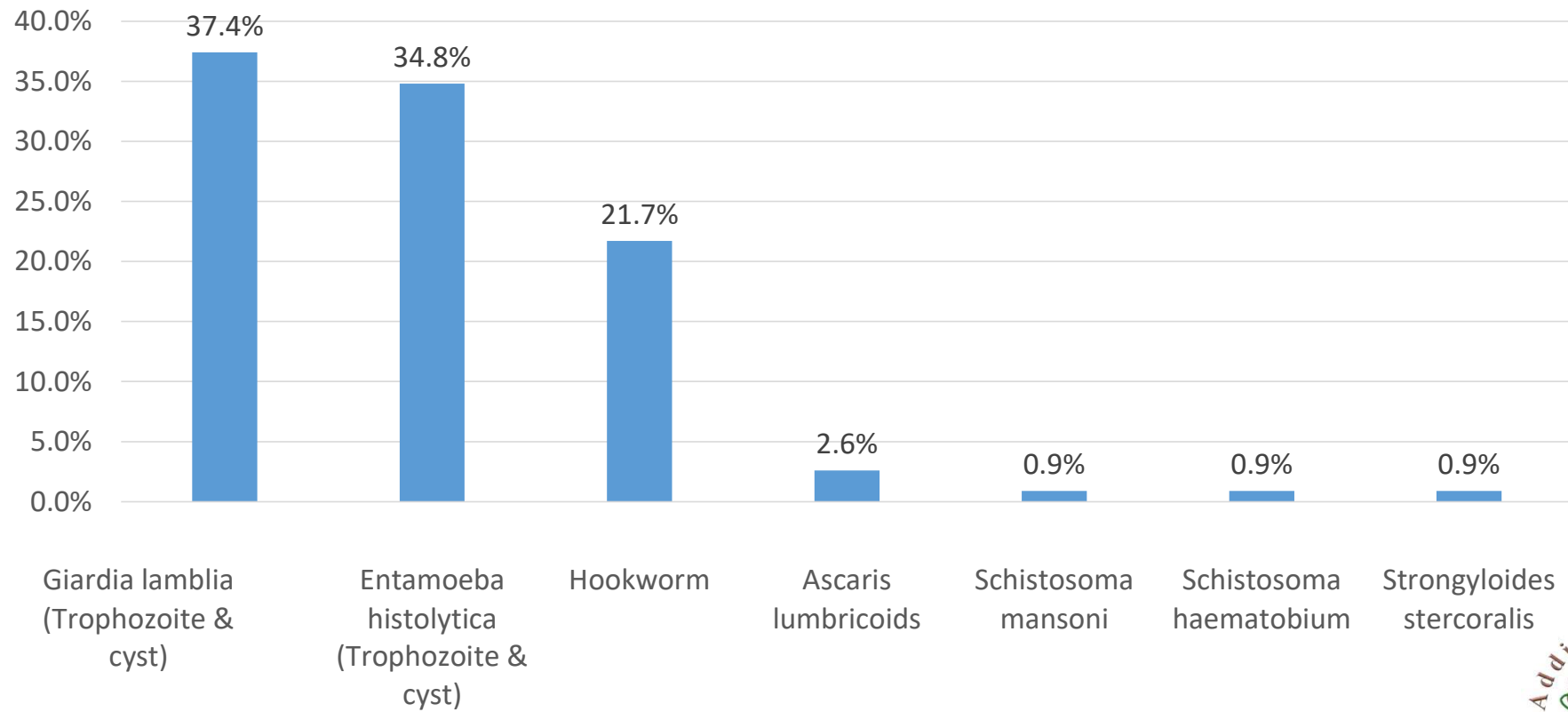
- Stool samples were collected from a subset of 350 women
- 25 was the median age 43.3% had no formal education
- 86.5% had access to a public tap and dug well sources for drinking
- 66.3% had improved toilet facilities

# Findings from ENAT study

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- One hundred nine women (31.0%) were found to have a parasitic stool infection after prior deworming.
- **Six** mothers had co-infections with at least two parasites with trophozoites of *Giardia lamblia* and *Entamoeba histolytica* co-infection being dominant.
- 15 (19.2%) women reported gastrointestinal symptoms, while 63 (80.7%) were asymptomatic.
- The most common infections were
  - ***Giardia lamblia*** (n=43, 37.4%),
  - ***Entamoeba histolytica*** (n=40, 34.8%), and
  - ***Hookworm*** (n=25, 21.7%).

## Types of parasitic infections among pregnant women who received presumptive deworming (n=350), Amhara region, Ethiopia



# Discussion

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- Studies in similar settings have shown that the cure rates of hookworm with a single dose of albendazole/ mebendazole treatment were low.
- Certain populations may have a degree of innate resistance to the medications in use.
- Drug resistance to mebendazole in human hookworms has been reported in Mali.
- Other factors could be a recurrence of infections related to poor sanitation and hygiene and low socioeconomic status.

# Conclusions

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- The prevalence of intestinal parasitic infections in late pregnancy is high in rural Amhara despite current ANC deworming practices.
- It is critical to understand the type and prevalence of intestinal parasitic infections in the specific setting to better tailor clinical management and recommendations
- If supported with further studies to suggest the need for presumptive protozoal treatment.
- Identifying the right dose, regime, and type of drug is needed to effectively treat IP during pregnancy and thereby reduce adverse pregnancy outcomes.
- Further research is needed to inform optimal prophylaxis and treatment regimens in pregnancy.

# Limitations

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- Stool examination was performed using direct wet mount microscopy, the standard of care at the health center level in Ethiopia.
- This method has lower sensitivity than other techniques such as the formol-ether concentration technique.
  - The prevalence of IP infections would be higher than we have reported in the current study.
- This study could not determine whether deworming was ineffective and did not clear the infection or whether individuals were re-infected within a month of testing.
- The sample size was not adequately powered to look for association with important factors.

Thank you!

