

This is a repository copy of *Efficacy and cost-effectiveness of a community-based smoke-free-home intervention with or without indoor-air quality feedback in Bangladesh (MCLASS II): a three-arm, cluster-randomised, controlled trial.*

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/id/eprint/170269/>

Version: Accepted Version

Article:

Mdege, Noreen Dadirai orcid.org/0000-0003-3189-3473, Fairhurst, Caroline Marie orcid.org/0000-0003-0547-462X, Wang, Han I orcid.org/0000-0002-3521-993X et al. (12 more authors) (2021) Efficacy and cost-effectiveness of a community-based smoke-free-home intervention with or without indoor-air quality feedback in Bangladesh (MCLASS II): a three-arm, cluster-randomised, controlled trial. *The Lancet Global Health*. e639-e650. ISSN: 2214-109X

[https://doi.org/10.1016/S2214-109X\(21\)00040-1](https://doi.org/10.1016/S2214-109X(21)00040-1)

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

Table 1: Cost breakdowns for interventions and unit costs

	Unit cost (\$USD)	Source
Intervention costs		
Training cost for IAQ		
Trainers (staff time)	39.4/day	Trial team
Trainees (staff time)	12.2/day	Trial team
Material	2.7/person	Trial team
Logistics	1.0/person	Trial team
Venue	48.8	Trial team
Training cost for SFH		
Trainers (staff time)	4.9/hour	Trial team
Trainees (staff time)	3.7/hour	Trial team
Food	3.1/person	Trial team
Travel	640	Trial team
Venue	48.8	Trial team
Delivery cost for IAQ		
Adaptor	30.75 each	Trial team
Battery	332.5 each	Trial team
Shipping cost	1046.3	Trial team
Tax at airport	9648.3	Trial team
Staff time	12.2/day	Trial team
Travel cost	1.2/visit	Trial team
Consumables (booklet, food, etc)	219.8	Trial team
Delivery cost for SFH		
Religious leaders (staff time)	3.7/hour	Trial team
Consumables	0.4/copy	Trial team
Booklets	4.9/copy	Trial team
Healthcare costs		
Inpatient stays	54.4/stay	World Health Organisation ²⁶
Outpatient visits	1.9/visit	World Health Organisation ²⁶
A&E visits	2.5/visit	Islam et al ²⁷
Home visits (doctor)*	13.5/visit	Bangladesh Bureau of Statistics ²⁵
Home visits (nurse)*	8.5/visit	Bangladesh Bureau of Statistics ²⁵

*The average time for a home visit was assumed to be 1 hour 40 minutes including travel time

Table 2: Baseline household characteristics (as followed up)

	Usual Services (n=450)	SFH intervention (n=420)	SFH intervention plus IAQ feedback (n=480)	Total (n=1,350)
Age of lead adult, years				
Mean (SD)	40.8 (12.8)	40.7 (12.7)	40.3 (12.1)	40.6 (12.5)
Median (min, max)	38.2 (20.1, 85.4)	37.3 (22.1, 85.5)	38.1 (20.2, 84.7)	38.1 (20.1, 85.5)
Gender of lead adult (male), n (%)	429 (95.3)	387 (92.1)	461 (96.0)	1277 (94.6)
Number of adult residents				
Mean (SD)	2.4 (0.8)	2.5 (0.8)	2.3 (0.7)	2.4 (0.8)
Median (min, max)	2.0 (1.0, 6.0)	2.0 (1.0, 6.0)	2.0 (1.0, 5.0)	2.0 (1.0, 6.0)
Number of child residents				
Mean (SD)	1.3 (1.1)	1.4 (1.1)	1.5 (1.1)	1.4 (1.1)
Median (min, max)	1.0 (0.0, 7.0)	1.0 (0.0, 5.0)	1.0 (0.0, 6.0)	1.0 (0.0, 7.0)
Home has outside space, n (%)	244 (54.2)	243 (57.9)	237 (49.4)	724 (53.6)
Number of bedrooms				
Mean (SD)	1.5 (0.7)	1.5 (0.7)	1.3 (0.6)	1.4 (0.7)
Median (min, max)	1.0 (0.0, 5.0)	1.0 (1.0, 5.0)	1.0 (1.0, 4.0)	1.0 (0.0, 5.0)
Type of fuel used for cooking, n (%)				
Electricity	41 (9.1)	71 (16.9)	11 (2.3)	123 (9.1)
LPG/natural gas/biogas	401 (89.1)	362 (86.2)	479 (99.8)	1,242 (92.0)
Kerosene	27 (6.0)	5 (1.2)	21 (4.4)	53 (3.9)
Number of adult resident smokers				
Mean (SD)	1.1 (0.3)	1.1 (0.3)	1.1 (0.3)	1.1 (0.3)
Median (min, max)	1.0 (1.0, 3.0)	1.0 (0.0, 3.0)	1.0 (0.0, 3.0)	1.0 (0.0, 3.0)
Number of child resident smokers				
Mean (SD)	0.0 (0.1)	0.0 (0.1)	0.0 (0.2)	0.0 (0.1)
Median (min, max)	0.0 (0.0, 1.0)	0.0 (0.0, 1.0)	0.0 (0.0, 1.0)	0.0 (0.0, 1.0)
Residents allowed to smoke, n (%)				
Anywhere inside your home	197 (43.8)	180 (42.9)	262 (54.6)	639 (47.3)
Only in some rooms in your home	5 (1.1)	6 (1.4)	1 (0.2)	12 (0.9)
Only in one room in your home	14 (3.1)	36 (8.6)	15 (3.1)	65 (4.8)
Only outside	233 (51.8)	196 (46.7)	199 (41.5)	628 (46.5)
Don't know	1 (0.2)	2 (0.5)	3 (0.6)	6 (0.4)

Visitors are allowed to smoke, n (%)				
Anywhere inside your home	178 (39.6)	146 (34.8)	247 (51.5)	571 (42.3)
Only in some rooms in your home	4 (0.9)	6 (1.4)	1 (0.2)	11 (0.8)
Only in one room in your home	11 (2.4)	30 (7.1)	12 (2.5)	53 (3.9)
Only outside	250 (55.6)	229 (54.5)	213 (44.4)	692 (51.3)
Don't know	7 (1.6)	9 (2.1)	7 (1.5)	23 (1.7)
Are residents allowed to smoke in front of children in the home?, n (%)				
Yes	132 (29.3)	142 (33.8)	194 (40.4)	468 (34.7)
No	221 (49.1)	179 (42.6)	191 (39.8)	591 (43.8)
Don't know	6 (1.3)	3 (0.7)	10 (2.1)	19 (1.4)
No children live in this house	91 (20.2)	96 (22.9)	85 (17.7)	272 (20.1)
Are visitors allowed to smoke in front of children in the home?, n (%)				
Yes	118 (26.2)	112 (26.7)	196 (40.8)	426 (31.6)
No	234 (52.0)	201 (47.9)	185 (38.5)	620 (45.9)
Don't know	9 (2.0)	12 (2.9)	14 (2.9)	35 (2.6)
No children live in this house	89 (19.8)	95 (22.6)	85 (17.7)	269 (19.9)

Table 3: PM_{2.5} Dylos measurements by trial group over time

Average PM_{2.5} measurement (ug/m³)		Usual Services (n=601)	SFH intervention (n=560)	SFH intervention and IAQ feedback (n=640)	Total (n=1,801)
Baseline (as randomised)	N	572	542	632	1,746
	Mean (SD)	41.9 (38.5)	39.5 (29.3)	44.6 (43.7)	42.2 (38.0)
	Median (min, max)	29 (2, 251)	30 (8, 166)	30 (1, 422)	30 (1, 422)
Baseline (as analysed)	N	447	419	480	1346
	Mean (SD)	44.2 (40.8)	42.1 (30.7)	46.6 (42.3)	44.4 (38.6)
	Median (min, max)	30 (2, 251)	34 (8, 166)	30 (5, 334)	31 (2, 334)
Month 3	N	450	420	480	1,350
	Mean (SD)	85.3 (86.8)	75.6 (83.7)	74.9 (76.9)	78.6 (82.5)
	Median (min, max)	44.5 (1, 417)	38 (6, 459)	38 (1, 353)	39 (1, 459)
Month 12	N	441	405	468	1314
	Mean (SD)	65.2 (44.7)	68.9 (49.5)	65.8 (39.6)	66.5 (44.6)
	Median (min, max)	54 (11, 340)	57 (13, 389)	56 (14, 244)	55 (11, 389)

Table 4: Primary analysis results (log-transformation of outcome data in sensitivity analysis)

Follow-up	Comparison	Adjusted mean difference (95% CI)	p-value
Month 3	SFH intervention plus IAQ feedback vs. Usual services	-12.6 (-26.3 to 1.0)	0.07
	SFH intervention vs. Usual services	-9.3 (-24.0 to 5.4)	0.22
	SFH intervention vs. SFH intervention plus IAQ feedback	3.4 (-10.7 to 17.4)	0.64
Month 12	SFH intervention plus IAQ feedback vs. Usual services [primary comparison]	-1.0 (-12.8 to 10.9)	0.88
	SFH intervention vs. Usual services	5.0 (-7.9 to 18.0)	0.45
	SFH intervention vs. SFH intervention plus IAQ feedback	6.0 (-6.3 to 18.3)	0.34
Log-transformed			
Month 3	SFH intervention plus IAQ feedback vs. Usual services	-0.13 (-0.32 to 0.05)	0.16
	SFH intervention vs. Usual services	-0.11 (-0.30 to 0.09)	0.30
	SFH intervention vs. SFH intervention plus IAQ feedback	0.03 (-0.16 to 0.22)	0.78
Month 12	SFH intervention plus IAQ feedback vs. Usual services	0.02 (-0.15 to 0.19)	0.79
	SFH intervention vs. Usual services	0.06 (-0.12 to 0.25)	0.50
	SFH intervention vs. SFH intervention plus IAQ feedback	0.04 (-0.13 to 0.21)	0.64

Table 5: Total costs, QALYs and ICER per household by trial groups

	No. of households	Costs			QALYs (SD)	ICER
		Intervention \$USD	Healthcare \$USD (SD)	Total \$USD (SD)		
Trial results						
SFH intervention plus IAQ feedback	429	21·9	11·0 (22·0)	32·8 (22·0)	3.31 (1.20)	\$653/QALY gained
SFH intervention	383	2·9	23·0 (61·0)	25·8 (61·0)	3.25 (1·18)	Dominated
Usual services	425	-	13·2 (30·4)	13·2 (30·4)	3.28 (1.22)	-
				Incremental costs (\$)	Incremental QALYs	ICER
Results of bootstrapped SUR models						
SFH intervention plus IAQ feedback vs. usual services (mean, 95% CI)				19·5 (14·2 to 24·9)	-0·05 (-0·05 to 0·05)	Dominated
SFH intervention vs. usual services (mean, 95% CI)				12·1 (6·6 to 17·6)	-0·10 (-0·14 to -0·07)	Dominated