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## Dissertation Abstract

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### **Risk Perceptions as Potential Mediators of Environmental Toxicants Associated with Biomass Fuel Use**

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In this dissertation, I collect and analyze ethnographic, biological, and environmental data to investigate if risk perceptions mediate exposure to airborne toxicants associated with biomass fuel (e.g. charcoal) use in the home. This research took place over a period of twelve months in Chipata, Zambia. This study enrolled participants which were entirely reliant on biomass fuel and a pseudo-control group which had consistent access to electricity. The five main aims of this research were to (1) determine the prevalence of cardiovascular/pulmonary diseases in these communities, (2) determine environmental and personal airborne toxicant exposure levels for both groups, (3) assess the extent of shared cultural models of disease and cooking practices within and between these two groups, (4) determine if risk perceptions mediate exposure to airborne toxicants, (5) and lastly identify if there is cultural significance of braziers and whether this significantly affects their use. There were no significant differences between these two groups in the prevalence of cardiovascular or pulmonary disease or function. Both groups were exposed to air pollution at levels far higher than safe thresholds outlined by the WHO; however, the biomass group was significantly higher between the two for particulate matter and urinary metabolites of polycyclic aromatic hydrocarbons. Bayesian cultural consensus analysis showed mixed results between groups. Nearly all participants indicated they routinely performed tasks that increased their risk of exposure to household air pollution such as cooking indoors using charcoal. Relatively little risk is associated with the use of charcoal even inside the home. While most participants expressed a desire to have electric stoves, electricity is still prohibitively expensive. Further complicating these findings are droughts and climactic instability in the region that restricts access to electricity even to those who are able to afford it. In a country reliant on hydroelectric power, droughts result in long periods of electricity rationing and blackouts. The results of this study demonstrate human exposure to chronically high levels of airborne toxicants attributable to biomass fuel use and points to the need for more research on this topic in sub-Saharan Africa.

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