

Ethnotheories of climate change and disease

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Introduction

- This study examines local beliefs about causative pathways between climate change and disease across eight global locations (Australia, Bolivia, China, Fiji, London, New Zealand, Paraguay, and Phoenix) with 685 adults.
- Understanding more about the similarities and differences in cultural perceptions of climate change-related disease causation can better inform culturally specific public health measures.
- We assume that standardized public health prevention models differ slightly from *ethnotheories* (i.e. “lay cultural models”). Thus, we expect to see discrepancies between the climate change-disease connections made by the standardized model and cultural models.
- Overall, this study explores:
 - Climate change-disease beliefs *within* and *across* diverse cultures
 - Comparisons between cultural and scientific models

Research Questions

- What beliefs about climate change and disease causation are shared *within* individual cultures?
- Are there any overarching cultural beliefs about climate change and disease causation that are shared *across* diverse cultures?
- How do cultural models of climate change-disease causation compare with public health models?

Methods

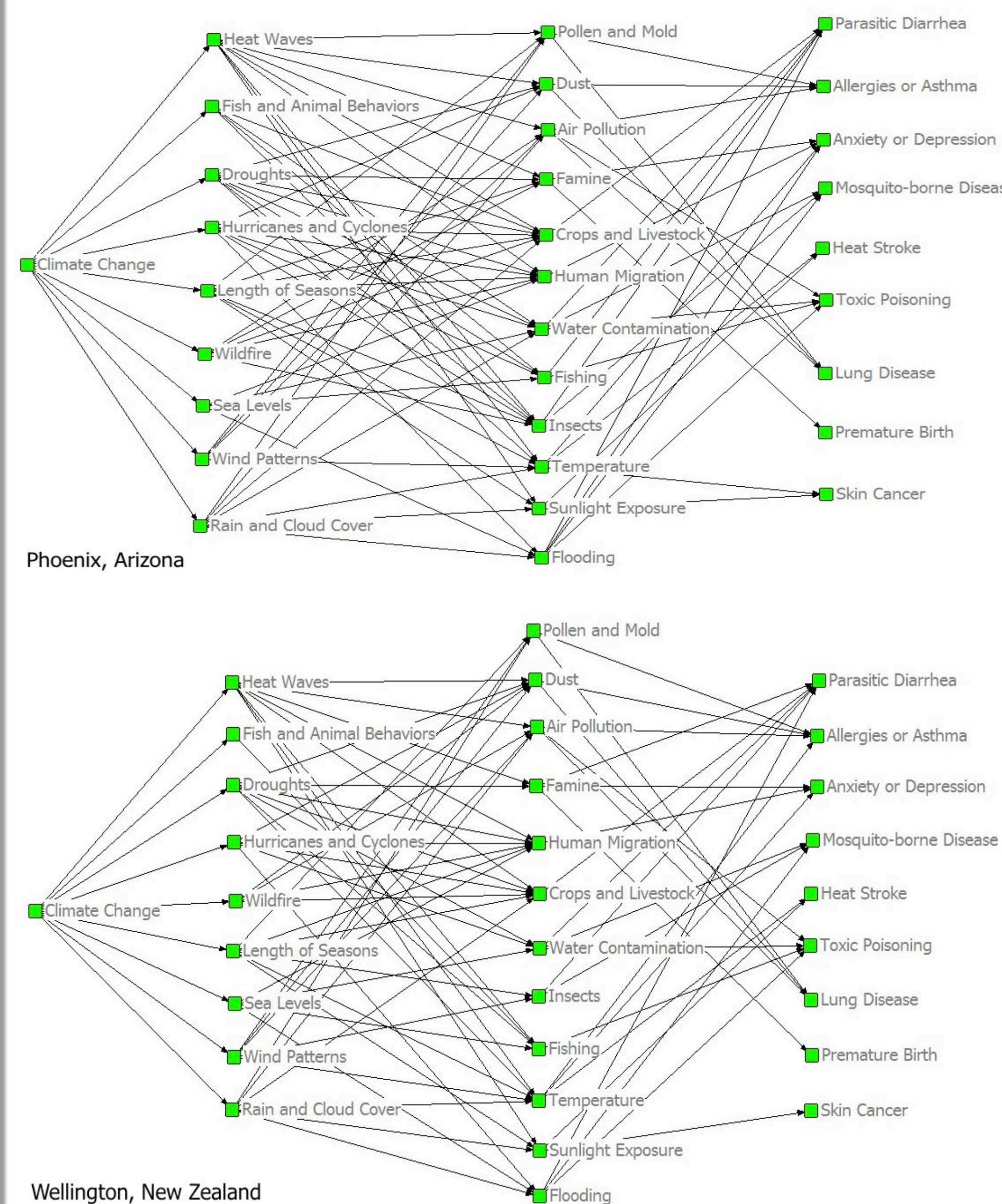
- A cultural consensus analysis was run using UCINET to identify the most culturally “correct” answers for each question and to assess whether individual knowledge is shared within only one country or across countries.
- Culturally shared answers were determined by creating a person-person similarity matrix of survey responses and subjecting it to a factor analysis.
- Cultural models were defined based on the following criteria:
 - An eigenratio of at least 3:1 between the first two factors.
 - An absence of negative loadings on the first factor.
 - An average loading of 0.5 or higher on the first factor.
- Culturally-shared responses are those most commonly provided, with the answers of respondents who loaded high on the first factor weighted most heavily. Four of the resulting causal connections are visualized as network diagrams in Figures 1-4.
- The researchers generated a scientific model based on current scientific consensus regarding climate change-disease connections.
- Using the Quadratic Assignment Procedure (QAP), we determined the amount of correlation between the scientific model and each cultural model.

Results

- Cultural models of the study locations illustrate how each culture understands connections between climate change and health outcomes.
 - Green nodes** signify causal relationships fully connecting climate change to specific health outcomes.
 - Black nodes** signify connections that do not form full causal pathways between climate change and specific health outcomes.
 - Red nodes** signify isolates.
- The QAP analysis of the models suggests that cultural perceptions differ notably between two groupings of the surveyed countries. Four of the eight cultural models are depicted below to help visually illustrate these differences (see Figures 1-4).

Cultural Models: Phoenix, New Zealand, Australia, & London

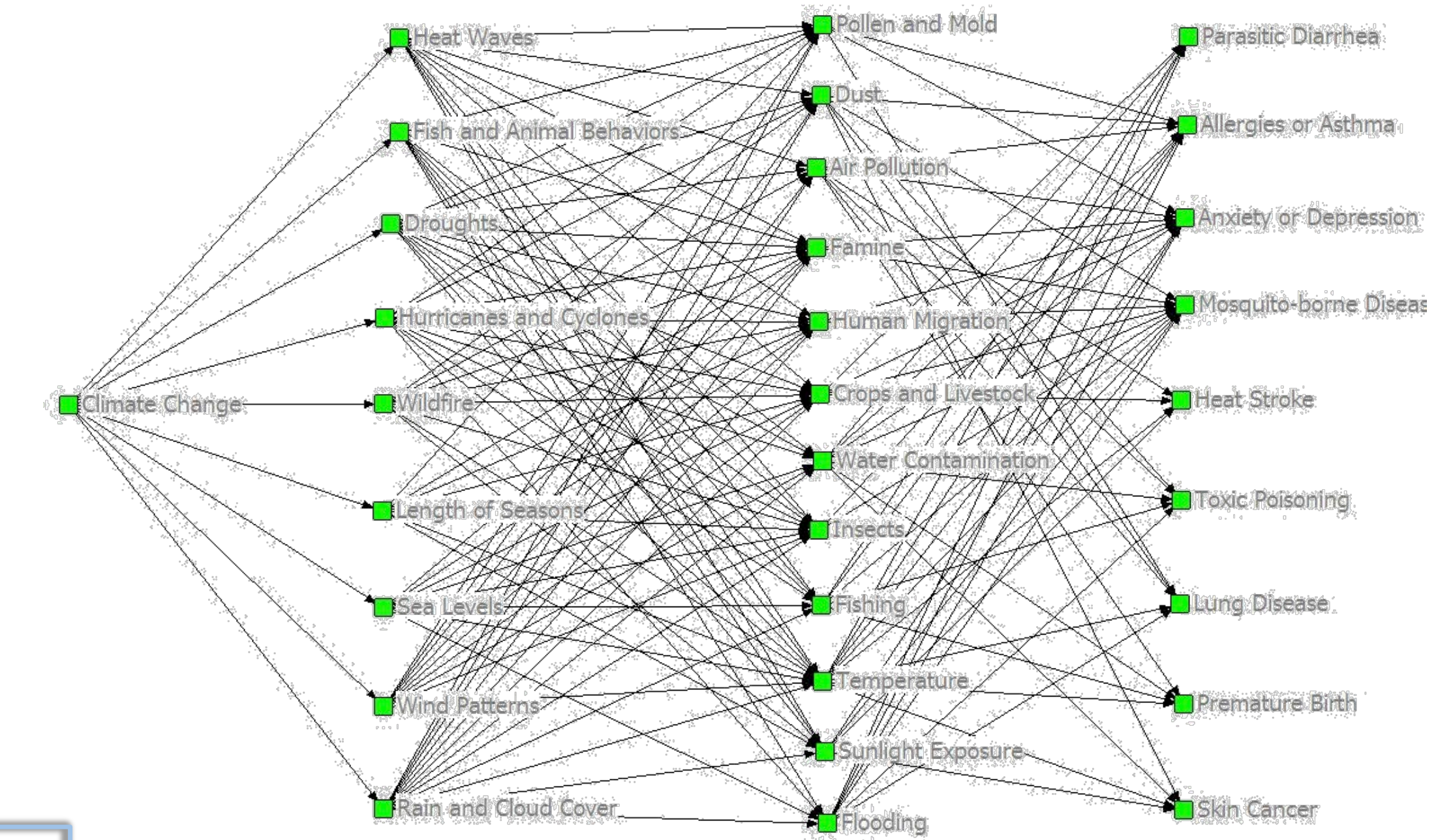
- The cultural models for these four countries were relatively similar to one another in both the culturally shared connections that were made and the density of these connections (see Figures 1-2).
 - Interestingly, climate change was found to be fully causally connected to nearly all health outcomes.
 - There is a higher density of connections between climate change and variables within the first three levels compared to connections between third level variables and potential outcomes.



Figures 1-2: Cultural models for (1) Phoenix, Arizona and (2) Wellington, New Zealand.

Scientifically Correct Model

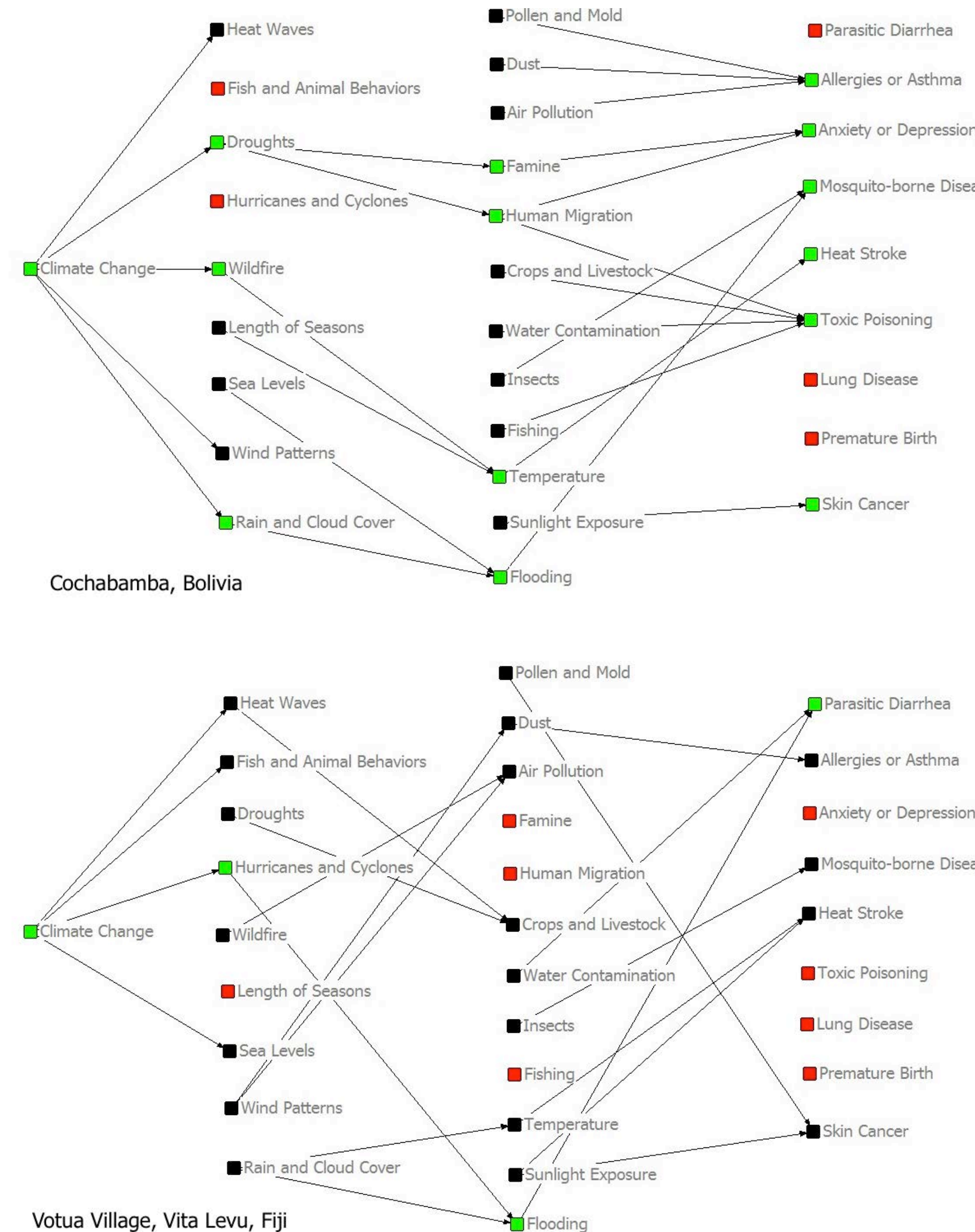
- The scientifically correct model (see Figure 5) depicts the scientifically supported causative pathways between climate change and disease.
- The QAP correlation analysis indicates a stronger correlation between the scientific model and the cultural models of English speaking sites than between the scientific model and the cultural models of non-English speaking sites.



Figures 5: Scientifically correct model.

Cultural Models: Bolivia, Fiji, China, & Paraguay

- In contrast to the cultural models of English speaking countries, the cultural models of non-English speaking countries had significantly fewer causal connections between climate change and specific outcomes (see Figures 3-4).
 - There are some interesting isolate factors, including several health outcomes (e.g. parasitic diarrhea, lung disease, premature birth).
 - There is a higher density of causal relations between third level factors and potential outcomes compared to relations between climate change and the first three levels.



Figures 3-4: Cultural models for (3) Cochabamba, Bolivia and (4) Vita Levu, Fiji.

Analysis

- The analysis revealed a high level of intercorrelation between the models of English speaking, industrialized countries. Additionally, cultural models from the non-English speaking sites were highly intercorrelated with one another.
- Overall, the English speaking sites tended to have more complex models with a greater density of causal links. In addition, the models from the English speaking sites had high levels of correlation with the scientific model.

Conclusion

- Based on these findings, we suggest that cultural beliefs related to climate change-related disease causation may be influenced by complex local factors. For example, complex differences in education and media influences along with localized differences in climate change impacts may, in part, contribute to divergences between the cultural models.
 - A multiple linear regression analysis was used to investigate the correlation between specific local factors and the density of causal links. However, there were no salient statistically significant local factors were identified using this analysis.
 - More complex analyses may be needed to investigate the potential cultural factors that contribute to the divergence of climate change-disease connections in these models.