

Factors associated with latrine use and ownership among rural populations:

Findings from a desk review and analysis of multi-
country formative research studies

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Water

Session overview

- Background
- Study objectives and methods
- Key findings
- Conclusions

Background

- WSP supporting governments to scale up rural sanitation since 2006
- Understanding factors that facilitate or impede latrine adoption and use through formative research is a critical part of program
- Opportunity to mine data across studies conducted in several countries

Research objectives

- Identify factors associated with latrine ownership among rural populations, particularly among the poor
- Identify factors associated with consistent use of a latrine, among toilet owners
- Identify commonalities and differences in behavioral determinants across countries

Studies covered in desk review

Country/location	Date	Methods
Cambodia: Kandal, Siem Reap, Svay Rien	2006	FGD (N=6)' SI (N = 939)
India: Meghalaya	2012	IDI (N=18)' FGD (N=21), SI (N=960)
India: Rajasthan	2012	IDI & FGD: (N=56), SI (N=3,301)
India: Bihar	2012	IDI & FGD: (N=45), SI (N=3,971)
Indonesia: East Java	2008	FGD (N=6), IDI (N=6), SI (N=2,009)
Kenya: 8 districts	2012	FGD (N=16), SI (N=2,000)
Malawi: Dowa, Mangochi, Nkhata Bay	2011	IDI (N=35), FGD (N=15), SI (N=222)
Peru: Callao, Cajamarca Ancash, and Loreto	2007	FGD (N=24)
Tanzania: Musoma, Kiteto, Rufiji, Iringa	2008	SI (N=1,000)
Uganda*: Tororo District [USAID/FHI-360]	2009	IDI (N=30)

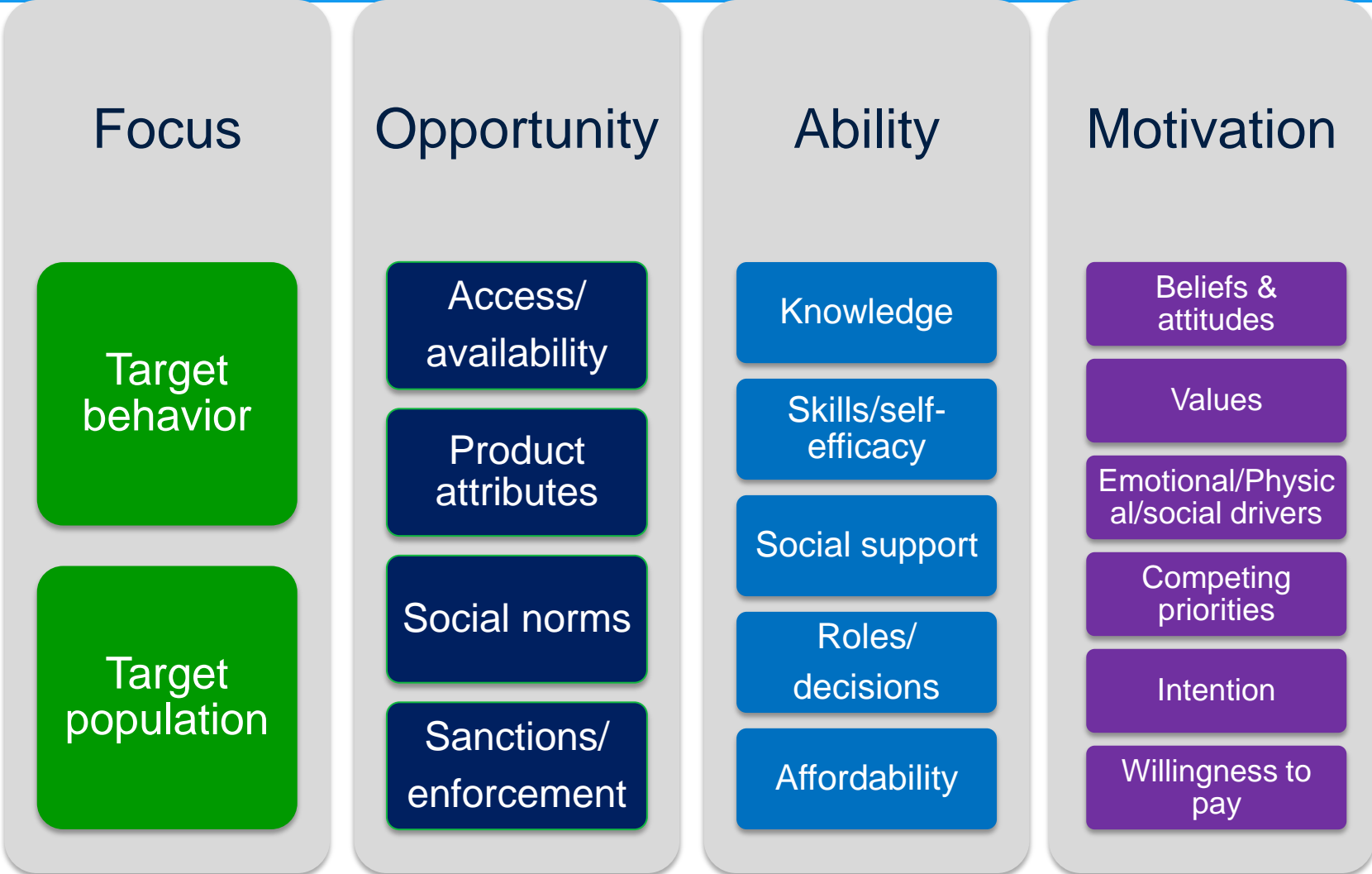
**FGD: Focus group discussion; SI: Structured Interview;
IDI: In-depth Interview**

Studies covered in multi-country analysis

Country/location	Date	Methods
Cambodia: Kandal, Siem Reap, Svay Rien	2006	FGD (N=6)' SI (N = 939)
India: Meghalaya	2012	IDI (N=18)' FGD (N=21), SI (N=960)
India: Rajasthan	2012	IDI & FGD: (N=56), SI (N=3,301)
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SaniFOAM behavior change framework



Development of SaniFOAM scaled constructs

	Corrected item-total correlation	Cronbach alpha
Sanctions and Enforcement, Meghalaya		
Villagers criticize if they see others defecating in the open		
Households who have toilets pressurize households without toilets not to defecate near the village		
More people use toilets because there are village rules to stop open defecation		
Villagers are intolerant of people who defecate near the village		

Psychometric analysis of scaled items

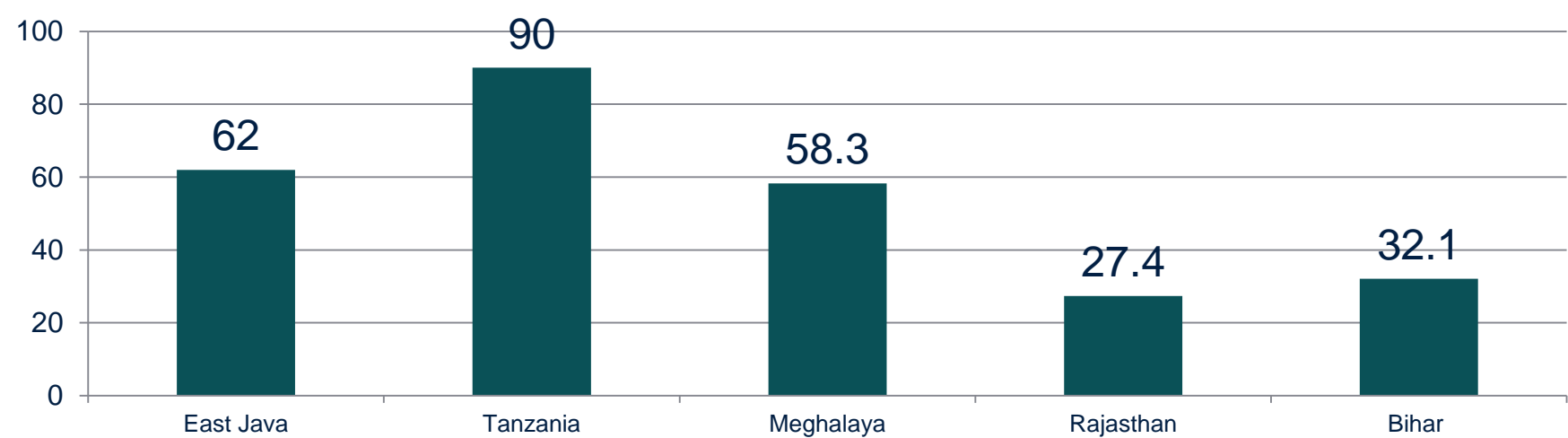
Type of analysis	Purpose	Test and scale development
Review of the content of each item.	Face validity	Each item was assessed according to the SaniFOAM definition to ensure it captured the definition.
Frequency analyses	Item distribution and skew	Items with two or more adjacent scale points showing ~ 10% of the responses were highlighted as having frequency problems.
Analysis of variance	Discriminate validity.	Items that did not distinguish between this were subject to exclusion from the multi-item scaled construct.
Corrected item to total correlations	Content reliability.	Items were identified as problematic if they correlated with their own facet at values less than Pearson $r \sim 0.40$.
Exploratory factor analysis	Content reliability.	Factors with eigen values greater than one were retained and for each identified factor, items with a factor loading greater than 0.40 were retained.
Chronbach's alpha	Internal consistency reliability.	Where alpha values increased on the deletion of an item, this item was removed. Final scales had to have an acceptable alpha's value of 0.70 (Streiner & Norman, 1996).

Analysis

- Separate logistic regression models to presented adjusted odds ratios (AORs) and 95% confidence intervals (CIs):
 - Latrine ownership,
 - Latrine ownership among the poorest households
 - Use of the latrine, among latrine owning households
- Covariates:
 - Multi-item or single item scaled constructs
 - Items with different response options
 - Adequate water supply to use a latrine, sufficient land space to build a latrine (1, Yes, 0, No, 98, Don't know)
- Background covariates:
 - Household wealth index estimated from asset variables using principal components analysis
 - Other covariates, e.g. age, education, number of household members, employment.

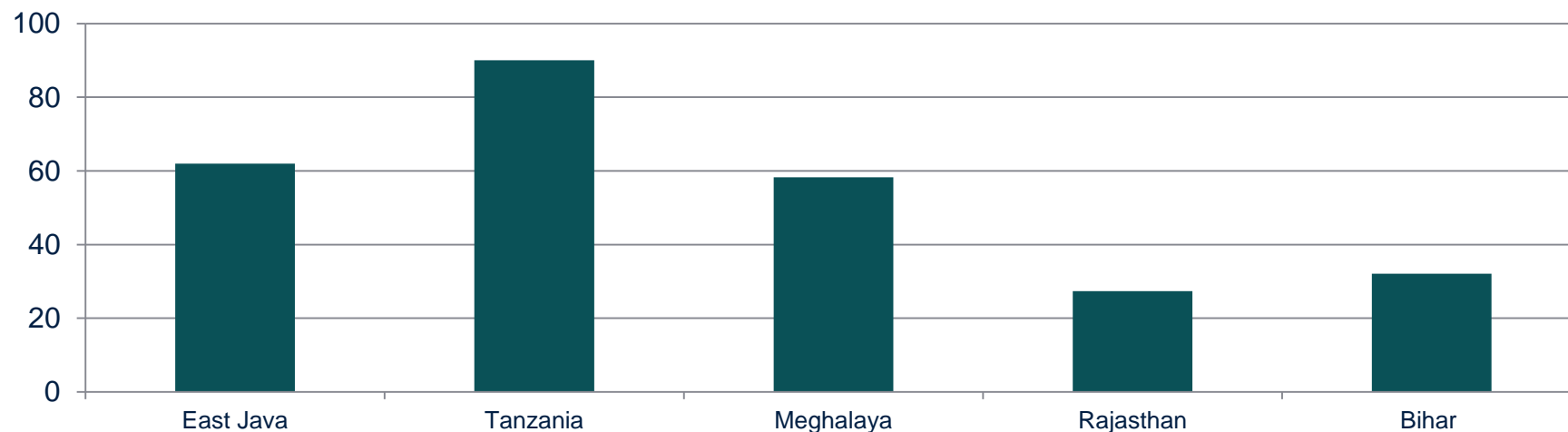
Sample

Rates of latrine ownership



Sample

Rates of latrine ownership



Selected background characteristics

	East Java N= 2,009	Tanzania N=983	Meghalaya N= 960	Rajasthan N= 3,301	Bihar N= 3,971
Male	100%	57.2%	64.5%	96.7%	96.2%
Farmer	43.2%	84.5%	61.5%	62.0%	49.6%

Opportunity factors

	East Java 62.0% ownership N= 2,006 AOR (95% CI)	Tanzania 90.3% ownership N=962 AOR (95% CI)	Meghalaya 58.3% ownership N= 960 AOR (95% CI)	Rajasthan 27.4% ownership N= 3,301 AOR (95% CI)	Bihar 32.1% ownership N= 3,971 AOR (95% CI)
Access and availability					
Social norms	3.53 (2.70-4.61)***	1.80 (1.31-2.45)***	8.90 (5.53-14.3)***	2.01 (1.57-2.58)***	1.30 (1.15-2.46)*
Product attributes (satisfaction)	<ul style="list-style-type: none"> - It is not acceptable to defecate in the open - It is not civilized to defecate in the open - Those who defecate in the open air will endanger the community they live in - Those who defecate in the open air will not be accepted in the community the live 				
Sanctions & enforcement					

Opportunity factors

	East Java 62.0% ownership N= 2,006 AOR (95% CI)	Tanzania 90.3% ownership N=962 AOR (95% CI)	Meghalaya 58.3% ownership N= 960 AOR (95% CI)	Rajasthan 27.4% ownership N= 3,301 AOR (95% CI)	Bihar 32.1% ownership N= 3,971 AOR (95% CI)
Access and availability					
Social norms	3.53 (2.70-4.61) ^{***}	1.80 (1.31-2.45) ^{***}	8.90 (5.53-14.3) ^{***}	2.01 (1.57-2.58) ^{***}	1.30 (1.15-2.46) [*]
Product attributes (satisfaction)	4.41 (3.75-5.19) ^{***}	2.55 (1.78-3.64) ^{***}	2.89 (1.99-4.04) ^{***}	10.72 (8.85-12.98) ^{***}	6.13 (5.40-6.96) ^{***}
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Sanctions & enforcement	--	--	2.21 (1.37-3.53)***	1.30 (1.08- 1.57)*	1.21 (1.04-1.4)***

Opportunity factors

	East Java 62.0% ownership N= 2,006 AOR (95% CI)	Tanzania 90.3% ownership N=962 AOR (95% CI)	Meghalaya 58.3% ownership N= 960 AOR (95% CI)	Rajasthan 27.4% ownership N= 3,301 AOR (95% CI)	Bihar 32.1% ownership N= 3,971 AOR (95% CI)
Access and availability	ns	--	3.11 (1.64-5.90)***	2.37 (1.59- 3.54)***	ns
Social norms	3.53 (2.70-4.61)***	1.80 (1.31-2.45)***	8.90 (5.53-14.3)***	2.01 (1.57-2.58)***	1.30 (1.15-2.46)*
Product attributes (satisfaction)	4.41 (3.75-5.19)***	2.55 (1.78-3.64)***	2.89 (1.99-4.04)***	10.72 (8.85-12.98)***	6.13 (5.40-6.96)***
Sanctions & enforcement	--	--	2.21 (1.37-3.53)***	1.30 (1.08- 1.57)*	1.21 (1.04-1.4)***

Ability factors

	East Java 62.0% ownership N= 2,006 AOR (95% CI)	Tanzania 90.3% ownership N=962 AOR (95% CI)	Meghalaya 58.3% ownership N= 960 AOR (95% CI)	Rajasthan 27.4% ownership N= 3,301 AOR (95% CI)	Bihar 32.1% ownership N= 3,971 AOR (95% CI)
Skills & self-efficacy	--	1.66 (1.17-2.33)**	--	--	1.32 (1.14-1.52)***

People in your family know how to build a latrine

It is easy to construct kucha toilets

Ability factors

	East Java 62.0% ownership N= 2,006 AOR (95% CI)	Tanzania 90.3% ownership N=962 AOR (95% CI)	Meghalaya 58.3% ownership N= 960 AOR (95% CI)	Rajasthan 27.4% ownership N= 3,301 AOR (95% CI)	Bihar 32.1% ownership N= 3,971 AOR (95% CI)
Skills & self-efficacy	--	1.66 (1.17-2.33)**	--	--	1.32 (1.14-1.52)***
Affordability (perceived)	1.41 (1.14-1.74)***	--	1.89 (1.29-2.76)***	1.25 (1.02-1.56)*	-

Motivation factors

	East Java 62.0% ownership N= 2,006 AOR (95% CI)	Tanzania 90.3% ownership N=962 AOR (95% CI)	Meghalaya 58.3% ownership N= 960 AOR (95% CI)	Rajasthan 27.4% ownership N= 3,301 AOR (95% CI)	Bihar 32.1% ownership N= 3,971 AOR (95% CI)
Attitudes & beliefs	1.49 (1.11-2.01)**	2.82 (1.47-5.45)**	1.60 (1.07-2.43)*	1.85 (1.49- 2.29)***	--
Values	ns	--	ns	--	ns
Emotional, social and physical drivers	2.55 (1.71-3.81)***	2.82 (1.49-5.35)***	3.59 (1.85-6.95)***	1.65 (1.22- 2.22)***	--
Competing priorities	--	3.76 (2.48-5.84)***	--	--	--

Factors among the poorest

- Household wealth index estimated from DHS asset variables using principal components analysis. Respondents from households that fell into the two lowest quintiles were included in the logistic regression analysis.
- Factors associated with latrine ownership among the lowest 2 quintiles are similar to those all respondents.
- However, sanctions and enforcement and perceived affordability no longer significant

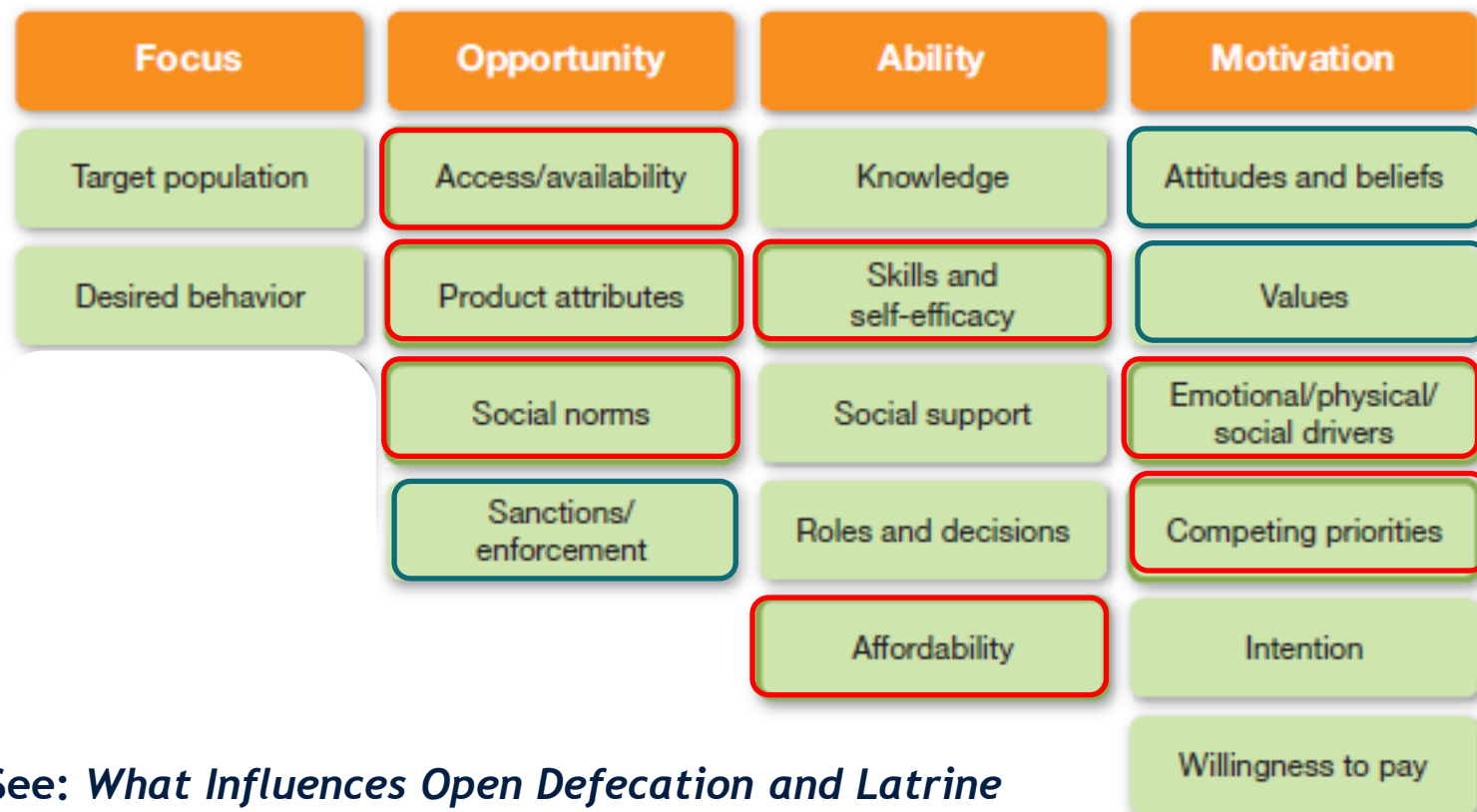
Factors associated with consistent use among toilet owners

	Rajasthan 86.7% consistent latrine use N= 904 AOR (95% CI)	Bihar 63.7% consistent latrine use N= 1,275 AOR (95% CI)
Opportunity		
Social norms	2.1 (1.6-2.8)***	2.4 (1.8-2.9)***
Product attributes	1.3 (.87-1.9)*	1.4 (1.2-1.6) ***
Motivation		
Values	1.9 (1.3-2.7)***	1.7 (1.12-1.8)**

Values:

- Educated households have toilets
- Clean people have toilets at home
- Good parents have toilets at home
- Having toilets in the house means that the family is health conscious
- Building a toilet will add value to my house

The desk review: key findings



See: *What Influences Open Defecation and Latrine Ownership in Rural Households?: Findings from a Global Review*, WSP, Kathryn O'Connell
August 2014

Study limitations

- No causality
- Not all of the SaniFOAM factors were measured in the survey instruments
- Instruments are not standardized
- Associations between improved and unimproved latrines were not explored

Conclusions

- General consistency across countries
- The multi-country analysis confirmed the findings from the desk review and the relevancy of a number of factors used in behavior change interventions:
 - Social norms, sanctions and enforcement and motivational factors.
- Methodological improvements regarding survey design and standardization are merited
- Further analysis by gender is needed

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