

Engaged Approaches to Advance Environmental Health Trials in Resource-Poor LMIC Settings

Session: Challenges and Successes in Diversity and Inclusion in Clinical Trials

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Household air pollution (HAP) from burning solid fuels is a major risk factor for adverse health

- Top 10 risk factor for premature death and disability in 2019
Premature deaths: 2.3 million (95% CI: 1.6 to 3.1 million)
Lost years of “healthy” life (DALYs): 91.5 million (95% CI: 67 to 119 million)
- Shouldn't this be a solvable global health problem?



Photos: Joanna B. Pinneo

Sources: Murray et al., GBD 2020

Decades of health research on “cleaner” household energy technologies... only modest global impact

- When “improved” biomass-burning stoves are adopted sustainably, exposures are not reduced to target levels
- Low adoption and sustained use of “clean” stoves/fuels

Access & Affordability Issues

Stove “stacking”



Photos: Joanna B. Pinneo

Sources: Murray et al., GBD 2020



A (very brief) tale of two studies...



Honduras Cookstove Trial: Community-engaged approach for stove selection, recruitment, regular meetings, and report-back



Photos: Bonnie Young

Study design: Stepped-wedge randomized trial

Young et al. *BMC Public Health* (2019) 19:903 BMC Public Health
<https://doi.org/10.1186/s12889-019-7214-2>

STUDY PROTOCOL

Open Access

Study protocol for a stepped-wedge randomized cookstove intervention in rural Honduras: household air pollution and cardiometabolic health



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Randomization
N=230
Assigned Stove Type

Study visit number:	1	2	3	4	5	6
Data collection:	Aug – Dec 2015	Jan – May 2016	Sep – Dec 2016	Feb – May 2017	Sep – Dec 2017	Feb – May 2018
Arm 1 (n=115)	Traditional	Traditional	Justa	Justa	Justa	Justa
Arm 2 (n=115)	Traditional	Traditional	Traditional	Traditional	Justa	Justa

HAPIN: 4-country LPG Trial

- Behavior change strategies – ~2 years of formative research
 - Formative Research: series of focus group discussions, key informant interviews and/or structured observations at each site

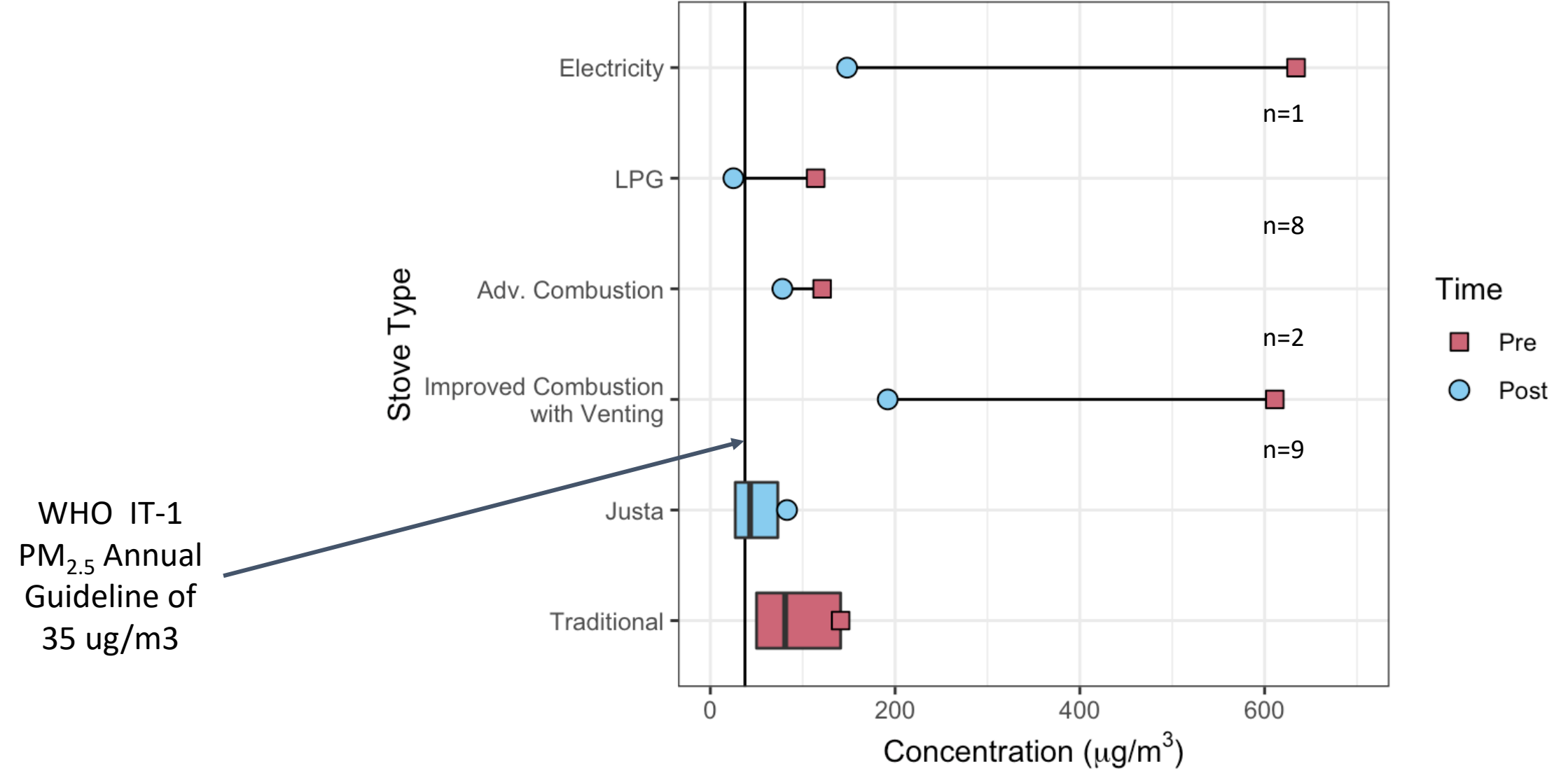


Multi-PIs: Tom Clasen (Emory), Jen Peel (CSU), Will Checkley (JHU)

	Guatemala	India	Peru	Rwanda
Monitoring Gas Stove Use				
Stove use monitors to alert wood stove use in intervention homes	X	X	X	X
Monthly questionnaires/observations to ascertain barriers to gas stove use	X	X	X	X
Minimum threshold of LPG refills /month	X	X	X	X
Two LPG cylinders in home	X	X	X	X
Behavioral Intervention Strategies to Promote Gas stove Use				
Stove Use Pledge	X	X	X	X
Gas stove use demonstration	X	X	X	X
“Behavioral specialist” who visits homes to reinforce behaviors	X	X	X	X
Videos	X			X
Calendars	X		X	
Posters/pamphlets	X	X		
LPG delivery by HAPIN staff	X			X
LPG delivery by gas company		X	X	

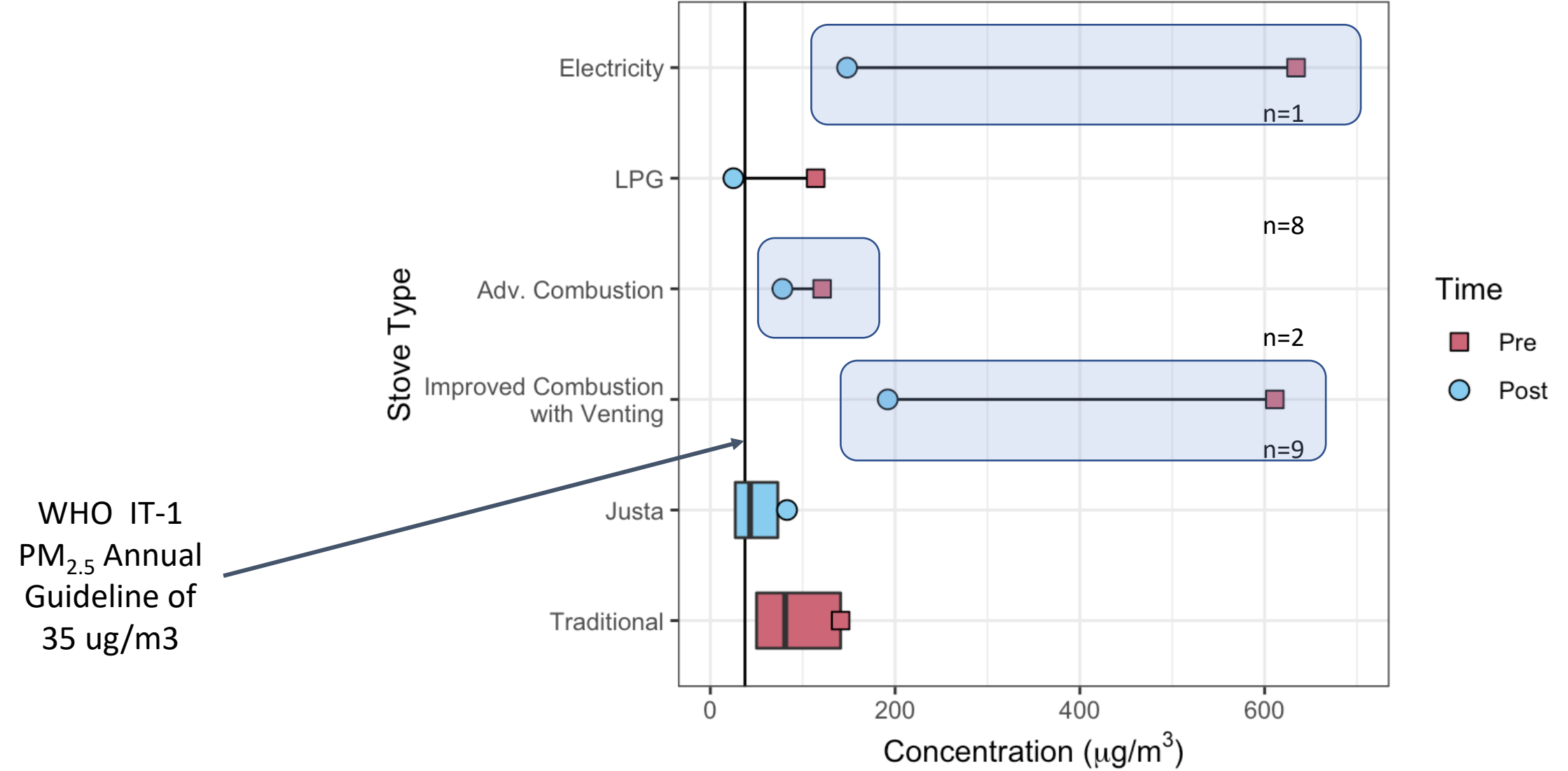


Comparison to stoves in Pope et al. 2021 review



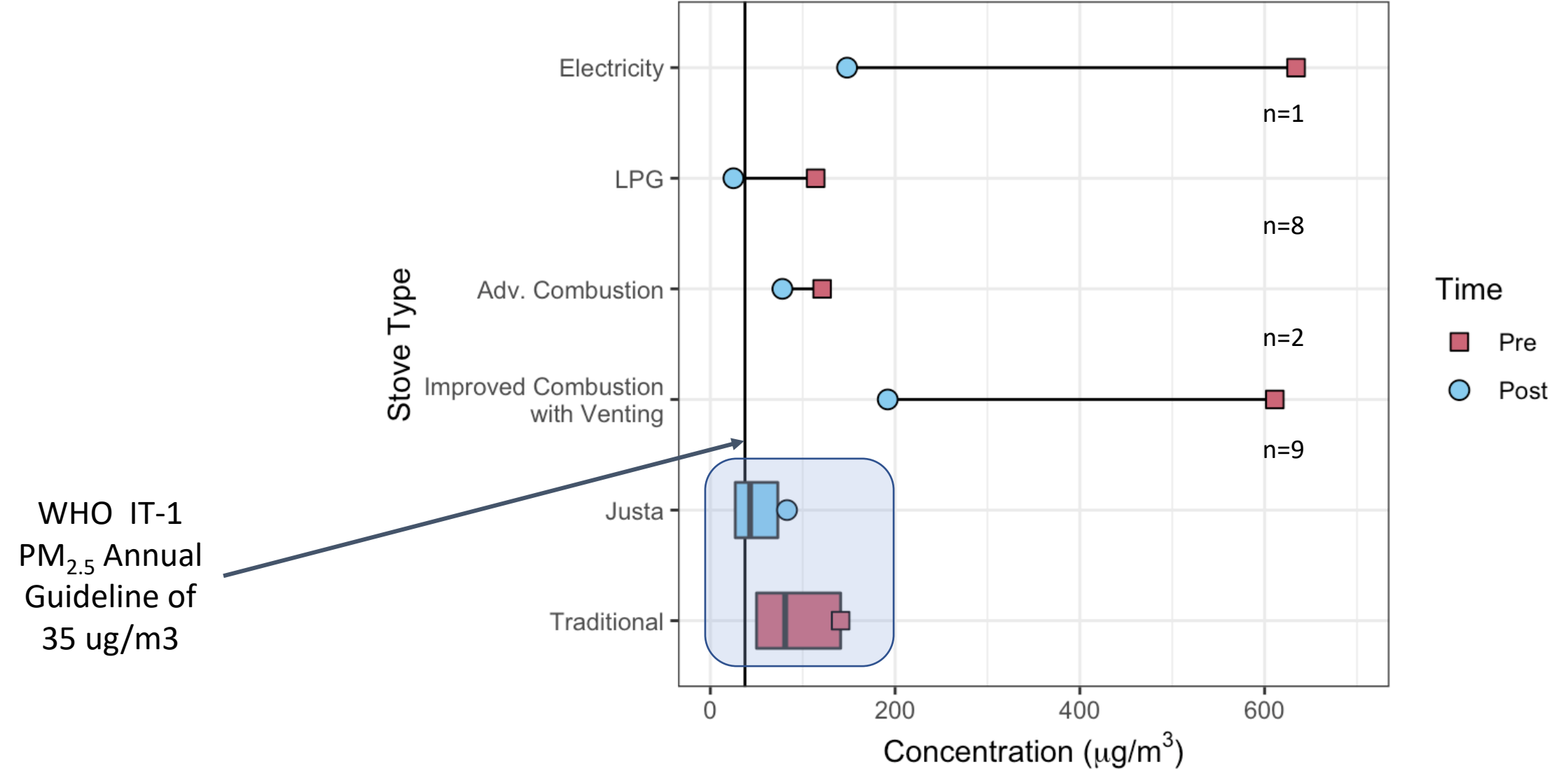
Data from Pope et. al 2021; PM Honduras Study

Comparison to stoves in Pope et al. 2021 review



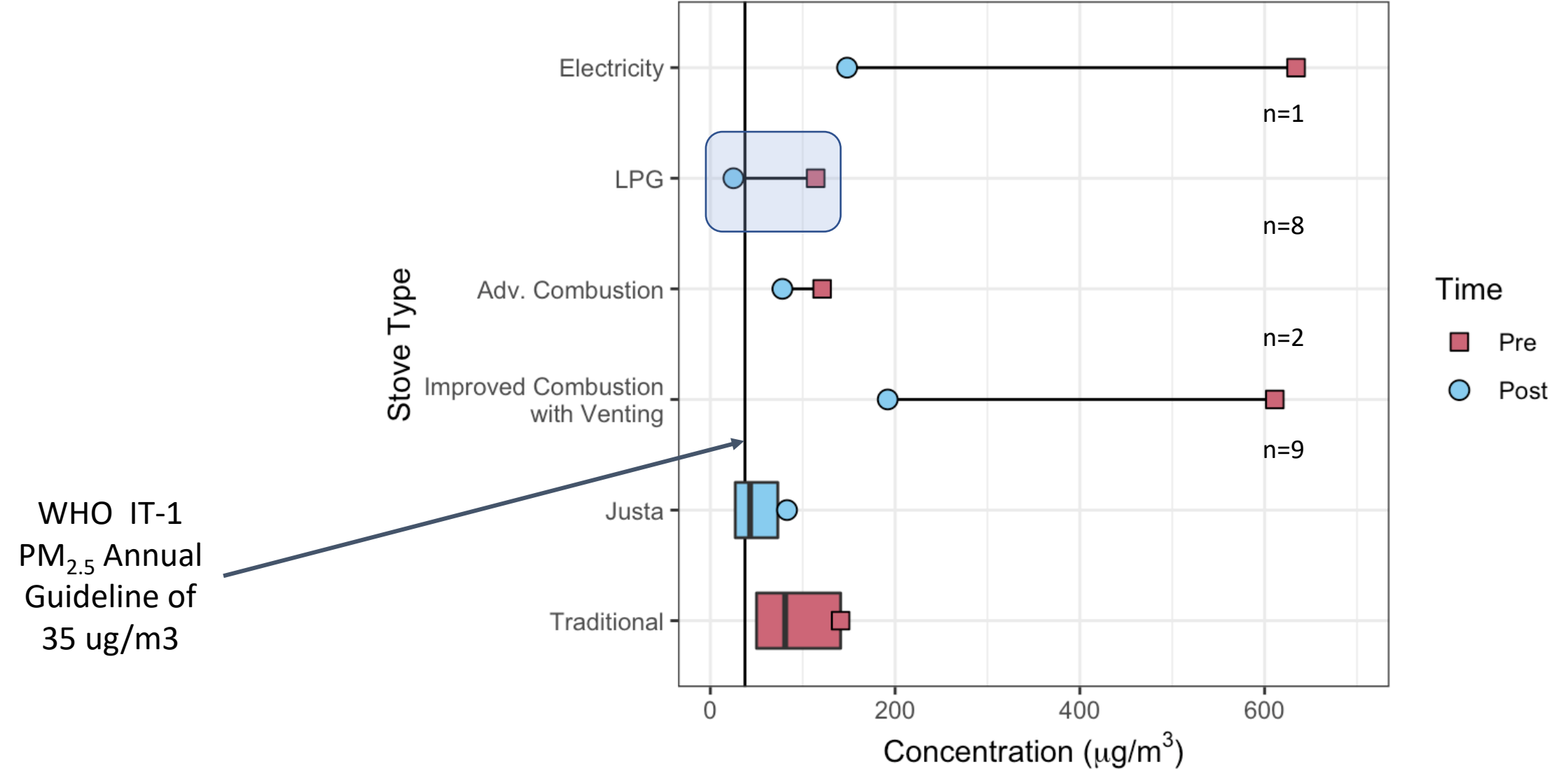
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So where do we go from here?

ENVIRONMENTAL RESEARCH LETTERS



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LETTER

Just and fair household energy transition in rural Latin American households: are we moving forward?

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World view

Blanket bans on fossil fuels hurt women



By Vijaya
Ramachandran

Better legislation will help all without significantly contributing to climate change.

If you want to learn how dangerous cooking can be, ask my cousin. When she was three, growing up in the small town of Saram, India, she knocked over her mother's kerosene stove, scalding herself badly. Her face was scarred for the rest of her life.

The dangers of some fuels aren't always so obvious. About 2.6 billion people, mostly in lower-income countries, experience energy poverty – the lack of access to clean fuels – and cook on open fires or stoves using kerosene, coal, wood, animal waste or other forms of biomass.

The World Health Organization (WHO) estimates that 3.8 million people die prematurely each year from illnesses

“That cooking falls heavily on women is already misogyny; an added insult is the public-health crisis linked to that chore.”

cooking fuels. The West needs to get a grip and devise a more sensible strategy to solve this public-health crisis.

Last month, the United Nations published a report on the progress made towards achieving the Sustainable Development Goals, including SDG7 (see go.nature.com/3y6i), which aims to ensure affordable, reliable, sustainable and modern energy for all by 2030. It makes clear that the world is falling far short of the investments necessary to reach this goal. About US\$4.5 billion a year is needed to achieve universal access to clean fuels for cooking (this estimate includes supplying infrastructure, such as LPG stoves). Rich countries have so far coughed up about \$130 million a year.

A clean-cooking metric that incorporates cooking fuels, thus providing better data for policymakers, could speed progress. The WHO provides country-level estimates of clean-fuel use, but there are years when no data are avail-



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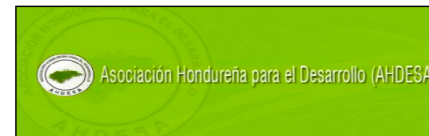
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