Cooking, health, and daily exposure to pollution spikes

On-line Appendix

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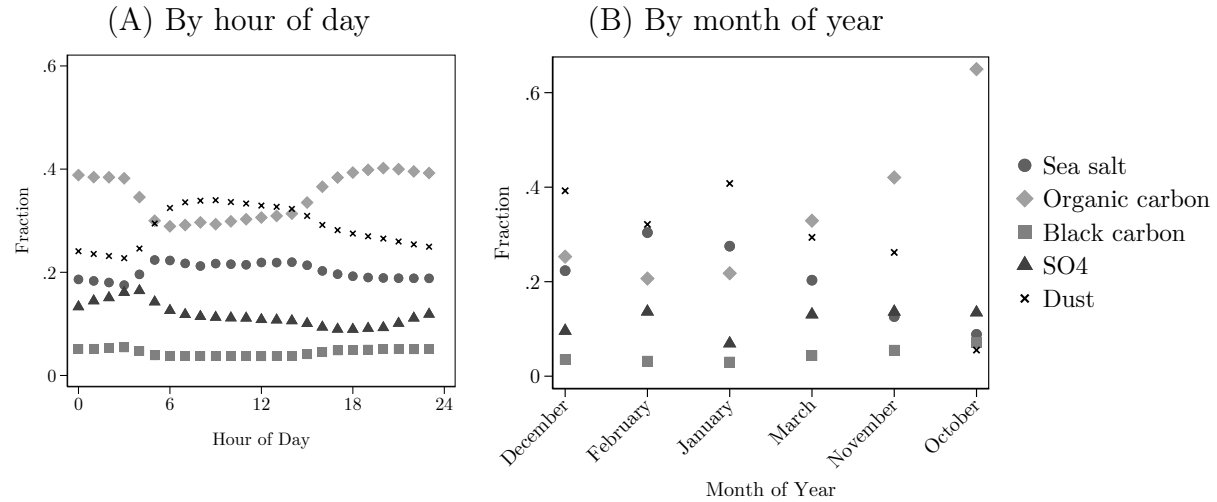
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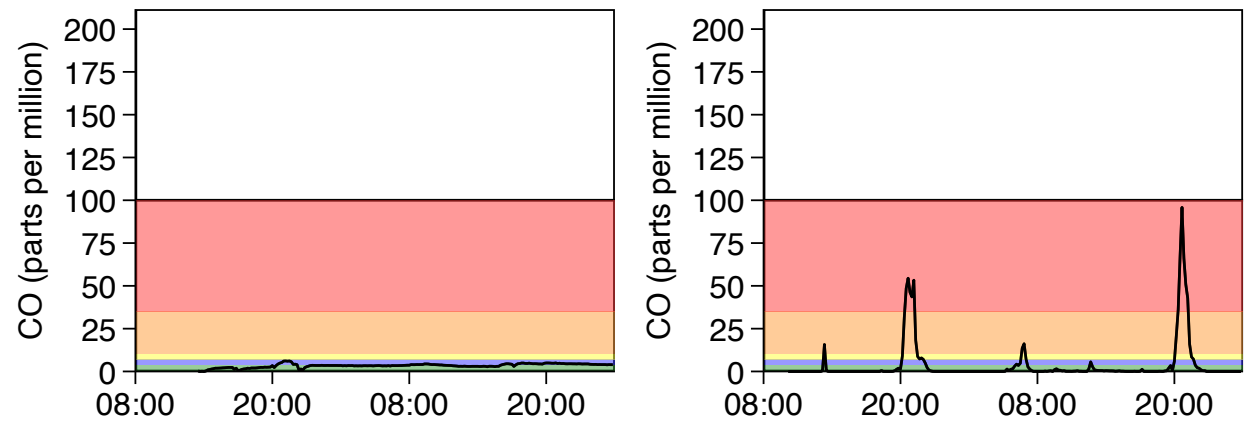
A   Figures

Figure A1: Contents of PM2.5 in Nairobi, Kenya

(A) By hour of day   (B) By month of year

Contents of particulate matter (PM2.5) as a fraction as recorded by MERRA-2 satellites (NASA GMAO 2015; 2015).

Figure A2: CO exposure for two study participants, both with average exposure of 3.2ppm


Ten minute averages (of 1-minute frequency measurements) collected by two study participants, both residing in Nairobi, Kenya, carrying LASCAR over 48 hours. Both have average daily CO exposure of 3.2 ppm. The black horizontal line marks 100 ppm, the WHO's most severe target for 15-minute limits. The green, blue, yellow, orange, and red bars indicate the World Health Organization's recommended air pollution targets, ranging from <4ppm (the most stringent 24-hour average target) to 35–100ppm (the most severe 15-minute limit) respectively (WHO, 2021). **??** presents similar examples for PM2.5. **??** provides more detail on data collection.

Figure A3: BDM Hidden price distribution
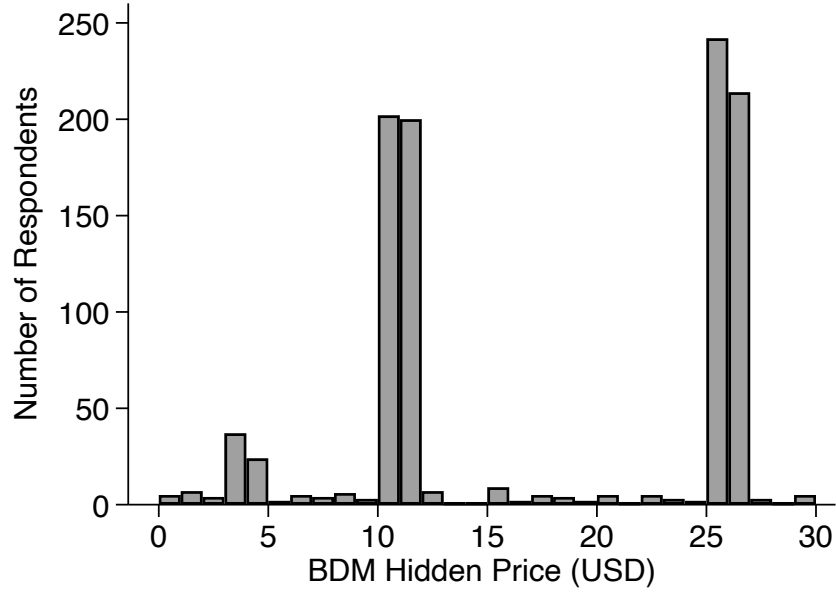
Reproduced from Berkouwer and Dean (2022a). The distribution of prices P_i used in the BDM elicitation mechanism. 6% of participants are allocated a price drawn from $U[3.50, 4.50]$, 39% of participants are allocated a price drawn from $U[10, 12]$, and 44% of participants are allocated a price drawn from $U[25, 27]$. The remaining prices are drawn from a uniform distribution over the entire interval $U[0.01, 29.99]$. Respondents buy the stove if and only if $WTP_i \geq P_i$.

Figure A4: Impacts of experimental treatments on WTP
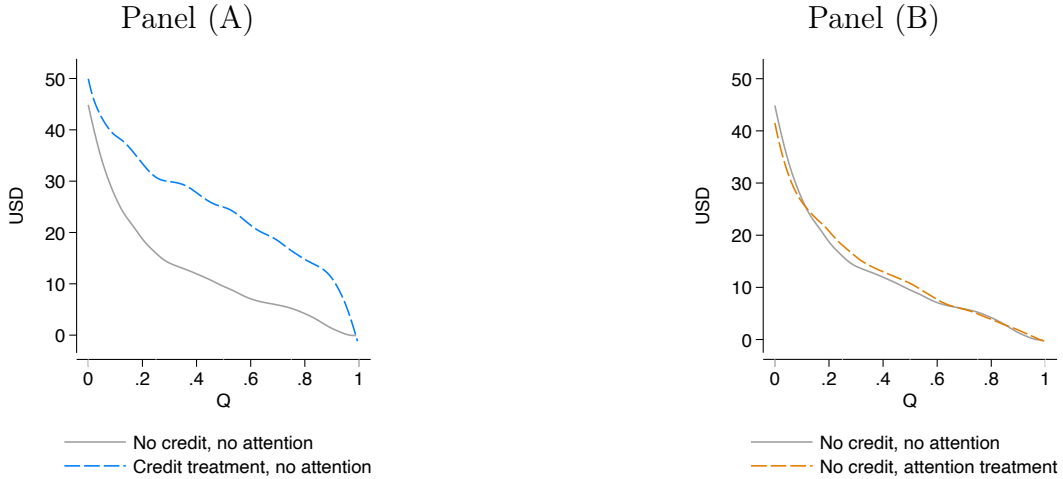
Note: This figure has been reproduced in its entirety from Berkouwer and Dean (2022a). Graphs show the cumulative distribution of WTP for the control and treatment groups for both treatments. Panel A presents results by credit treatment status among people in the attention control group only. Panel B presents results by attention treatment status among people in the credit control group only. Access to credit increases WTP by USD 13 (104 percent relative to control). Attention to benefits does not affect WTP.

Figure A5: Time use data: cooking hours by cooking technology

(A) Traditional jiko

(B) Jikokoa

(C) LPG

(D) All stove types
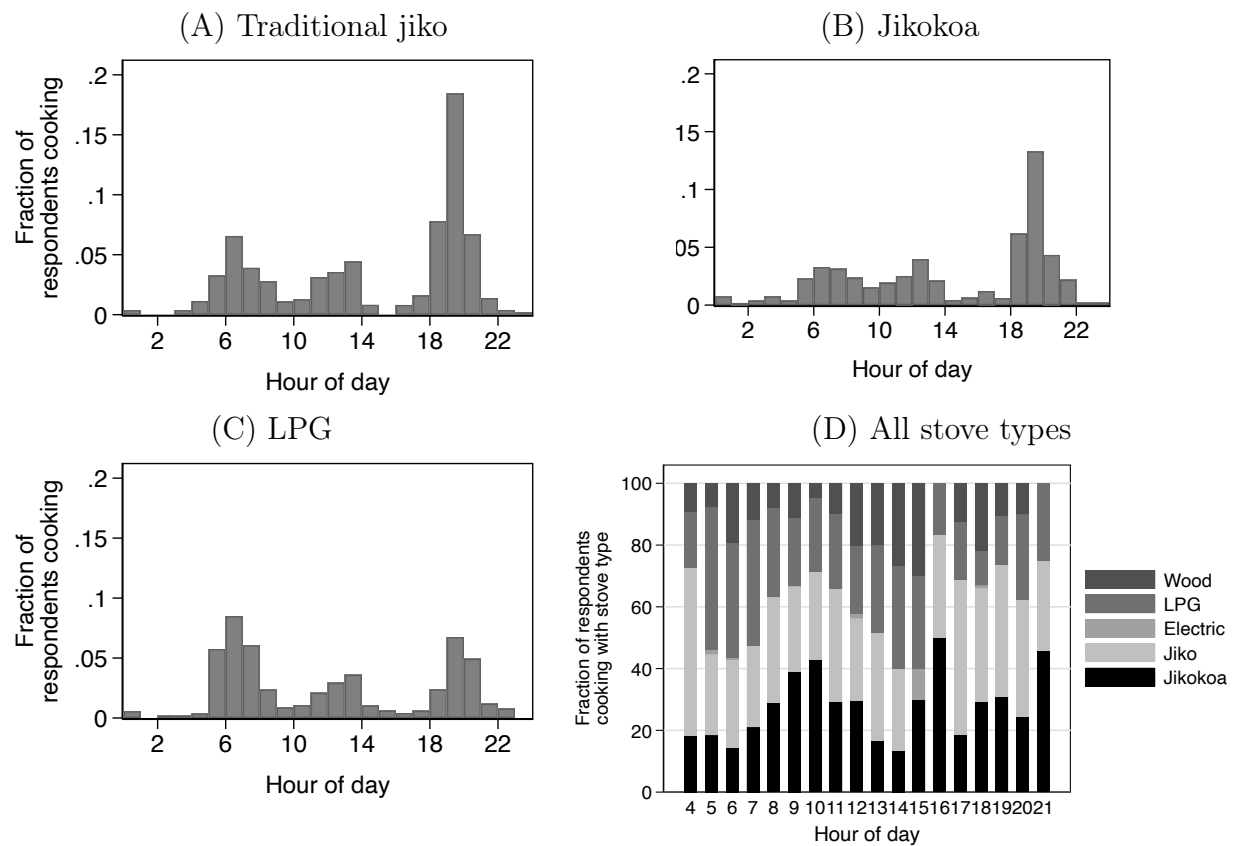
Panels (A), (B), and (C) show the fraction of respondents who report using a particular cooking technology across the various hours of the day. Panel (D) shows the same as a percentage of people who report cooking during each hour.

Figure A6: Devices to record air pollution and mesh backpacks containing them

(A) Particulate Matter

(B) Carbon Monoxide

(C) Backpack contents

(D) Final backpack

Panel A shows a Purple Air Inc. device, which records PM1.0 and PM2.5 readings every 2 minutes. Panel B shows a Lascar Electronics device, which records one CO reading every minute. Panel C displays how the devices are affixed to a lightweight foam material to stay in place. Behind the purple air device is a battery. Panel D displays the final backpack as deployed with respondents.

Figure A7: Co-located air pollution readings for devices

A) PM2.5 (PA-II devices)
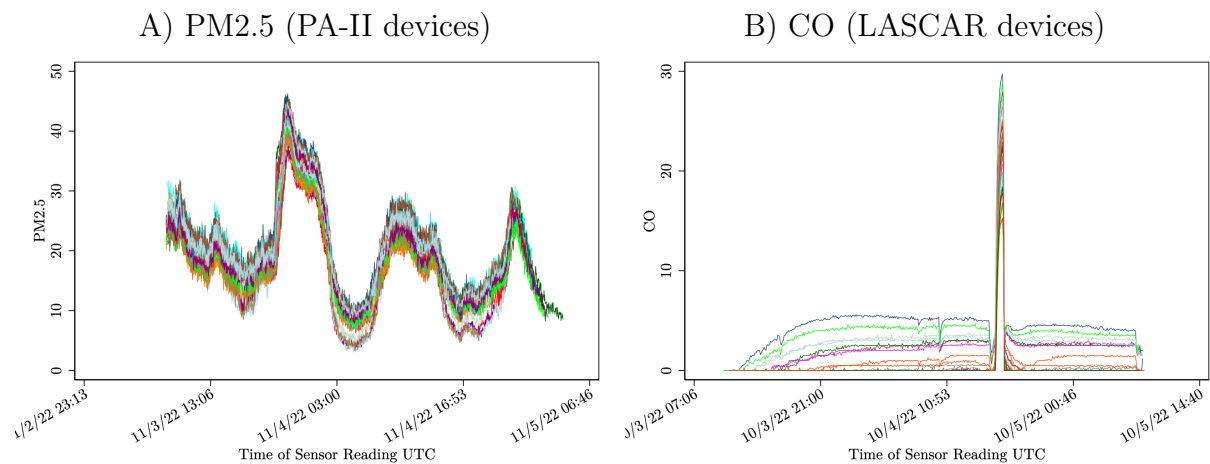
B) CO (LASCAR devices)

Air pollution data from a 48-hour testing window during which all 68 devices (34 PA-II devices and 34 LASCAR devices) were placed in the same location (Busara offices). To capture level differences across devices, all regressions include device fixed effects where relevant.

Figure A8: Particulate Matter (PM1.0, in $\mu g/m^3$) and Carbon Monoxide pollution by Jikokoa ownership

A) Average hourly exposure over the hours of the day
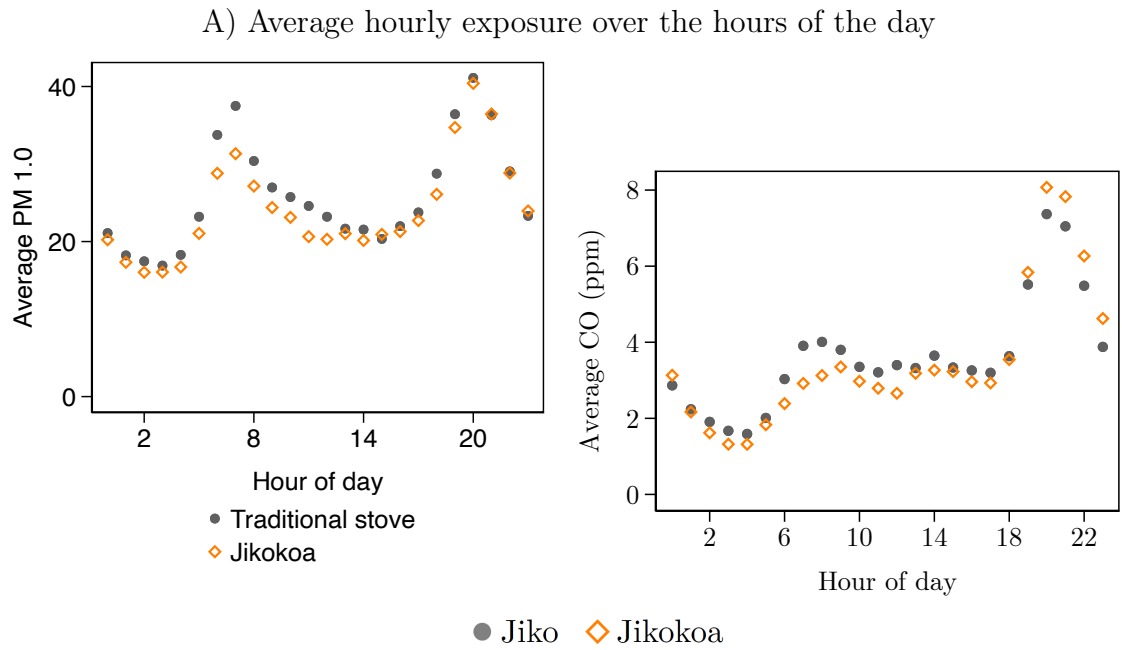
● Jiko   ◇ Jikokoa

B) Distribution of 50th and 90th percentile of 10-minute concentrations, across individuals
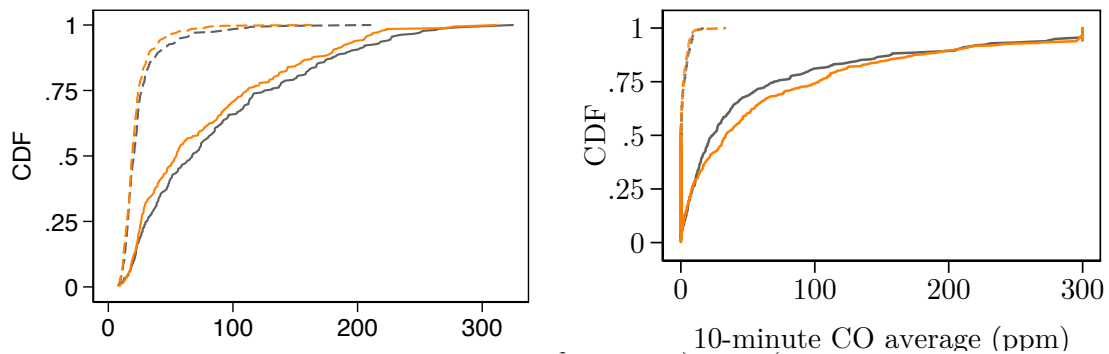
Panel A presents average PM1.0 and CO exposure by hour of day and endline Jikokoa ownership, as collected by respondents wearing backpacks for on average 48 hours. Panel B presents the distribution of mean and 99th percentile 10-minute average exposure across respondents. **??** presents the same for PM2.5.

Figure A9: Diffusion of PM2.5 and CO after reaching peak while cooking
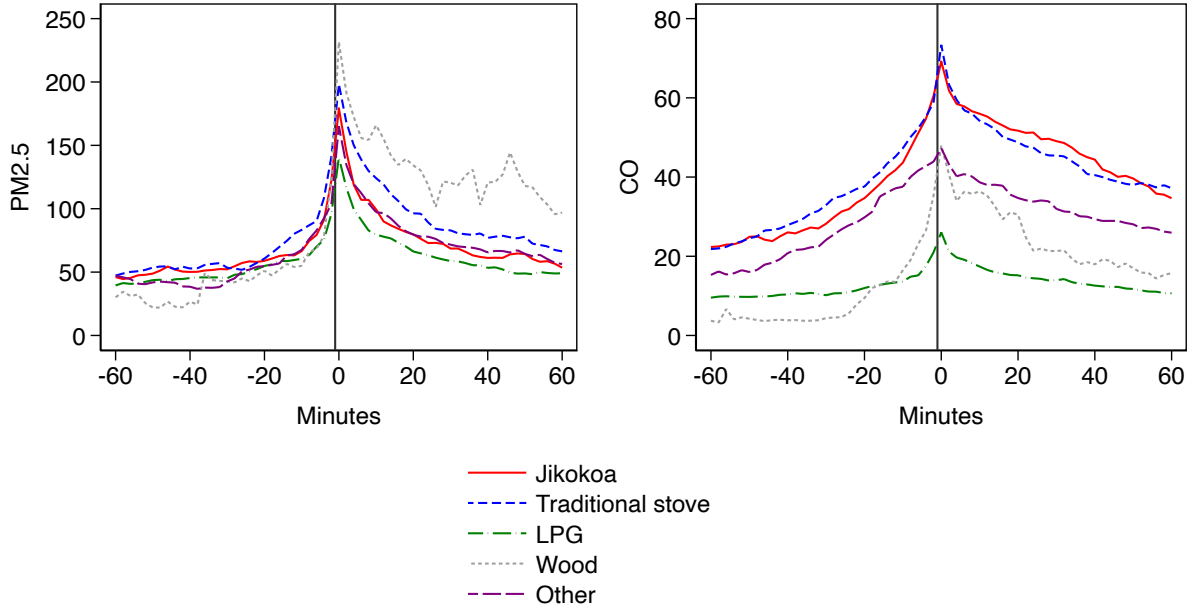
Each line represents mean pollution for the 60 minutes before and after an individual reaches their peak pollution while cooking with a particular stove. We drop observations where an individual's peak pollution was reached when they reported cooking with multiple stoves simultaneously (<1.2% of observations). "Traditional stove" refers a charcoal-burning cookstove that is not a Jikokoa.

Figure A10: Correlation between Jikokoa ownership and average hourly PM2.5 (in $\mu g/m^3$)
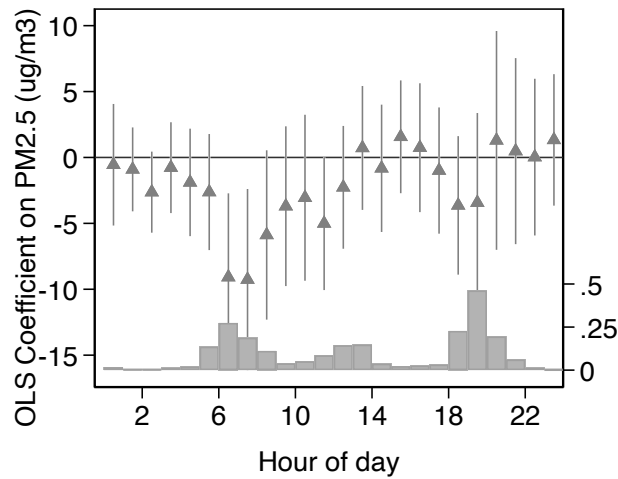
Coefficients from an OLS regression of PM2.5 on Jikokoa ownership. Both regressions include socioeconomic controls and panel data fixed effects. The gray bars report the fraction of respondents who report cooking during any given hour in the time use survey. **??** presents the Instrumental Variables version.

B   Tables

Table B1: Experimental research on cookstove impacts

Authors	Year	Country	Urban	Pollution Monitored	Health Measure-ments	Point Estimate	House-holds
Berkouwer and Dean	2023	Kenya	Yes	PM, CO	Yes	-2%	702
RESPIRE trial papers							
McCracken *et al.*	2007	Guatemala	No	PM	Yes	-61%	537
Smith-Sivertsen *et al.*	2009	Guatemala	No	CO	Yes	-62%	534
Smith *et al.*	2011	Guatemala	No	CO	Yes	-50%	534
Thompson *et al.*	2011	Guatemala	No	CO	Yes	-39%	266
HAPIN trial papers							
Checkley *et al.*	2024	Peru	No	PM, CO[b,c]	Yes	-21%	180
Johnson *et al.*	2022	[d]	No	PM, CO[c]	Yes	-66%	3200
Romieu *et al.*	2009	Mexico	No	*None*	Yes	NA	668
Burwen and Levine	2012	Ghana	No	CO	No	+0.24 SD	488
Beltramo and Levine	2013	Senegal	No	PM, CO[b]	No	+24%	790
Alexander *et al.*	2014	Bolivia	No	CO	No	-79%	20
Jary *et al.*	2014	Malawi	No	PM, CO	Yes	-1.88 SD	50
Bensch and Peters	2015	Senegal	No	*None*	Yes	NA	253
Tielsch *et al.*	2016	Nepal	No	PM	No	-33%	3376
Hanna *et al.*	2016	India	No	CO	Yes	-3%	2575
Mortimer *et al.*	2017	Malawi	No	*None*	Yes	NA	8470
Alexander *et al.*	2018	Nigeria	Yes	PM, CO	No[a]	-11%	324
Adane *et al.*	2021	Ethiopia	No	PM	No	-46%	1977
Clasen *et al.*	2022	[d]	No	PM, CO[c]	Yes	-66%	3200

"Pollution Monitoring" refers to quantitative monitoring using a pollution device. "Health Measurements" refer to quantitative measurements (most commonly blood pressure, blood oxygen saturation, or spirometry). Pollution monitored includes particulate matter (PM) and carbon monoxide (CO). [a]While no health measurements are conducted, pregnancy outcomes are verified by hospital reports. [b]Also measures nitrogen dioxide (NO_2). [c]Also measures black carbon BC. [d]Guatemala, India, Peru, and Rwanda.

Table B2: IV estimates of the causal impact of cookstove adoption on cooking behavior

	Minutes per day	Cooking (=1)		Cooking indoors (=1)	
	(1)	(2)	(3)	(4)	(5)
Own Jikokoa	4.131	0.013	0.014	-0.026	-0.065
	(9.025)	(0.010)	(0.010)	(0.047)	(0.061)
Control Mean	137.013	0.101	0.101	0.889	0.872
HOD FE	N/A	N/A	Yes	N/A	Yes
Weak IV F-Stat	51	51	69	46	47
Observations	697	697	31887	649	3068

Instrumental variables regressions using randomly assigned price and credit treatment status as instruments for endline Jikokoa ownership. Column (1) uses survey data. Columns (3) and (5) use hourly time use data. Columns (2) and (4) use time use data averaged at the household level. Columns (4) and (5) are conditional on cooking in that hour. Regression includes socioeconomic controls.

Table B3: Correlation of Time Use and Pollution Exposure

	Mean Hours Per Day	PM2.5	CO
	(1)	(2)	(3)
Jikokoa: Indoors (=1)	0.54	0.02	0.36
	[1.06]	(0.93)	(0.35)
Jikokoa: Outdoors (=1)	0.08	-2.21	-0.14
	[0.38]	(2.16)	(0.81)
Traditional Stove: Indoors (=1)	0.64	0.62	0.10
	[1.31]	(0.74)	(0.28)
Traditional Stove: Outdoors (=1)	0.18	1.57*	0.22
	[0.96]	(0.95)	(0.35)
LPG: Indoors (=1)	0.59	-0.64	-0.64*
	[0.99]	(0.96)	(0.36)
LPG: Outdoors (=1)	0.00	-2.80	1.62
	[0.04]	(19.47)	(7.27)
Wood Fire: Indoors (=1)	0.09	1.34	-0.63
	[0.51]	(2.16)	(0.80)
Wood Fire: Outdoors (=1)	0.04	4.90***	0.62
	[0.49]	(1.80)	(0.67)
Electric: Indoors (=1)	0.02	2.85	-1.90
	[0.16]	(5.09)	(1.90)
Other stove: Indoors (=1)	0.27	-0.13	0.37
	[0.71]	(1.30)	(0.48)
Eating away from home	1.90	-0.05	0.15
	[0.93]	(1.13)	(0.42)
Eating at home	0.55	1.50	0.06
	[0.93]	(1.04)	(0.39)
On Bus	0.38	-1.52*	-0.51*
	[1.11]	(0.82)	(0.31)
On Bike	0.03	0.65	0.85
	[0.19]	(4.45)	(1.66)
Walking	1.93	0.49	0.03
	[2.32]	(0.41)	(0.15)
At work: Indoors	2.22	0.62*	0.09
	[3.81]	(0.34)	(0.13)
At work: Outdoors	2.96	0.45	0.13
	[4.05]	(0.32)	(0.12)
Doing Schoolwork: Outdoors	0.01	1.13	-0.48
	[0.20]	(4.60)	(1.72)
Doing Schoolwork: Indoors	0.07	-3.65	-0.42
	[0.34]	(2.83)	(1.06)
Other activities: Away	0.84	0.79	0.22
	[1.63]	(0.62)	(0.23)
Other activities: Home	3.99	0.26	0.34**
	[3.56]	(0.38)	(0.14)
Sleeping	6.09	30.41	3.94
	[2.74]	[33.21]	[11.88]
Observations	648	642	642

Column 1 presents the mean hours per day participants were doing the activities in each row. Columns 2 and 3 are separate OLS regressions of either Pm2.5 or CO exposure on the list of activities. Controls include socioeconomic controls, PA-II or Lascar device fixed effects, and field officer fixed effects. Hour spent sleeping was omitted from the regressions. The mean hours per day spent sleeping, PM2.5 levels while, and CO levels while sleeping are presented in the penultimate row. No one in our sample used an electric stove or "other" stove outdoors.

Table B4: First stage: impact of random treatments on take-up

	(1)	(2)	(3)	(4)	(5)
Credit treatment	0.29***		0.30***	0.21***	0.20**
	(0.04)		(0.04)	(0.08)	(0.08)
Subsidy (10 USD)		0.20***	0.20***	0.23***	0.23***
		(0.02)	(0.02)	(0.03)	(0.04)
Credit treatment X Subsidy (10 USD)				0.00	0.00
				(0.00)	(0.00)
Socioeconomic controls	No	No	No	No	Yes
Observations	702	702	702	702	702
Control mean	0.4	0.4	0.2	0.2	0.2

Impact of randomly assigned subsidy (USD 10-40), credit treatment status, and their interaction on endline Jikokoa ownership, estimated using OLS.

Table B5: IV estimates of the causal impact of cookstove adoption on socio-economic outcomes

	Control Mean	Treatment Effect	N
Charcoal expenditures past 7 days (USD)	3.84	-1.50***	702
	[3.16]	(0.47)	
Charcoal expenditures past 7 days (log)	5.98	-0.33***	667
	[0.82]	(0.12)	
Earnings past 2 weeks (USD)	32.53	4.73	563
	[35.41]	(7.83)	
Has formal bank account (=1)	0.13	0.11	702
	[0.34]	(0.07)	
Total savings (USD)	53.64	-8.63	701
	[86.62]	(19.88)	
... in mobile banking (USD)	5.85	-0.22	702
	[12.29]	(2.05)	
... contributions to SACCO (USD)	7.93	-0.67	701
	[14.30]	(2.69)	
... in SACCO payout (USD)	40.25	-15.30	701
	[64.75]	(13.97)	
... in formal banking (USD)	7.63	6.81	702
	[34.99]	(8.69)	
Minutes cooking per day	136.72	3.49	702
	[57.76]	(8.32)	
... minutes in the morning	30.97	-0.20	702
	[18.73]	(2.81)	
... minutes in the afternoon	40.53	1.17	702
	[25.05]	(4.06)	
... minutes in the evening	65.22	2.53	702
	[31.56]	(4.19)	
People in network who adopted Jikokoa	0.78	1.13***	702
	[2.04]	(0.40)	
... neighbors	0.28	0.56***	702
	[0.82]	(0.16)	
... family members	0.20	0.21	702
	[0.69]	(0.13)	
... friends	0.20	0.22*	702
	[0.69]	(0.13)	
... other people	0.10	0.14	702
	[0.45]	(0.10)	

Each row is an instrumental variables regressions where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership, and includes socioeconomic controls. The lower number of observations (<702) for "Charcoal expenditures past 7 days (log)" can be attributed to participants reporting zero charcoal expenditures in the past seven days. The lower number of observations for the other rows can be attributed to participants declining to answer.

Table B6: IV estimates of the causal impact of cookstove adoption on types of food cooked

	Control Mean	Treatment Effect	N
Ugali	0.97	-0.00	702
	[0.17]	(0.02)	
Vegetables	0.94	0.03	702
	[0.24]	(0.05)	
Potatoes	0.79	0.02	702
	[0.41]	(0.06)	
Fish	0.59	-0.00	702
	[0.49]	(0.07)	
Beans	0.90	0.00	702
	[0.30]	(0.05)	
Githeri	0.86	0.10**	702
	[0.34]	(0.05)	
Meat	0.78	0.02	702
	[0.42]	(0.06)	
Chapati	0.75	0.03	702
	[0.44]	(0.06)	
Egg	0.75	0.00	702
	[0.44]	(0.06)	
Tea	0.96	-0.01	702
	[0.20]	(0.02)	
Other foods	0.21	0.12**	702
	[0.41]	(0.06)	

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. Respondents were not asked to provide information about what "other foods" they cooked.

Table B7: IV estimates of the causal impact of cookstove adoption on pollution exposure

Panel A) Between 6–8am and 6–9pm (when most respondents report cooking)

	PM2.5				CO			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Median	Mean	Max Hour	99th	Median	Mean	Max Hour	99th
Own Jikokoa	-7.1	-9.4	-28.6*	-23.2	0.5	5.1*	18.4*	21.2
	(4.3)	(5.7)	(16.3)	(22.9)	(1.7)	(3.0)	(10.6)	(15.3)
Control Mean	37.4	53.4	117.0	189.8	3.4	9.3	33.1	54.8
Weak IV F-Statistic	53	53	53	53	52	52	52	52
Observations	649	649	646	649	656	656	656	656

Panel B) When self-reporting not cooking

	PM2.5				CO			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Median	Mean	Max Hour	99th	Median	Mean	Max Hour	99th
Own Jikokoa	-0.0	-0.7	-15.0	-5.8	-0.6	2.0	18.8	23.9*
	(1.7)	(3.3)	(18.2)	(23.1)	(0.4)	(1.6)	(12.3)	(14.2)
Control Mean	24.7	36.2	138.5	189.1	1.8	6.2	46.5	57.7
Weak IV F-Statistic	53	53	53	53	52	52	52	52
Observations	651	652	651	651	656	656	656	656

IV with randomly assigned price, credit treatment status, and their interaction instruments for endline Jikokoa ownership. Columns (1) and (5) use median exposure, (2) and (6) use mean exposure, (3) and (7) use maximum 1-hour average exposure, and (4) and (8) use 99th percentile of 10-min average exposure. Regressions include socioeconomic controls and LASCAR or PA-II device FE. **??** presents the same for all hours and for when self-reporting cooking. Table B9 presents all four outcomes in logs.

Table B8: IV estimates of the causal impact of cookstove adoption on CO exposure

Panel A) All hours

	(1) Median	(2) Mean	(3) Max Hour	(4) 99th
Own Jikokoa	-0.5	2.2	21.5*	25.6*
	(0.4)	(1.7)	(12.8)	(15.1)
Control Mean	1.8	6.5	49.6	61.6
Weak IV F-Statistic	52	52	52	52
Observations	656	656	656	656

Panel B) When self-reporting cooking

	(1) Median	(2) Mean	(3) Max Hour	(4) 99th
Own Jikokoa	1.1	1.4	8.3	6.3
	(2.1)	(3.1)	(9.9)	(14.2)
Control Mean	4.2	9.2	25.3	41.3
Weak IV F-Statistic	47	47	47	47
Observations	609	609	608	609

Each column is an IV regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Column (1) uses median exposure, (2) uses mean exposure, (3) uses maximum 1-hour average exposure, and (4) uses 99th percentile of 10-min average exposure. Of the 702 respondents surveyed, 656 consented to having at least one air pollution monitoring device (?? discusses attrition), and some of these never self-reported cooking. Regressions include socioeconomic controls and a fixed effect for the specific LASCAR or PA-II device used for that respondent. ?? presents the same for PM2.5. Table B7 presents the same for when self-reporting not cooking as well as for the hours between 6–8am and 6–9pm specifically, which is less prone to recall bias. Table B9 presents all four outcomes in logs.

Table B9: IV estimates of the causal impact of cookstove adoption on pollution exposure (in logs)

Panel A) All

	PM2.5				CO		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Median	Mean	Max Hour	99th	Mean	Max Hour	99th
Own Jikokoa	-0.01	-0.03	-0.13	-0.07	0.48	0.51*	0.56**
	(0.06)	(0.08)	(0.14)	(0.14)	(0.33)	(0.30)	(0.28)
Control Mean	3.1	3.5	4.8	5.0	0.7	2.8	3.1
Weak IV F-Statistic	53	53	53	53	53	53	53
Observations	651	652	651	651	652	651	645

Panel B) When self-reporting cooking

	PM2.5				CO		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Median	Mean	Max Hour	99th	Mean	Max Hour	99th
Own Jikokoa	-0.17*	-0.24**	-0.28*	-0.36**	0.18	0.20	0.16
	(0.09)	(0.11)	(0.15)	(0.18)	(0.41)	(0.41)	(0.37)
Control Mean	3.4	3.7	4.1	4.6	0.9	1.8	2.5
Weak IV F-Statistic	48	48	48	48	45	44	45
Observations	598	599	595	598	548	546	548

Panel C) Between 6–8am and 6–9pm (when most respondents report cooking)

	PM2.5				CO		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Median	Mean	Max Hour	99th	Mean	Max Hour	99th
Own Jikokoa	-0.09	-0.12	-0.23	-0.16	0.26	0.33	0.24
	(0.08)	(0.10)	(0.14)	(0.15)	(0.37)	(0.35)	(0.31)
Control Mean	3.5	3.8	4.5	5.0	1.0	2.3	2.9
Weak IV F-Statistic	53	53	53	53	50	50	50
Observations	649	649	646	649	628	628	628

Panel D) When self-reporting not cooking

	PM2.5				CO		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Median	Mean	Max Hour	99th	Mean	Max Hour	99th
Own Jikokoa	-0.01	-0.03	-0.11	-0.06	0.55*	0.55*	0.47*
	(0.06)	(0.08)	(0.14)	(0.15)	(0.33)	(0.31)	(0.28)
Control Mean	3.1	3.5	4.7	5.0	0.6	2.7	3.1
Weak IV F-Statistic	53	53	53	53	53	53	52
Observations	651	652	651	651	651	651	643

Instrumental variables regressions where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. We omit presenting median CO in log because 55% of 10-minute average observations equal 0. Columns (1) and (5) use median exposure, (2) and (6) use mean exposure, (3) and (7) use maximum 1-hour average exposure, and (4) and (8) use 99th percentile of 10-min average exposure. Regressions include socioeconomic controls and fixed effects for the specific LASCAR or PA-II device used for that respondent. **??** presents the same for all hours and for when self-reporting cooking.

Table B10: IV estimates of the causal impact of cookstove adoption on pollution exposure using hourly data

	Cooking	PM 2.5		PM 1.0		CO	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	IV	OLS	IV	OLS	IV	OLS	IV
Own Jikokoa	0.00	-1.79	0.39	-1.14	0.14	0.89	2.84**
	(0.01)	(1.54)	(2.91)	(0.91)	(1.74)	(0.69)	(1.44)
Cooking and Own Jikokoa		-9.72***	-14.95**	-5.15***	-8.31**	1.29	-1.46
		(3.05)	(7.30)	(1.78)	(4.21)	(1.37)	(2.43)
Cooking		9.20***	12.07***	5.04***	6.77***	0.78	2.30
		(2.56)	(4.04)	(1.53)	(2.31)	(0.83)	(1.54)
DoW*HoD*Geocluster FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Mean	0.10	36.33	36.33	25.65	25.65	6.17	6.17
Weak IV F-Statistic	39		29		29		29
Households	661	652	652	652	652	656	656
Observations	29429	23374	23374	23374	23374	29155	29155

Columns (2), (4), and (6) are each OLS regressions, while Columns (3), (5), and (7) are instrumental variables regressions which use randomly assigned price and credit treatment status as instruments for endline Jikokoa ownership. Standard errors clustered by respondent. All regressions include socioeconomic controls, panel data fixed effects, and Lascar or PA-II device fixed effects.

Table B11: IV estimates of the causal impact of cookstove adoption on minutes per day in excess of exposure thresholds

Panel A) All

	(1)	(2)	(3)	(4)	(5)	(6)
	$50\mu g/m^3$	$75\mu g/m^3$	$100\mu g/m^3$	$200\mu g/m^3$	$300\mu g/m^3$	$400\mu g/m^3$
Own Jikokoa	1.4	-2.7	-2.8	-2.2	-2.3	-2.1
	(30.8)	(23.3)	(18.6)	(10.7)	(7.3)	(4.9)
Households	653	653	653	653	653	653
Control Mean	193.5	120.8	86.3	36.1	20.4	12.6

Panel B) When self-reporting cooking

	(1)	(2)	(3)	(4)	(5)	(6)
	$50\mu g/m^3$	$75\mu g/m^3$	$100\mu g/m^3$	$200\mu g/m^3$	$300\mu g/m^3$	$400\mu g/m^3$
Own Jikokoa	-4.4	-5.4	-4.3	-3.8	-4.4**	-2.6*
	(8.1)	(6.2)	(5.0)	(3.0)	(2.1)	(1.5)
Households	599	599	599	599	599	599
Control Mean	35.6	24.2	17.7	8.5	5.3	3.3

Each column is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Column labels are the exposure thresholds. Regressions include socioeconomic controls and fixed effects for the specific LASCAR or PA-II device used for that respondent.

Table B12: IV estimates of the causal impact of cookstove adoption on diagnoses by a medical professional

	Control Mean	Treatment Effect	N	q-value
Number of health diagnoses	0.30	0.13	702	
	[0.58]	(0.09)		
Asthma	0.01	-0.01	702	0.72
	[0.08]	(0.01)		
Pneumonia	0.13	0.02	702	0.81
	[0.34]	(0.05)		
Chronic Pulmonary Disease	0.00	0.01	702	0.72
	[0.06]	(0.01)		
Other lung disease	0.01	-0.01	702	0.72
	[0.08]	(0.01)		
Stroke or cardiovascular disease	0.01	-0.00	702	0.81
	[0.08]	(0.01)		
Hypertension	0.05	0.11***	702	0.10
	[0.22]	(0.04)		
Tuberculosis	0.01	0.02	702	0.72
	[0.08]	(0.01)		
COVID	0.01	-0.01	702	0.72
	[0.08]	(0.01)		
Diabetes	0.02	-0.00	702	0.91
	[0.14]	(0.02)		
Other	0.04	0.01	702	0.81
	[0.19]	(0.03)		
Typhoid	0.02	0.01	702	0.81
	[0.14]	(0.02)		
Tuberculosis	0.01	-0.01	702	0.81
	[0.08]	(0.02)		
Cholera	0.00	0.01	702	0.77
	[0.00]	(0.01)		

Each variable is the respondent's self-report of whether they have been diagnosed with each disease by a doctor in the past three years. Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls.

Table B13: IV estimates of the causal impact of cookstove adoption on respiratory-related health symptoms

	Control Mean	Treatment Effect	N	q-value
Respiratory health symptom index	-0.00	-0.24*	702	
	[1.00]	(0.13)		
Number of respiratory health symptoms	1.70	-0.48**	702	
	[1.76]	(0.23)		
Respiratory health symptom index	0.00	-0.27**	702	
(frequent symptoms)	[1.00]	(0.13)		
Number of respiratory health symptoms	1.61	-0.46**	702	
(frequent symptoms)	[1.63]	(0.22)		
Persistent cough	0.24	-0.09	702	0.71
	[0.43]	(0.07)		
Always feeling tired	0.30	-0.07	702	0.77
	[0.46]	(0.07)		
Breathlessness at night	0.08	-0.01	702	0.77
	[0.27]	(0.04)		
Frequent diarrhea	0.02	-0.02	702	0.77
	[0.15]	(0.03)		
Difficulty breathing / Chest tightness	0.07	-0.01	702	0.77
	[0.26]	(0.04)		
Runny nose	0.23	-0.05	702	0.77
	[0.42]	(0.07)		
Sore throat	0.16	-0.12*	702	0.63
	[0.37]	(0.06)		
Headache	0.52	-0.12	702	0.71
	[0.50]	(0.08)		
Wheezing	0.03	0.01	702	0.77
	[0.17]	(0.03)		
Persistent mucus problems	0.04	-0.01	702	0.77
	[0.19]	(0.02)		

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. Rows 3 and 4 only include symptoms with prevalence of at least 5% among the control group.

Table B14: IV estimates of the causal impact of cookstove adoption on non-respiratory related health symptoms

	Control Mean	Treatment Effect	N	q-value
Non-respiratory health symptom index	-0.00	-0.03	702	
	[1.00]	(0.19)		
Number of non-respiratory health symptoms	1.09	-0.24	702	
	[1.54]	(0.25)		
Non-respiratory health symptom index	0.00	-0.31*	702	
(frequent symptoms)	[1.00]	(0.16)		
Number of non-respiratory health symptoms	0.84	-0.33*	702	
(frequent symptoms)	[1.16]	(0.19)		
Fever	0.20	0.01	702	0.95
	[0.40]	(0.07)		
Malaria	0.15	-0.13*	702	0.19
	[0.36]	(0.07)		
Stomach pain	0.16	-0.11*	702	0.19
	[0.37]	(0.06)		
Pain when urinating	0.01	-0.01	702	0.88
	[0.10]	(0.03)		
Worms	0.01	0.05**	702	0.19
	[0.11]	(0.02)		
Rapid weight loss	0.06	-0.09**	702	0.19
	[0.24]	(0.04)		
Frequent and excessive urination	0.03	0.02	702	0.79
	[0.16]	(0.02)		
Skin Rash or irritaion	0.02	0.04	702	0.38
	[0.12]	(0.03)		
Constant thirst / increased drinking of fluids	0.14	-0.01	702	0.95
	[0.35]	(0.05)		
Difficulty swallowing	0.03	-0.02	702	0.77
	[0.17]	(0.02)		
Muscle pain (myalgia)	0.12	-0.01	702	0.95
	[0.32]	(0.05)		
Loss of sense of smell / not being able to taste food	0.05	-0.01	702	0.88
	[0.21]	(0.03)		
Diarrhea / Nausea / Vomiting	0.05	-0.04	702	0.38
	[0.21]	(0.03)		
Swelling in ankles, feets or legs	0.04	0.00	702	0.95
	[0.20]	(0.03)		
Other accidents	0.02	0.07***	702	0.06
	[0.14]	(0.02)		

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. Rows 3 and 4 only include symptoms with prevalence of at least 5% among the control group.

Table B15: IV estimates of the causal impact of cookstove adoption on cognitive function

	Control Mean	Treatment Effect	N	q-value
Cognitive index	0.00	-0.00	578	
	[1.00]	(0.14)		
Working memory (Corsi)	-0.00	-0.43**	294	0.16
	[1.00]	(0.21)		
Attention (d2)	0.00	-0.09	564	0.63
	[1.00]	(0.15)		
Inhibitory control (HF - % correct)	-0.00	0.15	529	0.63
	[1.00]	(0.16)		
Inhibitory control (HF - reaction time)	-0.00	0.08	529	0.63
	[1.00]	(0.17)		

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. See ?? and Appendix D for descriptions of the cognitive exercises conducted to measure cognitive function. Variables standardized for the control group to have mean 0 and standard deviation 1. Due to a technical issues with the tablets not displaying the behavioral games, the sample size for some of the cognition outcomes is smaller than in other outcome tables. Since this was a technical issue that occurred in the earlier stages of the surveying round, and since the order of follow-up surveys was randomized, it is unlikely that this biased the results in any meaningful way. Regressions control for baseline demographic and socioeconomic characteristics.

Table B16: IV estimates of the causal impact of cookstove adoption on healthcare utilization outcomes

	Control Mean	Treatment Effect	N	q-value
Non-hospital health expenditures (USD)	4.34	0.80	702	0.73
	[7.64]	(1.07)		
Hospital visits in past 30 days	0.33	-0.01	702	0.90
	[0.57]	(0.09)		
Hospital visit expenditures (USD)	3.39	1.03	702	0.73
	[11.17]	(1.48)		

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls.

Table B17: IV estimates of the causal impact of cookstove adoption on children's health

	Control Mean	Treatment Effect	N	q-value
Child weight (z-score)	0.57	-0.96	223	0.71
	[2.57]	(0.88)		
Child height (z-score)	-1.95	1.31	199	0.74
	[6.82]	(1.70)		
Child arm circumference (z-score)	0.60	1.76	142	0.71
	[7.05]	(1.95)		
Child weight (kg)	17.73	-1.02	224	0.78
	[7.57]	(1.80)		
Child height (cm)	98.59	6.02	199	0.71
	[31.07]	(6.08)		
Child arm circumference (cm)	16.37	1.24	220	0.71
	[7.26]	(1.41)		
Number of child health symptoms	1.19	0.35	343	
	[1.50]	(0.40)		
Child health symptom index	0.00	0.32	343	
	[1.00]	(0.29)		
Fever	0.18	-0.01	343	0.96
	[0.38]	(0.09)		
Vomiting	0.10	-0.01	343	0.96
	[0.30]	(0.06)		
Cough	0.40	0.03	343	0.96
	[0.49]	(0.12)		
Diarrhea	0.10	0.00	343	0.96
	[0.30]	(0.07)		
Breathlessness	0.04	0.08	343	0.71
	[0.19]	(0.06)		
Persistent headache	0.08	0.06	343	0.71
	[0.27]	(0.05)		
Very bad cough	0.25	0.10	343	0.71
	[0.43]	(0.09)		
Pneumonia - DHS	0.03	0.03	343	0.76
	[0.18]	(0.05)		
Pneumonia - WHO	0.22	0.07	408	0.71
	[0.35]	(0.08)		

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include household and adult socioeconomic controls. Z-scores are calculated using data from WHO (2006) and Onis et al. (2007), which combined provides mean and standard deviation heights for children age 0 to 19. We subtract each child's height with the mean for children of their age, then divide by the associated standard deviation to create the z-scores. The WHO only provides data on arm circumference for children age 5 or younger, so we do not include children older than five in that regression. 'Pneumonia - DHS' and 'Pneumonia - WHO' make an attempted pneumonia diagnosis based on self-reported respiratory symptoms and hospital visits using guidelines from the Demographic and Health Survey (DHS) and World Health Organization (WHO), respectively.

Table B18: Correlation of blood pressure and blood oxygen with self-reported health outcomes

	Mean	Blood Pressure	Blood Oxygen	N
	(1)	(2)	(3)	(4)
Health symptoms index (z-score)	-0.12	0.03	-0.01	696
	[1.00]	(0.04)	(0.04)	
Number of health symptoms	2.47	0.05	-0.02	696
	[2.64]	(0.10)	(0.10)	
Respiratory health symptom index	-0.11	-0.03	-0.01	696
	[1.00]	(0.04)	(0.04)	
Number of respiratory health symptoms	1.53	-0.04	0.00	696
	[1.59]	(0.06)	(0.06)	
Non-respiratory health symptom index	-0.09	0.07*	-0.01	696
	[1.00]	(0.04)	(0.04)	
Number of non-respiratory health symptoms	0.94	0.09	-0.02	696
	[1.42]	(0.06)	(0.05)	
Health diagnoses index	-0.06	0.11***	0.03	696
	[1.00]	(0.04)	(0.04)	
Number of health diagnoses	0.28	0.06***	0.02	696
	[0.55]	(0.02)	(0.02)	
Cognitive index	0.04	-0.00	0.03	572
	[1.00]	(0.04)	(0.04)	
Hospital visits in past 30 days	0.28	-0.01	0.01	696
	[0.53]	(0.02)	(0.02)	
Hospital visit expenditures (USD)	2.75	0.24	0.34	696
	[10.14]	(0.43)	(0.42)	

Each cell in Columns (2) and (3) is an OLS regression of the row variable on standard deviations of either blood pressure or blood oxygen. Column (1) presents the mean of the row variable over the entire sample. Regressions include socioeconomic controls. Table B29, Table B30, and Table B31 provide correlations of blood pressure and blood oxygen with more detailed outcomes on diagnoses, respiratory symptoms, and non-respiratory symptoms respectively.

Table B19: Correlation of average ambient PM2.5 exposure with baseline socio-economic characteristics

	Mean	Owns Jikokoa (=1)	Mean Pollution in SD	Median Pollution in SD	Max Hourly Pollution in SD	Hours Above $100\mu g/m^3$
	(1)	(2)	(3)	(4)	(5)	(6)
Owns Jikokoa (=1)			-0.11	-0.07	-0.08	-0.18
			(0.08)	(0.08)	(0.08)	(0.14)
Income (1 USD)	3.39	-0.00	0.00	0.00	0.00	-0.00
	[3.18]	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Savings (100 USD)	0.71	0.04**	-0.08**	-0.07*	-0.07**	-0.10
	[1.19]	(0.02)	(0.04)	(0.03)	(0.04)	(0.06)
Primary education (=1)	0.69	0.02	-0.06	-0.20**	0.09	-0.02
	[0.46]	(0.05)	(0.10)	(0.10)	(0.10)	(0.17)
Residents	4.86	0.02**	0.00	0.01	0.01	0.01
	[2.10]	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)
Observations	651	651	650	651	651	651

Ambient pollution only includes observations recorded during hours where the respondent did not self-report cooking. Each column is regression. Regressions control flexibly for month of survey, age, and device, and include binary indicators for female and rural.

Table B20: Correlation between health and average, maximum, and duration of PM2.5 exposure

	Mean	Average Pollution in SD	Max Hourly Pollution in SD		Hours Above $100\mu g/m^3$		N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Average systolic blood pressure	123.49	-0.08	0.52	0.52	0.25	0.25	645
	[21.60]	(0.91)	(0.85)	(0.85)	(0.50)	(0.50)	
Average diastolic blood pressure	81.74	0.53	0.53	0.53	0.29	0.29	645
	[12.71]	(0.56)	(0.53)	(0.53)	(0.31)	(0.31)	
Hypertension: Stage 1 or higher	0.51	0.01	0.00	0.00	0.00	0.00	645
(>130/80)	[0.50]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Hypertension: Stage 2 or higher	0.27	0.00	-0.01	-0.01	0.00	0.00	645
(>140/90)	[0.44]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Blood oxygen	96.72	0.12	-0.03	-0.03	0.03	0.03	645
	[2.43]	(0.10)	(0.10)	(0.10)	(0.06)	(0.06)	
Number of health symptoms	2.52	0.02	0.23**	0.23**	0.02	0.02	651
	[2.66]	(0.11)	(0.10)	(0.10)	(0.06)	(0.06)	
Health symptoms index (z-score)	-0.09	0.01	0.07**	0.07**	0.01	0.01	651
	[0.92]	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	
Number of non-respiratory health	0.96	0.03	0.15***	0.15***	0.02	0.02	651
symptoms	[1.44]	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)	
Non-respiratory health symptom	-0.07	0.02	0.09**	0.09**	0.01	0.01	651
index	[0.99]	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	
Number of respiratory health	1.55	-0.01	0.08	0.08	0.00	0.00	651
symptoms	[1.60]	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)	
Respiratory health symptom index	-0.09	-0.01	0.04	0.04	-0.00	-0.00	651
	[0.88]	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	
Number of health diagnoses	0.29	-0.03	-0.00	-0.00	-0.02	-0.02	651
	[0.56]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Health diagnoses index	-0.04	-0.04	0.00	0.00	-0.03	-0.03	651
	[0.89]	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	
Hospital visits in past 30 days	0.30	-0.01	0.01	0.01	-0.00	-0.00	651
	[0.55]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Non-hospital health expenditures	4.17	0.63*	0.60*	0.60*	0.28	0.28	651
(USD)	[7.94]	(0.33)	(0.32)	(0.32)	(0.18)	(0.18)	
Hospital visit expenditures (USD)	2.82	0.66	0.62	0.62	0.26	0.26	651
	[10.14]	(0.44)	(0.42)	(0.42)	(0.24)	(0.24)	
Control for average pollution			No	Yes	No	Yes	

Each row and column cell in Columns (2)–(6) is a separate OLS regression. Regressions include socioeconomic controls and fixed effects for month surveyed and for the specific LASCAR device used for that respondent. Regressions in Columns (4) and (6) control for average PM2.5 pollution, while regressions in Columns (3) and (5) don't.

Table B21: Correlation between health and average, maximum, and duration of CO exposure

	Mean	Average Pollution in SD	Max Hourly Pollution in SD		Hours Above 10coppm		N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Average systolic blood pressure	123.49	1.50*	0.79	0.79	-0.08	-0.08	645
	[21.60]	(0.88)	(0.88)	(0.88)	(0.27)	(0.27)	
Average diastolic blood pressure	81.74	1.32**	0.71	0.71	0.06	0.06	645
	[12.71]	(0.54)	(0.54)	(0.54)	(0.17)	(0.17)	
Hypertension: Stage 1 or higher	0.51	0.02	0.00	0.00	-0.01	-0.01	645
(>130/80)	[0.50]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Hypertension: Stage 2 or higher	0.27	0.04**	0.02	0.02	-0.00	-0.00	645
(>140/90)	[0.44]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Blood oxygen	96.72	0.23**	0.19*	0.19*	0.06*	0.06*	645
	[2.43]	(0.10)	(0.10)	(0.10)	(0.03)	(0.03)	
Number of health symptoms	2.52	0.14	0.17	0.17	0.08**	0.08**	651
	[2.66]	(0.11)	(0.11)	(0.11)	(0.03)	(0.03)	
Health symptoms index (z-score)	-0.09	0.05	0.06*	0.06*	0.03**	0.03**	651
	[0.92]	(0.04)	(0.04)	(0.04)	(0.01)	(0.01)	
Number of non-respiratory health	0.96	0.05	0.11*	0.11*	0.03*	0.03*	651
symptoms	[1.44]	(0.06)	(0.06)	(0.06)	(0.02)	(0.02)	
Non-respiratory health symptom	-0.07	0.04	0.08**	0.08**	0.02*	0.02*	651
index	[0.99]	(0.04)	(0.04)	(0.04)	(0.01)	(0.01)	
Number of respiratory health	1.55	0.08	0.06	0.06	0.05**	0.05**	651
symptoms	[1.60]	(0.06)	(0.06)	(0.06)	(0.02)	(0.02)	
Respiratory health symptom index	-0.09	0.06	0.03	0.03	0.02**	0.02**	651
	[0.88]	(0.04)	(0.04)	(0.04)	(0.01)	(0.01)	
Number of health diagnoses	0.29	0.04*	0.03	0.03	0.00	0.00	651
	[0.56]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Health diagnoses index	-0.04	0.04	0.04	0.04	-0.00	-0.00	651
	[0.89]	(0.04)	(0.04)	(0.04)	(0.01)	(0.01)	
Hospital visits in past 30 days	0.30	-0.01	0.01	0.01	0.00	0.00	651
	[0.55]	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	
Non-hospital health expenditures	4.17	0.18	0.10	0.10	-0.10	-0.10	651
(USD)	[7.94]	(0.33)	(0.33)	(0.33)	(0.10)	(0.10)	
Hospital visit expenditures (USD)	2.82	0.49	0.11	0.11	-0.11	-0.11	651
	[10.14]	(0.42)	(0.43)	(0.43)	(0.13)	(0.13)	
Control for average pollution			No	Yes	No	Yes	

Each row and column cell in Columns (2)–(6) is a separate OLS regression. Regressions include socioeconomic controls and fixed effects for month surveyed and for the specific PA-II device used for that respondent. Regressions in Columns (4) and (6) control for average PM2.5 pollution, while regressions in Columns (3) and (5) don't. Table B13, Table B14 and Table B12 present detailed results on symptoms and diagnoses.

Table B22: Heterogeneity in primary health impacts by baseline socioeconomic variables

	Treatment X Age	Treatment X WTP	Treatment X Health	Treatment X Health beliefs	Treatment X LPG	N
	(1)	(2)	(3)	(4)	(5)	
Average systolic blood pressure	-0.73	-2.53	-2.20	-1.51	-0.32	696
	(3.26)	(4.88)	(3.07)	(3.42)	(6.16)	
Average diastolic blood pressure	-2.49	-3.07	-3.77*	-1.58	-0.46	696
	(2.09)	(3.13)	(1.97)	(2.32)	(4.06)	
Hypertension: Stage 1 or higher	-0.01	-0.05	-0.15*	-0.05	-0.06	696
(>130/80)	(0.08)	(0.13)	(0.09)	(0.09)	(0.17)	
Hypertension: Stage 2 or higher	0.03	-0.20*	-0.15*	-0.09	0.04	696
(>140/90)	(0.08)	(0.12)	(0.08)	(0.08)	(0.14)	
Blood oxygen	0.05	0.94	-0.15	-0.05	0.70	696
	(0.33)	(0.60)	(0.35)	(0.37)	(0.67)	
Number of non-respiratory health	0.00	0.31	0.21	0.10	0.44	702
symptoms	(0.20)	(0.35)	(0.21)	(0.29)	(0.48)	
Non-respiratory health symptom	-0.07	0.10	0.15	0.09	0.32	702
index	(0.14)	(0.23)	(0.14)	(0.21)	(0.34)	
Number of respiratory health	0.25	0.04	-0.12	-0.02	-0.05	702
symptoms	(0.20)	(0.34)	(0.21)	(0.24)	(0.45)	
Respiratory health symptom	0.12	-0.06	-0.07	-0.00	0.12	702
index	(0.12)	(0.19)	(0.11)	(0.13)	(0.25)	

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. All heterogeneity variables are baseline measures and standardized to have mean 0 and standard deviation 1. There are 48 respondents whos age is >60.

Table B23: IV estimates of the causal impact of cookstove adoption on primary health outcomes by ambient concentrations

	Treatment (1)	Treatment X Ambient (2)	N
Average systolic blood pressure	-1.20	3.64	649
	(4.69)	(5.97)	
Average diastolic blood pressure	1.43	-1.06	649
	(2.85)	(4.03)	
Hypertension: Stage 1 or higher (>130/80)	0.07	-0.11	649
	(0.11)	(0.17)	
Hypertension: Stage 2 or higher (>140/90)	-0.02	0.05	649
	(0.10)	(0.15)	
Blood oxygen	-0.08	0.44	649
	(0.41)	(0.67)	
Number of non-respiratory health symptoms	0.12	-0.76	655
	(0.31)	(0.52)	
Non-respiratory health symptom index	0.07	-0.24	655
	(0.22)	(0.38)	
Number of respiratory health symptoms	-0.34	-0.14	655
	(0.28)	(0.45)	
Respiratory health symptom index	-0.17	-0.05	655
	(0.17)	(0.25)	
Health diagnoses index	0.06	0.08	655
	(0.24)	(0.32)	
Number of health diagnoses	0.10	0.06	655
	(0.13)	(0.19)	
Cognitive index	-0.09	0.13	538
	(0.20)	(0.29)	
Non-hospital health expenditures (USD)	1.04	0.25	655
	(1.42)	(2.32)	
Hospital visits in past 30 days	-0.02	0.02	655
	(0.12)	(0.19)	
Hospital visit expenditures (USD)	0.99	2.37	655
	(1.67)	(3.07)	

High ambient concentration is a dummy for above median average non-cooking PM2.5, which among people with below (above) average ambient pollution is 27.4 $\mu g/m^3$ (43.0 $\mu g/m^3$) . Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls.

Table B24: IV estimates of the causal impact of cookstove adoption on primary health outcomes for rural respondents

	Control Mean (1)	Treatment Effect (2022 Ownership) (2)	Treatment Effect (2019 ownership) (3)	N
Physiological health index (blood oxygen and blood pressure)	-0.03 [0.91]	-1.04*** (0.31)	-0.98*** (0.33)	53
Number of non-respiratory health symptoms	0.64 [0.79]	-0.11 (0.21)	-0.11 (0.21)	53
Non-respiratory health symptom index	-0.29 [0.44]	0.08 (0.08)	0.07 (0.07)	53
Number of respiratory health symptoms	1.23 [1.11]	-0.02 (0.35)	0.06 (0.35)	53
Respiratory health symptom index	-0.31 [0.50]	-0.15 (0.19)	-0.13 (0.19)	53
Health diagnoses index	-0.16 [1.18]	0.38** (0.18)	0.41** (0.19)	53
Number of health diagnoses	0.14 [0.47]	0.14 (0.12)	0.14 (0.13)	53
Cognitive index	-0.06 [0.76]	-0.02 (0.25)	-0.05 (0.25)	51
Healthcare utilization index (spending and visits)	0.02 [0.97]	0.80* (0.44)	0.84* (0.46)	53

Health outcomes for the rural sample only. Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. **??** presents results for the full sample.

Table B25: IV estimates of the causal impact of cookstove adoption on Time Use

	Control Mean	Treatment Effect	N
Cooking	2.50 [1.84]	0.31 (0.23)	691
Sleeping	9.60 [2.26]	-0.73** (0.34)	691
Eating	2.38 [1.07]	-0.15 (0.17)	691
Bus	0.32 [0.91]	-0.05 (0.15)	691
Bicycle	0.03 [0.17]	0.01 (0.04)	691
Walking	1.67 [2.01]	0.37 (0.33)	691
Work	4.40 [4.12]	0.36 (0.67)	691
Schoolwork	0.08 [0.34]	0.03 (0.04)	691
Other (away)	0.82 [1.54]	-0.29 (0.26)	691
Other (home)	3.86 [3.21]	-0.13 (0.51)	691

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Each regression includes socioeconomic controls. The outcome variable for each row is hours spent on each task each day. Rows add up to > 24 as some respondents report multiple activities within a given hour window.

Table B26: Testing for experimenter demand: direct effect of price on symptom reports

	Respiratory			Non-respiratory		
	(1)	(2)	(3)	(4)	(5)	(6)
Owns Jikokoa	-0.45*** (0.12)	-0.29 (0.28)	-0.30 (0.28)	-0.39*** (0.11)	-0.40 (0.26)	-0.38 (0.27)
Price (10 USD)	-0.00 (0.07)	0.05 (0.11)	0.05 (0.11)	-0.06 (0.06)	-0.07 (0.10)	-0.06 (0.10)
Owns Jikokoa X Price (10 USD)		-0.09 (0.14)	-0.09 (0.14)		0.00 (0.13)	0.01 (0.13)
WTP (10 USD)			0.02 (0.05)			-0.02 (0.05)

Regressions include socioeconomic controls. If respondents with a lower price (higher subsidy) were more likely to self-report better health, price would correlate directly with self-reported symptoms rather than through the adoption channel ('Owns Jikokoa'). We do not find evidence of this here, meaning we do not find evidence of experimenter demand.

Table B27: Attrition

	Baseline Mean	Attrited	N
BDM Price (USD)	17.6	0.3	955
	[8.3]	(0.6)	
Credit Treatment	0.7	-0.0	955
	[0.5]	(0.0)	
Attention Treatment	0.7	0.1*	955
	[0.5]	(0.0)	
Jikokoa (=1)	0.6	-0.0	955
	[0.5]	(0.0)	
Persistent cough in past week	0.3	-0.0	955
	[0.5]	(0.0)	
Persistent breathlessness in past week	0.3	-0.0	955
	[0.5]	(0.0)	
Hours work missed due to health in past week	3.2	1.1	951
	[14.8]	(1.1)	
Female	1.0	-0.0	955
	[0.2]	(0.0)	
Respondent age	37.5	-3.8***	955
	[11.8]	(0.9)	
Number of household residents	4.8	-0.4**	955
	[2.1]	(0.2)	
Number of child residents	2.6	-0.3*	955
	[1.7]	(0.1)	
Savings in bank, mobile, ROSCA (USD)	75.7	11.8	955
	[130.2]	(9.5)	
Household income (USD/week)	47.3	2.5	949
	[34.8]	(2.6)	
Total energy consumption (USD/week)	8.6	-0.4	955
	[3.6]	(0.3)	
Charcoal consumption (USD/week)	5.6	-0.4*	955
	[2.6]	(0.2)	
Price of old jiko (USD)	3.4	0.2	950
	[1.3]	(0.1)	
Risky investment amount (0-4 USD)	1.2	-0.0	955
	[1.0]	(0.1)	
Mean		0.26	

All variables from baseline (2019). Attrited = 1 if respondent has not completed a 2022–2023 endline survey. Column (1), Baseline Mean, is the mean of both attriters and non-attriters in 2019. Column (2), Attrited, is the difference in means between the full sample and attriters. Any changes in Column (3), N, is due to participants declining to answer a question. The bottom row, Mean, presents the percentage of respondents who attrited.

Table B28: Attrition: reaching participants

Reason	Frequency
Completed survey	702
Unable to contact	164
Unavailable	12
Withdrew from study	31
Relocated outside survey team reach	29
Deceased	7
Imprisoned	2
Other	8
Total	955

Participants who we were unable to contact were labeled only after repeated phone calls to their phone numbers and to the phone numbers of family members, physical visits to their home locations, and inquiries with nearby participants. Participants were labeled as "relocated outside survey team reach" if they moved out of Kenya or far away from the major cities of Nairobi and Mombasa.

Table B29: Correlation of blood pressure and blood oxygen with self-reported respiratory diagnoses

	Mean (1)	Blood Pressure (2)	Blood Oxygen (3)	N (4)
Asthma	0.00	0.00	0.00	696
	[0.05]	(0.00)	(0.00)	
Pneumonia	0.12	0.01	0.01	696
	[0.32]	(0.01)	(0.01)	
Chronic Pulmonary Disease	0.00	0.00	-0.00	696
	[0.04]	(0.00)	(0.00)	
Other lung disease	0.00	0.00	0.00	696
	[0.07]	(0.00)	(0.00)	
Stroke or cardiovascular disease	0.00	0.00	-0.00	696
	[0.05]	(0.00)	(0.00)	
Hypertension	0.06	0.06***	0.01	696
	[0.23]	(0.01)	(0.01)	
Tuberculosis	0.00	-0.00	0.00	696
	[0.05]	(0.00)	(0.00)	
COVID	0.01	0.00	0.00	696
	[0.08]	(0.00)	(0.00)	
Diabetes	0.02	0.00	0.00	696
	[0.14]	(0.01)	(0.01)	
Other	0.04	-0.01	0.00	696
	[0.19]	(0.01)	(0.01)	
Typhoid	0.02	-0.01	-0.00	696
	[0.13]	(0.01)	(0.01)	
Tuberculosis	0.00	0.01***	-0.00	696
	[0.07]	(0.00)	(0.00)	
Cholera	0.00	0.00	-0.00	696
	[0.05]	(0.00)	(0.00)	

Each cell in Columns (2) and (3) is an OLS regression of the row variable on standard deviations of either blood pressure or blood oxygen. Column (1) presents the mean of the row variable over the entire sample. Regressions include socioeconomic controls.

Table B30: Correlation of blood pressure and blood oxygen with self-reported respiratory symptoms

	Mean (1)	Blood Pressure (2)	Blood Oxygen (3)	N (4)
Respiratory health symptom index	-0.12	0.03	-0.01	696
	[1.00]	(0.04)	(0.04)	
Number of respiratory health symptoms	1.53	-0.04	0.00	696
	[1.59]	(0.06)	(0.06)	
Persistent cough	0.23	-0.00	0.01	696
	[0.42]	(0.02)	(0.02)	
Always feeling tired	0.28	0.01	0.02	696
	[0.45]	(0.02)	(0.02)	
Breathlessness at night	0.06	-0.00	-0.00	696
	[0.25]	(0.01)	(0.01)	
Frequent diarrhea	0.02	-0.00	0.00	696
	[0.12]	(0.01)	(0.00)	
Difficulty breathing / Chest tightness	0.06	-0.02*	-0.01	696
	[0.23]	(0.01)	(0.01)	
Runny nose	0.22	-0.01	-0.01	696
	[0.41]	(0.02)	(0.02)	
Sore throat	0.15	-0.00	0.00	696
	[0.36]	(0.01)	(0.01)	
Headache	0.48	-0.00	0.00	696
	[0.50]	(0.02)	(0.02)	
Wheezing	0.03	-0.00	-0.01	696
	[0.16]	(0.01)	(0.01)	
Persistent mucus problems	0.02	-0.01	0.00	696
	[0.15]	(0.01)	(0.01)	

Each cell in Columns (2) and (3) is an OLS regression of the row variable on standard deviations of either blood pressure or blood oxygen. Column (1) presents the mean of the row variable over the entire sample. Regressions include socioeconomic controls.

Table B31: Correlation of blood pressure and blood oxygen with self-reported non-respiratory symptoms

	Mean (1)	Blood Pressure (2)	Blood Oxygen (3)	N (4)
Non-respiratory health symptom index	-0.09	0.07*	-0.01	696
	[1.00]	(0.04)	(0.04)	
Number of non-respiratory health symptoms	0.94	0.09	-0.02	696
	[1.42]	(0.06)	(0.05)	
Fever	0.22	0.04**	-0.00	696
	[0.42]	(0.02)	(0.02)	
Malaria	0.13	-0.01	-0.02	696
	[0.33]	(0.01)	(0.01)	
Stomach pain	0.13	0.01	0.01	696
	[0.33]	(0.01)	(0.01)	
Pain when urinating	0.01	0.00	-0.00	696
	[0.11]	(0.00)	(0.00)	
Worms	0.01	0.00	0.00	696
	[0.11]	(0.00)	(0.00)	
Rapid weight loss	0.05	-0.01	0.00	696
	[0.21]	(0.01)	(0.01)	
Frequent and excessive urination	0.02	0.02**	-0.00	696
	[0.15]	(0.01)	(0.01)	
Skin Rash or irritaion	0.02	0.00	-0.00	696
	[0.13]	(0.01)	(0.01)	
Constant thirst / increased drinking of fluids	0.13	-0.00	-0.01	696
	[0.33]	(0.01)	(0.01)	
Difficulty swallowing	0.02	0.00	0.01	696
	[0.14]	(0.01)	(0.01)	
Muscle pain (myalgia)	0.09	0.02	-0.00	696
	[0.29]	(0.01)	(0.01)	
Loss of sense of smell / not being able to taste food	0.03	-0.00	-0.00	696
	[0.17]	(0.01)	(0.01)	
Diarrhea / Nausea / Vomiting	0.03	0.01	0.01	696
	[0.17]	(0.01)	(0.01)	
Swelling in ankles, feets or legs	0.03	0.01	0.00	696
	[0.18]	(0.01)	(0.01)	
Other accidents	0.02	0.00	-0.01	696
	[0.14]	(0.01)	(0.01)	

Each cell in Columns (2) and (3) is an OLS regression of the row variable on standard deviations of either blood pressure or blood oxygen. Column (1) presents the mean of the row variable over the entire sample. Regressions include socioeconomic controls.

Table B32: IV estimates of the causal impact of cookstove adoption on health by baseline health beliefs

	Treatment X Health Belief regarding Jikokoa (1)	Treatment X Health Belief regarding Traditional Stove (2)	N
Average systolic blood pressure	4.23 (3.86)	-3.14 (3.49)	696
Average diastolic blood pressure	1.60 (2.43)	-2.32 (2.36)	696
Hypertension: Stage 1 or higher ($>130/80$)	0.14 (0.09)	-0.09 (0.10)	696
Hypertension: Stage 2 or higher ($>140/90$)	0.07 (0.08)	-0.13* (0.08)	696
Blood oxygen	0.17 (0.37)	-0.08 (0.37)	696
Number of non-respiratory health symptoms	0.09 (0.26)	0.12 (0.29)	702
Non-respiratory health symptom index	0.16 (0.20)	0.06 (0.20)	702
Number of respiratory health symptoms	-0.15 (0.24)	0.05 (0.25)	702
Respiratory health symptom index	-0.06 (0.14)	0.03 (0.14)	702

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. All heterogeneity variables are baseline measures and standardized to have mean 0 and standard deviation 1. Beliefs were all measured on a 5-point Likert scale. Beliefs about the contemporaneous health impacts of the traditional stove were averaged into a single standardized index from three separate questions.

Table B33: IV estimates of the causal impact of cookstove adoption on health by beliefs about the impacts of the Jikokoa on health

	Treatment (1)	Treatment X Score2 (2)	Treatment X Score3 (3)	Treatment X Score4 (4)	Treatment X Score5 (5)	N
Average systolic blood pressure	79.40	-155.59	-63.34	-159.58	-90.12	696
	(246.42)	(563.00)	(230.19)	(635.96)	(279.96)	
Average diastolic blood pressure	7.56	-16.71	-78.76	36.22	-5.21	696
	(118.15)	(275.16)	(121.08)	(314.51)	(135.56)	
Hypertension: Stage 1 or higher (>130/80)	-1.52	2.35	-3.88	6.86	1.59	696
	(10.48)	(24.05)	(8.02)	(26.97)	(11.90)	
Hypertension: Stage 2 or higher (>140/90)	2.70	-5.81	-1.29	-5.97	-2.89	696
	(8.75)	(20.08)	(8.15)	(22.71)	(9.96)	
Blood oxygen	10.14	-24.60	-9.93	-16.23	-11.45	696
	(32.63)	(75.11)	(30.36)	(84.51)	(37.01)	
Number of non-respiratory health symptoms	-3.64	0.31	-3.87	14.52	2.48	702
	(32.81)	(70.50)	(18.72)	(86.94)	(36.62)	
Non-respiratory health symptom index	-1.30	-2.03	-4.67	8.58	0.77	702
	(22.10)	(47.72)	(13.15)	(58.62)	(24.72)	
Number of respiratory health symptoms	-4.09	8.20	0.97	8.34	4.13	702
	(23.50)	(50.85)	(18.48)	(63.89)	(26.38)	
Respiratory health symptom index	-1.70	3.78	-0.82	3.96	1.91	702
	(12.46)	(27.31)	(12.03)	(34.86)	(14.12)	

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. Beliefs about the Jikokoa's health impacts were measured on a 5-point Likert scale and categorized into different bins.

Table B34: IV estimates of the causal impact of cookstove adoption on health by beliefs about the impacts of their traditional stove on health

	Treatment (1)	Treatment X Quintile2 (2)	Treatment X Quintile3 (3)	Treatment X Quintile4 (4)	Treatment X Quintile5 (5)	N
Average systolic blood pressure	39.75 (276.07)	-194.06 (1099.91)	10.62 (498.44)	60.08 (386.41)	-13.76 (204.74)	696
Average diastolic blood pressure	28.77 (86.22)	-32.10 (347.95)	-68.16 (159.38)	-21.02 (129.26)	-26.74 (64.93)	696
Hypertension: Stage 1 or higher (>130/80)	1.92 (4.46)	-1.12 (17.51)	-3.21 (7.99)	-3.11 (5.97)	-1.92 (3.30)	696
Hypertension: Stage 2 or higher (>140/90)	-0.18 (3.43)	-1.27 (14.34)	0.23 (6.51)	1.61 (5.09)	0.34 (2.50)	696
Blood oxygen	19.02 (91.32)	-72.61 (363.06)	7.10 (164.67)	8.55 (127.62)	-10.03 (68.03)	696
Number of non-respiratory health symptoms	7.29 (27.64)	3.80 (85.35)	-19.42 (44.03)	-16.63 (33.01)	-9.05 (22.73)	702
Non-respiratory health symptom index	5.31 (18.35)	1.99 (56.64)	-13.26 (29.40)	-11.33 (22.23)	-6.44 (15.16)	702
Number of respiratory health symptoms	-2.21 (13.40)	5.49 (39.77)	-6.07 (20.83)	2.96 (15.44)	1.07 (11.02)	702
Respiratory health symptom index	-1.66 (5.59)	2.52 (16.36)	-0.84 (8.42)	2.27 (6.25)	1.18 (4.56)	702

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. Beliefs about the contemporaneous health impacts of the traditional stove were averaged into a single standardized index from three 5-point Likert scale questions and categorized into quintiles.

Table B35: IV estimates of the causal impact of cookstove adoption on health by whether the respondent named 'reduced smoke' as one of the primary advantages of the Jikokoa stove

	Treatment (1)	Treatment X Reduced Smoke (2)	N
Average systolic blood pressure	-2.46 (4.28)	1.06 (3.14)	537
Average diastolic blood pressure	-1.08 (2.60)	1.00 (1.99)	537
Hypertension: Stage 1 or higher (>130/80)	-0.02 (0.12)	-0.01 (0.08)	537
Hypertension: Stage 2 or higher (>140/90)	-0.11 (0.09)	0.07 (0.07)	537
Blood oxygen	0.33 (0.48)	-0.35 (0.38)	537
Number of non-respiratory health symptoms	-0.05 (0.35)	0.03 (0.24)	541
Non-respiratory health symptom index	0.13 (0.25)	0.01 (0.18)	541
Number of respiratory health symptoms	-0.53* (0.31)	0.05 (0.23)	541
Respiratory health symptom index	-0.21 (0.18)	-0.04 (0.13)	541

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. "Reduced Smoke" is a dummy for observations where respondents indicated that the best aspect of owning a Jikokoa is less indoor smoke.

Table B36: IV estimates of the causal impact of cookstove adoption on health by baseline charcoal usage

	Treatment X Charcoal Spend Last 7 Days (USD) (1)	Treatment X Charcoal Spend Last 7 Days (Log) (2)	N
Average systolic blood pressure	-8.56	-1.98	662
	(14.47)	(5.74)	
Average diastolic blood pressure	-8.47	-1.28	662
	(10.50)	(3.67)	
Hypertension: Stage 1 or higher (>130/80)	-0.37	-0.13	662
	(0.35)	(0.13)	
Hypertension: Stage 2 or higher (>140/90)	-0.22	-0.04	662
	(0.29)	(0.12)	
Blood oxygen	0.22	-0.07	662
	(0.81)	(0.48)	
Number of non-respiratory health symptoms	-1.55	-0.56	667
	(1.24)	(0.39)	
Non-respiratory health symptom index	-1.03	-0.43	667
	(0.83)	(0.27)	
Number of respiratory health symptoms	-0.93	-0.36	667
	(0.86)	(0.35)	
Respiratory health symptom index	-0.59	-0.24	667
	(0.49)	(0.19)	

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. All heterogeneity variables are baseline measures and standardized to have mean 0 and standard deviation 1.

Table B37: IV estimates of the causal impact of cookstove adoption on health by age (in decades)

	Treatment (1)	Treatment XAge30-40 (2)	Treatment XAge40-50 (3)	Treatment XAge50-60 (4)	Treatment XAge60-70 (5)	Treatment XAge70-80 (6)	N
Average systolic blood pressure	-20.83	-36.03	-40.99	418.07	56.53	28.64	696
	(458.49)	(664.87)	(971.66)	(661.52)	(592.68)	(486.60)	
Average diastolic blood pressure	159.17	-319.66	-442.48	495.75	-120.99	-140.13	696
	(971.08)	(1395.76)	(2071.06)	(1372.90)	(1251.37)	(1028.31)	
Hypertension: Stage 1 or higher ($>130/80$)	5.08	-7.42	-6.58	-7.78	-7.66	-5.67	696
	(12.32)	(17.62)	(26.21)	(16.21)	(15.84)	(12.99)	
Hypertension: Stage 2 or higher ($>140/90$)	-2.24	3.32	4.34	1.40	1.66	2.45	696
	(6.92)	(9.80)	(14.65)	(9.05)	(8.88)	(7.30)	
Blood oxygen	-0.96	-7.66	6.84	27.47	2.82	-0.38	696
	(37.38)	(54.00)	(81.10)	(54.41)	(47.74)	(39.38)	
Number of non-respiratory health symptoms	15.19	-25.44	-15.57	-22.91	-22.18	-17.22	702
	(53.00)	(75.41)	(112.41)	(53.00)	(66.53)	(55.42)	
Non-respiratory health symptom index	13.33	-23.05	-18.68	-6.48	-17.23	-14.44	702
	(49.16)	(69.98)	(104.41)	(50.91)	(61.78)	(51.47)	
Number of respiratory health symptoms	-9.97	18.36	29.51	-30.51	3.96	6.38	702
	(85.50)	(121.63)	(181.51)	(94.03)	(107.64)	(89.60)	
Respiratory health symptom index	-6.62	12.42	17.77	-17.32	3.70	4.76	702
	(51.41)	(73.10)	(108.97)	(56.10)	(64.76)	(53.90)	

Each row is an instrumental variables regression where the randomly assigned price, credit treatment status, and their interaction are used as instruments for endline Jikokoa ownership. Regressions include socioeconomic controls. Ages were categorized into decades.

C   Pre-analysis plan

A pre-results proposal for this paper was registered with the AEA RCT Registry (#2484) and accepted by the Journal of Development Economics (Berkouwer and Dean, 2022b).

Outcome variables

We list the outcome variables pre-specified in the analysis plan, along with the paper tables that present the impacts on these outcomes:

1. 48-hour exposure to particulate matter (PM2.5) and carbon monoxide (CO): **??** and Table B8, respectively.
2. Blood pressure: **??**.
3. Indicators for having normal blood pressure ($<120/<80$ mmHg), elevated blood pressure (>120-$129/<80$ mmHg), stage 1 hypertension (130-139/80-89 mmHg) and stage 2 hypertension ($\geq 140/\geq 90$ mmHg): **??**.
4. Pulse oximetry: **??**.
5. An indicator variable for whether the respondent has 'normal' blood oxygen levels, defined as being above 95 percent by the NIH: **??**.
6. Charcoal and stove usage: **??**.
7. Self-reported adult health and a standardized adult physical health index consisting of the symptoms elicited in the survey: **??**.
8. Adult-reported child health and a standardized child physical health index consisting of the symptoms elicited in the survey: Table B17.
9. Maternal health: We do not present these outcomes. We deviated from the PAP for this outcome for two reasons. First, 143 respondents had at least one pregnancy since adopting the improved stove, of which only 3 resulted in stillbirth, miscarriage, or abortion, and we felt that the sample was too small to draw meaningful conclusions from this. Second, only 1 respondent was able to report baby birth weight or baby birth length.
10. Child physical measurements: Table B17.
11. Adult and child cognitive assessments: Table B15 presents results for adults. Due to logistical issues we were unable to implement cognitive tests among children.

Heterogeneity analyses

We analyze heterogeneity in results along the following variables that were collected during the initial 2019 baseline survey round:

- **Baseline health beliefs (I):** by beliefs about the impacts of the Jikokoa on health. This was measured on a 5-point Likert scale. We estimated this bin-by-bin (Table B33) and linearly (Table B32).

- **Baseline health beliefs (II):** by beliefs about the contemporaneous impacts of their traditional stove on health. This was measured using three Likert scale questions, which we standardized and averaged to generate a single index. We estimated this by quintile (Table B34) and linearly (Table B32).
- **Baseline health beliefs (III):** whether the respondent named 'reduced smoke' as one of the primary advantages of the Jikokoa stove (Table B35).
- Baseline WTP: Table B22.
- **Baseline charcoal usage:** measured as weekly charcoal expenditures (Table B36).
- Baseline self-reported health index: Table B22.
- **Age:** We estimated this by decade (Table B37) and linearly (Table B22).

D Cognitive assessments

D.1 Reverse Corsi Block

Implementation of the Reverse Corsi Block task follows Brunetti, Del Gatto, and Delogu (2014). For each trial, nine blue blocks appear in random locations on the screen. They take turns lighting up. Respondents are then asked to tap the blocks in reverse order of how they lit up (see Figure C1). For each element in the sequence, if the respondent taps on the correct block, it turns green and the respondent can proceed to tap the next block in the sequence. If the respondent taps any other block, it flashes red and the respondent moves to the next trial. The first trial sequence contains two elements. For each sequence the respondent gets completely correct, the sequence length increases by one.

Figure C1: Corsi Stimuli

(a) Blocks appear in random positions

(b) Blocks light up yellow randomly

(c) Respondents tap blocks in reverse order
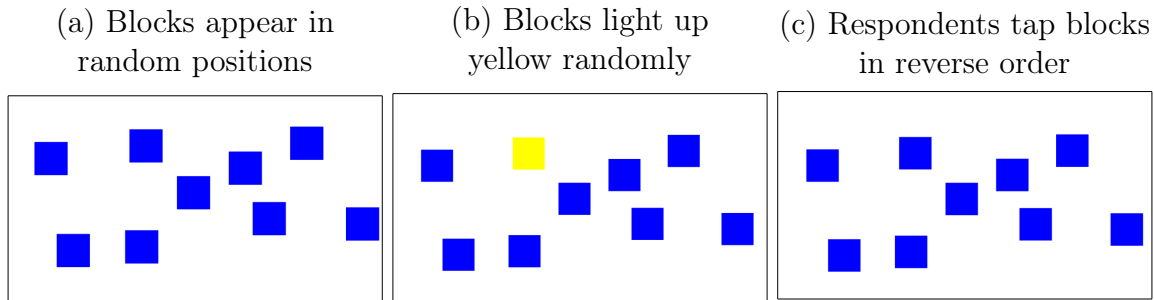
Note: This figure shows the three stages of the reverse Corsi blocks test. The test is designed to measure working memory. First nine blocks appear in random positions. They then light up in a random sequence. Respondents must then tap the blocks in the reverse order of how they lit up. After each correct trial, the length of the sequence increases by one, and after every incorrect trial, the length of the sequence decreases by one down to a minimum of two elements.

D.2 Hearts and Flowers

Implementation of the Hearts and Flowers task follows the "dots" task outlined by Davidson et al. (2006). Respondents see a fixation dot in the center of their screen with blue boxes on the left and right. Respondents then see a sequence of hearts and flowers appear on the boxes. For each trial, respondents must press either the "Q" or "P" key. When a heart appears, respondents must press the key on the same side as the heart. While when a flower appears, respondents must press the key on the opposite side (see Figure C2).
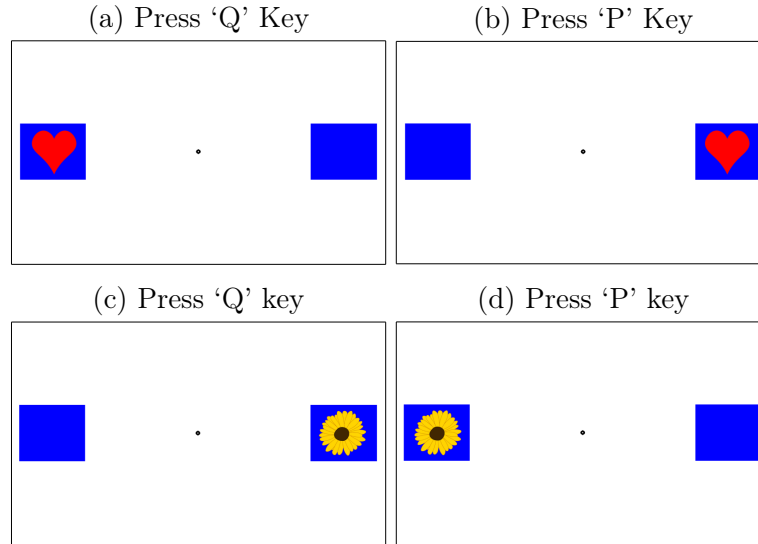
Figure C2: Hearts and Flowers Possible Stimuli and Responses

Note: The figure shows the four possible stimuli and responses for the hearts and flowers test. The test is designed to assess inhibitory control. Respondents see a series of hearts and flowers appear on the blocks. When a flower appears, the respondent must press the key on the opposite side of the keyboard. When a heart appears, the respondent must press the key on the same side of the keyboard.

D.3 d2 Attention Task

The d2 task follows the general instructions outlined in Brickenkamp and Zillmer (1998) and Bates and Lemay Jr. (2004). For each trial, eleven letters (either p or d) appear on the screen with between zero and two dashes above and zero and two dashes below for a total number of dashes between zero and four (see Figure C3). The respondent's job is to mark all of the d's with a total of two dashes by tapping the box below the letter. After 5106 ms, the trial ends. Until that time has elapsed, respondents can un-mark and re-mark letters as they please. Another set of eleven letters appears after 500 ms.

Figure C3: d2 Stimuli
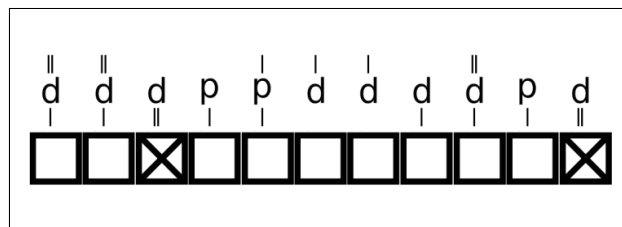
Note: The figure shows an example of a trial from the d2 test. The test is designed to assess attention. Respondents see a series of d's and p's with up to two lines below and above. They must tap the boxes below all d's with a total of two dashes before the trial ends.

E. Survey questionnaire

Survey 1:
- Section A – Introduction
- Section B – Questions about charcoal and stove usage
- Section C – Self-reported adult health of primary stove user
- Section D – Child health
- Section H – Physical measurements
- Section J1 – Air quality device deployment

Survey 2 (approx. 48 hours later):
- Section J2 – Air quality device pick-up
- Section F – Blood pressure measurements
- Section G – Blood oxygen measurement
- Section I - Cognitive assessments
- Section E – Maternal health

SURVEY 1

Enter time:
Enter date:
Record GPS:

<u>Consent</u>
[Ask to sign]

<u>Section A – Introduction</u>
FO: Thank you for agreeing to take part in the 'Nairobi Jikokoa Health Follow-up" survey.

FO: If there's a stove
- How long has that stove been lit?
- Has the stove been inside, outside, or mixed?
- [if inside or mixed] Please move the stove outside (or come back later).

<u>Section B – Questions about Charcoal and Stove Usage</u>

Charcoal purchases
What was the price of charcoal this week?
      Price (KES):   Units: [mkebe/kasuku/debe/gunia/100g/1kg]

I would like to ask you some questions about how much charcoal you usually buy.

      Think back to yesterday. How much did you spend on charcoal yesterday?

      Think of yesterday, the day before that, and the day before that. How much did you spend on charcoal in total in those past 3 days?

      Think of the last 7 days. How much did you spend on Charcoal in that one week?

Cookstove ownership
Have you purchased any traditional jiko since we last spoke by phone with you, on [X]?

      [If yes:] How many have you bought since then? For each one, please tell me:
            On what date did you buy it?
            How much did you pay for it?

[If control group] Have you purchased a Jikokoa since we last spoke by phone with you, on [X]?

            [If yes:] *FO: confirm visually that it is the Jikokoa, not a different modern stove*
- On what date did you buy it?
- How much did you pay for your Jikokoa?
- How did you obtain the [Jikokoa price] Ksh to buy your Jikokoa?
  (select multiple)
  - Savings (M-Pesa)
  - Savings (ROSCA/SACCO/Rotating group payout)
  - Savings (Formal bank account)

- Received gift (from spouse)
- Received gift (from other family member)
- Received gift (from someone else)
- Loan (from friend or family)
- Loan (from employer)
- Loan (from mobile money, e.g. Mpesa)
- Loan (from other informal lender)
- Loan (from formal bank)
- Other:
  [If selected "Other"] Please provide any more information on how you got the money for the Jikokoa:

[If no:] Have you purchased a different type of modern cooking stove since we last spoke by phone with you, on [X]? For example, energy efficient charcoal cookstoves, LPG stoves, electric/hotplate stoves, or modern and modern and energy efficient wood stoves?

[If yes:] How many?
> [For each stove]
> What is the type of stove?
> - Energy efficient charcoal cookstoves.
> - LPG stoves.
> - Electric/hotplate stoves.
> - Modern and energy efficient wood stoves.
> - Other (Specify): ___
> What is the brand of the stove? _____ (text)

[If treatment group] Do you currently still own the original Jikokoa stove that you bought from us?
> [If yes] *FO: Please ask to see the Jikokoa and confirm that it is indeed the Jikokoa from Burn. If it is not, please go back and change your answer.*

> [If yes] When you discuss the Jikokoa with your friends or family, what is the main benefit that you tell them about?
> [Let the respondent answer naturally. Then, select the answer closest to what they said.]
> - It saves money
> - It doesn't break very often
> - Food tastes better
> - Less smoke indoors
> - I am more modern
> - I save time
> - I don't know
> - Other (specify): ___

> [If yes] When you discuss the Jikokoa with your friends or family, what is the worst thing about the Jikokoa that you tell them about?
> [Let the respondent answer naturally. Then, select all the responses mentioned.]
> - It is expensive
> - It does not fit a big pot / only fits small pots
> - It does not warm my room/house well

- It is difficult to light
- It takes long to light
- It requires frequent cleaning
- Easy to get burnt
- Nothing
- Other (specify): ___

[If no] What happened to your Jikokoa?
    [If they returned it]
        Why did you return it?
    [If they pawned it]
        How much money did you pawn the Jikokoa for (What was the size of the loan you received)?
    [If they sold it]
        Why did you sell it?
        How much money did you sell the Jikokoa for?
        What did you do with this money?

[If no] Have you bought a new Jikokoa to replace the one you lost?
    [If no] Are you considering buying a new one?
    [If yes] How much did you pay for this Jikokoa?

Have you purchased a different type of modern cooking stove since we last spoke by phone with you, on [X]? For example, energy efficient charcoal cookstoves, LPG stoves, electric/hotplate
    stoves, or modern and modern and energy efficient wood stoves.

    [If yes:] Please enter the brand name or other details about their new stove(s):
- Energy efficient charcoal cookstoves.
- LPG stoves.
- Electric/hotplate stoves.
- Modern and energy efficient wood stoves.
- Other.
    [If Other]: Please indicate the brand name or type of stove you bought.

[Modern cookstove] Do you still have a traditional charcoal jiko in this house?

    [If yes] Does your traditional jiko still work?

        [If yes] How often do you use your traditional jiko?

    [If no] What happened to the old jiko that you used before you bought the Jikokoa/[modern stove model/type]?
        [If they sold it] How much money did you sell this old jiko for?

[Treatment and still has jikokoa only] Please know that this next question is just hypothetical! We are not taking away your Jikokoa – your Jikokoa is yours to keep. However, imagine that you lost your Jikokoa today, or that it got stolen.

Do you think you will buy a Jikokoa for the price of KSH 3990 in the store within the next year? Y/N

[If yes] If this happened today, when do you think you would have enough money to go to the store and buy a new one?

[If no] Why would you not buy a new stove?

[If no] Do you think you will buy a Jikokoa for the price of KSH 2990 in the store within the next year? Y/N
      [If yes] If this happened today, when do you think you would have enough money to go to the store and buy a new one?

[If yes] During our previous visit we played a game to determine the highest price that you would be willing to pay for the Jikokoa. If we were to play the same game again today, how much would you be willing to pay for the stove?

<u>Cookstove use and maintenance</u>
[Jikokoa owner] Have you ever taken your Jikokoa to the shop for maintenance?

    [If yes]
- How many times?/How frequently?
- Why have you taken your Jikokoa to the shop for maintenance? (select multiple)
  - For scheduled maintenance.
  - It was not heating properly.
  - It fell and broke.
  - Other reason (please specify)
- Did you ever pay anyone to fix your Jikokoa?
  - [If yes] How much did you have to pay?

    [If no] Why have you never taken your Jikokoa to the shop for maintenance? (select multiple)
- The Jikokoa needed to be fixed, but I could not find anyone who knew how to fix it.
- The Jikokoa needed to be fixed, but the closest shop was too far away.
- The Jikokoa needed to be fixed, but I did not have the money to pay for the repair.
- Other reason (please specify).

[Other modern cookstoves owner] Have you ever taken your [modern cookstove model/type] to the shop for maintenance?

    [If yes]
- How many times?/How frequently?
- Why have you taken your cookstove to the shop for maintenance?
  - For scheduled maintenance.
  - It was not heating properly.
  - It fell and broke.
  - Other reason (please specify)
- Did you ever pay anyone to fix your cookstove?
  - [If yes] How much did you have to pay?

    [If no] Why have you never taken your cookstove to the shop for maintenance? (multiple select)

- The cookstove needed to be fixed, but I could not find anyone who knew how to fix it.
- The cookstove needed to be fixed, but the closest shop was too far away.
- The cookstove needed to be fixed, but I did not have the money to pay for the repair.
- Other reason (please specify).

[Traditional charcoal cookstoves] Have you ever taken your traditional charcoal cookstove to the shop for maintenance?

    [If yes]
- How many times?/How frequently?
- Why have you taken your cookstove to the shop for maintenance?
  - For scheduled maintenance.
  - It was not heating properly.
  - It fell and broke.
  - Other reason (please specify)
- Did you ever pay anyone to fix your cookstove?
  - [If yes] How much did you have to pay?

    [If no] Why have you never taken your cookstove to the shop for maintenance? (multiple select)
- The cookstove needed to be fixed, but I could not find anyone who knew how to fix it.
- The cookstove needed to be fixed, but the closest shop was too far away.
- The cookstove needed to be fixed, but I did not have the money to pay for the repair.
- Other reason (please specify).

[Modern charcoal cookstove] How frequently do you take out the ash out of your modern charcoal cookstove? Select one:
- At least once per day
- Once every 2-3 days
- Around once per week
- Around once per month

[Traditional charcoal cookstove] How frequently do you take out the ash out of your traditional charcoal cookstove?
- At least once per day
- Once every 2-3 days
- Around once per week
- Around once per month

[Modern charcoal cookstove] Where do you dispose the ash of your modern charcoal cookstove?

[Traditional charcoal cookstove] Where do you dispose the ash of your traditional charcoal cookstove?

Please think of a regular day during which you cook your food.
    How many minutes do you cook in the morning (any time before 10am?)
    How many minutes do you cook in the afternoon (between 10am and 3pm?)
    How many minutes do you cook in the evening (any time after 3pm?)

Ok, so you spend [X] minutes, or [Y] hours, cooking every day. During a regular day…
- [If they own a Jikokoa] How many of these hours do you use a Jikokoa?
- [If they own a jiko] How many of these hours do you use a jiko?
- [If they own an electric stove] How many of these hours do you use an electric cooking device (pressure cooker, hotplate, etc.)?
- [If they own an LPG stove] How many of these hours do you use an LPG stove?

Of these [Z] hours you cook with a charcoal stove, how many are indoors?

What types of food do you prepare at least once per week? (multiple choice)
- Ugali
- Vegetables (sukuma wiki, cabbage, etc.)
- Rice
- Potatoes
- Fish
- Beans
- Githeri
- Meat/stew
- Chapati
- Egg
- Tea/Chai

Any Network Purchases

Think of the 10 households that are located the closest to your house here. Have any of these neighbors purchased a Jikokoa in the past 2 years?

[If yes] How many of your 10 neighbors have purchased a Jikokoa since the last time we visited?

Other than your 10 nearest neighbors, do you know anyone else (for example, a friend or family member) who has purchased a Jikokoa since the last time we visited?
[If yes] How many of your family members have purchased a Jikokoa since the last time we visited?
[If yes] How many of your friends have purchased a Jikokoa since the last time we visited?
[If yes] How many other people do you know that have purchased a Jikokoa since the last time we visited, for example colleagues or anyone else you know?

Jikokoa owners – savings
[Jikokoa owners] How much do you think you have saved in total on charcoal in the PAST MONTH?

[Jikokoa owners, savings > 0] What have you been doing with the money that you have saved? Buying…
- Food for cooking (sugar, maize, etc.)
- Food for eating (e.g. at a restaurant)
- Non-alcoholic drinks (tea, soda, etc.)
- Shared household items (e.g. soap for washing clothes)
- Female personal items (clothes, hair products, etc.)
- Male personal items (clothes, cigarettes, beer, etc.)
- Cell phone credit
- Kerosene
- Natural gas
- Electricity tokens
- Transport (e.g. matatu fees)
- Children school fees
- Health spending (hospital, insurance)
- Saved the money
- Other (Specify):

[Optional: write down more detail on how they spend money saved]

[Jikokoa owners] If you still had a traditional jiko, how much do you think you would spend on charcoal over the NEXT ONE MONTH, in total?

[Jikokoa owners] With your Jikokoa, how much do you think you will spend on charcoal in the NEXT ONE MONTH, in total?

Savings activities
I would like to ask you some questions about your savings activities.
1. Do you use any mobile money services, like M-Pesa, Airtel Money, or Equitel?
2. Do you participate in a SACCO, merry-go-round, or ROSCA?
3. Do you have a savings account in a formal bank?
4. Do you have any lending apps on your phone?

[If 1, 2, 3, or 4 are 'yes'] I would now like to ask you some more questions about your savings activities. For the following questions, if you do not know the exact amount please guess what you think it is.

FO: If the respondent feels uncomfortable about these questions, please tell them: Please remember that we are a research organization, and we will do everything to keep your information confidential. If they refuse to answer, enter 999 as a response

[include "refuse to answer" as an option – enter -999 if refuse]
[If 1 is yes] What is the total amount in shillings in your mobile banking account right now?
[If 2 is yes] What is the total amount in shillings of SACCO / merry-go-round / ROSCA contributions that you made last month?
[If 2 is yes] If you received money from your SACCO / merry-go-round / ROSCA today, how much money would this be?
[If 3 is yes] What is the total amount in shillings in your formal bank account right now?
[If 4 is yes] Across all of the lending apps that you have, what is your total borrowing limit?

Work and earnings
How many hours did you work yesterday? Please do not consider the time that you devoted to household chores.

How many hours have you worked in the past 3 days? Please do not consider the time that you devoted to household chores.

How many days did you work in the past 2 weeks? Please do not consider the time that you devoted to household chores.

[If hours worked yesterday > 0] How much money did you earn working yesterday? If you are unsure, please estimate.

[If hours worked past three days > 0] How much money did you earn working in the past 3 days? In shillings. If you are unsure, please estimate.

[If hours worked past two weeks > 0] How much money did you earn working in the past two weeks? In shillings. If you are unsure, please estimate.

Section C – Self-reported adult health of primary stove user

I would now like to ask you a few questions about your health.

I am going to read to you a list of illnesses and symptoms. Please let me know if you have experienced any of these illnesses or symptoms in the last four weeks.

Read options. Indicate all that apply. (1=Yes, 2=No, 3=DK what that symptom / illness is)

(A) Fever |___|
(B) Malaria |___|
(C) Persistent cough |___|
(D) Typhoid |___|
(E) Always feeling tired |___|
(F) Tuberculosis |___|
(G) Stomach pain |___|
(H) Pain when urinating |___|
(I) Worms |___|
(J) Cholera |___|
(K) Yellow fever |___|
(L) Rapid weight loss |___|
(M) Breathlessness at night |___|
(N) Frequent and excessive urination |___|
(O) Skin rash or irritation |___|
(P) Constant thirst / increased drinking of fluids |___|

(Q) Diabetes |___|
(R) Difficulty Swallowing |___|
(S) Difficulty breathing / Chest tightness |___|
(T) Runny nose |___|
(U) Sore throat |___|
(V) Muscle pain (myalgia) |___|
(W) Headache |___|
(X) Loss of sense of smell / not being able to taste food |___|
(Y) Diarrhea / Nausea / vomiting |___|
(Z) Wheezing |___|
(Z1) Persistent mucus production |___|
(Z2) Swelling in ankles, feets or legs |___|
(Z3) Other accidents |___|

During the last WEEK, how many hours of work or housework did you miss due to poor health?

How often, when you are cooking, do you get teary eyes from the smoke?
How often do you get a headache while you are cooking or immediately after that?
How often do you get a burn while cooking?
- At least once per day
- A few times per week
- Around once a week
- Less frequently

How do you usually get a burn while cooking? Please choose the most frequent situation.
- Touching the handles, which are too hot.
- Accidentally touching the metal cladding while manipulating the cookstove.
- Accidentally touching hot charcoal.
    - [Can't choose this option if doesn't own a charcoal cookstove]
- Asked Busara for more options.

Have you ever been diagnosed by a doctor or nurse for…
- Asthma? Y/N
- Pneumonia? Y/N
- Chronic Pulmonary Disease? Y/N
- Tuberculosis? Y/N
- Hypertension? Y/N

- COVID? Y/N
- Other lung disease? Y/N
- Stroke or cardiovascular disease? Y/N

- If yes: are you taking meds? Y/N
- Diabetes? Y/N
    - If yes: "severity" (how to measure?)
- (Y) Other (specify): _____ |___|

In the past 30 days, have you or any children in your household made any visits to a hospital or clinic?
[For every visit:]
- Who in your household visited?
    - Self, [child name 1], [child name 2], etc.
- What was the reason for this/these visits?
- Was the hospital or clinic able to address your needs?
- How much money did you spend at the clinic?

Other than the visits above, how much money did you spend in total, in the past 30 days, on health expenditures? Examples of health spending can include pills for headache or other pains, any medicines, anti-malaria bed net or malaria treatment, deworming pills, bandages or bandaids, etc.

Stove impact

[If doesn't own Jikokoa/modern stove] Please think about the stove that you currently use to cook most of your meals with. Do you think your current usage of a traditional cookstove has an impact on your health? For example, by making you feel more tired, causing a cough, or hurting your eyes or breath?
[If owns modern cookstove] Please think back to the traditional stove that you used to cook most of your meals with, before your modern stove. Do you think your usage of the traditional
cookstove had an impact on your health? For example, by making you feel more tired, causing a cough, or hurting your eyes or breath?
- no impact
- a small impact
- a medium impact
- a large impact
- a very large impact

Please think about the stove that you currently use to cook most of your meals with.
[If doesn't own Jikokoa/modern stove] Do you think usage of a traditional cookstove has an impact on the health of your children, or any children that visit here?
[Modern charcoal cookstove] Do you think usage of a traditional cookstove has an impact on your chance of getting a long-term serious illness, such as cancer, or an infection?
- no impact
- a small impact
- a medium impact
- a large impact
- a very large impact

[If doesn't own any modern cookstove] If you had an efficient charcoal cookstove like the Jikokoa, do you think that using it would have an impact on your health?
- It would have no impact.
- It would have a positive impact.
- It would have a negative impact.

[If doesn't own any modern cookstove] If you had an electric or gas cookstove, do you think that using it would have an impact on your health?
- It would have no impact.
- It would have a positive impact.
- It would have a negative impact.

[Modern charcoal cookstove] Do you think that using a modern charcoal cookstove has had an impact on your health?
[Other modern cookstoves] Do you think that using a [modern stove type/model] has had an impact on your health?
- It has had no impact.
- It has had a positive impact.
- It has had a negative impact.

[If doesn't own modern charcoal cookstove] Do you think that using a modern charcoal cookstove, like the Jikokoa, would allow you to feel healthier at work, and therefore earn more money?
- I think it would have no impact.
- I think it would have a positive impact.
- I think it would have a negative impact.

[If doesn't own other modern cookstoves] Do you think that using a gas or electric cookstove would allow you to feel healthier at work, and therefore earn more money?
- I think it would have no impact.
- I think it would have a positive impact.
- I think it would have a negative impact.

[Modern charcoal cookstove] Do you think that using a modern charcoal cookstove has allowed you to feel healthier at work, and therefore earn more money?
[Other modern cookstove] Do you think that using a modern cookstove has allowed you to feel healthier at work, and therefore earn more money?
- It has had no impact on my earnings.
- It has had a positive impact on my earnings.
- It has had a negative impact on my earnings.

    [IF THEY ANSWER YES:] earn how much MORE money PER DAY?
    Answer in Ksh.

When is the last time you smoked a cigarette?
- X [hours/days/weeks] ago. If can't remember, write 99 weeks.
- If less than 24 hours ago: On average, how many cigarettes do you smoke per day?
- If less than 1 week ago: On average, how many cigarettes do you smoke per week?

When is the last time you had an alcoholic beverage?
- X [hours/days/weeks] ago. If can't remember, write 99 weeks.
- If less than 24 hours ago: On average, how many alcoholic beverages do you drink per day?
- If less than 1 week ago: On average, how many alcoholic beverages do you drink per week?

Section D – Child Health

How many children age 5 or younger live in this house (sleep here at least 4 nights per week)?

For each child:

First name only (a nickname is ok):

What is [child]'s month and year of birth:

Overall, would you say [child]'s health is very good, good, fair, poor, or very poor?

During the past seven days, has [child] experienced any of the following:

Fever / malaria? Y/N	Diarrhea? Y/N
Vomiting? Y/N	Breathlessness? Y/N
Cough? Y/N	Persistent headache? Y/N
Any other infection? Y/N	
[If yes] Specify:_____	

[If "no" to malaria in past 7 days] During the past month, has [child] had malaria?

Last night, did [child] sleep under a bed net?

Have any drugs for worm infections or schistosomiasis been given to [child] in the last 12 months?

How many days, in total, did [child] attend school in the last 2 weeks?

[If child has spent 5 or fewer days in school during last 2 weeks] When they are at home, how many hours per day do they spend within 2 meters of you?

[If child has spent 5 or fewer days in school during last 2 weeks] Previously you said that usually spend around [X] time cooking. Of these hours, how many hours does this child spend within 2 meters of you while you are cooking? *[must be <= previous question]*

[This following section is trying to see if they have pneumonia. This is hard to diagnose, so a few ways to do this.]

- In the past month, has one of your children had such a bad cough that you wanted to take them to a doctor?
  - Did you actually take them to a doctor?
  - [If yes] Did a doctor decide to take an X-ray because of the cough?
  - Did the doctor diagnose them with Pneumonia? Y/N
- Has your child had fast, short, rapid breaths or difficulty breathing at any time in the last 2 weeks? Y/N
- Was the fast or difficult breathing due to a problem in the chest or to a blocked or runny nose?
  - Chest only
  - Nose only
  - Both
  - Other (specify): _____
  - Don't know

We would like to measure your child's height and weight. Would it be easiest to do this now, or a little later? (Depends on if the kids are e.g. at school or at home)

Section H – Physical measurements

(For adults and for children)

1. **Height Measurement** - Follow these steps to conduct the height measurement:
    a. Direct the subject to a wall or solid surface on which the subject may stand still with their head, shoulder blades, buttocks, and heels making contact with the surface.
    b. Instruct the subject to stand up straight with heels together and toes apart. See the Appendix for a graphical representation of the correct body position for measurement.
    c. Mark on wall
    d. Measure with tape

2. **Arm Circumference Measurement** - Follow these steps to conduct the arm circumference measurement:
    a. Direct subject to stand upright with shoulders relaxed and right arm hanging loosely at the sides.
    b. Facing the right side of the subject, **wrap the measuring tap** around the arm at the level of the upper arm mid-point.
    c. Record the measurement.

Section J1 – Air quality device deployment

Enter device ID:
Enter device ID again:
Enter the device's filter ID:
Enter the device's filter ID again:

Take a picture of the QR code:

We would like to install a portable indoor air pollution monitor in your home. Me, or one of my colleagues, will come back in 2 days to collect the monitor.

Do you agree to participate and return the device within 2 days? Y/N

If yes:

FO: Explain to the respondent that they should not change their behavior in terms of using the cookstove while the monitor is in the house and should continue to cook and/or use the cookstove just as they would normally do.

(If stove is indoors): Can I measure the dimensions of the kitchen?
(If yes): Enter one of the side lengths in centimeters:
(If yes): Enter the other side length in centimeters:
(If yes): Enter the height in centimeters:

Enter time respondent started wearing device:

Did the respondent raise any issues about (y/n):
- Discomfort
- Sleeping with the device
- Device being heavy
- Device being hot to touch
- Device making a sound
- Device being too tight
- Device itching/causing sore skin

END SURVEY ONE

SURVEY 2
(aim: 48 hours after survey 1)

Enter time:
Enter date:
Record GPS:

Section A2 – INTRODUCTION 2
FO: Thank you for agreeing to take part in the second section of this survey, and for having carried the air quality device. At the end of this section, I will take some measurements of your health. For this reason, please sit on a chair and sit still as much as you can during the interview. Also, please do not smoke or drink alcoholic beverages, tea, or coffee during the survey. That way, the measurements will be more accurate.

Section J2 – PICK-UP SURVEY

Enter time respondent stopped wearing device:
Was the respondent wearing the device when you arrived at the household?

Enter device ID:
Enter device ID again:

FO: I would now like to ask you some questions about where you were and what you were doing while wearing the backpack for the last 48 hours. Please try your best to remember.

- Please describe what you were doing and where you were between START and END AM/PM on DATE
- FO: Select one if the respondent did one activity in that hour, or select multiple if they engaged in multiple activities:
    - Cooking using a Jikokoa
    - Cooking using a jiko
    - Cooking using LPG
    - Cooking using an electric/hotplate stove
    - Cooking using firewood
    - Sleeping
    - Eating
    - Traveling on a bus
    - Traveling on a bicycle
    - Walking outdoors
    - At work (indoors)
    - At work (outdoors)
    - Doing schoolwork at home
    - Doing schoolwork away from home
    - Other activities at home
    - Other activities away from home
    - [we should ask Busara if there are any other options we're missing here]
    - [If "Other activities at home" or "Doing schoolwork at home" or "sleeping" or "eating"]: While you were at home, were you warming the home using your stove at any time? If so, which stove?

- They were not using a stove to warm the house
- A traditional jiko
- A Jikokoa
- A different modern stove
- [If: Cooking using any cooking option] While you were cooking, where you indoors or outdoors?
  - Indoors
  - Outdoors
  - Other
- [If: Cooking using any cooking option] Which foods were you cooking? (select multiple)
  - Ugali
  - Vegetables (sukuma wiki, cabbage, etc.)
  - Rice
  - Potatoes
  - Fish
  - Beans
  - Githeri
  - Meat/stew
  - Chapati
  - Egg
  - Tea/Chai
  - Other
- [If: Cooking using any cooking option] Did you cook more than you would on a normal day?
  - Yes
  - No
- [If: "Walking", "Traveling on a bicycle"] Where were you while you were walking or bicycling?
  - In the village where I live
  - In a different nearby village
  - In the Nairobi city center
  - Far from the Nairobi city center
  - On a highway
- [If: "Walking", "Traveling on a bicycle", "Traveling on a bus"] Did you travel more than you would on a normal day?
  - Yes
  - No
- [If: "Doing schoolwork away from home] Were you doing schoolwork indoors or outdoors?
  - Indoors
  - Outdoors
  - Other
- [If: "Doing schoolwork away from home] Where were you while you were doing schoolwork?
- [If: "Other activities away from home] Where were you while you were doing the (other activities)?
- [If: "Other activities away from home] What were the (other activities)?
- [After each follow-up question] Was the backpack within one meter of you?
  - Yes
  - No
- How often were the children around you during this hour?

- ▪ Never
- ▪ Some of the time
- ▪ Most of the time
- ▪ All of the time
  - ○ [If NOT Never] Where were you when the children were with you?
- Did you smoke any cigarettes or inhale other people's tobacco smoke during this hour?
  - ▪ I smoked cigarettes
  - ▪ I inhaled other people's tobacco smoke
  - ▪ I neither smoked cigarettes nor inhaled other people's tobacco smoke.
- Did you stop using the backpack completely after this hour?
  - ▪ Yes
  - ▪ No
  - ▪ The follow-up survey began this hour
  - ○ [If "Yes"] Why did you stop using the backpack?

- Did you ever take off the device?
  - ○ If so, when exactly? Enter all times (of multiple times).
  - ○ How many hours did you TAKE OFF the device?
  - ○ Why?

- Did the respondent raise any issues about (y/n; select all that apply):
  - ▪ Discomfort of the device
  - ▪ Sleeping with the device
  - ▪ Device being heavy
  - ▪ Device being hot to touch
  - ▪ Device making a sound
  - ▪ Device being too tight
  - ▪ Device itching/causing sore skin
  - ○ Please explain;
- Did you notice any problems with the air monitors you were wearing?

(If stove is indoors, and not measured already): Can I measure the dimensions of the kitchen?
(If yes): Enter one of the side lengths in centimeters:
(If yes): Enter the other side length in centimeters:
(If yes): Enter the height in centimeters:

Section F – Blood pressure measurements

This is a procedure list for the FO; the FO should read the instructions to the participant, and answer for themselves the questions under each instruction.

"Please sit on a chair and keep your back straight."
- Is the subject sitting on a chair? Y/N/Other
- Is the subject leaning against the back of the chair? Y/N/Other
  - ○ If the chair does not have a back, is the subject sitting up straight? Y/N/Other

"Please put your feet flat on the floor and do not cross your legs."

- Are their feet flat on the floor? Y/N/Other
- Are their legs not crossed? Y/N/Other

"Please put your left arm on a flat surface. Keep your upper arm at your heart level."
- Is the subject's arm supported? Y/N/Other
- Is the subject's upper arm at the heart level? Y/N/Other
- Are you using the left/right arm? Y/N/Other

- [FO: Does the subject have clothes over the bend of her elbow?]
    [If yes] "Please take off the clothes that cover the bend of your elbow. That way, the measurements will be more accurate."

    [FO: Did the subject refuse to take off the clothes that cover the bend of the subject's elbow?] Y/N/Other
        [If yes] [FO, please go on with the measurement.]

"Now, please let me wrap the cuff above the bend of your elbow?
- Is the cuff placed directly above the bend of the elbow? Y/N/Other

"Please turn you palm upwards and slightly flex your elbow."
- Are the subject's palms upwards? Y/N/Other
- Is the subject's elbow slightly flexed? Y/N/Other

"Now, please wait and remain silent for a minute while the blood pressure is working. That way, the measurements will be more accurate."
- Have you started the measurement?
    [If no] Please start the measurement and then click on 'Yes, I have started the measurement'.
    [If yes] Please wait until the measurement has finished. Once it has finished, please press 'The measurement has finished' to continue.
        [Force one-minute wait via surveyCTO]
        [If measurement has finished] Did the individual remain in silence while you were measuring blood pressure?
            [If no] Please repeat the measurement, ensuring that the individual remains in silence.
            [If yes] [Automatically moves to next screen]

"We have completed the [# of measurement] measurement. Now, please let me remove the cuff."
    – [FO: Did you remove the cuff?] Y/N

[FO, enter the diastolic pressure.]
- [Add automatic (background-recorded) time stamp]
- [Force 30-second wait through surveyCTO]
- [Constraint: value must be between A and B].
- [If the device displays the reading in increments of 2 – as the one used in the NHANES – constrain to even values only]

[Calculate field: detect whether the diastolic pressure result entered by the FO is within the likely range of 60 to 100]

[If diastolic is not within likely range]
     [FO, the value you entered ([VALUE]) is outside the likely range for the diastolic pressure of people in the age group of the participant. Please check whether that value is equal to the diastolic pressure measurement you see in the screen of the device.

          If ([VALUE]) is NOT the diastolic pressure measurement you see in the screen of the device, please press '([VALUE]) is not the correct value'. That will allow you to type the value you seen in the screen of the device.

          If ([VALUE]) is the diastolic pressure measurement you see in the screen of the device, press '([VALUE]) is the correct value'.]

[FO: Now, enter the systolic pressure. This must be between K and L.]
   • [Add automatic (background-recorded) time stamp]
   • [Force 30-second wait through surveyCTO]
   • [Constraint: value must be between K and L.]
   • [Constraint: systolic must be > than diastolic.]
   • [If the device displays the reading in increments of 2 – as the one used in the NHANES – constrain to even values only]
   • [Calculate field: detect whether the diastolic pressure result entered by the FO is within the likely range of 90-140]

[If systolic is not within likely range]
     [FO, the value you entered ([VALUE]) is outside the likely range for systolic pressure of people in the age group of the participant. Please check whether that value is equal to the diastolic pressure measurement you see in the screen of the device.

          If ([VALUE]) is NOT the systolic pressure measurement you see in the screen of the device, please press '([VALUE]) is not the correct value'. That will allow you to type the value you seen in the screen of the device.

          If ([VALUE]) is the systolic pressure measurement you see in the screen of the device, press '([VALUE]) is the correct value'.]

[FO: Please take a picture of the screen of the measurement device and upload it.]
          [Force 60-second wait through surveyCTO]

[If # of maneuver = 1] "Now, we will repeat the measurement one more time".
[If # of maneuver = 2] "Now, we will repeat the measurement one more time".

Section G – Blood oxygen measurement

Oximeter

This is a procedure list for the FO; the FO should read the instructions to the participant, and answer for themselves the questions under each instruction.

[FO: Is there a chair where the subject can sit?] Y/N/Other
      [If yes] [FO: Does the chair have a back?] Y/N/Other
           [If yes] "Please sit on a chair and keep your back straight, leaning against the back of the chair."
- Is the subject sitting up straight? Y/N/Other
- Is the subject leaning against the back of the chair? Y/N/Other

      o [If no] "Please, sit on a chair and keep your back straight".
- Is the subject sitting up straight? Y/N/Other

"Please tell me if your hands warm."
- Are the subject's hands warm? Y/N/Other
    o [If not warm]: "Please rub your hands until they are warm".

"Please place your right hand below the level of your heart and relax it"
- Is the subject's right hand below the level of the heart? Y/N/Other
- Is the subject's right hand relaxed? Y/N/Other

[FO, Does the right middle finger have nail polish?]
      [If yes]: Is there any finger in the right hand that does not have nail polish?
           [If yes]: Choose any finger of the right hand that does NOT have nail polish on it. THUMB/INDEX/MIDDLE/RING/PINKY finger.
           [If no]: Is there any finger in the left hand that does NOT have nail polish?
             [If yes]: Choose any finger of the left hand that does NOT have nail Polish on it. THUMB/INDEX/MIDDLE/RING/PINKY finger.

"Now, I will place the clip on your [X] finger."
- [FO: Ensure that the clip is not too tight and not too loose.]
- Did you place the clip on the subject's [X] finger?

"Now, I will press the button that will start the measurement. We will wait until the reading stops changing and displays one steady number. Please do not move while the device is measuring".
- [Force one-minute wait via surveyCTO]
- Have you pressed the button? Y/N
      [If no] Please press the button.
      [If yes] Is the subject sitting still?
         [If no] Please stop the measurement, ensure that the subject is sitting still and then begin the measurement again.
         [If yes] Has the reading stabilized and the screen shown a steady number? Y/N/Other
            [If no] Please wait until the screen shows a steady number.
            [If yes] Please press 'OK' to continue to the screen where you will have to enter the result of the measurement. (OK)

[FO: Please enter the result of the measurement.]
  [Force 45-second wait through surveyCTO]
  [Add automatic (background-recorded) time stamp]
  [Constraint: value must be between 20 and 100].
[FO: Please take a picture of the result and upload it.]
  [Force 60-second wait through surveyCTO]

Section I - Cognitive Assessments

(For adults and for children)
- Hearts and Flowers (See attachment for protocols)
- Reverse Corsi Blocks (See attachment for protocols)
- D2 Task (See attachment for protocols)

Section E – Maternal health [only if primary stove user is a woman]

We now would like to ask some questions about pregnancy and birth. We understand that these are sensitive questions and it may be difficult or upsetting to talk about, but please remember to include pregnancies that did not end in live birth. Also please remember that this survey is confidential and that the information will be used for research purposes only.

a) Are you currently pregnant?

b) [If a==1, say "Other than your current pregnancy, ..."]
   Since June 1 2019, how many times have you been pregnant?

c) [If b=1] Did this pregnancy result in stillbirth, miscarriage, or abortion?
   [If b>1] How many of these pregnancies resulted in stillbirth, miscarriage, or abortion?

d) [If b > c] How many live children did you give birth to in total (note that d>b-c if twins)?
   For each child:
   a. Month and year of birth: (should be June 2019 or later)
   b. Baby weight at birth:
   c. Baby length at birth: