SOCIO-ECOLOGICAL RISK FACTORS FOR *CAMPYLOBACTER* INFECTION IN RURAL MADAGASCAR

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EMORY
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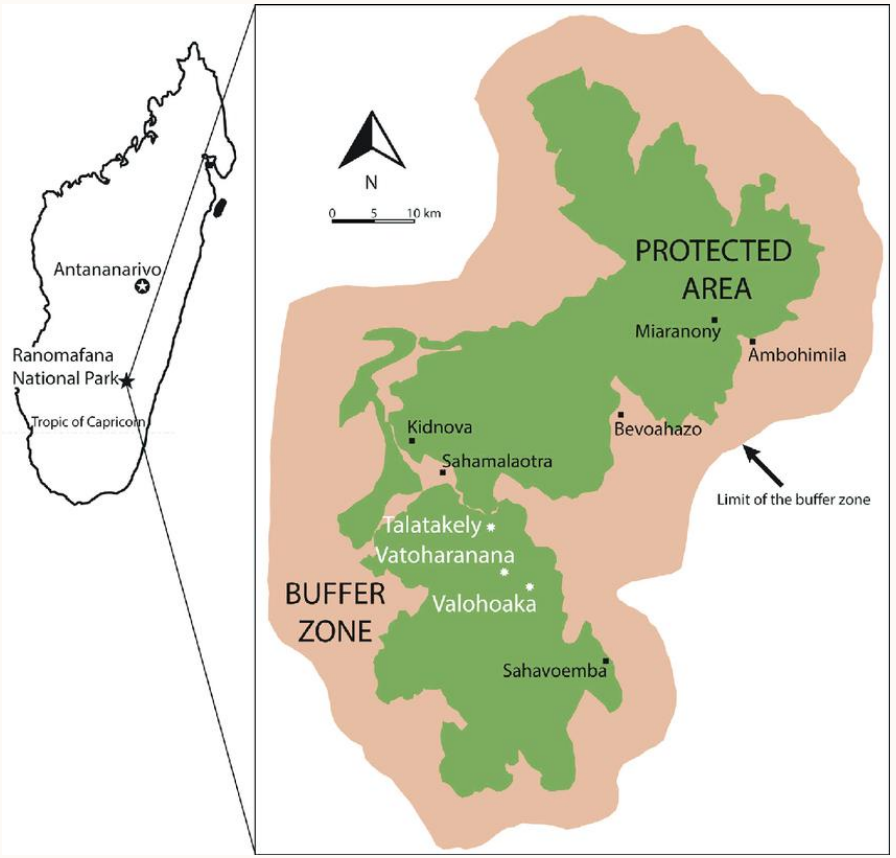
BACKGROUND

- Diarrhea in Madagascar
  - 11% overall deaths
  - 9.9% deaths in children <5
- Transmission methods for *Campylobacter*[2]
- Rural Malagasy communities practice subsistence farming
- Pivot and Centre ValBio (CVB) currently facilitate healthcare to villages bordering the Ranomafana National Park[3]

McGee E, et al.



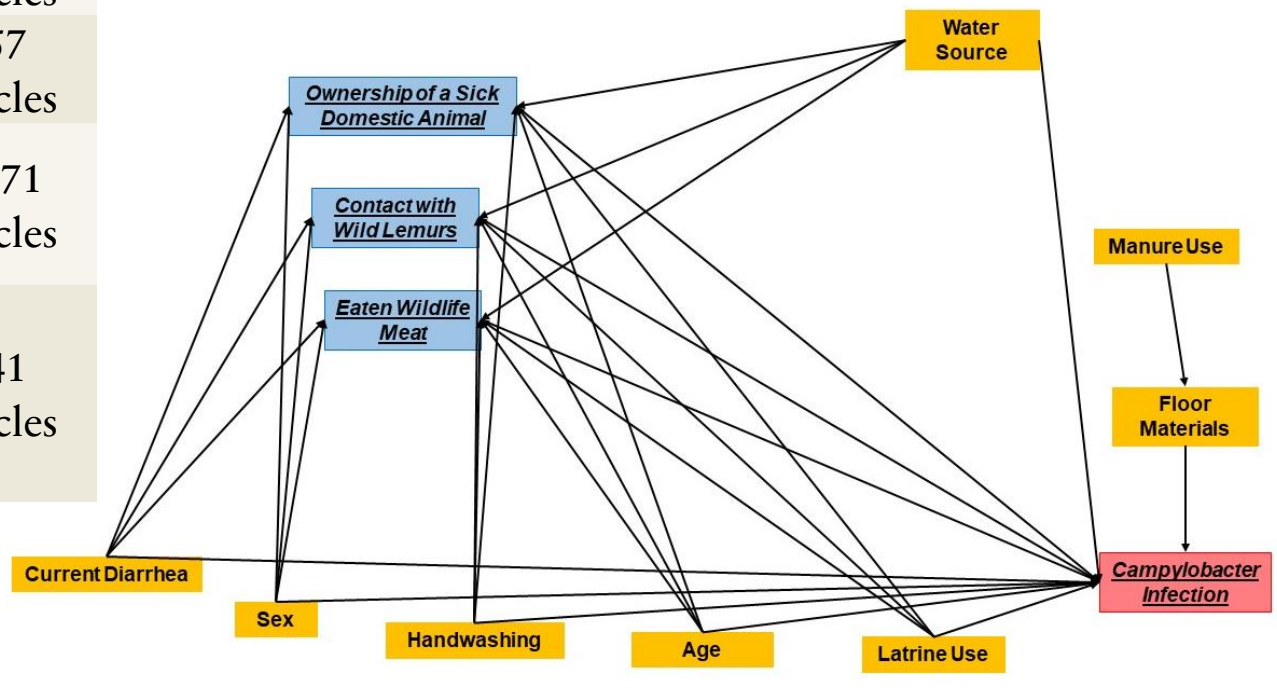
AIMS

1. Conduct a literature review
2. Develop a Directed Acyclic Graph (DAG)
3. Estimate 3 Prevalence Ratios of exposure to sick domestic animal ownership, contact with wild lemurs, ingestion of wildlife meat, and *Campylobacter* infection
4. Produce a report that is shared with the research team, Principal Investigator, CVB, and Pivot

METHODS

"Eco-Epidemiology of Diarrheal Disease" 2017 project dataset courtesy of Dr. Thomas Gillespie (Emory ENVS)

Search String	Results
((("Zoonoses"[Mesh]) AND "Madagascar"[Mesh]) AND "Epidemiological Models"[Mesh])	0 articles
(("Zoonoses"[Mesh]) AND "Epidemiological Models"[Mesh]) OR "Zoonoses/epidemiology"[MeSH]	4,846 articles
(("Zoonoses"[Mesh]) OR "Bacterial Zoonoses"[Mesh]) AND "Regression Analysis"[Mesh]	157 articles
((("Zoonoses"[Mesh]) OR "Bacterial Zoonoses"[Mesh]) OR "Stomach Diseases"[Mesh]) AND "Regression Analysis"[Mesh]	3,871 articles
((((("Zoonoses"[Mesh]) OR "Bacterial Zoonoses"[Mesh]) OR "Dysentery"[Mesh]) OR "Waterborne Diseases"[Mesh]) AND "Regression Analysis"[Mesh]	241 articles



RESULTS

Table 2. Participant Characteristics from the Eco-Epidemiology of Diarrheal Disease Study (2017), Stratified by Ownership of a Sick Domestic Animal

	Owns a Sick Domestic Animal (N=39)	Does Not Own a Sick Domestic Animal (N=89)	Missing (N=40)	Overall (N=168)
Currently Experiencing Diarrhea				
Yes	6 (15.4%)	4 (4.5%)	1 (2.5%)	11 (6.5%)
No	33 (84.6%)	85 (95.5%)	39 (97.5%)	157 (93.5%)
Has access to a Handwashing Area				
Yes	0 (0%)	4 (4.5%)	0 (0%)	4 (2.4%)
No	39 (100%)	85 (95.5%)	40 (100%)	164 (97.6%)
Encountered Wild Lemurs in the last 4 weeks				
Contact with Lemurs	7 (17.9%)	16 (18.0%)	2 (5.0%)	25 (14.9%)
No Contact with Lemurs	32 (82.1%)	68 (76.4%)	37 (92.5%)	137 (81.5%)
Missing	0 (0%)	5 (5.6%)	1 (2.5%)	6 (3.6%)
Eaten Wildlife Meat in the last 4 weeks				
Has Eaten Wildlife Meat	3 (7.7%)	1 (1.1%)	2 (5.0%)	6 (3.6%)
Has Not Eaten Wildlife Meat	36 (92.3%)	83 (93.3%)	38 (95.0%)	157 (93.5%)
Missing	0 (0%)	5 (5.6%)	0 (0%)	5 (3.0%)

Table 3. Adjusted Prevalence Ratios of Ecological Exposures among Children under 5 in the Eco-Epidemiology of Diarrheal Disease Study (2017)

	Exposed N (%)	Adjusted Prevalence Ratio	95% Confidence Interval
Ownership of Sick Domestic Animals	39 (23.2)	2.60	[0.96 – 7.04]
Encountered Wild Lemurs in the last 4 weeks	25 (14.9)	0.98	[0.39 – 2.47]
Ate Wildlife Meat in the last 4 weeks	6 (3.6)	1.16	[0.19 – 6.93]

DISCUSSION

- Hypothesis: all 3 exposures would have a significant, harmful effect
- Applies epidemiologic methods and tools to infectious disease ecology
- In resource limited settings, my findings suggest two things:
    1. Devote resources to caring for sick domestic animals as a preventive measure for *Campylobacter* infections
    2. Investigate asymptomatic *Campylobacter* in rural communities

<u>Strengths</u>

- Highlights a rural, understudied, resource limited population
- Utilizes statistically significant findings from previous literature to inform approach

<u>Weaknesses</u>

- Lack of variability in data
- Cannot estimate causal relationship due to the study design
- Current generalizability

RECOMMENDATIONS

- Additional research is needed to understand the true relationship between wild and domestic animal exposures and enteric diseases, especially in rural and resource-limited communities

One Health Trust

- Madagascar Ministry of Health and One Health
  - Incorporate environmental health and animal health professionals in diarrheal disease surveillance and outbreak response
  - Provide resources and funding to organizations like CVB and Pivot to build the healthcare capacity in rural areas
  - Educate rural communities on the importance of WASH and the potential of animal-human transmission

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THANK YOU

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