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Understanding barriers to and facilitators of latrine use in rural India

May 2021

Working
Paper 44

Water, sanitation and waste management



International
Initiative for
Impact Evaluation

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About this working paper

This paper, *Understanding barriers to and facilitators of latrine use in rural India*, compares qualitative data on the barriers to and facilitators of latrine use in the states of Bihar, Karnataka and Odisha in India. This paper has been copyedited and formatted for publication by 3ie.

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1. Background

In an effort to eradicate open defecation in the country by October 2019, the Indian government launched its flagship programme, the Swachh Bharat Mission (SBM), also known as the Clean India Mission, in 2014. The primary focus of the programme was the large-scale construction of toilets (DoDWS 2020). However, several studies suggest that access to a toilet does not necessarily imply its use.

Therefore, in 2016, the International Initiative for Impact Evaluation (3ie) launched the Promoting Latrine Use in Rural India Evidence Programme, which draws insights from behavioural science to generate evidence on the design and implementation of context-specific, low-cost interventions to support latrine use amongst those with access.

During the programme’s 3-month formative phase, 9 teams tested interventions in 8 Indian states. Based on these pilot studies, 3ie funded four impact evaluations of the most promising interventions to promote latrine use in rural India. The 4 teams – from Oxford Policy Management, the Swiss Federal Institute of Aquatic Science and Technology, Emory University, and the London School of Hygiene & Tropical Medicine – conducted impact evaluation studies over 18 months in the states of Bihar, Karnataka, Gujarat and Odisha (Table 1).

Table 1: Description of the interventions carried out by the four teams

State	Research team, implementing partner	Behavioural science approach	Activities
Bihar	OPML, World Vision India	Nudge theory	Card game, pledge, calendar, lockbox, French drain demonstration and posters to support latrine use
Karnataka	EWAG, Water Aid India	Risks, attitudes, norms, abilities and self-regulation (RANAS)	Community, household, and mothers groups meetings and a supportive phone call
Gujarat	LSHTM, IIPHG	Behaviour-centred design	Social marketing campaign to support the use of a five star toilet
Odisha	Emory, Rural Welfare Institute	Risk perceptions, abilities, social norms, motivation, physical opportunity and self-regulation	Theatre, transect walk, wall painting, household visits, latrine repairs, community and mothers meetings, and positive deviant recognition

Note: OPML = Oxford Policy Management; EWAG = The Swiss Federal Institute of Aquatic Science and Technology; LSHTM = London School of Hygiene & Tropical Medicine; IIPHG = Indian Institute of Public Health, Gandhinagar.

Sources: Caruso et al. 2019a; 2019b; Chuahan et al. 2020; Friedrich et al. 2020; 3ie 2020; Viswanathan et al. 2020. Additional information on the teams and their interventions can be viewed [here](#).

The interventions increased self-reported latrine use in Odisha, Gujarat and Karnataka but had null effects in Bihar (Caruso et al. 2019a; 2019b; Chuahan et al. 2020; Friedrich et al. 2019; 2020; 3ie 2020; Lane et al. 2020; Viswanathan et al. 2020). Certain groups,

such as women and individuals from scheduled castes, were more likely to use latrines. Others have also investigated the relationships between demographic characteristics and the adoption of latrine use (Coffey et al. 2017b; Sinha et al. 2016). However, these quantitative findings do not elucidate individual motivations for latrine (non-)use.

In addition to conducting quantitative impact evaluations, each of the four teams supported by 3ie gathered qualitative data regarding their interventions and latrine use. Using this qualitative information, we considered the barriers to and facilitators of latrine use in these settings. Although the use of different questionnaires and survey methodologies in each study presents some limitations to synthesis, we compare the barriers and facilitators identified across contexts.

2. Methods

2.1 Data collection and sample

All evaluations were co-designed by the teams; however, activities, implementation and data collection were conducted independently (Caruso et al. 2019a; 2019b; Chuahan et al. 2020; Friedrich et al. 2020; 3ie 2020; Viswanathan et al. 2020). Each research team developed its own qualitative data collection protocol, which was informed by early quantitative results. Semi-structured interviews were conducted during impact evaluations of three of the interventions. The interview structure of the fourth study was too different to be included in these analyses (Appendix 1).

Included studies used a variety of data collection methods – including key informant interviews, in-depth interviews and focus group discussions – to gather information related to reasons for use, physical constraints, social pressures and the perceived behaviour of others (Supplemental table A1). Certain target groups, including women, non-latrine users and de-sludgers, were interviewed by research teams in accordance with their specific research goals. The interview approaches and sample sizes are presented in Table 2. Data were processed according to Qualitative Data Repository curation policy.

Table 2: Types of qualitative data collected by the three study teams

	Villages	Individuals	Characteristics of participants
Bihar			
In-depth interview	4	16	10 female 6 male
Key informant interview	2	4	Village institution representatives
	2	1	World vision representative
	2	1	De-sludger
Focus group discussion	2	--	Females
Odisha			
In-depth interview	4	20	Stratified sampling of people with and without changes in latrine use and changes in child faeces disposal
Focus group discussion	6	152	Sex-segregated focus group discussion in each village
Karnataka			
In-depth interview	8	18	12 female 6 male
Focus group discussion	6	--	Village institution representatives

2.1.1 Odisha

The aim of this research was to understand which aspects of the intervention are perceived to have precipitated behaviour change, which were viewed as ineffective or poorly targeted, and which were deemed essential to future programming. Qualitative interviews took place immediately after completion of the endline survey in four sample villages. A small number of individuals identified in endline data collection who either had started using the latrine, or continued non-use of the latrine, were interviewed. Interview responses were transcribed verbatim.

2.1.2 Karnataka

This study identified behavioural factors driving latrine use in the target population. The questions tried to identify activities related to the promotion of latrine use that had occurred in the trial villages in the past year. They also sought to identify the extent to which increases in self-reported latrine use and spillover effects between treatment and control villages were driven by these activities versus seasonal changes, social pressure and survey effects.

Three control and two treatment villages were selected because they reported large increases in latrine use. In addition, one control village was selected in which latrine use decreased drastically. Endline survey respondents were randomly selected for qualitative data collection. Transcripts were not available; however, detailed notes were provided and coded.

2.1.3 Bihar

The goal of this qualitative research was to determine true latrine use and challenges to use. The qualitative survey took place approximately four months after the completion of the intervention. It was conducted in two intervention villages, which were selected based on the magnitude of change in open defecation rates at the district level and the number of treatment houses per village.

2.2 Data analysis

CL developed a pre-analysis plan (Appendix B), which was reviewed by a qualitative expert as well as someone involved in the project. Both authors then discussed themes that were likely to emerge from the interviews based on CL's experience with the project.

RJ coded the interviews from Odisha and Karnataka – adding themes when barriers or facilitators that had not been expected were identified – and reviewed the coding several times to ensure consistency. CL then reviewed this coding; added, removed and regrouped themes; coded interviews from Bihar; and finally reviewed and updated all coding as needed.

The majority of changes made during the reviews involved un-coding text that described reasons for liking or disliking latrines without explicit reference to whether these preferences affected behaviour. Statements such as, 'The latrine that they build is of poor quality' (female, Odisha), were excluded during checks because they do not say that this issue resulted in non-use. Although such statements are likely to indicate usage habits, they also allow for significant interpretation and are likely to be affected by the authors' biases while coding. Ultimately, the same set of themes was applied to all three studies, irrespective of differences in the intent and context of a given question and responses to it.

Inductive coding was performed using NVivo® version 12, which facilitated the organisation of themes across a diverse set of respondents and data collection approaches. Both authors acknowledge that, as non-Indians, it is possible for social and cultural biases to occur. The systematic approach using NVivo® for coding was adopted to reduce the possibility of bias. Neither author was involved in the design or implementation of these programmes.

Once themes were established, hierarchy charts were developed. The most common themes were then selected for elaboration within this article. Quotes reflecting these themes were selected based on their representativeness of the themes, diversity of viewpoints reflected, brevity, and ability to stand alone without context. Because different questionnaires and survey methodologies were used in the three studies, it is not possible to rule out the presence of a determinant in a given context. It is only possible to establish that certain determinants *are* present in particular contexts.

3. Results

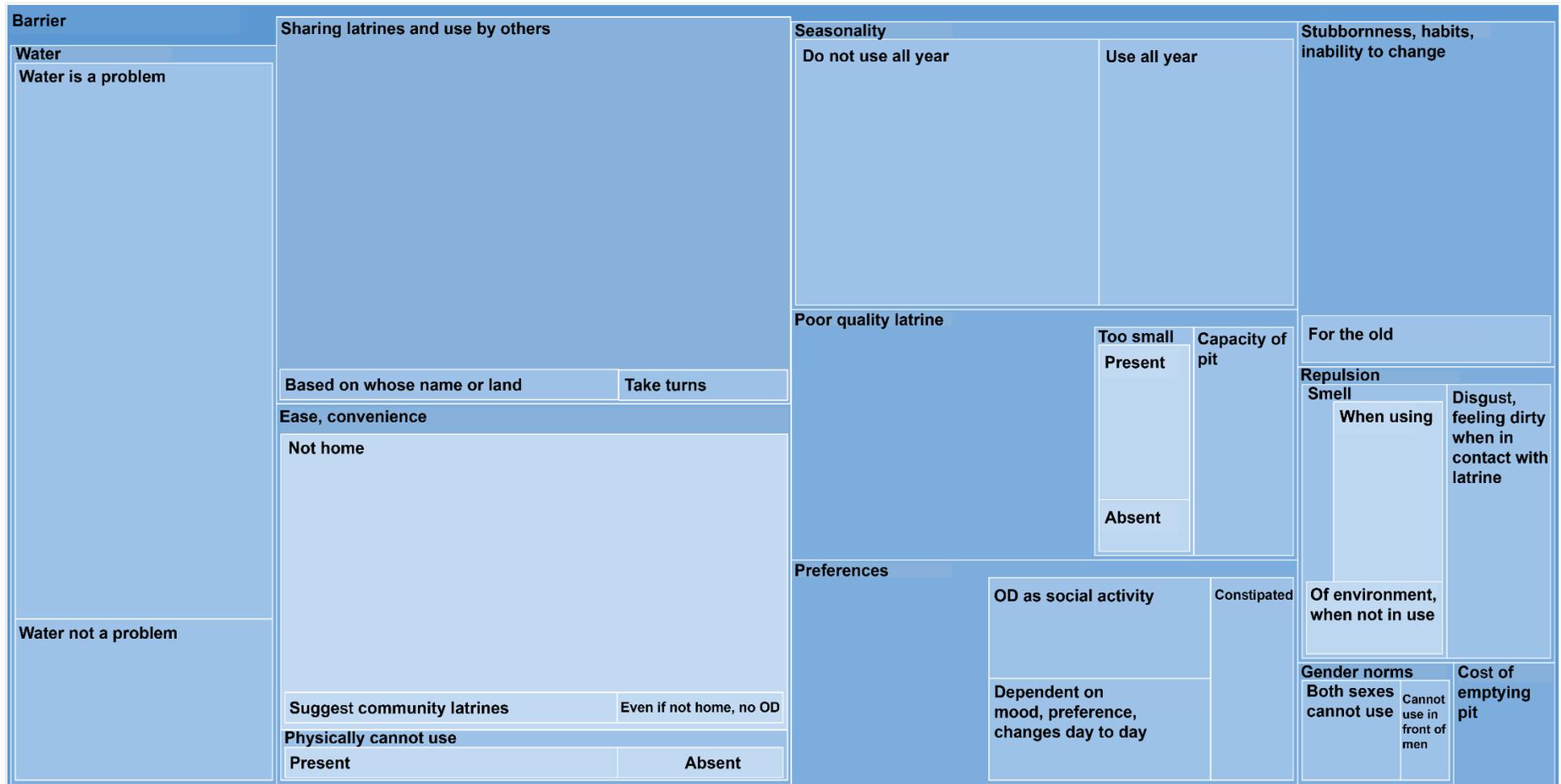
Barriers and facilitators were mentioned with roughly equal frequency, with barriers mentioned in 28 interview documents and facilitators mentioned in 23 interview documents. Some point to existing problems surrounding latrines that prevent use, while others say that changes are beginning to take hold:

It is not about the habits.... It is because we have some problems. – Male, Odisha

So, everything is changing, so also people will change their activities and behaviours. There are many families who do not go out at all for open defecation. People will take another more year to change. – Male, Odisha

3.1 Barriers to latrine use

Figure 1: Hierarchy chart of barriers to latrine use, based on the number of times each barrier was mentioned



Note: Developed in NVivo®

There continues to be a generalised preference for open defecation. Commonly cited barriers to latrine use included water, seasonality, ease or convenience, and sharing with others (Figure 1). Interviewers specifically probed respondents on issues relating to water and seasonality, whereas respondents mentioned issues relating to convenience and sharing without prompting. Where interviewers specifically inquired about a barrier, there was frequently a subset of respondents that affirmed the issue's importance, as well as a subset that claimed not to experience the issue.

3.1.1 Water

Water was mentioned as a barrier to latrine use in all states. There was an extensive discussion of this challenge in Karnataka. Participants repeatedly mentioned that they wanted to use the latrine for health and cleanliness reasons but could not because they did not have enough water. In Odisha, a few women discussed water together. One maintained, 'Due to the water problem only many people are not using latrine'. Another said, 'Those who have water supply near the toilet, they may be using the latrine all the time; otherwise, the latrines are seasonally used'. Only one person (female) from Bihar mentioned water scarcity as an issue.

A meaningful number of people queried replied that water was not an issue. In some cases, this was a very direct response. For example, a woman in Bihar was asked, 'But there is no scarcity of water?' and simply replied, 'No, there isn't'. Most of those maintaining that water was not an issue were from Bihar; however, one person from Karnataka said that water was not an issue.

3.1.2 Seasonality

Seasonality in latrine use was also mentioned in all states. In Karnataka, every mention of seasonality was directly linked to water scarcity (e.g., 'During summer, it is difficult to use the toilet because there is very little water'). In contrast, in Odisha, seasonality seems to be driven by a dislike of open defecation during rainy season. One male respondent explained, 'Now it is dry outside, but in rainy season, there is no chance to go out to defecate'. In Bihar, challenges relating to latrine use during monsoons, and a preference for latrine use in winter, were mentioned but infrequently.

For the most part, respondents who say that latrines can be used year-round were from Bihar. When asked about latrine use during monsoons, a man replied, 'We have to take an umbrella and go'. Only one person outside of Bihar (male, Odisha) said he could use the latrine all year without an issue.

3.1.3 Ease or convenience

For many respondents across all states, open defecation is simply easier than using a latrine. One male respondent in Odisha explained, 'It is a little easier for us to go outside' (male, Odisha). Primarily, this is because people, especially men, will defecate in the open while they are away from the house, particularly while farming. Notes from Karnataka show people saying, 'We can't come back home just to use the toilet'. Similarly, in Bihar, a woman said, 'If they go far away, then they won't be able to come back home [to use the toilet], no?'

3.1.4 Sharing the latrine

Issues related to sharing latrines were common, especially in Bihar and Odisha. For large families in particular, there may not be enough latrines available, so one person will defecate in the open while another is in the latrine. A woman from Bihar mentioned, 'If there is only one toilet for 20 people, so at a time only one person can go and the rest have to run'. A man from Odisha cited a similar issue, explaining, 'Almost all have the urge to defecate around six o'clock, so if there is someone in the latrine, the other members definitely have to go outside'.

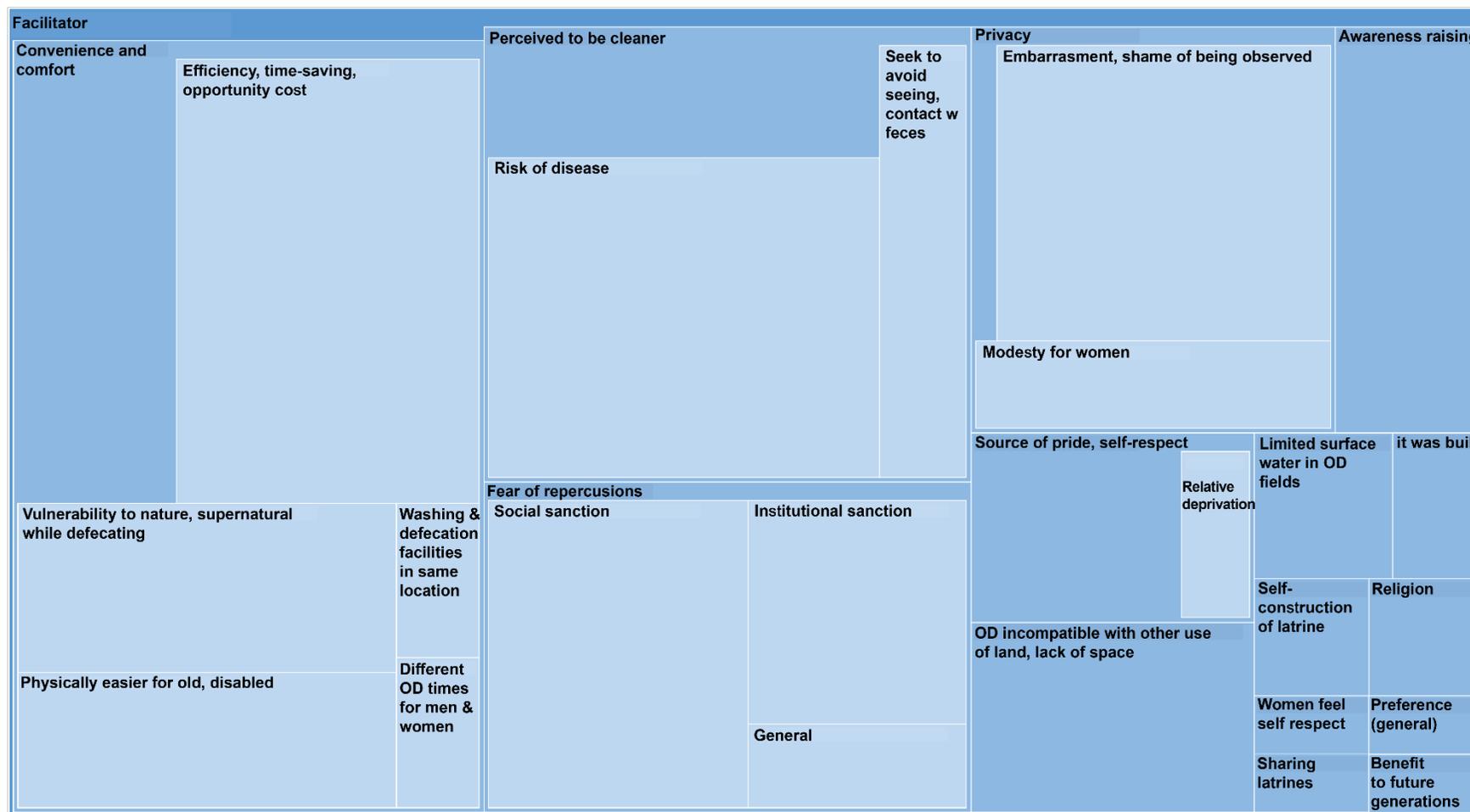
In Bihar, some respondents navigated this based on the owner of the latrine ('If it has been built in my name, then only I go', female, Bihar) indicated that taking turns resolved the issue of sharing latrines. A less commonly mentioned, though related, challenge pertains to an aversion to sharing latrines. A woman in Odisha explained, 'The same latrine will be used by so many people, will one not feel disgusting, dirty?'

3.1.5 Other barriers to use

Other barriers to latrine use included habits, repulsion and preferences. Some people simply prefer open defecation. One female respondent in Bihar said, 'Now some people were going because they wanted to'. In Karnataka, notes indicate respondents felt that 'defecating in the open feels more free...an old habit most difficult to break'. Some cited the smell as a reason for not using the toilet. One male respondent in Odisha explained, 'They feel the latrine creates bad smell, so they don't use it'.

3.2 Facilitators of latrine use

Figure 2: Hierarchy chart of facilitators of latrine use, based on the number of times each facilitator was mentioned



Note: Developed in NVivo®

Commonly cited facilitators of latrine use include convenience and comfort, perception of cleanliness, privacy and fear of social sanction (Figure 2). Several facilitators were often mentioned in the same discussion. Most of the facilitators of latrine use were identified in Karnataka and Odisha.

3.2.1 Convenience and comfort

Many noted the convenience of the latrine without further explanation. Notes from Karnataka show that, 'Now, we feel toilet is only convenient. So everybody in the house uses it'. Those who elaborated upon the increased convenience often mentioned time savings and the opportunity costs of open defecation. Most of the information regarding time savings came from Odisha. Women there said, 'We are saving time by having a latrine at home'.

They also referenced challenges related to waiting for privacy, explaining, 'If someone passes by, we had to wait till those people have gone. By that, we lost time'. A few people explained that they used the latrine due to the inconvenience of open defecation for the elderly and disabled and the potential for harm while going to the fields, but these reasons were far less common.

3.2.2 Privacy

Almost all mention of privacy as a motivation for latrine use came from Odisha, where benefits of time saving are linked to the benefit of greater privacy in latrines. A female respondent explained, 'People would be around [during open defecation], so can't defecate in their presence. Have to wait till they leave the place'. Respondents repeatedly mentioned having to wait or stand up as others pass by.

This issue is not unique to women. A male respondent stated, 'In the fields, one cannot cover oneself, and people may see us. But, inside a latrine, there is no one to see once we shut the door'. Privacy concerns were reported to a lesser extent in Bihar, where a woman mentioned, 'Now I feel that if I go outside to attend nature's call, people would be able to see my butt'.

3.2.3 Perception of cleanliness

A woman from Bihar noted, 'I feel disgust if someone asks me to go outside'. This was related to the possibility of coming into contact with faeces while going out to defecate. In Odisha, a male respondent reported 'fear[s] of stepping on faeces in the dark'. Many participants associated the avoidance of faeces and perception of cleanliness with positive health impacts, especially in Karnataka and Odisha. In Karnataka, respondents reflected, 'It is good for our own health'. One woman from Bihar shared health concerns, explaining, 'If you take them outside, then the flies will sit on it, and those very flies will tomorrow sit on your food, right?'

3.2.4 Fear of punishment or censure

Fear of repercussions was mentioned as a facilitator to latrine use in all states, but the vast majority of these references were from Odisha. These fears were related to both social and institutional pressures.

From a social standpoint, there were fears of being shouted at and having community members learn that an individual had practiced open defecation. One woman from Odisha was concerned about social repercussions, saying, 'Don't go out to defecate....

Your pic will be made viral'. In Bihar, a woman explained that, 'They come around 4 a.m. and whistle to stop anyone defecating in the field.... If a lady goes to defecate openly, a male blows the whistle and if a male person does so, then a woman will blow the whistle'.

Institutional pressures varied in their severity. In some instances, the act of checking latrines and discussing with community members provided this pressure. Notes from Karnataka show respondents explaining, 'When village officials visit houses and check toilets, people become alert and start using toilets'.

However, in some instances, it seems that fears may have related to more severe consequences. In Karnataka, one person mentioned that rations would be cut as punishment for open defecation. In Odisha, members of separate male and female focus groups mentioned that someone had been fined 24,000 rupees for keeping firewood in his latrine. One man in a focus group said, 'Due to frequent checking and regular meeting, the ones who had been storing [it] must have now removed the firewood out of fear'.

4. Discussion

Open defecation is a culturally entrenched behaviour in India, with many people simply preferring the practice to using a latrine (Sinha et al. 2017). We find that this generalised preference for open defecation remains more common than a preference for latrine use in these three states. Therefore, although India has been declared open-defecation free (DoDWS 2020), complacency about the behaviour must be avoided. If barriers persist and facilitators are not sufficiently promoted, there remains the possibility that people will revert to their previous behaviours.

Our work adds to previous efforts to understand latrine use by considering individual motivation. This builds upon the work of Routray and colleagues (2015), who conducted a similar analysis in Odisha in 2011 by considering other states and using newer data. We attempt to limit bias by only considering the barriers and facilitators explicitly mentioned by participants.

The main identified barriers to latrine use were water access and seasonality, ease or convenience, and the necessity of sharing the latrine. Conversely, the main facilitators of latrine use were convenience and comfort, privacy, the perception of cleanliness, and fear of repercussions. Barriers are not consistent across states. For example, in Bihar, sharing latrines was a major barrier. Seasonality and water scarcity were major barriers to latrine use in Karnataka. Convenience, sharing of latrines and seasonality were problems in Odisha.

We were intrigued that convenience was both a barrier and facilitator of latrine use. Routray and colleagues (2015) documented the increased workload associated with pulling water for the latrine, as well as the convenience of not having to walk far to the fields to defecate. In the data analysed in this study, the closest option for defecation appears to be the preferred one. If one is at home, then a latrine is the most convenient option; otherwise, however, the fields tend to be most convenient. Two people (one male, one female) from Odisha suggested that building latrines near agricultural fields may reduce open defecation there.

The impact of seasonality on latrine use is documented in several other studies (Routray et al. 2015; Sinha et al. 2017). However, the relationship between water scarcity and latrine use has received less attention. We find that the barrier presented by water scarcity is likely to be regionally specific. As expected, the issues of seasonality and water scarcity are linked, especially in Karnataka.

People are more likely to use latrines during rainy season when the outside environment is perceived to be dirtier, there is less dry land available for open defecation and water is less scarce. We did find one respondent in Bihar who claimed that their latrine flooded during rainy season, illustrating the multiple ways in which seasonality affects latrine use.

Because of the importance of perceptions of purity within Indian society, the belief that latrines are dirty is a barrier to latrine use that has received considerable attention (Coffey et al. 2017a; Juran et al. 2019; Routray et al. 2015). We did find that repulsion was mentioned as a barrier to use in a few instances. However, in general, a perception of cleanliness was more common than repulsion of latrine use. Other work documented the simultaneous perception in Odisha that latrines are impure and open defecation is disgusting (Routray et al. 2015). We found that disgust towards open defecation is driven by extensive messaging around the risk of disease transmission.

Few participants mentioned religion as a facilitator of latrine use. Intensive cleansing routines may persist and require significant amounts of water; however, these findings could be the result of probing and the focus the topic has been given. Our findings indicate that water scarcity, rather than religious belief, can drive people to open defecation. This indicates that increasing water access may diminish open defecation without necessitating a change in religious beliefs.

4.1 Limitations

The data collection approaches themselves may drive some of these results. Most facilitators of latrine use were identified in Karnataka and Odisha. In these states, enumerators explicitly asked why participants use latrines. Such questions are more likely to elicit reasons for use than those posed in Bihar, which focused on reasons for non-use. As a result, we cannot conclude that these facilitators were not present in Bihar. Rather, we know that they were present in the other two states.

In addition, the research team explicitly probed for some barriers, such as water scarcity. It is unclear whether social desirability bias would encourage participants to agree with barriers suggested by the interviewer or to claim that they had no problems using the latrine.

Although the effect of gender norms on latrine use is not explicitly addressed in this analysis, it may be an important determinant. Gender norms were repeatedly mentioned in the context of latrines, but not often with an explicit statement that they affected use. For example, one woman's statement in Bihar that 'the women use it, the men mostly go outside' reflects a norm, but it does not necessarily indicate that the reason men practice open defecation is because of their gender. It could be related to other factors, such as the tendency for men to work on farms and women to work at home.

In an effort to avoid the introduction of author biases, we did not code such statements as barriers, though they likely reflect social and cultural norms that decrease latrine use among men. Concerns regarding the effects of latrine use on women's freedoms have been raised previously (Coffey et al. 2017a). We find troubling evidence in Odisha that building latrines results in restriction of women's movements: 'They [his wife and her friends] would come after three hours. They would chat with their friends and would return home. But now, those hours they used to lose/waste chatting in the field does not happen'. However, an investigation of the effects of gender norms on latrine use is beyond the scope of this paper.

Similarly, the effect of poor construction on latrine use may be understated in this paper. Incomplete construction has been previously identified as a barrier to latrine use (Routray et al. 2015). However, many of the statements related to poor construction did not actually concern use. Notes from Karnataka indicate 'several quality issues – the doors were not fitted properly, pits were dug up too deep, connection pipes were broken, etcetera'. However, it is unclear whether these quality issues prohibited latrine use. Therefore, we only coded quality issues as barriers to use if there was a statement that the issue prevented use. For example, a male respondent in Odisha explained, 'It is not like they like going outside, is not the fields.... It is because the latrines aren't fit for use. That is why we go outside'.

5. Conclusion

We find suggestive evidence that water access and seasonality, ease or convenience, and sharing the latrine continued to be barriers to latrine use near the end of the SBM. Continued efforts to address these barriers are necessary to maintain the progress that has been made to eliminate open defecation. Convenience and comfort, privacy, and the perception of cleanliness seem to facilitate latrine use. Promoting these facilitators while addressing persistent barriers will ensure the continued success of the SBM. However, future work should evaluate barriers and facilitators across states using consistent methodological approaches to understand how they may occur differently across contexts.

Appendix A: Description of data collection in the excluded study

Four randomly selected clusters (two from each study arm) were identified for qualitative data collection in Gujarat. Data collection was interspersed throughout intervention delivery. No table regarding the characteristics of interviewed individuals was provided. Furthermore, the endline report of this team does not indicate that understanding barriers to use was a goal of qualitative data collection.

In contrast to the other studies, the Gujarat team did not use a single set of questions, making the analysis of this data challenging. Due to the unstructured nature of the questionnaire protocols, there is serious concern about the data validity. The differences in how the questionnaire was administered are likely to have meaningfully altered responses. For example, while most interviews started with some variant of 'What do you do when you wake up?', this was the seventh question in one interview and was not asked at all in at least one interview.

These concerns become more severe as the interviews progress, as they result in informants being primed differently for key questions. In one interview, the use of a toilet is first mentioned in question 75 through the question, 'Now you have toilet in your house, but before seven years you had to go out. What difference do you find after having a toilet in your house?' In another interview, question 41 was the first to mention a toilet, asking, 'In your house there is a toilet; when did you build it?'

These came after a series of questions regarding recent, beneficial household purchases; however, in the latter case, the interviewer did not inquire about the benefits of a toilet until after 16 other questions regarding toilet use and construction, likely diminishing the impacts of the previous priming.

In another interview, the presence of a toilet was inquired about during a discussion of morning activities, rather than after questions regarding beneficial household changes, meaning that there was no priming. In yet another case, a participant was discussing the fact that painting his house would help his marriage by making it look good for guests, when he was then asked, 'Do people still go outside for toilet in your village?' In this context, the question represents a non sequitur. After one additional question, he was asked about the benefits of a toilet. Due to the significant differences in priming and question phrasing, it was determined that this data was inappropriate for analysis and will not be considered further.

Table A1: Questions related to barriers and facilitators of latrine use in included studies

Questions examining the determinants of latrine use across the three studies	Interview type			Team
	IDI	DA	FGD	
Protocol question				
General				
Why do you use the latrine for defecation? What motivates you to use it? Did any programmes/activities by the SBM, SVYM or any NGOs help you switch to latrine use? What about these activities made you switch to latrine use?	x			Karnataka
Which of these activities, according to you, helped more people to start using latrines?		x		Karnataka
Which of these activities, according to you, helped more people to start using latrines? Why?			x	Karnataka
Why did you choose to use the latrine?	x			Odisha
Do you always use the latrine and never go outside? Why?	x			Odisha
How did you learn to use the latrine?	x			Odisha
For what reasons did you start using the latrine? Were you having problems for which you started using the latrine? What are the benefits of latrine use?	x			Odisha
When/why do you use the latrine and not the field?	x			Odisha
Was the government's programme a failure?			x	Odisha
Physical determinants				
When the latrine was constructed, why? Who all use it at home? If there was a situation that someone in your family did OD – why would they do this? Has such a situation ever happened? I have heard that summer and monsoon season pose more challenges – how do these two seasons affect your family? How difficult is it for you to use the latrine then?	x			Karnataka
In which month is the latrine mostly used?	x		x	Odisha
Toilet cleaning and repair	x		x	Bihar
Pit filling and pit emptying	x		x	Bihar
Toilet construction	x		x	Bihar
Toilet attributes	x		x	Bihar
Social pressure				
Did you ever feel pushed by others in your village to use the latrine? What were some of the conditions imposed on families in your community if they did not build latrines? What checks are there for construction and usage? Is there any	x			Karnataka

Questions examining the determinants of latrine use across the three studies	Interview type			Team
	IDI	DA	FGD	
Protocol question				
punishment given out to those who did not use the latrines? How did the pressure to build latrines increase over the year? Has this pressure increased over the past year?				
Why do you use the latrine for defecation? What motivates you to use it? Did any of these programmes/activities by the SBM, SVYM or any NGOs help you switch to latrine use? What about these activities made you switch to latrine use?	x			Karnataka
How did you learn to use the latrine?	x			Odisha
Is there a rule or restriction framed at the village level to keep the village faeces-free? How do people in the village view open defecation?	x			Odisha
Do you discuss with your family latrine use? Have they motivated you?	x			Odisha
Has there been an effort to eradicate open defecation throughout the village?			x	Odisha
Perception of others' behaviour				
What about latrine usage? How many of these households do you think are using toilets? Based on your experience, what is your sense of the percentage of people with toilets who are using them? Despite owning toilets, why do you think people are not using them?		x		Karnataka
Does anyone in your family prefer to defecate in the open?	x			Odisha
Do you think people's behaviour has changed?	x			Odisha
Why do people use the latrine?	x			Odisha
What is the state of open defecation in your village/family?			x	Odisha
Feelings				
How did you feel when you started using the latrine? (probe why)	x			Odisha
How did you initially feel about using a latrine compared to the present day? (probe regarding changes in feeling and attitudes)	x			Odisha
What are your thoughts about open defecation? (probe why)	x			Odisha
What do you know/feel about public toilets?			x	Odisha
Use				
Toilet facility – observations	x			Karnataka
Where did you defecate today?	x			Odisha
Often, where do you defecate?	x			Odisha
Do you always use the latrine and never go	x			Odisha

Questions examining the determinants of latrine use across the three studies	Interview type			Team
	IDI	DA	FGD	
Protocol question				
outside? Why?				
Toilet non-use	x		x	Bihar
Toilet use	x		x	Bihar
Do you always use the latrine and never go outside? Why?	x			Odisha

Notes: IDI = in-depth interview; DA = data analysis; FGD = focus group discussion; SVYM = Swami Vivekananda Youth Movement.

Appendix B: Pre-analysis plan

B1. Overview

The Sustainable Development Goals target the ending of open defecation by 2030 (SDG 6.2). Sixty per cent of those defecating in the open reside in India. In an effort to eradicate open defecation by October 2019, the Indian government launched its flagship programme, the SBM, in 2014. Given that most Indian households did not have access to toilets at that point, the primary focus of the programme was a large-scale construction of toilets. However, several studies suggest that access to a toilet does not necessarily imply its use.

In 2016, 3ie launched a thematic window to supplement the work being done under the SBM. Its Promoting Latrine Use in Rural India Thematic Window used insights from behavioural science to generate evidence on the design and implementation of context-specific, low-cost interventions to support latrine use amongst individuals with latrine access.

During the 3-month formative phase of the window, 9 teams tested interventions in 8 Indian states to develop context-specific, mature interventions. Based on these findings, 3ie funded four impact evaluations of interventions to promote latrine use in rural India. The 4 teams conducted impact evaluation studies over 18 months in the states of Bihar, Odisha, Gujarat and Karnataka. Additional information on the teams and their interventions can be viewed [here](#).

Here, we aim to synthesise the qualitative findings of these studies to determine why individuals with access to latrines may choose not to use them. Because the four studies took place in decidedly different contexts, this analysis has an opportunity to identify shared determinants of use in several different states of India. This qualitative analysis plan details the analytical approach that will be taken in order to accurately identify the barriers.

B2. Data collection and sample

While unified by a common goal of promoting latrine use through behavioural-science-informed interventions, these data are drawn from four different studies. As such, it is important to acknowledge differences in sampling procedures and interview format, which could alter informant responses. The different approaches are detailed here.

Three studies included the identification of determinants of latrine use as a goal of qualitative data collection; however, the extent of this focus is varied. Within these three studies, qualitative data were collected through semi-structured interviews after quantitative data were collected. Qualitative data collection protocols were informed by the quantitative results.

Research teams each developed their own qualitative data collection protocols; however, they all included open-ended questions related to reasons for use, physical constraints, social pressures, and perceptions of the behaviour of others (Table A1). They used a variety of data collection methods, including key informant interviews, in-depth interviews and focus group discussions. Certain target groups, including women, non-latrine users

and de-sludgers, were interviewed by research teams in accordance with their specific research goals. The interview approaches and sample sizes are presented in Table 1.

The fourth study, from Gujarat, had a different primary goal and data collection procedure, which makes its analysis incompatible with the previous three studies. Additional information regarding this decision is outlined below. Interview responses were transcribed verbatim. Data were processed according to the Qualitative Data Repository curation policy.

Bihar

The goal of this qualitative research was to determine true latrine use and challenges to use. The survey took place approximately four months after completion of the intervention. Villages chosen for the qualitative assessment were identified through district-level changes in open-defecation rates and the number of treatment houses per village. The full qualitative survey was conducted in two villages that received the intervention.

Odisha

The aim of this research was to understand what aspects of the intervention may have led to behavioural change, what aspects were not effective, and what factors at the individual and community level were not targeted effectively or may not be alterable. Qualitative interviews took place immediately after completion of the endline survey in four of the villages. A small number of individuals who started using the latrine (according to endline data collection), and a small number of individuals who continued to not use the latrine, were interviewed to understand what motivated change or stasis in their behaviours.

Karnataka

This study identified behavioural factors steering latrine use in the target population. The questions aimed to identify activities related to the promotion of latrines that occurred in the trial villages during the past year. They also determined if these activities, seasonal changes, social pressure or survey effects account for increases in self-reported latrine use and spillover effects between treatment and control villages. Three control and two treatment villages were selected because they had large increases in latrine use. In addition, one control village was selected where latrine use had drastically decreased. From these six villages, participants from the endline survey were randomly selected for qualitative data collection.

Gujarat

The goal of this work was to explore perceptions related to the campaign theme – ‘the world is getting smarter’ – through qualitative interviews and discussions with participants in the intervention arm and non-recipients in the control arm. Because the goal of this study was not to identify barriers to latrine use, an unstructured approach was utilised in which questions and format were altered for different respondents. Due to the differences in goal and approach of this study relative to the other three studies, it is considered incompatible for this analysis. For additional information regarding sample selection and data validity, see Appendix 1.

B3. Data analysis

Coding will be conducted using the NVivo® software to identify themes that emerge from the data regarding the primary research question: Why do individuals with access to latrines choose to use them or choose not to use them? We will use a simple theoretical framework, organising respondent feedback into categories based on themes, including, but not limited to, social pressure, personal feelings, physical constraints and habit.

Additional themes will be added as they are identified in the data. To the extent possible, the same set of themes will be applied to all three studies. If certain themes prove to be broad, sub-themes may be added through a second round of coding, as appropriate. NVivo® will facilitate the organisation of themes across a diverse set of respondents and data collection approaches. It will allow us to determine if certain themes were more salient for specific subgroups.

The main limitation of this approach is that different data collection methods were used in the three studies; therefore, it will likely not be possible to ascertain whether a determinant is *not* present in a certain state. It will only be possible to establish that certain determinants *are* present across contexts. However, this is a common challenge in most research, as it is very difficult to prove the absence of a particular factor.

Appendix 1

Four randomly selected clusters (two from each study arm) were identified for qualitative data collection in Gujarat. Data collection was interspersed throughout intervention delivery. No table regarding the characteristics of interviewed individuals was provided. Furthermore, the endline report of this team does not indicate that understanding barriers to use was a goal of qualitative data collection.

In contrast to the other studies, the Gujarat team did not use a single set of questions, thereby making the analysis of this data challenging. Due to the unstructured nature of the questionnaire protocols, there is serious concern about the data validity. The differences in how the questionnaire was administered are likely to have meaningfully altered responses. For example, while most interviews started with some variant of 'What do you do when you wake up?', this was the seventh question on one interview and was not asked at all in at least one interview. These concerns get more severe as the interviews progress because they result in informants being primed differently for key questions. In one interview, the use of a toilet is first mentioned in question 75 through the question 'Now you have toilet in your house but before 7 years you had to go out. What difference do you find after having toilet in your house?' In another, question 41 was the first to mention a toilet, asking, 'In your house there is a toilet; when did you build it?' These questions came after a series of questions regarding recent, beneficial household purchases; however, in the latter case, the interviewer did not inquire about the benefits of a toilet until after 16 other questions regarding toilet use and construction, likely diminishing the impacts of the previous priming. In another interview, the presence of a toilet was inquired about during the discussion of the morning activities, not after the questions regarding beneficial household changes, meaning there was absolutely no priming. In yet another case, a participant was discussing the fact that painting his house would help his marriage by making it look good for guests when he was then asked, 'Do people still go outside for toilet in your village?' In this context, the question represents a non sequitur. After one additional question, he was asked about the benefits of a toilet. Due to the significant differences in priming and question phrasing, it was determined that this data was inappropriate for analysis and will not be considered further.

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