

# Effects of Helminths and Anthelmintic Treatment on Cardiometabolic Diseases and Risk Factors: A Systematic Review

Khanh Pham MD, MS, Anna Mertelsmann MD, Keith Mages PhD, MLS, Justin R. Kingery MD, PhD, Humphrey D. Mazigo DVM, PhD, Hyasinta Jaka MD, PhD, Fredrick Kalokola MD, John M. Chagalucha MSc, Saidi Kapiga MD, ScD, Robert N. Peck MD, PhD, Jennifer A. Downs MD, PhD

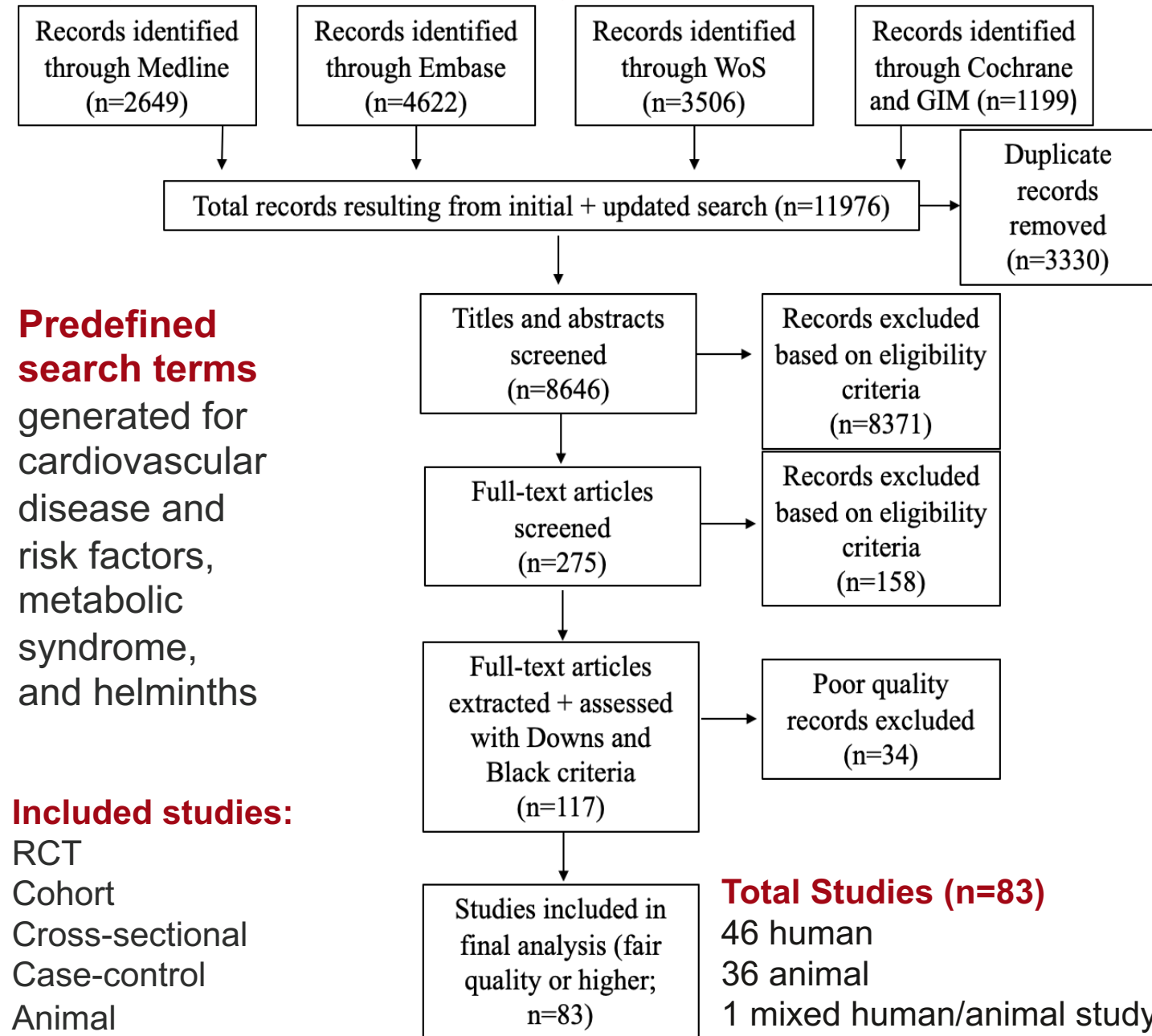
## Background

- Cardiometabolic diseases are the leading cause of death worldwide.
- Helminth infections affect 2 billion people globally and often overlap with cardiometabolic diseases in individuals and populations.
- Neither the causal relationship between helminths nor the effect of anthelmintic treatment on cardiometabolic disease risk have been reviewed systematically.

## Methods

- Registered prospectively in PROSPERO (CRD42021228610).
- Two people screened and a third person resolved discrepancies.
- Meta-analysis was not possible due to heterogeneity.

Figure. PRISMA flow diagram of systematic review



## Results

Cardiometabolic disease or risk factor	Number of studies	Median sample size	Overall effect of helminths on outcome	Overall effect of anthelmintic therapy on outcome
Serum lipids	44	167.5	Mostly ↓ (35 of 44 studies)	Mostly ↑ (5 of 6 studies)
Metabolic syndrome	38	213.5	Mostly ↓ (22 of 38 studies)	Mostly ↑ (7 of 10 studies)
Diabetes	30	279.5	Mostly ↓ (17 of 29 studies)	Mostly ↑ (3 of 5 studies)
Atherosclerotic cardiovascular disease	11	319	Mostly ↓ (7 of 10 studies)	Not studied
Blood pressure	18	555	Mixed (no effect in 10 of 18 studies)	No effect (3 of 3 studies)
High-sensitivity CRP	5	646	No effect (5 of 5 studies)	No effect (1 of 1 study)
Non-atherosclerotic cardiovascular disease	4	45	Mixed (2 showed ↑, 1 showed ↓, and 1 reported no effect)	Not studied

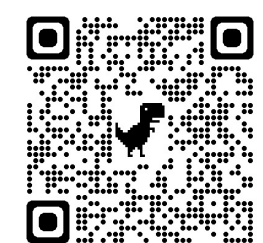
## Objectives

We conducted a systematic review to assess the reported effects of helminth infections on the severity or development of cardiometabolic diseases and risk factors in humans and animal models.

## Conclusions

- Helminth infection may protect against dyslipidemia, metabolic syndrome, diabetes, and atherosclerotic cardiovascular disease.
- This protection may lessen after anthelmintic treatment.
- Ability of helminths to lower cardiometabolic risk may be explained by a reduction in metabolic risk factors.
- Certain helminths are known to affect the liver, an organ crucial to lipid and carbohydrate metabolism.
- Prospective research is needed to clarify the effects of parasite eradication on cardiometabolic diseases and determine the mechanistic pathways linking helminth infections with these noncommunicable diseases and risk factors.

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