

Evaluation of Clean Cooking Behavior Change Communication Interventions in Kenya, Bangladesh, and Nigeria

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Evaluation Partners

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Summary of implemented behavior change communication

Bangladesh: Social Marketing Company (SMC) and Purplewood



Community-based promotion of improved biomass cookstoves and liquid petroleum gas (LPG) in peri-urban and rural areas.

Aug 2017 – Aug 2018

Interpersonal communication (IPC) was combined with out of home (OOH) materials such as street theater, billboards and cookstove events to reach a wider audience. Total estimated exposed: 1.6 million people

Kenya: The Mediae Company (Mediae)



Home makeover TV & radio show, *Shamba Chef*, featuring a range of fuels and technologies and promoting clean cooking and nutrition

Ran Sept - Dec 2017

13 episodes of *Shamba Chef* aired on TV and radio, in English and Kiswahili.

Four episodes featured modern wood burning stoves; seven modern charcoal burning stoves; two LPG stoves.

Total estimated exposed: 5 million people

Summary of implemented behavior change communication

Kenya: Population Services, Kenya (PS Kenya), with technical input from Practical Action



Technology/brand neutral campaign to promote broad themes of awareness and adoption of cleaner cooking, as well as category messaging aimed at increasing purchase and use of improved charcoal stoves.

Ran March 2017 - May 2018

In addition to a radio campaign, the PSK BCC employed a mix of approaches via sales-driven and BCC-focused organizations.

Channels and settings: households, workplaces, community gatherings and markets

Total estimated exposed: 2.8 million people

Nigeria: Africare and McCann Global Health



Mass media campaign supported with IPC to improve uptake of LPG in urban and peri-urban areas of Abuja and Lagos State.

Ran Aug 2017 – May 2018

A five-part web based mini-series, radio ads / jingles, and social media campaign were combined with door to door IPC on the safe use and benefits of cooking with gas.

Total estimated exposed: 4 million people

Evaluation study aims and key questions

Study Aim

To identify which BCC interventions support scale-up of clean and efficient cooking, to understand how and why they work, and ultimately to model their impact in the Alliance's key mission areas of health, environment, livelihood and gender.

Research questions

Are the BCC interventions effective in motivating people to purchase and correctly use clean cooking technologies?

To what degree can the changes in behavior be attributed to the BCC interventions?

Is there a dose-response relationship between higher exposure to cookstove messages and the outcomes of cookstove purchasing and correct stove usage?

Were there aspects of the BCC intervention that were more effective than others?

What are the impacts of the BCC interventions on relative progress towards health, environment, gender, and livelihood goals?

Evaluation study design

A **quasi-experimental design**, due to the limitations of a real-world evaluation, was used to examine the dose-response relationship between exposure to the implemented BCC interventions and behavior changes over time.

To further correct for real-world influences, we **multivariate regression modeling** was used to generate and interpret study results using a cookstove-messaging dosage index (CDMI):

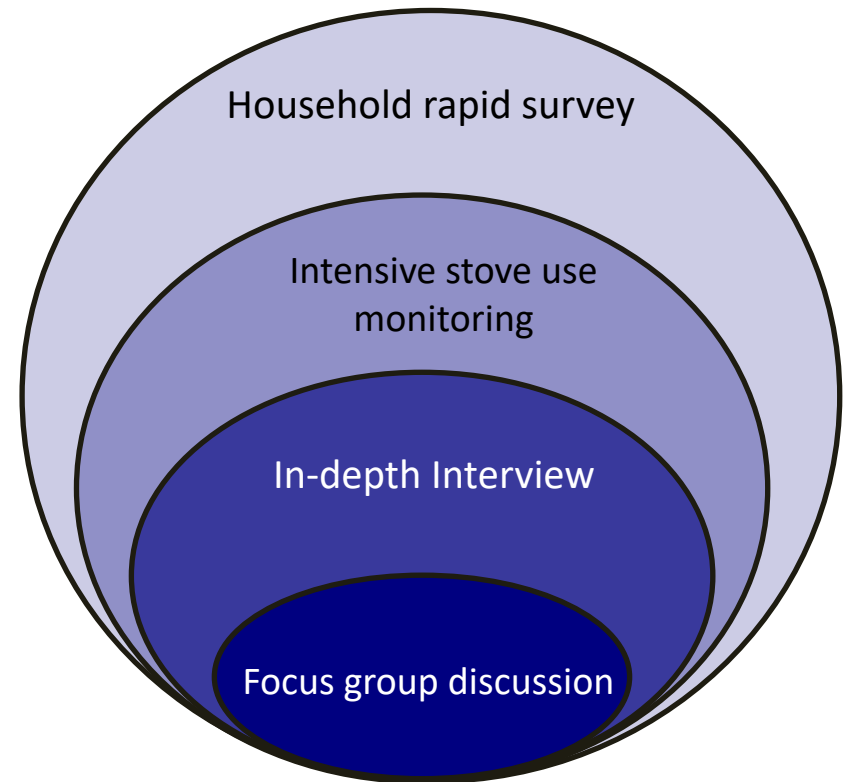
$$\text{Self-reported exposure} + \text{External independent tracking} = \text{Cookstove-messaging dosage index (CMDI)}$$

Where possible, **core elements were maintained across all projects** to allow for cross-project comparison, while allowing context-specific flexibility.

Data collection methods

A mixed method approach was used to collect data.

Due to the variations between intervention contexts, the Africare/McCann evaluation is the only location where all methods were implemented.



Inquiring minds want to know

BCC Project	SMC/Purplewood, Bangladesh		Mediae, Kenya		PS Kenya, Kenya		Africare/ McCann, Nigeria	
Implementation	Aug 2017 – Aug 2018		Sept-Dec 2017		Mar 2017- August 2018		Aug 2017 – April 2018	
Data collection methods	Date	n*	Date	n	Date	n	Date	n
	Baseline rapid survey	April 2017	559	Jan 2017	854	Jan 2017	690	May 2017
Midline rapid survey							Dec 2017	815
Endline rapid survey	Nov 2018	907	Jan 2018	860	Oct ⁴ 2017	793	May 2018	804
Stove use monitoring							Feb-May 2018	125
In-depth interviews	Jan 2019	75	May 2018	150			June 2018	150
Focus group discussions (FGDs)							Nov 2018	1 male 1 female

*n= number of households except for the FGDs where the n refers to groups of 8-10 people. Most rapid survey interviews involved one person from the household but sometimes involved two when the cook was not involved in decision making for the home. See section 2.2.1 for more detail.

Evaluation key findings

Exposure to the BCC materials **increased awareness of cleaner cooking options** (as promoted by each BCC campaigns) **25-fold in the SMC/Purplewood sample, and quadrupled awareness in both the Mediae and PS Kenya samples.**

The Africare/McCann sample had nearly 100% LPG awareness at baseline, however BCC exposure **doubled intention to purchase** an LPG stove in the next month in the Africare/McCann peri-urban sample (no observed impact among other samples).

Additionally, there was **suggestive evidence of an impact on 1) purchasing an LPG stove, and 2) increasing LPG use** during the exposure period in the Africare/McCann samples (no observed impact in the other samples).

In summary

BCC boosted awareness and in some cases intention to purchase in Bangladesh and Kenya, with suggestive impacts on actual purchase of promoted stoves or increased use of LPG fuel in Nigeria.

Evaluation key findings

Secondary aim to model potential climate or health impacts of BCC interventions was not achieved because an insufficient number of purchasers of the promoted technologies/fuels were detected in our samples.

Given its real-world context, **the evaluation was limited by unexpected external factors including:**

- Changes to BCC channels and messaging;
- Shifts in energy policies;
- Competing cookstove and fuel advertising;
- Target populations who face severe liquidity constraints; and
- Oft-reported desire/need to prioritize other household expenditures.

It may be possible to **control for some confounding factors** in future studies, which are relatively new to the sector.

In conclusion

Because of the scale we're working on, we project that **even modest success** using BCC to increase uptake of cleaner cooking solutions across large populations **could have meaningful climate and health implications.**

	SMC/ Purplewood		Mediae		PS Kenya		Africare/McCann: Peri-urban		Africare/McCann: Urban	
Outcome ¹	Baseline (N=559) Freq (%)	Endline (N=907) Freq (%)	Baseline (N=854) Freq (%)	Endline (N=858) Freq (%)	Baseline (N=690) Freq (%)	Midline (N=792) Freq (%)	Baseline (N=465) Freq (%)	Endline (N=437) Freq (%)	Baseline (N=357) Freq (%)	Endline (N=367) Freq (%)
Awareness of improved biomass stoves										
Yes	3 (0.5%)	141 (16%)	565 (66%)	610 (71%)	507 (73%)	624 (79%)	n/a ³	n/a	n/a	n/a
No	552 (99%)	766 (84%)	289 (34%)	248 (29%)	183 (27%)	168 (21%)	n/a	n/a	n/a	n/a
Awareness of the benefits of LPG/gas stoves										
Yes	n/a	882 (97%)	n/a	596 (69%)	n/a	540 (68%)	459 (99%)	435 (99.5%)	357 (100%)	365 (99.5%)
No	n/a	25 (3%)	n/a	262 (31%)	n/a	252 (32%)	5 (1%)	2 (0.5%)	0 (0%)	2 (0.5%)
Positive attitudes towards improved stoves or modern stoves (among those who were aware of modern stoves)										
Minimal positive attitudes	n/a	391 (92%)	n/a	160 (26%)	n/a	303 (38%)	245 (63%)	164 (41%)	173 (66%)	155 (49%)
Greater positive attitudes	n/a	3 (8%)	n/a	447 (74%)	n/a	490 (62%)	141 (37%)	234 (59%)	89 (34%)	161 (51%)
Intention to purchase an improved stove within next month (among those that were aware of modern stoves)										
Yes, within next month	15 (11%)	73 (8%)	108 (19%)	59 (10%)	99 (20%)	90 (15%)	48 (13%)	17 (7%)	23 (11%)	31 (16%)
No	119 (89%)	834 (92%)	457 (81%)	549 (90%)	406 (80%)	529 (85%)	326 (87%)	238 (93%)	197 (90%)	165 (84%)
Increased use of LPG/started using LPG within past year (out of those who had changed their LPG use)										
Yes	n/a	24 (17%)	n/a	n/a	n/a	n/a	n/a	19 (83%)	n/a	20 (80%)
No	n/a	121 (83%)	n/a	n/a	n/a	n/a	n/a	4 (17%)	n/a	5 (20%)
Purchase an improved biomass stove within the BCC exposure period² Follow up data only										
Yes	No purchase		1 (6%)		4 (25%)		n/a		n/a	
No	No purchase		16 (94%)		12 (75%)		n/a		n/a	
Purchase an LPG stove within the BCC exposure period ² Follow up data only										
Yes	209 (39%)		25 (13%)		42 (20%)		42 (10%)		85 (23%)	
No	329 (61%)		163 (87%)		165 (80%)		395 (90%)		282 (77%)	

Endline sample characteristics for all interventions

	SMC/ Purplewood (N=907)	Mediae (N=860)	PS Kenya (N=793)	Africare/McCann: Peri-urban (N=437)	Africare/McCann: Urban (N=367)
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Area of residence	Division Dhaka: 616 (68%) Barisal: 291 (32%)	Urban: 336 (39%) Peri-urban: 403 (47%) Rural: 121 (14%)	Urban: 647 (82%) Semi-urban: 146 (18%) Rural: 0 (0%)	Study site Lagos State: 380 (87%) Abuja City: 57 (13%)	Study site Lagos State: 322 (88%) Abuja City: 45 (12%)
Age group (years)	20-24: 234 (26%) 25-29: 285 (31%) 30-35: 388 (43%)	23-25: 266 (31%) 26-30: 230 (27%) 31-50: 364 (43%)	23-25: 294 (37%) 26-30: 203 (26%) 31-50: 296 (37%)	18-25: 84 (19%) 26-30: 128 (29%) 31-35: 105 (24%) 36-40: 120 (28%)	18-25: 66 (18%) 26-30: 96 (26%) 31-35: 90 (25%) 36-40: 115 (31%)
Education level	Of Respondent Primary or less: 397 (44%) Some HS: 372 (41%) HS or more: 138 (15%)	Of Respondent None through primary complete: 326 (38%) Some secondary or higher: 532 (62%)	Of Respondent None through primary complete: 208 (26%) Some secondary or higher: 585 (74%)	Of Primary Earner None through some secondary: 129 (30%) Secondary through some post-secondary: 213 (49%) Post-secondary or higher: 95 (22%)	Of Primary Earner None through some secondary: 89 (24%) Secondary through some post-secondary: 192 (52%) Post-secondary or higher: 86 (23%)

BCC evaluation team

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Article

The *Shamba Chef* Educational Entertainment Program to Promote Modern Cookstoves in Kenya: Outcomes and Dose–Response Analysis

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Abstract: Background: Globally, an estimated 3.6 billion people rely on solid fuels for cooking over open fires or in simple cookstoves. Universal access to clean cooking fuels and technology by 2030 is a United Nations' Sustainable Development Goal. Methods: The Mediae Company created a home makeover television and radio show, *Shamba Chef*, designed to promote modern, cleaner, safer cooking methods and improved nutrition in Kenya, which reached 5 million homes in late 2017. This was accompanied by a mobile phone platform called iChef. Researchers evaluated the effects of *Shamba Chef* on cookstove purchase, use, and attitudes, beliefs, and intentions. Results: The study revealed dose–response effects of *Shamba Chef* exposure on several key outcomes. Exposure to the program was associated with an awareness of improved biomass stoves (OR 4.4; 95% CI 2.8 to 6.9), and aspirations to own an improved biomass stove (OR 2.0; 95% CI 1.4 to 2.9). Receiving information about modern stoves from two or more sources generated greater awareness of liquefied petroleum gas (LPG) stoves (OR 2.0; 95% CI 1.3 to 3.1). The qualitative study revealed that *Shamba Chef* explained how the stoves worked, communicated their benefits, and encouraged participants to trust and purchase those cookstoves. Conclusion: *Shamba Chef* was successful in influencing determinants of cookstove purchase and use, and there is evidence from the qualitative study that it influenced the purchase and use of improved biomass stoves.

Keywords: cookstoves; public health; environment; social marketing; behavior change communication; demand creation