Science of the Total Environment 643 (2018) 762–774

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Social determinants of environmental health: A case of sanitation in rural Jharkhand

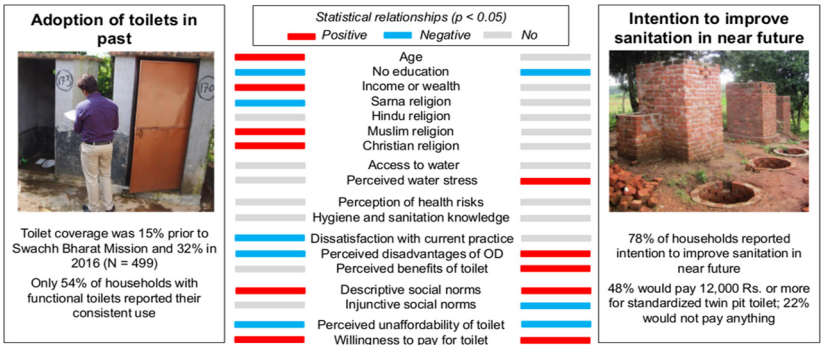
Josef Novotný [a,*], František Ficek [a], Joseph K.W. Hill [b,1], Anant Kumar [b]

[a] Department of Social Geography and Regional Development, Faculty of Science, Charles University, Prague 12843, Czechia
[b] Xavier Institute of Social Service, Purulia Road, Ranchi, Jharkhand 834001, India

HIGHLIGHTS

- Cross-sectional analysis of household-level sanitation drivers in rural Jharkhand
- Identified low availability of toilets accompanied with their inconsistent use
- Low demand and perceived risks didn't explain variation in sanitation outcomes.
- Key importance of descriptive social norms but adverse effects of injunctive norms
- Structural barriers should be addressed together with social norms and attitudes.

GRAPHICAL ABSTRACT



ARTICLE INFO

Article history:
Received 2 February 2018
Received in revised form 19 June 2018
Accepted 19 June 2018
Available online xxxx

Editors: Simon Pollard and Jay Gan

Keywords:
Environmental health
India
Sanitation
Social norms
Toilets

ABSTRACT

An estimated 56% of households in rural India defecated in the open in 2015, making India the most significant contributor to the global sanitation burden. This cross-sectional study uses data collected in 2016 from 499 households in rural Jharkhand to understand the constraints of latrine adoption and drivers of sanitation preferences (plans to adopt toilets and willingness to pay for toilets). Focusing on a region with a large tribal population, the study examines two types of predictors, namely structural factors (objective socioeconomic, sociocultural and ecological characteristics) and psychosocial drivers (perceived unaffordability of toilet, hygiene and sanitation knowledge, perceived health risks, attitudes, both descriptive and injunctive social norms, and perceived water stress). We find that structural constraints related to educational, economic and sociocultural inequalities predict toilet ownership. Low sanitation rates can neither be attributed to a lack of expressed demand nor lack of recognition of the disadvantages of open defecation. Similarly, variations in sanitation preferences are neither explained by differences in hygiene and sanitation knowledge nor by understandings of sanitation health risks. We find that perceived unaffordability, attitudes (perceived benefits of toilet and disadvantages of OD) and perceived descriptive social norms are of key importance. This implies a potential for persuasive strategies that manipulate social norms around sanitation, particularly if they simultaneously address perceptions around financial unaffordability of toilets and around the benefits of toilets. Importantly, however, attempts to change sanitation preferences by acting on forces of social (dis)approval (i.e. through perceived injunctive social norms) may be ineffective and generate negative unintended consequences.

Abbreviations: OD, open defecation; SBM, Swachh Bharat Mission (Clean India Mission); PAIT, plan to adopt or improve toilet in the near future; RANAS, Risk, Attitudes, Norms, Abilities, and Self-regulation factors; WTP, willingness to pay for standardized twin pit toilet; SD, standard deviation.

* Corresponding author.
E-mail addresses: pepino@natur.cuni.cz (J. Novotný), ficekf@natur.cuni.cz (F. Ficek), jkwhill@rediffmail.com (J.K.W. Hill), anantkumar@xiss.ac.in (A. Kumar).
[1] Society for Promotion of Wastelands Development, Eastern Region Office, Harmu, Ranchi, Jharkhand 834012, India.

https://doi.org/10.1016/j.scitotenv.2018.06.239
0048-9697/

1. Introduction

It is estimated that in 2015 only 39% of the global population used adequate sanitation facilities and more than one billion practiced open defecation (OD), mostly in rural areas of low- and middle-income countries. Nearly half of those who practiced OD in 2015 were from India which recorded a national OD rate of 56% (WHO/UNICEF, 2017). Earlier national sanitation programmes in India did not fulfil expectations due to implementation shortcomings and neglect of attention to the behavioural underpinnings of sanitation (Hueso and Bell, 2013; Freeman et al., 2016; Hueso et al., 2017). The current Swachh Bharat (Clean India) Mission (SBM) has addressed sanitation with unprecedented political support and scale. Despite progress, it is quite uncertain whether the acclaimed SBM goal to eradicate OD by 2019 will be met and whether the officially recorded new toilets will actually be both usable and consistently used.

The SBM implementation guidelines outline a multi-component campaign to address both behavioural and infrastructural sanitation dimensions (GoI, 2014). Considerably narrower understandings, however, prevail in practice. The "latrine-first" narrative has arguably been the most prevalent one, particularly among government officers (Hueso et al., 2017). It conceives *the material unaffordability of toilets* to be the primary barrier largely attributable to structural constraints such as poverty and socioeconomic inequality, possibly interrelated with ecological and sociocultural constraints. The provision of subsidized toilets is thus seen as a necessary first step, with the expectation that the health and other benefits of toilets will be realized after gaining access. This view tends to ignore various psychosocial determinants of sanitation behaviour, particularly those beyond traditional cognitive awareness about health risks.

The unsatisfactory results of previous Indian sanitation programmes and increasing popularity of community-led behaviour change approaches gave rise to another narrative that can be referred to as the "demand-first" narrative. In this view psychosocial drivers including the *socially constructed perception of unaffordability of toilets* are assumed to determine the low demand for toilets. The creation of a genuine demand represents the main priority, to be achieved through the triggering of communities with the aim of establishing new social norms around sanitation, changing attitudes, risk-perception and igniting collective action to improve sanitation.

Based on data collected in 2016 through interviews and observations in 499 households covering 2966 individuals, this study examines sanitation in rural Ranchi district, Jharkhand, a socioculturally diverse region with a considerable adivasi (tribal) population. In addition to a descriptive characterization of sanitation conditions at the beginning of SBM implementation, a general objective of the study is to examine and compare the role of structural factors emphasized by the latrine-first narrative and psychosocial drivers stressed in the demand-first narrative. In this paper, structural factors denote objective socioeconomic, sociocultural, and ecological characteristics and psychosocial factors refer to subjective constructs measuring factual hygiene and sanitation knowledge, perceived health risks, perceived unaffordability of toilets, attitudes towards OD and toilet use, perceived water stress, and perceived descriptive and injunctive social norms. In order to understand the constraints of latrine adoption in the past as well as the drivers of future sanitation preferences the following three outcomes are analyzed: (1) the ownership of toilets built prior to SBM, (2) plans to adopt or improve toilets in the near future (PAIT), and (3) willingness to pay for toilets (WTP). The *first research question* is thus: Which structural and which psychosocial factors associate with toilet ownership prior to SBM and reported sanitation preferences (PAIT, WTP)?

There is ample evidence that differential sanitation rates in India mirror various socioeconomic, sociocultural, and spatial inequalities (Ghosh and Cairncross, 2014; O'Reilly and Louis, 2014; Banerjee et al., 2017; O'Reilly et al., 2017; Coffey et al., 2017a,b; Sinha et al., 2017; Geruso and Spears, 2018). Nevertheless, it is less clear whether these differential sanitation rates are primarily caused by poverty and financial constraints as the latrine-first narrative invokes, or by socially determined differences in demand as the demand-first narrative implies. The policy implications inferred from available research tend to point towards one of the two directions. For example, drawing on a case study of sanitation drivers in Uttarakhand, O'Reilly et al. (2017) emphasizes the need to address poverty, marginality, and physical and sociopolitical remoteness, while being critical of behaviour-change approaches that tend to ignore the structural causes of sanitation and health inequalities. By contrast, the most resonant inferences of studies based on a larger survey conducted across five north Indian states emphasize that socio-culturally determined preferences for OD rather than poverty explain low sanitation rates in India (Coffey et al., 2014, 2017a; Hathi et al., 2016). The latter reasoning is supported by Banerjee et al. (2017) who found a low preference for toilets in India compared to other consumer durables. Possible explanations refer to a socio-culturally determined dislike of cheap latrines and aversion to the emptying of pits embedded in purity-pollution-untouchability issues and caste inequalities (Coffey et al., 2014, 2017a; Gupta et al., 2016) or related to gendered social norms and needs (Sinha et al., 2017). Yet another reason may be the traditional focus on the provision of subsidies that may undermine demand to invest in sanitation. Although distinct, these potential sources of behavioural distortions imply that the perceived unaffordability of toilets is largely a social construct and may not correspond to the factual affordability and, more generally, to socioeconomic differences between households. This assumption is tested in the *second research question*: Is the perceived unaffordability of toilets dependent on socioeconomic and educational inequalities or is it socially constructed?

We further assume that the social construction of perceived unaffordability can be shaped by perceived social norms around sanitation. Another goal of this study is thus to explore the role of perceived social norms in regards to the analyzed sanitation outcomes. Congruent with the focus theory of normative conduct (Cialdini et al., 1990), we distinguish between perceptions of descriptive social norms and injunctive social norms. In this study, descriptive social norms comprise opinions on the prevalence of OD or latrine use, whereas injunctive social norms capture opinions on social (dis)approval for the behaviours. It is known that descriptive and injunctive social norms act on distinct forces such as the desire for making a correct choice and the desire to gain social approval or avoid social sanctions for noncompliance, respectively. Therefore, these two types of social norms perceptions may have different and at times antagonistic effects on the analyzed outcomes, such as when people disapprove certain behaviour but still practice it (Cialdini et al., 1990).

With respect to the Indian context it can be expected that descriptive rather than injunctive social sanitation norms will be consequential due to the prevalent latrine-first narrative. Strategies to address injunctive social norms by activating social (dis)approval and social sanctions mechanisms have until recently been less used, and have reportedly had little success (Hathi et al., 2016; Gupta et al., 2016). An exception was the "No Toilet, No Bride" campaign initiated in Haryana in 2005 that, however, established a specific link between sanitation and marriage and thus focused on a specific segment of population (Stopnitzky, 2017). In the present context, we expect that although people are generally aware that toilets represent a correct choice, social disapproval towards OD is typically not strong and it is uncertain whether and how the power of injunctive social norms can be utilized.

A recent study from rural Ethiopia illustrates that perceived social norms around sanitation are not only influential directly, but also indirectly because they work as a "social filter" that can interact with other sanitation determinants (Novotný et al., 2017). Their study showed that those factors which are subject to social construction, rather than established through respondents' own experience, are particularly likely to interact with perceived social norms (Novotný et al., 2017, p. 11). The perceived unaffordability of toilets may thus represent