

# The Effects of Cooking Practices on Human and Environmental Health in Rural Madagascar



Mandena, Madagascar

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Using quantitative and qualitative methods, we assessed indoor air quality, firewood consumption, and trends in cooking practices as they relate to both human and environmental health outcomes.

## PROJECT OBJECTIVES

- Quantify household air quality
  - Particulate matter (PM 2.5)
  - Carbon monoxide (CO)
- Quantify household firewood usage
- Correlate findings to cooking method/stove type



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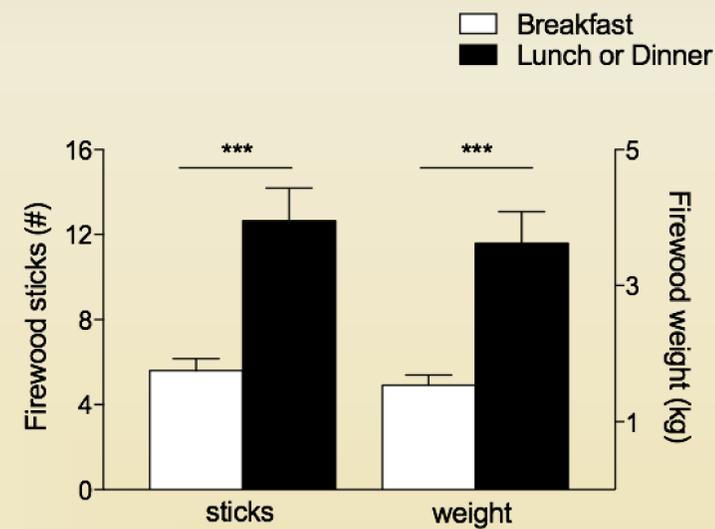
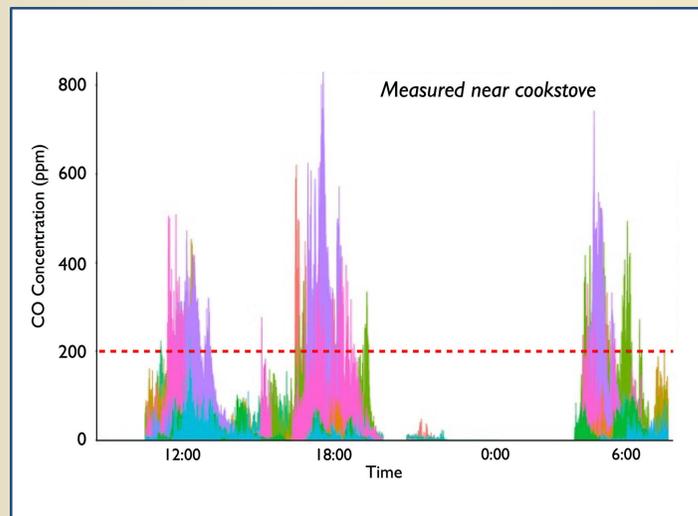
Typical Cooking Method In Mandena

## METHODOLOGY

- Enrolled 25 randomly selected households
- Measured CO and PM 2.5 in cooking area
- Observed firewood collection
- Weighed household firewood to estimate usage

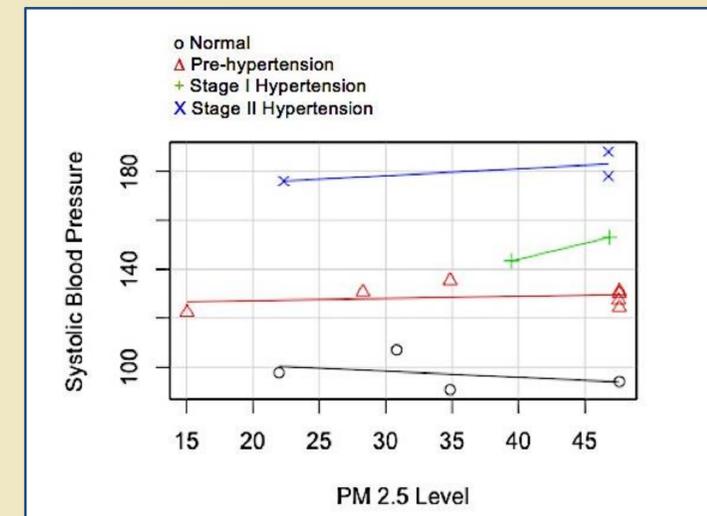
### The typical cook in a household:

- is a woman, married to the head of the household
- is around 39 years old
- cooks with firewood on a traditional stove or open fire
- cooks inside or outside, but in a separate room from the main living space
- has some simple ventilation in the cooking area



## CONCLUSIONS

- CO levels exceed healthy threshold at meal times in both cooking and sleeping areas
- High PM 2.5 levels appear to be a driver of hypertension
- Less firewood is used for breakfast than for other meals
- Women are likely to suffer biggest health impacts because they are most exposed to air pollution while cooking meals
- Next steps: investigating improved stoves and better ventilation methods



Clockwise from top left: summary of the primary cook; less wood is used at breakfast; CO peaks correspond to mealtimes; blood pressure correlates to PM<sub>2.5</sub> exposure within each group, but not across groups.



The ADES Cookstove