

Ending Open Defecation in India:

Insights on Implementation
and Behavior Change for
Swachh Bharat Abhiyan

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LIST OF ACRONYMS

ANM	Auxiliary Nurse Midwife	OBC	Other Backward Caste
APL	Above the Poverty Line	OD	Open Defecation
ASHA	Accredited Social Health Activist	ODF	Open Defecation-Free
AWW	<i>Anganwadi</i> Worker	OHC	Other High Caste
BPL	Below the Poverty Line	PLUM	Passive Latrine Use Monitor
BCC	Behavior Change Communication	PPP	Purchasing Power Parity
CDC	Centers for Disease Control	SBA	<i>Swachh Bharat Abhiyan</i> (<i>Swachh Bharat</i> Mission)
CHW	Community Health Worker	SBAG	<i>Swachh Bharat Abhiyan Gramin</i> (Rural)
CLTS	Community-Led Total Sanitation	SBAU	<i>Swachh Bharat Abhiyan</i> Urban
CRSP	Central Rural Sanitation Program	SC	Scheduled Caste
DFID	UK Department for International Development	SD	<i>Swachhata Doot</i>
DHS	Demographic and Health Survey	SMNet	Social Mobilization Network
DTF	District Task Forces	SQUAT	Sanitation Quality, Use, Access, & Trends survey
GOI	Government of India	ST	Scheduled Tribe
IEC	Information, Education and Communication	TSC	Total Sanitation Campaign
IHHL	Individual Household Latrines	USAID	United States Agency for International Development
IPC	Interpersonal Communication	VHF	Village Health Funds
MPHW	Multipurpose Health Worker	VWSC	Village Water and Sanitation Committees
NBA	<i>Nirmal Bharat Abhiyan</i>	VHSNC	Village Health, Sanitation and Nutrition Committees
NHM	National Health Mission	WHO	World Health Organization
NGP	<i>Nirmal Gram Puraskar</i>		
NGO	Non-governmental Organization		
NSSO	National Statistical Sampling Office		

INDIAN NUMBERING SYSTEM

Lakh	100,000	Crore	10,000,000
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EXECUTIVE SUMMARY

Objective

This report takes a holistic approach to identify the drivers of persistent open defecation (OD)ⁱ in India, considering how social, behavioral, cultural, economic, geographic, and political factors impact the habit.

Overview of the Problem

India has an OD rate of 60% – four times the global rate. It is well documented that OD leads to the transmission of diseases and produces adverse health outcomes for nearby populations, especially children. Since 1986, India has taken measures to address this problem by implementing various sanitation campaigns to eliminate OD. Unfortunately, the campaigns have achieved limited success in changing the population’s OD behavior. The current campaign, Swachh Bharat Abhiyan (SBA) or “Clean India Mission” may fail to reach its goal of an open defecation-free (ODF) India by 2019 if the previous shortcomings are not properly addressed.

Summary of Findings

Our analysis of empirical data shows that:

- OD behavior is not simply a manifestation of poverty
 - Wealth does not appear to be a significant constraint on having a latrine in India
 - Preference for OD and/or dislike of simple pit latrines are more significant factors
- OD rates vary by religion, social group, and state/district/village
 - In India and other countries with high OD rates, Muslims are most likely to own a latrine. Muslims in India are also more likely to use a latrine.
- Cultural factors, including beliefs of purity and household pollution, drive OD rates
- Indian women are less likely than men to OD, but this does not necessarily reflect their preference for latrines
- The government suffers from an acute administrative capacity constraint at the central, state, and local levels that likely impacts SBA campaign oversight and spending
- It is difficult to assess progress and best practices since usable data is rarely available

ⁱThe act of relieving oneself directly in open fields or bush, in local water sources such as streams, or inappropriately disposing of excreta instead of using a toilet or latrine.

Recommendations

To make strides towards achieving an ODF India by 2019, we recommend:

- Further research be undertaken to understand the social, cultural, and behavioral drivers of OD. Without acknowledging the heterogeneity of latrine use preferences, executing large-scale behavioral interventions will fail to increase demand for latrines
- Rather than promoting building toilets as a means of preserving women's dignity, the SBA campaign promotes latrine use among all adult men and women
- The Government of India acknowledges and addresses its administrative capacity constraints
- State governments increase spending on targeted information, education, and communications (IEC) materials and deploy dedicated sanitation workers to interact with communities, spread awareness of harmful OD effects, and encourage latrine use
- The Government of India moves away from assessing ODF status through counting the number of latrines constructed and towards more accurately measuring OD behavior and latrine usage. This requires sufficient political will and increased resources for the monitoring and evaluation of SBA efforts.

1. THE OPEN DEFECCATION PROBLEM

1.1 Overview of Open Defecation

Open defecation (OD), which is the act of relieving oneself in the open or inappropriately disposing of excreta, is a public health concern. Over 1 billion people engage in the practice worldwide, contributing to many problems, including water contamination and the spread of diseases leading to, among other things, childhood malnutrition.^{1,2} Furthermore, 2.5 billion individuals do not use improved sanitation facilities, which “ensure the hygienic separation of human excreta from human contact” and prevent contamination of the local environment.³

Poor sanitation and hygiene have been linked to specific negative health outcomes, including diarrheal disease.⁴ Although preventable and treatable, diarrheal disease remains the second leading cause of death in children under age five worldwide, resulting in approximately 750,000 deaths annually.⁵ Furthermore, observational data has shown an association between childhood diarrhea and height; interventions that encourage fecal containment are associated with reductions in diarrheal disease and enteric parasite infections.^{6,7,8,9} Given the scale and scope of these adverse effects, the UN included sanitation as one of its Millennium Development Goals.¹⁰

1.2 India, OD, and Previous Intervention Attempts

Approximately 15% of the global population – nearly 1 billion people – openly defecates. India has four times this global rate, with nearly 60% of its population practicing open defecation. The problem is most acute in rural regions and the northern states, where 70% of Indians openly defecate.

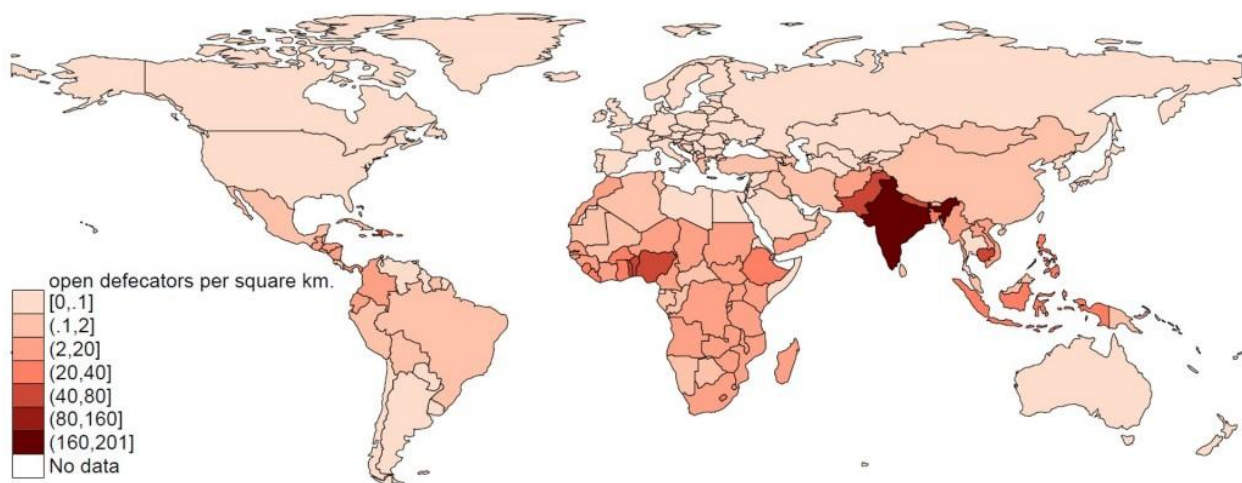


Figure 1. Number of people defecating in the open, per square km, 2012¹¹

India's situation is more striking given that it is richer than many other countries that have reduced OD, particularly in sub-Saharan Africa and across its border in Bangladesh. Culturally however, India appears distinct from other countries, which may explain its higher rates of OD. Data from the Research Institute for Compassionate Economics (r.i.c.e.) supports this theory and suggests that low rates of rural latrine adoption in five north Indian states are due to “beliefs, values, and norms about purity and pollution of private spaces and of bodies...that support the practice of open defecation and contribute to low demand for latrine use”.¹² The authors concluded that “having and using an inexpensive latrine at home [is] considered by many to be ritually impure and polluting” while, “open defecation, in contrast, is seen as promoting purity and strength, particularly of male bodies” and is considered a socially acceptable, healthy activity.¹³ Many of these norms are drawn from Hinduism, which teaches that human feces are ritually impure and that their accumulation should be avoided.¹⁴ Given that 80% of Indians identify as Hindu, these norms permeate society. In addition to low information regarding the health consequences of OD, many Indians lack adequate knowledge of the use and maintenance requirements of latrines. Thus, a combination of personal beliefs, misconceptions, and social norms contribute to the persistence of OD in India.

Indian policymakers are aware of the OD challenge, and have introduced a number of campaigns over the past three decades in response. Despite the rhetoric, however, much of the focus has been on building latrines rather than improving usage.¹⁵

1.3 Previous Sanitation Campaigns

The first national campaign to target sanitation – the Central Rural Sanitation Program (CRSP) – was launched in 1986, “primarily with the objective of improving the quality of life of the rural people and also to provide privacy and dignity to women.”¹⁶ An additional goal was to provide 25% of the rural population with improved sanitation facilities by the end of the decade. The effort was mostly supply-driven, with a focus on latrine construction. As a result, latrines were built despite low demand and they went largely unused.¹⁷

In 1999, the central government restructured and rebranded CRSP as the Total Sanitation Campaign (TSC). Learning from the disappointing results of CRSP, TSC intended to place greater emphasis on changing behavior and generating demand for toilets. With the aim to make India open defecation-free (ODF) by 2017, the campaign dispersed information, education, and communication (IEC) materials about the negative health consequences of OD.¹⁸ However, while TSC called for greater investment in behavior change, actual implementation was limited.

In addition to the information-based behavior change efforts, TSC also offered financial incentives. Households below the poverty line (BPL) received subsidies for toilet construction in the amount of 3,200 rupees if the household contributed 300 rupees. To foster competition among communities and reward achievement, a monetary prize for further sanitation activities – called the Nirmal Gram Puraskar (NGP) – was given to villages declared ODF. While over 2,000 communities were declared ODF under the NGP, the program was phased out due to the difficulty of verifying ODF status. Despite programmatic changes, TSC also proved

ineffectual.ⁱⁱ Though census data indicates a modest increase in latrine coverage, from 22% in 2001 to 31% in 2011, latrine usage stubbornly lagged behind.^{19,20,21}

In 2012, the TSC was replaced by the Nirmal Bharat Abhiyan (NBA) with the new goal of providing access to improved sanitation facilities for all rural households by 2022 and enabling all villages to reach ODF status.²² Under this scheme, Village Water and Sanitation Committees were formed with the task of managing the sanitation program at the local level, and to promote transparency, community participation, inclusion, and ownership.²³ Under this scheme, toilet construction subsidies increased to 5,500 rupees per household if the household contributed 900 rupees. Additionally, for the first time households above the poverty line (APL) were eligible for subsidies.

1.4 Sanitation Today: The Swachh Bharat Abhiyan

The NBA campaign was short-lived, as new Prime Minister Narendra Modi replaced it in October 2014 with the Swachh Bharat Abhiyan (SBA) or “Clean India Mission.” Prime Minister Modi updated the goal, calling for an ODF India by 2019. SBA spans a range of actors and government levels and is comprised of two sub-missions geared towards rural (SBA-Gramin or SBAG) and urban (SBAU) efforts. In general, the structural guidelines are best understood as a gradual aggregating of implementation plans from each unit of government in the Indian state, with national level plans meant to supplement state plans; the latter includes specific annual activities and a communications and monitoring strategy. Various frontline actors are to carry out sanitation activities, including social health activists (ASHAs), *Anganwadi* workers, self-help groups, civil society organizations, and a limited number of *Swachhata Doots* (SBA workers) hired specifically for that purpose. In sum, the government expects to spend \$22 billion on the initiative,²⁴ with additional spending by NGOs and the World Bank. For comparison, the government allocated approximately \$8.3 billion (approximately \$41.5 billion if constant over five years) for the entire elementary education program in the 2014–2015 budget.²⁵

1.5 Technology and Toilets

Technological design is essential to addressing the environmental and health challenges in sanitation improvement efforts. Safety considerations largely relate to technical options and variations in the substructure component of a latrine. Variations in the design of toilet superstructures are generally related to usage, take-up, and other behavioral variables. Based on updated World Health Organization (WHO) definitions of safe sanitation and past governmental efforts, the Government of India set out latrine guidelines²⁶ and criteria under the SBA.ⁱⁱⁱ

ⁱⁱ During almost the same time period, the Indian government and international community successfully eradicated polio nationwide. Given the success of past public health campaigns, the failure to make headway on sanitation goals is all the more striking.

ⁱⁱⁱ In particular, see Chapter 3 on “Criteria for a sanitary toilet and sustainability of sanitation” in the “Handbook on Technical Options for On-Site Sanitation (2012)” published by the Government of India Ministry of Drinking Water and Sanitation.

Current government approaches to sanitation also feature improved recognition of the necessity of different toilet technologies and designs for various geographical conditions. Where possible, the SBA recommends connection to underground sewage systems.²⁷ This is mostly prescribed in urban settings. Yet many major Indian metropolises lack functional water infrastructure due to their fragmented development²⁸ and their rapid unplanned and unchecked growth, so these guidelines are rarely applicable in practice.^{iv29}

Overall, technological infrastructure is often the major impediment to toilet facility construction in urban settings, particularly in informal settlements.³⁰ Urban settings require customized and tailored approaches to latrine construction³¹ due to highly inconsistent sewage system infrastructure and water levels. For urban settings where underground systems are infeasible and rural settings where underground sewage systems are typically nonexistent, On-Site Sanitation (OSS) systems are more relevant.³²

Under the SBAG, the most common technical designs recommended for rural settings are simple, low-cost pit latrines.³³ Rural experiences with government latrine construction indicate that the government may benefit from additional options³⁴ for simple superstructure design,^v such as outer structure painting and embellishment, to help encourage usage once latrines are constructed and to combat perceptions of “poor quality.”³⁵ Under the SBA campaign, the government is also trying to promote the implementation of sustainable, higher-technology toilet designs such as the EcoSan model, which separates urine and fecal matter in such a way that both types of human excreta can be used safely in agriculture.³⁶ The urine is used as fertilizer without treatment, while the fecal matter is decomposed by microorganisms prior to use. Another example is the BioGas model, which uses anaerobic digestion to decompose human waste into biogas and fertilizer.³⁷ While more costly, such innovations may provide important alternatives to practices like manual scavenging³⁸ that are related to cultural beliefs³⁹ around purity and human waste.⁴⁰ In sum, as Coffey et al. have shown, cultural beliefs are a primary impediment to latrine demand in rural settings, and contribute to negative perceptions around certain aspects of simple pit toilet designs.⁴¹

1.6 International Context

1.6.1 Bangladesh and Community Led Total Sanitation

Though OD is a complex problem, many countries have mounted successful ODF campaigns. One notable example is Bangladesh, which has a shared history and similar health and economic conditions to India.⁴² Considering this, it is unsurprising that the nation faced analogous public health challenges, including a measured OD rate of 42% in 2003.⁴³ However, after launching the Bangladesh National Sanitation Campaign (BNSC) in 2003, which endeavored to end OD by 2010, OD fell to 3% over the next decade.⁴⁴ As such, BNSC provides a salient example of how broad government commitment and behavior change methods can

^{iv} As part of the overall objective of providing complete sanitation solutions to India’s 4041 statutory towns, the physical provision of household and public toilets is one of four key pillars of the mission.

^v See Chapter 6 on “Key technological problems in implementing household toilets” of the “Handbook on Technical Options for On-Site Sanitation (2012).”

effectively reduce OD.

While BNSC was a national campaign, the responsibility for implementation fell to the lowest level of government: Union Chairmen.⁴⁵ These officials had greater autonomy in constructing their intervention, developing relationships with central government and NGOs, and determining how to allocate resources. Generally, efforts followed one of four strategies:

1. Receive support only from the central government
2. Receive some support from the central government and some from international donors
3. Receive significant support from NGOs dedicated to behavior change methods
4. Receive significant support from NGOs not using behavior change methods⁴⁶

There are several recognized reasons for the BNSC's success, including a strong commitment at all levels of government, advocacy from the central to local government, and the institutionalization of sanitation best practices.^{47,48,49} To this end, the central government appointed a Sanitation Secretariat to coordinate efforts, marked a "sanitation month" each year, and earmarked funds for sanitation.⁵⁰

Another contributor to BNSC's success was the emergence and adoption of a behavioral change method called community led total sanitation (CLTS).⁵¹ Developed in 1999 by the NGO WaterAid to address OD in Bangladesh, this method brings members of a community together to appraise and analyze their defecation practices and change perceptions of OD as a shameful practice.^{52, 53} These efforts are initiated by facilitators, who bring residents together for activities that show how OD leads to accidental ingestion of feces. Underlying this model is the "basic assumption...that no human being can stay unmoved once they have learned that they are ingesting other people's shit."⁵⁴

The commitment to ending OD among government officials and the introduction of behavior change techniques ensured that BNSC's messages were continually reinforced. This inculcated ending OD as a national goal among the population, akin to the nation's independence movement.⁵⁵ As a result, not only did 52% of Bangladeshis report having better access to latrines, but toilet use also became a "socially accepted practice in all levels of society."⁵⁶ Bangladesh provides clear evidence that similar places have combatted OD through commitment and smart policies, including increased focus on behavior change. While critics of CLTS dislike its shaming messaging and believe in the importance latrine construction subsidies, CLTS has nevertheless been used by a growing number of countries to address OD.

1.6.2 Africa and Community Led Total Sanitation

Several African countries have also implemented CLTS principles to address OD. For example, in Mali, the government adopted CLTS to trigger households to construct simple latrine designs from locally available materials. According to the Institute of Development Studies, within six years of its implementation in 2009, the program was operating in five of Mali's eight regions. These areas demonstrated great success, with the construction of 60,000 new latrines and 1,780 villages (approximately 12% of the rural population) declared open defecation-free.⁵⁷ Data from a recent randomized control trial of Mali's CLTS program in Koulikoro district supports this success, finding that the percentage of households with a

private latrine within the treatment group increased by 30 percent 18 months after triggering.⁵⁸ What is particularly notable about the Mali case is that CLTS successfully increased toilet coverage without the additional support of subsidies. The conscious decision for a household to invest in a toilet better reflects demand and future use, and calls into question India’s continued emphasis on financial incentives to end OD.

Another example comes from Kenya, where the Ministry of Public Health and Sanitation adopted the CLTS program in 2011. By March 2014, 15% of Kenyan villages had received CLTS interventions, with 43% of triggered villages having declared ODF status.⁵⁹ Given the success of CLTS programming in other countries, it seems possible that similar principles can help promote an ODF India.

2. BEHAVIORAL DETERMINANTS

2.1 Drivers Of Latrine Construction: A Cross-Country Comparison

To develop strategies for behavior change, it is important to identify the drivers associated with the target behavior. It is equally useful to compare potential drivers of toilet construction and access across countries that demonstrated a higher capacity for reducing OD.

2.1.1 Data and Methodology

By using data from the Demographic and Health Surveys (DHS) program, we analyze a set of individual, household, and societal-level characteristics to identify which characteristics are most correlated with latrine access within a particular country. We compare potential drivers of latrine construction across neighboring countries in South Asia and in poorer countries in East and West Africa. We have chosen to look at six countries across two regions, with DHS survey years indicated in parentheses: India (2005-06), Bangladesh (2011), Nepal (2011), Pakistan (2012-13), Kenya (2008-09), and Mali (2012-13).

Differences in Economic Output and Household Income. Of this set of countries, India appears to be the country most capable of tackling OD given its economic profile. As shown in Table 1, India’s per capita economic output and median per-capita income are greater than the other countries.

Table 1. Differences in Economic Output and Household Income for Analyzed Countries

	India	Bangladesh	Nepal	Pakistan	Kenya	Mali
GDP per capita (USD) ^A	1596	1093	697	1334	1358	707
GDP per capita, PPP ^A	5,708	3,124	2,370	4,844	2,954	1,599
Median Household Income (USD) ^B	3168	2819	2718	4060	1870	1983
Median Per-Capita Income (USD) ^B	616	567	519	480	402	165

^AWorld Bank World Development Indicator, 2014.

^BCountry median annual household income and per-capita income estimated by Gallup, 2006 and 2012.

However, as shown in Table 2, significantly fewer Indians have any type of toilet facility available to them. Approximately 36.0% of Indians do not have a toilet facility (private or shared) at their home. Nepal most closely mirrors Indian rates at approximately 30.5%, but Bangladesh and Pakistan have significantly greater access by comparison.

Table 2. Percentage of Population with Available Toilet Facilities for Analyzed Countries

Type of Toilet Facility	India (2005-06)	Bangladesh (2011)	Pakistan (2012-13)	Nepal (2011)	Kenya (2008-09)	Mali (2012-13)
Pit Latrines						
Ventilated Improved Pit Latrine (VIP)	0.36%	13.78%	2.31%	0.93%	16.37%	1.08%
Pit Latrine with Slab	4.09%	28.95%	6.36%	9.99%	18.09%	36.59%
Pit Latrine without Slab/Open Pit	3.53%	29.73%	3.57%	8.12%	32.35%	42.85%
Composting Latrine	0.16%	0.01%	NA	0.30%	0.04%	0.20%
Dry Toilet	0.86%	NA	NA	NA	NA	NA
Subtotal	9.00%	72.47%	12.24%	19.34%	66.85%	80.72%
Flush Toilets	54.65%	18.36%	72.24%	50.12%	16.28%	8.70%
Bucket Toilet	NA	0.00%	0.43%	0.03%	0.62%	NA
Hanging Toilet/Latrine	NA	5.62%	0.25%	NA	0.21%	0.48%
No Facility	36.00%	3.53%	14.61%	30.51%	16.02%	10.09%
Other/ Missing Data	0.35%	0.02%	0.23%	NA	0.02%	0.01%

Of the four studied countries with at least 80% of their population having access to a toilet facility, three of them have relied primarily on inexpensive pit latrines. Well over two-thirds of Bangladeshis, Kenyans, and Malians have pit latrines^{vi} at home. By contrast, only 9.0% of Indians have a pit latrine available. South Asian countries, with the exception of Bangladesh, disproportionately rely on more expensive flush toilet technology than African countries. This lack of acceptance for low-cost pit latrines likely adds an additional financial hurdle for India to overcome, since households may require significantly more income to construct a toilet facility than is sufficient in other countries.

Methodology. To estimate the relationships between particular characteristics and toilet access^{vii}, we use standard OLS regression analysis techniques, clustering at the state/regional level. Our model controls for the following characteristics: State/Region, Urban/Rural^a, Age of Respondent^b, Religion of Respondent, Ethnic Group/Caste of Respondent, Whether Individual or Spouse is engaged in an Outdoor Occupation^c, Highest Educational Attainment by Individual or Spouse^e, Water Access, Water On-Site^d, Time Required to Fetch Water, DHS Wealth Index^b (specification note: ^abinary variable, ^bpiecewise model according to locally-weighted polynomial regression, ^cseparate binary variables for different categories). The following sections provide a summary of relevant findings from our statistical analyses. The full regression models are available on request.

^{vi} The type of facility with the largest representation in each of these three countries is a pit latrine without a concrete slab, which is designated as an ‘unimproved sanitation’ facility. Though this design is not recommended by the WHO or counted towards fulfillment of the Millennium Development Goals, it has helped these countries greatly reduce the practice of OD and we believe it is better than having no sanitation facility.

^{vii} For the purpose of this report, access to a toilet facility is defined as the presence of a serviceable toilet at the household, whether private or shared.

2.1.2 Summary of Findings

Wealth. To compare the relationship between wealth and toilet ownership between countries, we use the DHS wealth index to divide the sample from each country into percentiles. We then calculate the mean wealth and percentage of individuals with access to a toilet facility for each percentile and use locally-weighted polynomial regressions to smooth out the relationship between the two variables. Finally, we normalize the data by adjusting the spread of each wealth distribution based on the income share held by the lowest/highest 10% of individuals, then finally shift the wealth distributions to reflect the mean income of the lowest 10% of individuals (in PPP) as per World Bank data.

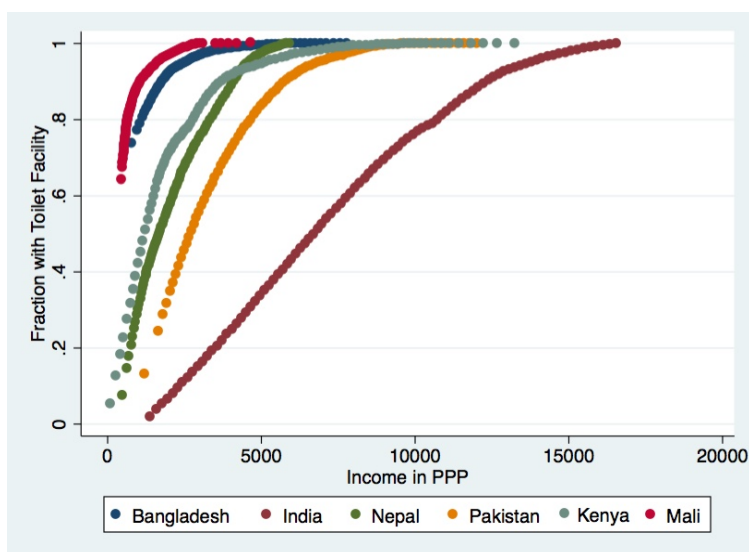


Figure 2. Fraction of individuals with toilet facilities, by income (PPP)

The resulting data, which is shown above in Figure 2, demonstrates that in each country, the percentage of individuals with access to a latrine increases as household wealth increases. In Bangladesh, Pakistan, Kenya, and Mali, toilet access becomes almost ubiquitous between the 20th and 40th percentiles of wealth. This threshold occurs much higher in the income distribution for India and Nepal. This finding is especially striking for India, given its substantially higher GDP per capita and median household income. Most importantly, the percentage of Indians with access to a toilet facility at every income level is significantly less than the other five countries. In Bangladesh and Mali, the mean proportion of individuals with access to a toilet is never less than 60%. Rather than absolute wealth, individual preferences for OD and/or disapproval of simple pit latrines are the more likely constraints on latrine access in India.

The impact of the national CLTS campaigns in Bangladesh and Mali can be illustrated through comparisons of similar analyses of previous DHS surveys conducted in these countries. From 2004 to 2011 in Bangladesh, the percentage of individuals without a toilet facility decreased from 10.33% to 3.53%. Figure 3 demonstrates that this increase in access to toilet facilities occurred at all levels of absolute income, except for those that already had full toilet facility coverage in 2004.

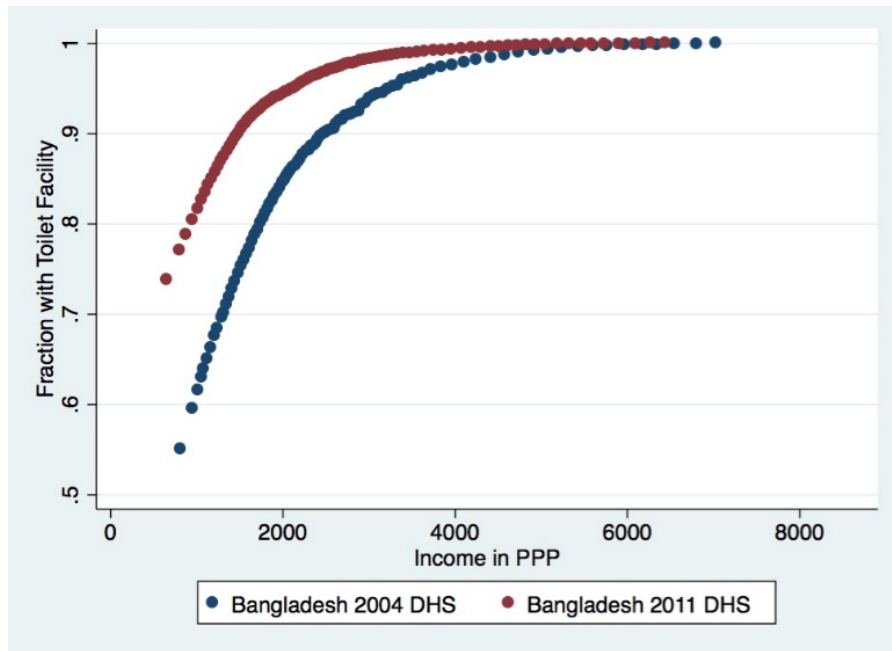


Figure 3. Fraction of Bangladeshis with toilet facilities, by income (PPP)

A similar trend can be found in Mali, where the percentage of families without a toilet facility dropped from 21.96% in 2006 to 10.09% in 2012/2013. Figure 4 shows that in Mali, similar to Bangladesh, the fraction of individuals with toilet facilities increased between the two time periods at almost every income percentile. The data from both Bangladesh and Mali illustrate the success that national CLTS campaigns can have on influencing latrine construction at all levels of the income distribution.

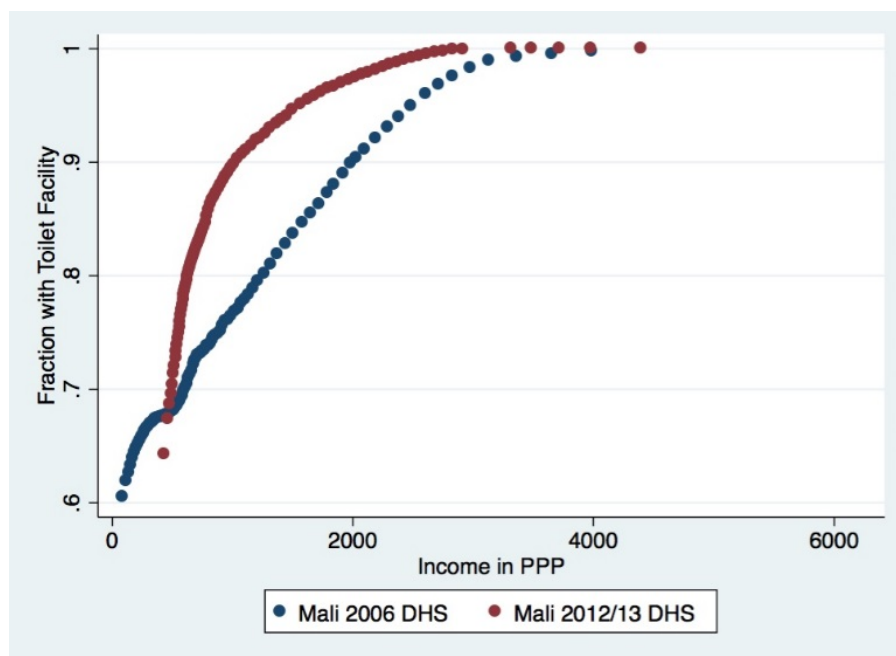


Figure 4. Fraction of Malians with toilet facilities, by income (PPP)

Religion. Our results are consistent with previous work by Geruso and Spears, which showed that Hindus are less likely than Muslims to both own and use latrines in India.⁶⁰ Controlling for the demographic characteristics previously described, Muslims in India are more likely to have access to a toilet than Hindus and Christians, but the results are not statistically significant.

In Kenya, Muslims are 6.02 percentage points more likely to have access to a latrine than Christians, and 14.82 percentage points more likely than individuals who did not declare a religion. The results are similar in Mali, where Muslims are 15.16 percentage points more likely to have access to a latrine than Christians, and 7.09 percentage points more likely than individuals who did not declare a religion. These results are statistically significant at the 5% significance level. These results reflect unobservable characteristics tied to religion that likely either encourage or discourage access to toilets and latrines.

Water Availability. In India, having access to water at home is associated with a 4.23 percentage point increase in the probability of having access to a toilet, statistically significant at the 1% level. In Bangladesh and Kenya, each additional minute added to the time required to fetch water is correlated with a statistically significant decrease in the probability of having access to a toilet. These results suggest that access to water may be an important prerequisite for latrine construction, though it cannot tell us anything about how water access subsequently affects latrine use.

Unobservable Cultural Factors. Controlling for the characteristics noted above, individuals in northeast India (states along and east of the Bangladeshi border) are most likely to have a latrine, significant at the 1% level. Conversely, the nine states where individuals are least likely to have access to a latrine are clustered in the northern part of the country (west of and not bordering Bangladesh), statistically significant at the 5% level for the six states with the lowest likelihood of having a latrine.

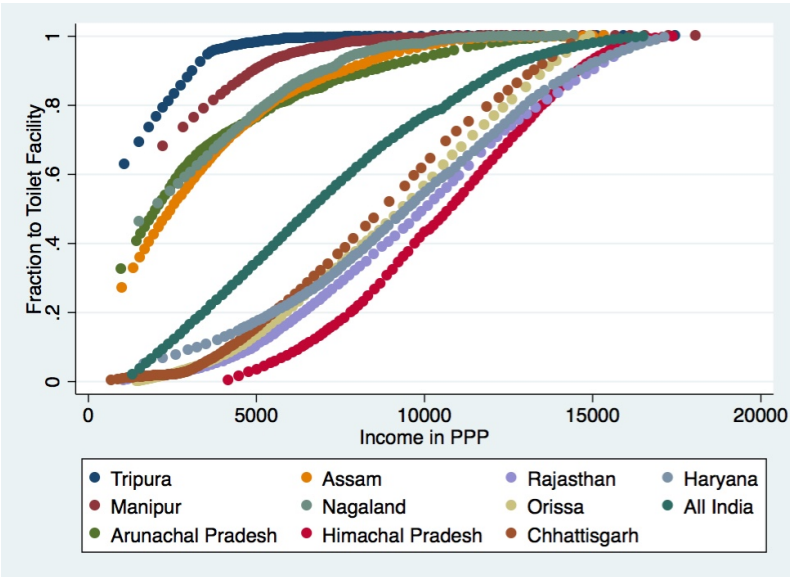


Figure 5. Fraction of Indians with toilet facilities in select states, as a function of income (PPP)

As an illustration of these regional differences, Figure 5 above demonstrates that all five of the best performing states (as determined by this OLS analysis) are in the northeast region and have a lower proportion of individuals at every income level with access to a toilet facility than all of the five worst performing states and India as a whole. This pattern seemingly demonstrates that northeast India shares certain cultural characteristics with its bordering neighbor Bangladesh, including a higher demand for latrines.

The poorest performing regions of both Nepal and Pakistan border the poorest performing Indian states, as demonstrated by statistically significant coefficients at the 10% level. In fact, inhabitants of the Terai region of Nepal, which spans the length of the Indian border, are between 17.27 and 26.63 percentage points less likely to have access to a toilet facility than inhabitants from the other regions of the country. This geographic concentration of individuals with the lowest rates of latrine ownership suggests that populations near the borders of Nepal and Bangladesh share particular unobserved cultural characteristics, besides religion, with their Indian neighbors that prove to be a significant impediment to the uptake of latrine construction.

2.2 Drivers Of Latrine Use In India

From December 2013 to April 2014, the Research Institute for Compassionate Economics (r.i.c.e.) conducted the Sanitation, Quality, Use, Access and Trends (SQUAT) Survey in five north Indian states – Bihar, Haryana, Madhya Pradesh, Uttar Pradesh, and Rajasthan – to examine rural latrine use.^{viii} SQUAT data on OD rates is consistent with well-established literature that describes income and education as strong predictors for health outcomes; not surprisingly, OD is negatively correlated with household wealth and education levels.^{ix} But given India's size, even lesser-known factors that marginally affect latrine use decisions may aggregate over millions of Indians. We use SQUAT data to further study the heterogeneity in OD practice and latrine use, looking specifically at household member age, gender, and marital status; and their religion, social group, or caste. The following sections provide an overview of the theory behind these drivers and present corroborating evidence from the SQUAT survey.

2.2.1 Religion and Social Group

Religion, caste, and social group norms have shaped OD habits in India. We know that Hindus are more likely to OD than Muslims, despite being on average richer and more educated.⁶¹ Two hypotheses could help explain low latrine use among Hindus:

1. Principles of the Hindu religion promote OD benefits: notions of pollution discourage defecation in or near the house, and notions of purity prescribe rituals for cleaning one's body and clothing that may make latrines less appropriate.

^{viii} The dataset includes 24,070 observations from 3,235 households. The survey is available at riceinstitute.org

^{ix} From SQUAT data, where household wealth was measured by an asset count and education measured in years. The correlations with the indicator for whether an individual usually open defecates are -0.50, and -0.24, respectively, statistically significant at the 1 percent level.

- Similarly, these principles are related to casteism since the lowest castes are traditionally assigned to cleaning latrines. If emptying latrines is problematic for higher caste households, they may be less likely to use them.

Evidence from the SQUAT survey in support of both hypotheses is discussed below. We also examine how latrine use by Hindus and Muslims compares to latrine use by members of scheduled castes (SC) and scheduled tribes (ST).

Overall Trends. Regular latrine users in rural India tend to be richer, more educated, better traveled, and better informed of the benefits of latrines.⁶² These are generally higher caste people, as low caste and tribal populations are more geographically and economically isolated.⁶³ SQUAT data confirms the relationship between household wealth and education for each subgroup: being Hindu, Brahmin, other high caste (OHC), or other backward caste (OBC) is positively correlated with both household assets and years of education, while being Muslim, SC, or ST is negatively correlated with assets and education.

But in spite of their higher wealth and education, Hindus living in households with latrines are more likely to openly defecate than Muslims living in households with latrines, at every age and across all five states surveyed by SQUAT. As you might expect, SCs and STs practice the highest rates of OD. What is especially interesting is that these trends stick at every wealth and education level, as shown below in Figure 6. With both increasing assets and years of education, OD rates for all groups decrease and begin to converge.

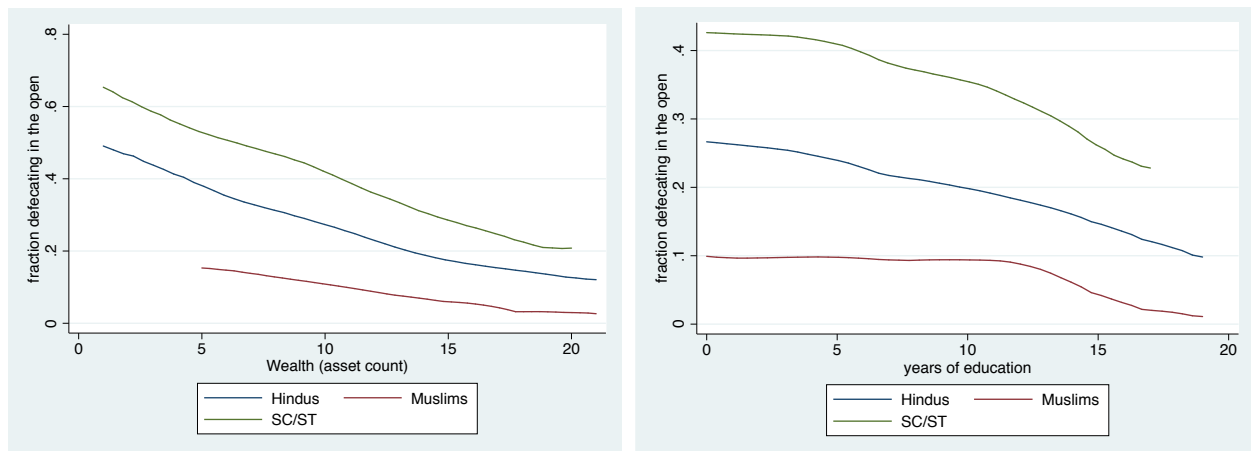


Figure 6. Fraction of OD by religion/group among households that own a latrine by wealth (left) and education (right) levels

Table 3 below summarizes the percentage of individuals over age two practicing OD by each group. Conditional on household latrine ownership, overall OD rates are different and highly statistically significant across each subgroup: higher for Hindus than non-Hindus; lower for Muslims than non-Muslims; lower for Brahmin, OHC, and OBC than non-Brahmin, non-OHC, or non-OBC; and higher for SC and ST than non-SC or non-ST.

Table 3. OD rates (%) by religion and group, for individuals age 2+ in households with a latrine

Group	All states	Haryana	Bihar	Uttar Pradesh	Madhya Pradesh	Rajasthan
All persons	21.1	15.8	22.5	19.7	25.7	30.5
Muslims	9.9	6.7	7.1	11.9	8.4	14.9
All Hindus	22.1	15.9	25.4	21.5	26.7	31.8
Brahmins	14.4	17.3	23.7	4.4	11.3	3.6
OHC	15.4	14.5	8.8	13.1	21.8	21.3
OBC	20.1	13.3	27.8	21.3	19.9	33.9
SC	36.3	26.4	35.2	33.3	50.4	76.1
ST	56.8	30	-	-	67.7	37

It should be noted that the dataset includes very few members from scheduled tribes, constituting of just 3.56% of the sample, and none were surveyed from Bihar or Uttar Pradesh. Most importantly, trends are not consistent across states, suggesting that latrine use does not follow a simple and negative relationship with education and wealth, and other complex religious and social factors may be important – and competing – drivers of latrine use.

Views on Purity and Pollution. As previously discussed, strongly held Hindu beliefs on purity affect post-defecation rituals and might affect decisions to use a latrine at all. Ritual purity and the sanctity of sacred spaces are important concepts for the Hindu home; feces are ritually impure and containing them in a pit within or near the home jeopardizes the purity of the entire house.^{64,65} This extends to both people and objects, so that a person, their clothes, and the cup of water for washing all become polluted after entering a latrine and cannot enter sacred areas of the home before ritual acts of purification have been performed.^{66,67}

Evidence from the SQUAT survey is consistent with the notion that strongly held views on household purity encourage the practice of OD. We construct an indicator for views on household purity from the SQUAT data set.^x Across all states and for households owning a latrine, 66.1% of respondents viewed latrines in or near the house as impure. This varied somewhat by state, ranging from 57.1% in Bihar to 73.4% in Madhya Pradesh. Not surprisingly, among households that own a latrine, individuals who believe that having the latrine in or near the home is impure are more likely to open defecate than individuals who think the latrine is pure, statistically significant at the 1% level.

The relationship between views on purity and social group are also important. Viewing a latrine as impure is positively correlated with being Hindu and negatively correlated with being Muslim. Testing for differences in views of purity across subgroups that own latrines also reveals that Hindus, Brahmins, OBCs, and STs are more likely to view latrines in or near

^x Equal to 1 if the respondent said that a latrine constructed inside or near the house was not pure, and 0 if they answered pure.

the home as impure. On the other hand, Muslims and OHCs are less likely to view latrines as impure than non-Muslims or non-OHCs. These differences are all statistically significant at the 1% level. There is no statistically significant difference between impurity views of SCs and non-SCs in households with a latrine.

Though the direction of causality is unclear, together these results provide evidence in support of the first hypothesis: views on latrine impurity are widespread and tied to religion and social group, and individuals who believe that latrines located in or near the house are impure are more likely to OD.

The Presence of “Casteism”. Indian villages are commonly comprised of different castes, and 85.8% of SQUAT respondents identified their village as home to people of different castes. The extent of hierarchal spread matters as well: 71.9% of sampled villages contain Brahmin households and 92.7% contain SC households. Though many believe that the rigidity of the caste system is declining and there is greater mobility today by social class and occupation, disparities exist between groups and discrimination against lower castes still occurs.⁶⁸ Houses are typically clustered by caste, with low caste households located some distance away from the higher caste hamlets such that defecation sites also differ.⁶⁹

As a proxy for “casteism” we created a binary variable equal to one if a respondent answered that their village sees conflict between people of different castes living together, and equal to zero if they live together peacefully or in a village with only people of the same caste. For households with latrines, 18.3% of respondents from all five states indicated conflict between castes, though this varied significantly by state, from 12.9% in Haryana up to 26.3% in Madhya Pradesh. For households with latrines, individuals who report conflict between castes in their village have higher rates of OD on average, statistically significant at the 1% level.

Testing for differences in views of caste conflict across subgroups that own latrines further reveals that members from SCs and STs are more likely to report caste conflict than non-SCs or non-STs, statistically significant at the 5% and 1% levels, respectively^{xi}. Additionally, members of OHCs^{xii} are less likely to report caste conflict than non-OHCs, statistically significant at the 1% level.

It is more difficult to discern why reported caste conflict is associated with OD behavior. We know that latrines are the most impure space of a Hindu home, and must traditionally be cleaned by the lowest caste members of society – those labeled ritually unclean.⁷⁰ In this sense, the services performed by members of SCs are needed by higher caste villagers to maintain social order. If the indicator for conflict between castes represents a disruption to this traditional social hierarchy – and particularly if it captures the desire of SCs to no longer perform the degrading task of cleaning out human feces – then it can help explain why Hindus in particular might avoid using latrines. Use must be minimized without a culturally appropriate means for emptying a pit latrine, and this is consistent with qualitative

^{xi} From two-sample t-tests with unequal variances testing the difference in mean values of casteism (binary variable for reported caste conflict) by subgroup (binary variables for being SC, being ST), among households that own a latrine.

^{xii} The SQUAT survey defines Other High Caste as those groups between Brahmins and OBC. For example, this includes members who identify with the Kshatriya and Vaishya classes.

work that indicates men prefer to let women use the latrine so as to keep it from filling up as quickly.⁷¹

There is some evidence that reported casteism is correlated with reported problems of having to empty a pit latrine. Though only 2.1% of respondents from households with a latrine report this as a problem, OHC respondents who report casteism are more likely to cite the pit-emptying problem than respondents who do not report casteism (statistically significant at the 1% level). By contrast, OBC respondents who report casteism are less likely to cite the pit-emptying problem than respondents who do not report casteism (statistically significant at the 10% level).

Together these results provide some evidence in support of the second hypothesis, though reported caste conflict is low relative to the percentage of villages comprised of different groups and few respondents cite having to empty the pit as a problem. Nevertheless, casteism is tied to pit-emptying issues for higher caste Hindus, and individuals who report casteism or problems with pit emptying are more likely to OD.

2.2.2 Gender and Age

Other qualitative studies suggest a strong consensus among rural Indians that latrines are for women,⁷² and indeed 62.2% of SQUAT respondents cited “women” as a reason for constructing a latrine. While perceived health benefits do not appear to be a strong motivator for latrine construction,⁷³ pointing instead to behavioral drivers like convenience, privacy, and security overlooks the differences these may suggest for men and women across age groups.

Overall Trends with Age. Gender and age are strong predictors of latrine use. Evidence from the SQUAT survey confirms that among households that own a latrine, women are less likely than men to openly defecate across all five states, as illustrated below by Figure 7.

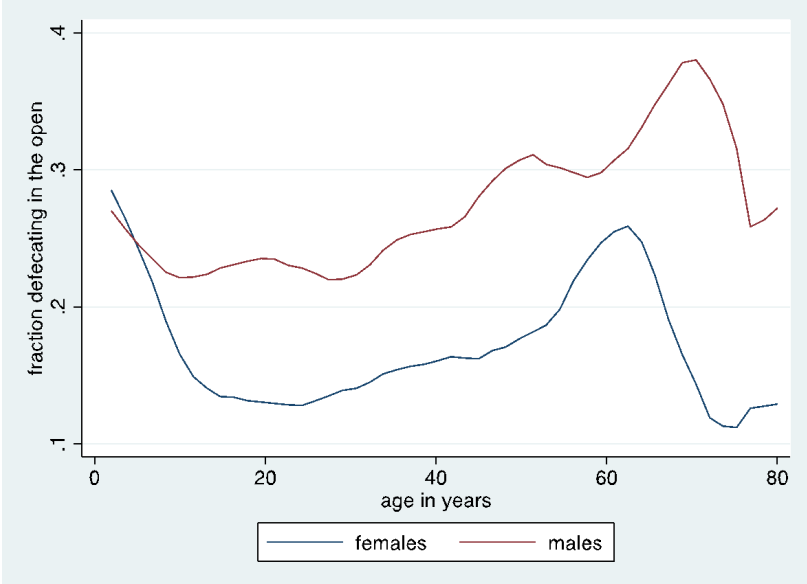


Figure 7. OD by gender and age, in households owning a latrine

This trend also holds across all ages except for the very young^{xiii}, consistent with literature that describes infants and young children defecating on the ground in the compound or inside the house on paper or cloth, after which mothers dispose of the feces outside. Similarly, disabled, sick, or very old members of the household may defecate on paper or cloth that is later disposed of outside.⁷⁴ Not surprisingly, 17.2% of respondents cited “old/disabled people” as a reason for constructing a latrine.

Convenience. Campaigns aimed at raising demand for latrines often focus on the comfort and convenience they can provide for women in particular. Because rural Indian women are traditionally engaged in household work, having a latrine at home should benefit women disproportionately to men. Having to go out to defecate in the fields costs women important time, especially during monsoon and rice growing season when space appropriate for OD is harder to come by.⁷⁵ Qualitative data further points to the fact that men, by contrast, seem to prefer OD because it is a convenient morning practice on their way to work in the fields.⁷⁶

Averaged over all five states surveyed by SQUAT, 88.4% of individuals in households with latrines did cite comfort and convenience as a benefit of latrine construction. But 40.8% of these respondents also cited pleasure, comfort, or convenience as a benefit of OD. Surprisingly, SQUAT data shows there is no statistically significant difference between reported benefits by men and women for either latrine convenience or OD convenience. Moreover, the mean time reported to reach an OD site is 16 minutes and there is no statistically significant difference between the time it takes males and females.

Privacy. Another argument for latrine construction is the need for women’s privacy. Though both men and women face public exposure during OD, social norms on modesty require women to cover themselves in front of men.⁷⁷ Across all states, 28.2% of respondents reported being seen defecating the previous day, ranging from 18.4% in Rajasthan to 36.3% in Bihar. Upon being seen openly defecating, 83.3% of respondents across all states reported feeling ashamed when they realized that someone had seen them defecating, ranging from 70.6% in Haryana to 90.9% in Uttar Pradesh. But there is no statistically significant difference between men or women’s reporting for being seen openly defecating or feelings of shame. This suggests that men and women are equally vulnerable to being seen publicly defecating and – despite the cultural significance placed on female modesty – women do not feel more ashamed at being seen.

The privacy argument further points to the particular vulnerability of women during seasons which make it more difficult to find a place to OD.⁷⁸ But SQUAT data contradicts this; among households that own a latrine, there are no statistically significant differences in reported OD by men and women in the monsoon season, summer, or winter. The data does however point to this seasonal variation in privacy affecting both men and women. Though the SQUAT survey conducted very few interviews during monsoon season, a higher fraction of individuals surveyed during rice growing season reported being seen than those surveyed in

^{xiii} Note that trends for the elderly may not hold due to small sample sizes: 95% are under age 65 and 63 for men and women, respectively.

other months, while a lower fraction of individuals surveyed during post-harvest months reported being seen than those surveyed during other months, both statistically significant at the 1% level. This fits with the fact it is considered taboo to OD in fields growing rice so, like in monsoon season, it is more difficult to find an open place to OD.⁷⁹ The opposite is true during post-harvest months, as people are free to OD in the empty fields and so presumably it is easier to find a secluded spot.

Security. Security is another oft-cited driver of latrine construction that references the vulnerability of women when they must venture out to find an appropriate place to OD, sometimes far away or in the dark. Media attention surrounding the 2014 rape and murder of two teenage girls in Uttar Pradesh who went out at night to OD suggested toilets were a women's rights issue.⁸⁰ However, the SQUAT survey does not support this claim that women are especially scared to go defecate outside. Only 3.9% of respondents across all five states reported feeling scared upon realizing that someone had seen them defecating. Furthermore, there is no statistically significant difference in reporting between men and women. Though qualitative evidence points to a female preference for going to open defecate in groups of four to five women due to concerns over safety and privacy,⁸¹ the SQUAT data also contradicts this. On average, individuals went with 1.6 people to defecate, and there is no statistically significant difference between this group size by men and women. Moreover, the percentage of women reporting attempted molestation when going to OD is less than that reported when traveling to the market on average (5.3% and 8.3% respectively). While increasing latrine use impacts public health broadly, including women's safety, Indian policymakers should seek policy solutions outside of SBA to address more critical threats to women's safety.

Household Status and the Role of Women. The household status of women in rural north India varies by age and role: male heads of households have decision-making power, though rank for both men and women increase with age.⁸² Men typically make economic decisions, and we would expect latrine construction to be no different, especially given their responsibility to protect female family members. Qualitative evidence does in fact point to the particular interest male heads of households have shown for constructing latrines for newlywed daughters-in-law, as it would be especially shameful for them to be seen defecating in the open.^{83,84}

Rituals of *pardah* and *ghuunghat* involve remaining out of the public eye, covering one's face, and not speaking to men or strangers, and are required of daughters-in-law living among their husband's family, regardless of their age.⁸⁵ The same restrictions are not placed on unmarried adolescent daughters in the family.^{86,87} New daughters-in-law prohibited from leaving the house alone or being seen by other men in the village must therefore go out to defecate very early in the morning, accompanied by their mother-in-law or sister-in-law.⁸⁸ For these reasons, a latrine can be especially convenient for a daughter-in-law, eliminating her need to complete her bathroom routine before sunrise.⁸⁹

We would therefore expect to see lower rates of OD for daughters-in-law than both unmarried adolescent daughters and women in general. SQUAT data partially confirms this trend for households that own a latrine: between the ages of 17 and 25, unmarried daughters

have higher OD rates than daughters-in-law^{xiv}. Figure 8 illustrates that during childbearing years, daughters-in-law have lower OD rates than females of the same age. Daughters-in-law also exhibit a visible downward trend in OD rates until age 25 or so, after which OD begins to increase, fitting the cultural norm of keeping women home during their childbearing years.

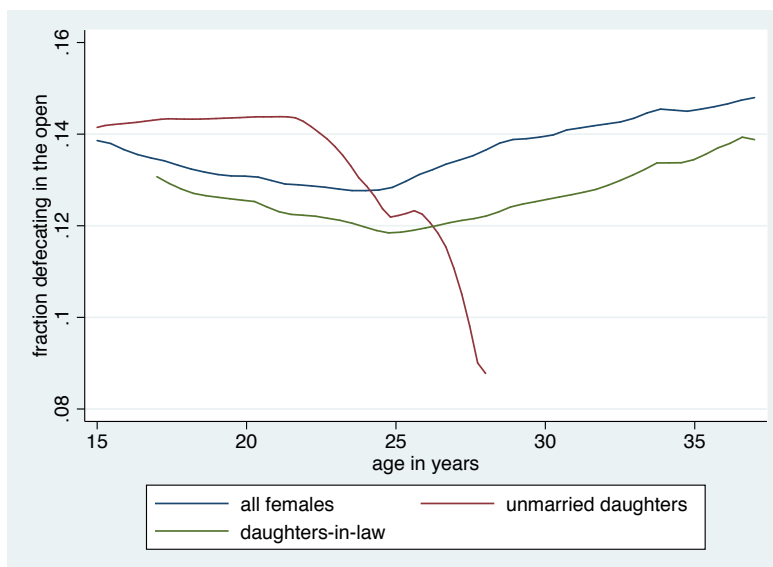


Figure 8. Female OD by status, in households owning a latrine

Freedom of Movement. There is qualitative evidence suggesting that women who are otherwise restricted to their home may actually have a preference for OD, at least in the evening when their household work is finished.⁹⁰ If this is the only time of the day when they have the opportunity to leave the house and socialize with other women, being restricted to using a household latrine would further reduce their mobility and perhaps their emotional well-being.⁹¹ Household roles shift as women get older and become mothers-in-law themselves, gaining more control of their daily routines and presumably more autonomy to decide when and where to defecate.⁹²

Freedom of movement is also tied with rigid class hierarchies. Qualitative data from Rajasthan, for example, describes how caste also helps define women’s public role; while higher caste women stay in the home, lower caste women are also often responsible for working in the fields and are thus more visible in the community.⁹³ This fits with SQUAT data that asked women whether they leave the house outside of going to defecate. Averaged across all states, 51.7% responded ‘yes’, though this ranged from 40.3% in Bihar to 66.6% in Madhya Pradesh. While there was no statistically significant difference between answers for Hindus and non-Hindus, a lower fraction of Muslims said they leave the house than non-Muslims, statistically significant at the 1% level. Among social groups, a lower fraction of Brahmins and OHCs reported leaving the house than non-Brahmins or non-OHCs, while a higher fraction of SCs and STs reported leaving the house than non-SCs or non-STs, all statistically significant at the

^{xiv} 90% of unmarried daughters living at home are aged 25 and under. To avoid bias from a small sample size, Figure 8 shows unmarried daughters up to age 28 (95th percentile)

1% level. SQUAT data clearly shows that Muslims and upper-caste women are more likely to stay home than non-Muslims and low-caste women. If Muslim women – like daughters-in-law – feel confined to their home, then having a latrine could further limit their mobility. On the other hand, for low-caste women who strive to achieve higher social status, using a latrine at home might be preferable to OD if it allows them to reduce their public visibility.

It seems there is a contradiction between female mobility and their preferences for OD. While households are commonly encouraged to invest in latrines for women – particularly daughters-in-law – these kinds of incentives do not in and of themselves create universal demand among women. In the very least, female preferences for latrine use are complex, varying with age, status in the home, and status in the community. At the very worst, building household latrines and encouraging women to use them could further seclude women in their homes, rather than promoting their empowerment.⁹⁴

The fact that women are more likely to use latrines does not necessarily mean they have a higher demand for latrines; it could instead reflect the fact that women with low household status have limits on their freedom of movement and presumably have less power to decide open defecation habits for themselves. India's current sanitation policies – especially policies like “No toilet, No bride” – do not encourage universal latrine use by both women and men. There seems to be a contradiction in reaching ODF under SBA: targeting women may reduce overall OD rates, but it is difficult to imagine promoting men's latrine use this way. Most importantly, if sanitation solutions come at the expense of women's empowerment then this trade-off should be both acknowledged and justified.

3. BEHAVIORAL CHANGE CONSIDERATIONS

3.1 Behavior Change Mechanisms and Overview

As demonstrated in previous sections, behavior change has become an important tool around the world in addressing public health challenges such as OD. While behavior change has proven effective in other contexts, in India such practices face many challenges related to the limitations of implementers and a debate about its efficacy vis-à-vis latrine construction.

One approach to behavior change is behavior change communication (BCC), which is “the strategic use of communication to promote positive health outcomes, based on proven theories and models of behavior change.”⁹⁵ BCC seeks to first make individuals aware of and then knowledgeable about a particular health issue and encourages a lasting behavioral adjustment. BCC messages should be stratified and targeted to reach a heterogeneous population. Importantly, this involves soliciting input and feedback from the target groups as well as other local stakeholders through behavioral analysis and formative research to inform the development of an effective campaign.⁹⁶ Generally, BCC strategies rely on information, education, and communication (IEC) materials that include the use of mass media messages as well as interpersonal communication (IPC).

SBA intends to strategically incorporate mass media communications. Specifically, efforts are focused on creating a large-scale awareness program that will transform SBA into a

social movement of the masses. To combat OD, the Indian government developed a multi-prong National Reachout Campaign to:

1. Increase awareness by deploying frontline workers who will initiate door-to-door contact with rural households
2. Launch a national and state-level media campaign, incorporating audio, visual, mobile phones, as well as local outreach to broadcast the messages
3. Involve celebrity spokespersons, such as movie and cricket icons
4. Mobilize communities through the involvement of local stakeholders (doctors, teachers, local political and religious leaders), NGOs, frontline health workers, self-help groups and community members at-large
5. Empower children to be messengers of change on sanitation and hygiene and hold activities at schools, such as rallies, seminars, walk/run for sanitation and painting competitions.⁹⁷

While it is still too early to measure the efficacy of these efforts on a national scale, anecdotally, we found that in our interviews with village residents in Uttar Pradesh, many were unaware of the specific SBA goals to increase toilet usage. Instead, respondents typically articulated the broad goal of keeping India clean. Supporting this observation, the SQUAT survey finds that only 62% of respondents were aware of any government scheme that assists individuals in building toilets.⁹⁸ Furthermore, only 30% of respondents reported ever seeing a poster, wall writing, or pamphlet about latrines, and only 9% reported ever seeing a street play or movie about the use of latrines.⁹⁹ This suggests that IEC efforts to date have failed to reach rural villagers.

3.2 Front Line Workers And Their Limitations

With outreach as an important part of SBA's behavior change efforts, it is clear that success is contingent on the activities of activists working on the ground level. These actors include community health workers (CHWs), particularly Accredited Social Health Activists (ASHAs), as well as Village Health, Sanitation and Nutrition Committees (VHSNCs), and CLTS facilitators. However, as described below, the limitations of these workers cast doubt on the efficacy of BCC in addressing OD in India.

3.2.1 ASHAs

An important part of the SBA effort to end OD stems from the Indian Government's National Health Mission (NHM). The objective of NHM is to address the health needs of underserved rural areas by strengthening the health system, with particular focus on the needs of the poor and vulnerable rural population.¹⁰⁰ One aspect of this mission is through the selection and training of local CHWs, called ASHAs.¹⁰¹

Primarily women between 25 and 45 years of age, ASHAs are local residents of a village selected by their village government to be trained in basic health delivery and education. These volunteer CHWs serve catchment areas of 1000 people, with the intention of improving health outcomes.¹⁰² To this end, ASHAs are expected to "create awareness on health and its

determinants, mobilize the community towards local health planning, and increase utilization of the existing health services."¹⁰³ Specifically the ASHA will provide information related to nutrition, sanitation and hygiene, pre and post-natal care, maternal health, and accessing health services including bringing pregnant women to hospitals for institutional deliveries and administering immunizations. She will also organize local Village Health Sanitation and Nutrition Committees to track and report on village health conditions to government officials.¹⁰⁴

Despite this lengthy list of responsibilities and the government's lofty vision of ASHAs as key local players in Indian public health and sanitation efforts, the program has run into a series of problems. Studies have shown that there is confusion about the exact roles ASHAs are expected to fill. In fact, many ASHAs cannot specify their own tasks.¹⁰⁵ The primary exceptions to this are the few activities that they are paid to perform.

Though the ASHA role is a voluntary one, there are certain activities for which ASHAs are reimbursed. Such activities include bringing pregnant women to medical facilities for delivery. In this role, studies have shown that ASHAs have been effective in changing behavior.¹⁰⁶ This implies that these CHWs can have impact but they are overburdened with tasks and struggle with prioritization. The result is that activities without compensation, such as sanitation promotion, fall to the wayside.¹⁰⁷

3.2.2 Village Health, Sanitation and Nutrition Committees

Another aspect of NHM's efforts is the creation of VHSNCs. The purpose of these committees is to "build and maintain accountability mechanisms for community level health and nutrition services provided by the government."¹⁰⁸ Specifically these committees:

1. Create awareness of health services and entitlements
2. Develop a village health plan for the community
3. Create a village health register and health information board and calendar
4. Analyze local health and nutrition challenges and report back to relevant government officials
5. Present annual health report to the Gram Sabha¹⁰⁹

These tasks are intended to support many public health initiatives, including ODF efforts, but their success has been limited.

Considering the substantial role these committees are supposed to play in their communities, it is important that they properly represent their villages. As such, NHM mandates that VHSNCs should have "one member from each category: [scheduled caste] and [scheduled tribe], [*Panchayati Raj* Institutions], teacher, retired person, ASHA, women's self-help group, ex-serviceman, AWW, ANM, MPHWS, and NGO representative."¹¹⁰ However, studies have found that compositions often failed to meet these standards. Particularly, there has been a lack of participation from teachers and ASHAs. Ostensibly, this creates challenges as the inappropriate composition undermines committee awareness of village needs. Moreover, this problem is indicative of a greater challenge: weak commitment to VHSNCs by their members.

Studies have also shown that members of VHSNCs have low awareness about their responsibilities. This is underscored by the infrequency of committee meetings. According to NHM guidelines, these committees are supposed to meet once a month. However, one study found that most committees met only once a year. The problem may run deeper, as one survey showed that 16% of committee members were not aware that they were on the committee.¹¹¹ This mixture of apathy and ignorance is detrimental to committee impact.

In villages with weak VHSNCs there are no awareness campaigns or village health plans. Furthermore, over a quarter of their members have little or no knowledge of how to access Village Health Funds (VHF). Every VHSNC is entitled to an annual 10,000 rupee grant from NHM to help initiate local health projects.¹¹² Low awareness of these funds means development resources could be left on the table, or lost to corruption. If VHSNCs are to be a cornerstone of NHM's strategy, it must do a better job training and monitoring the committees.

3.2.3 CLTS Facilitators

While the CLTS approach allows communities to decide how to address OD, success is largely dependent on the facilitators who guide the efforts.¹¹³ As discussed, when initiating CLTS, an individual – a government or NGO staff member, or a member of the community – will engage in a number of activities with the local populace to demonstrate the dangers of OD. Referred to as triggering, this process of social awakening may include, “mapping on the ground to show where people live and where they defecate, transit walks to visit and stand in those places, calculations of quantities of shit...produced...and identifying pathways to the mouth leading to the...recognition that ‘we are eating one another’s shit.’” The role of the facilitator continues after the triggering, as facilitators often help guide the creation of a plan and maintain enthusiasm.

Given this work, it is clear that being a facilitator is not easy. The individual must be motivated and patient as they work with various levels of society in the respective villages. OD is a sensitive topic, thus the CLTS Handbook states that “behaviour and attitudes are crucial. What works best...is a combination of boldness, empathy, humour and fun. It demands a hands-off approach, not teaching...but facilitating to enable people to confront their unpalatable realities.”¹¹⁴ Finding an appropriate person for these tasks remains a challenge.

These complexities prove to be a serious limit on the efficacy of CLTS in India, which is evident in the shortage of facilitators in the country.¹¹⁵ Making matters worse, many facilitators become frustrated and quit.¹¹⁶ With the success of CLTS dependent on these workers, attracting the right people is crucial.

If CLTS is to become a significant part of India’s response to OD, these challenges need to be addressed. One idea would be to increase the number of training centers throughout the country. Currently, only around three NGOs in India are providing CLTS training, thus limiting the number of facilitators, including many who might be most effective.¹¹⁷ However, in executing this scale-up there may be additional concerns. For instance, if CLTS were to be established as a national government program, the facilitators may have to become civil

servants. However, the civil servant selection process is not designed with these characteristics in mind.

3.3 Subsidies

Another a major struggle for behavior change has stemmed from a debate around ODF efforts: should latrine construction or behavior change should take precedence? As discussed, SBA and previous sanitation efforts place emphasis on toilet construction. This is achieved by offering subsidies to poor families and communities who have constructed latrines. Under SBA, the individual toilet subsidy is 12,000 rupees. The subsidy has increased toilet coverage, helping to construct over 5 million latrines in 2013 alone.¹¹⁸ However, toilet use remains low, as studies have concluded that most government-subsidized latrines have low usage rates.¹¹⁹

Furthermore, proponents of behavior change contend that subsidies are “liable to undermine CLTS.”¹²⁰ The reason for this is that behavior change requires the development of an internal motivation to construct and use toilets. When subsidies are offered, they act as an incentive for individuals to wait for government support, instead of taking their own initiative.¹²¹ Proponents further argue that the focus should be placed solely on behavior change efforts. There is evidence to support behavior change as the better strategy to ending OD. One study, which sought to disaggregate the effects of subsidies and behavioral change, concluded that the latter was nearly twice as effective in promoting toilet ownership.¹²²

However, such claims are disputed by another study that looked at OD campaigns in India, Indonesia, Mali, and Tanzania. It found that “health promotion generally worked through both convincing households to invest in in-home sanitation facilities and nudging increased use of those facilities.”¹²³ Therefore, subsidies could benefit behavior change.

Even if behavior change functions better without subsidies, it is at a disadvantage. Because it relies on intangible individual motivations, success is hard to measure and even harder to assign credit. Therefore, when deciding between offering money and implementing CLTS, officials are likely to see greater personal benefit from the former. Furthermore, when a local administrator chooses CLTS, charges of corruption may emerge as residents question what was done with the subsidy.¹²⁴

Taken together, one understands the importance of sensitive institutional support. Having government backing is crucial in marshaling the resources and legitimacy for CLTS. However, institutional support for subsidies can be detrimental to CLTS and behavior change.

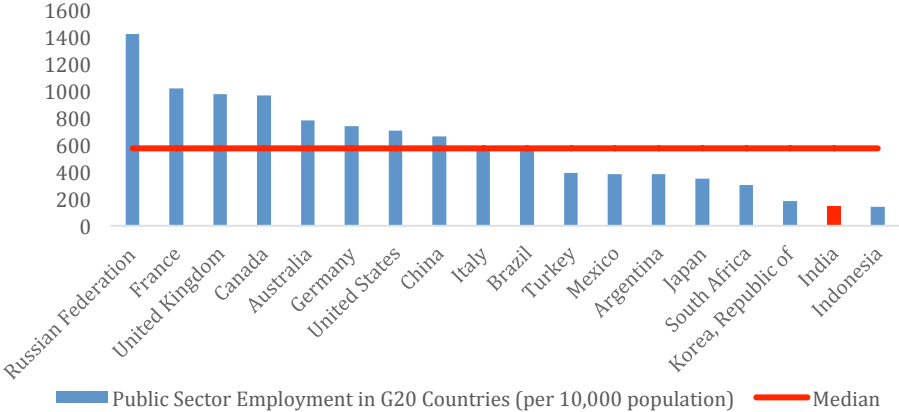
4. CHALLENGES TO IMPLEMENTATION

4.1 Allocation And Capacity

4.1.1 Capacity Constraints to Implementing SBA

Effective implementation of a large-scale program like SBA requires significant administrative capacity at various levels of government. India’s public sector, however, is relatively small by international standards. Figure 9 shows the estimated number of public

sector employees per 10,000 population across G20 countries. Across these countries, the median estimated number of public sector employees (represented by the red line) is 572 per 10,000 population. At 143 per 10,000, India's public sector employment level is just one fourth as high.



Source: data from the International Labor Organization (ILO) and the Carnegie Endowment for International Peace "India: State Capacity in Global Context."

Figure 9. Public Sector Employment in G20 Countries (Per 10,000 Population).

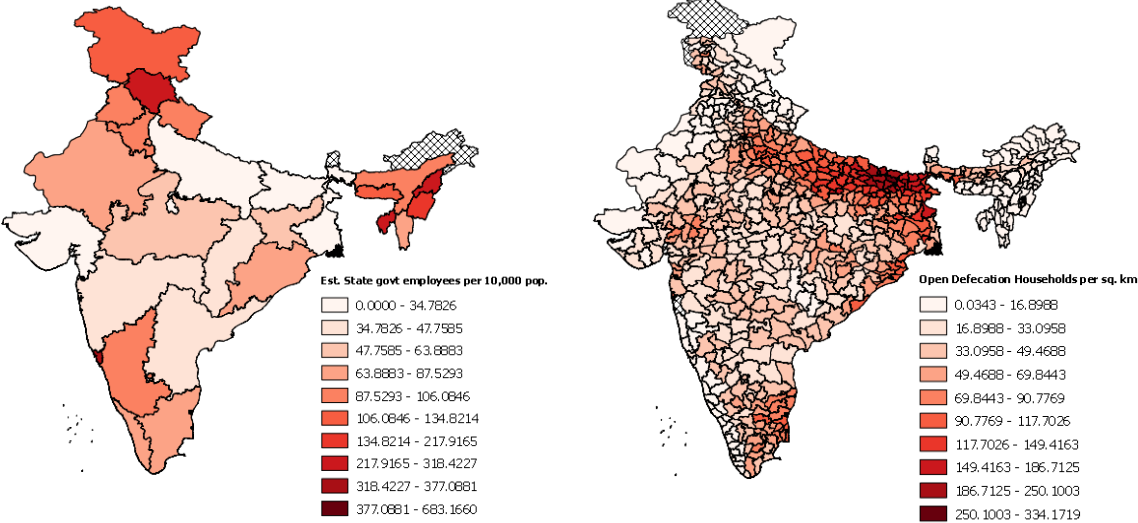
Although these aggregate figures give an indication of the capacity constraints under which India is implementing SBA, they also mask the significant variation that exists in public sector strength across Indian states. In 2012, state government employees per 10,000 population was as high as 683 per 10,000 population in the Andaman and Nicobar Islands and as low as 19 in Bihar.

Comparing the numbers of government employees per capita across states is by no means a perfect measure of administrative capacity. These figures give no indication of what the government employees do, nor do they describe their level of competency. Even so, it is reasonable to assume that there is a minimum threshold of public sector employees that states need to carry out a program like SBA. If state, district or local governments are significantly understaffed, they will have little choice but to decrease the scope and/or quality of SBA implementation. This would not be an issue if low-capacity states already had good sanitation, but in India, poor sanitation and low capacity often coincide.

SBA has made it a goal to end OD by 2019, and as a result, OD levels have become the leading sanitation measure in India. While percentage of households defecating in the open is the most common OD indicator, the indicator most directly relevant to health outcomes is arguably density of OD. People living in areas with high OD density are at higher risk of adverse health outcomes than those in areas with low OD density, even if an equal proportion of people in both areas OD.¹²⁵

The left side of Figure 10 below shows the estimated number of state government employees per 10,000 population.¹²⁶ Darker areas indicate higher levels of state government employment and lighter areas indicate lower levels. The right side shows OD density by district (number of families practicing OD per square kilometer). Darker areas indicate higher

OD density and lighter levels indicate lower OD density. Comparison of the maps suggests that OD density is particularly high in some of the states where state government employment is lowest – that is, many of the dark areas on the OD density map (high OD density) correspond to light areas on the state government employment map (low state government employment). This is particularly true of Uttar Pradesh, Bihar and West Bengal in the North/Northeast of India.



Source: Data from India Census (2011)

Figure 10. State Govt. Employees Per 10,000 Population (Left) and Households Defecating in the Open Per Sq. Km (Right).

Figure 11 below plots the two indicators (state government employment per 10,000 population and open defecation density) together. Here, there appears to be a downward trend – suggesting that states with higher density of open defecation have lower levels of state government employment. Thus, states with particularly high OD density are often those with the least government manpower to deal with such challenges.

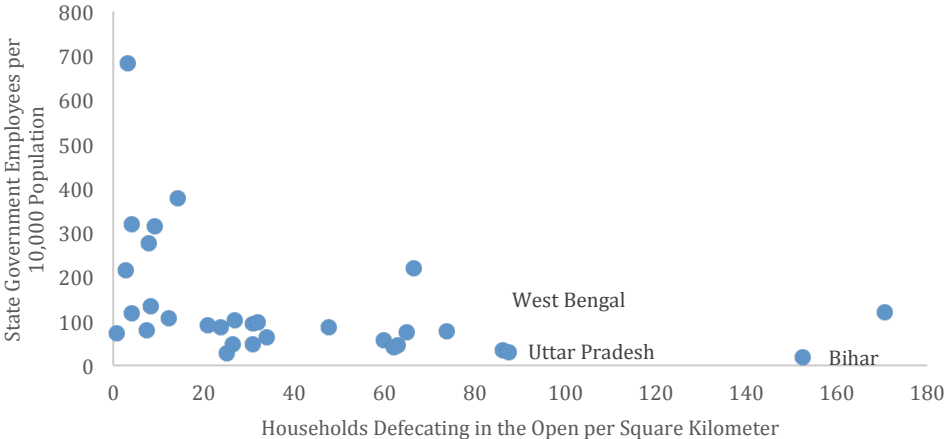


Figure 11. State Public Sector Employment and Open Defecation Density

4.1.2 Sanitation Spending

Variation in Per-Capital Sanitation Spending Across States. Although sanitation spending alone will not solve India’s OD problem, it is likely a necessary condition. The ability of SBA to translate spending into sanitation outcomes, however, will depend on what those funds are spent on and how they are targeted. Between 1999 and 2015, India spent more than 2,600 crore (close to \$4 billion) on its national sanitation schemes (TSC/NBA/SBA). Approximately two-thirds of that funding came from the central government, with most of the remainder coming from states.¹²⁷ Both under the current SBA and its predecessors, however, per-capita sanitation spending has varied significantly across states and districts. This is particularly true for the seven northeastern states (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura), which have had significantly higher per-capita expenditure than the rest of the country.

Even excluding the Northeast states, sanitation spending across India continues to be uneven. Figure 12 below plots per-capita SBA spending for each state during the 2014–2015 fiscal year against open state-level defecation rates (the area of each circle is proportional to population). Although average per-capita spending in India was 35 rupees, it was just 14 rupees in Bihar and rose to 72 rupees in West Bengal and 109 rupees in Sikkim. This is in spite of the fact that Bihar has nearly twice the open defecation rate of West Bengal (76% in Bihar vs. 39% in West Bengal) and nearly seven times the open defecation rate of Sikkim (11% in Sikkim).

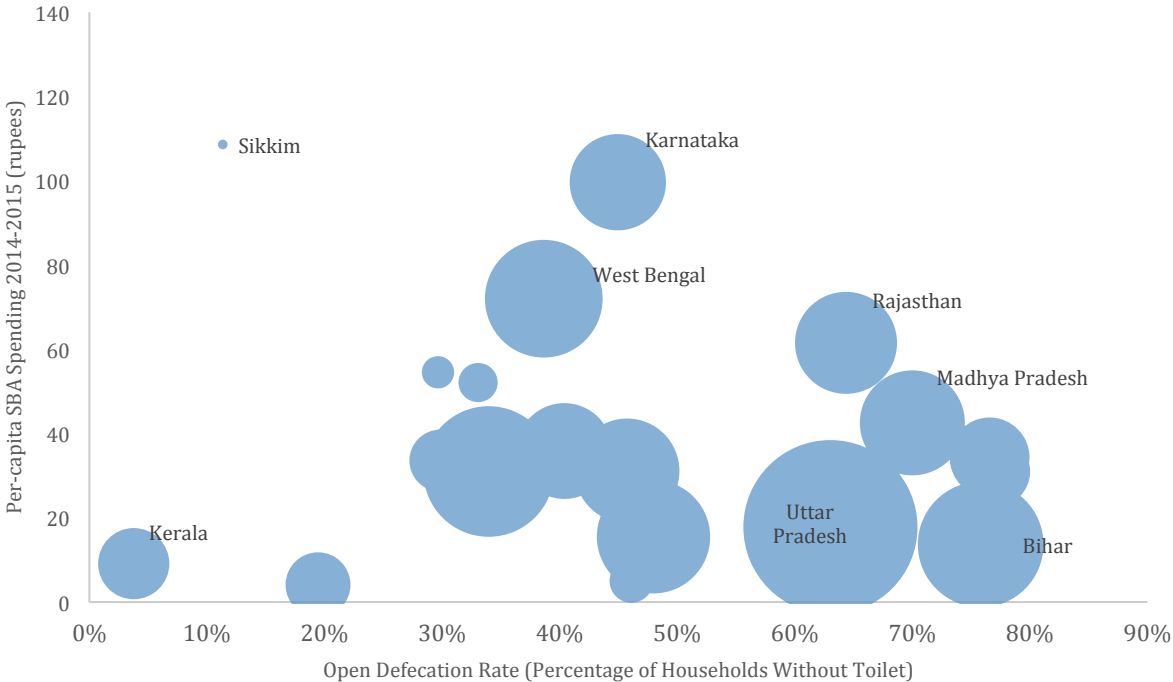


Figure 12. Per Capita SBA Spending By State (2014-2015)

Possible Causes of Variation in Sanitation Spending Across States. There are a variety of possible explanations for the variation in levels of per-capita sanitation spending. The most obvious is differences in the size of state budgets. Under SBA, the central government matches state government funding contributions at a ratio of 3 to 1. Since state contributions determine the level of total funding, poorer states are likely to spend less per capita. Lower spending may also be a result of the underspending of available funds. During the 2014-2015 fiscal year, for example, states spent 58% of total available SBA funds. Some states, however, spent as little as 5% of their available funds during that period.

Effective spending requires adequate administrative capacity at the state, district, and local levels. As a result, underspending may be the result of capacity constraints. The level of public sector employment, however, varies across states. Estimated state government employment per 10,000 population, for example, is as high as 377 in Goa and as low as 19 in Bihar.¹²⁸ Given this, it is possible that government officials simply do not have enough staff to complete all of the projects that would use available sanitation funding. Faced with these limitations, government officials must decide how to prioritize spending across sectors. Underspending on sanitation may therefore simply reflect sectoral priorities at the state, district, or local levels.

In addition to these factors, variation in sanitation spending may also reflect different levels of sanitation needs. This would imply that decision makers channel sanitation funds into areas with greater needs as a way to maximize sanitation impact. If this were the case, we would expect spending to be higher in areas with poorer sanitation indicators.

Data Used to Test the Determinants of Sanitation Spending. To test possible determinants of sanitation spending, we construct a spending and district/state-level characteristic dataset. The dataset covers a range of topics, including:

- Demographic characteristics
- Indicators of public sector capacity / institutional quality
- Indicators of sanitation needs (toilet ownership^{xv} & use of improved water sources^{xvi})
- Ministry of Drinking Water and Sanitation (MDWS) Baseline Survey (BLS) 2012 data
BLS 2012 data included the number of *Swachhata Doots* (SDs) reported per 10,000 population.

The concept of the SD, or “cleanliness messenger” was developed during India’s TSC to have a trained group of volunteers who would act as village-level sanitation motivators – a role the SBA guidelines still recognizes.¹²⁹ Variables were also added to indicate if SD data was uploaded for each district. State, district and local officials were responsible for uploading GP-level data to the BLS 2012 site, and response rates were below 100% (just 59.11% of GPs uploaded SD data, for example). Adding a variable for whether data was uploaded thus allows us to control for non-upload and to test whether that is relevant to spending performance.

^{xv} Households that had a public latrine available that they could use were counted as “having” a latrine.

^{xvi} Classification of improved water source based on WHO/UNICEF definition: “Improved and unimproved water sources and sanitation facilities,” WHO/UNICEF Joint Monitoring Programme (JMP) for Water and Sanitation.

Methods Used to Test the Determinants of Sanitation Spending. We test the determinants of sanitation spending by running regressions of per-capita 1999-2015 and 2013-2015 spending on the variables described above. We also run regressions on funding release and for spending on Individual Household Latrines (IHHLs) and Information Education and Communication (IEC) for 2013-2015. In addition, we test the determinants of fund absorption (both 1999-2015 and 2013-2015) and of IEC spending preference 2013-2015. Where 1999-2015 figures are used, the unit of observation is the district. Where 2013-2015 figures are used, the unit of observation is the district in a particular year. In these cases, we add an indicator to our regressions for the 2013-2014 fiscal year to account for countrywide changes in spending between the 2013-2014 and 2014-2015 fiscal years.^{xvii}

Sanitation Spending: Convergence of Needs, Capacity and Priorities. The results from analysis of district-level data suggest that sanitation-spending decisions are largely a function of needs and administrative capacity/motivation.^{xviii} One encouraging finding is that districts with greater sanitation needs tend to spend more per-capita on sanitation. Both over the 2013-2015 and 1999-2015 time periods, districts with higher rates of OD and those with less use of improved water sources had higher per-capita sanitation spending than other districts. Spending on the IHHLs and IEC components of SBA was also higher in districts with lower use of improved water sources. This suggests that districts are targeting areas with greater needs. If the magnitude of sanitation needs influences district spending priorities, it indicates that the objectives of SBA and the interests of decision makers are reasonably aligned – a fact that bodes well for SBA’s chances of being effective.

Our analysis provides limited evidence that sanitation spending was higher in districts with poorer or more marginalized populations. We do find that poorer districts (as measured by a Census asset count) had higher per-capita sanitation spending over the 1999-2015 and 2013-2015 periods than wealthier ones. In 2013-2015, this was also true of IHHL spending. Spending on IEC, however, was not higher in poorer districts. While it is a positive sign that decision makers are building more latrines in poorer areas, the fact that poverty has no detectable effect on IEC spending is concerning. Building latrines may be an important SBA strategy, but does not address behavioral constraints on latrine usage that are likely to be prevalent in poor areas.

Of similar concern is the fact that we find little correlation between scheduled caste/tribe and per-capita spending. Although we do find that districts with higher concentrations of SC and ST populations received more sanitation funding between 1999 and 2015, they do not appear to have spent more.^{xix} It appears that states have allocated more money to districts with higher concentrations of marginalized groups, but that those districts

^{xvii} In each regression specification, we cluster observations at the state level.

^{xviii} All tests for the results described included a variety of controls for demographic characteristics, including state income level, an asset measure, scheduled caste/tribe status, literacy and religion.

^{xix} We did find a positive correlation between percentage scheduled caste/tribe population and per-capita spending over that period, however, that relationship was not statistically significant (the difference was statistically indistinguishable from 0 at standard confidence levels) and was also significantly smaller in magnitude than estimate for amount released.

have not been particularly effective at converting those allocations into outlays. This is problematic because members of marginalized groups may be more likely to have behavioral barriers to latrine usage.¹³⁰ It could be that decision makers recognize these barriers are difficult to overcome and so have not significantly prioritized spending in areas with more marginalized groups. A decision not to focus heavily on such areas may free up resources for “less difficult” ones, and may deliver greater impact in the short-run than otherwise possible. Such a strategy, however, would simply push the most difficult challenges down the road and decrease the chances that SBA reaches its goals.

Spending Capacity and Priorities. Our examination of sanitation spending data provides evidence that administrative capacity plays a role in determining spending levels. Although we did not find any relationship between spending and state-level public sector employment, we did find that districts that reported a higher number of *Swachhata Doots* (SDs) per 10,000 population spent more per-capita on sanitation over the 1999–2015 and 2013–2015 time periods and that they also spent more on IEC. In addition, we also found that between 1999 and 2015 these districts had more funds released to them (per-capita).

There are a variety of ways to interpret these findings. It may be that spending is higher in districts where more SDs are reported because SDs actually facilitate programs and make it easier for district officials to implement projects.^{xx} It could be, however, that having more SDs reported is simply an indicator of general administrative capacity or prioritization of sanitation. Even if those listed as SDs were not actively engaged in sanitation promotion (which is possible since the 2012 BLS was self-reported), identifying people and uploading their information is in itself an indicator of a basic level of administrative capacity and interest.

To better understand this, we test factors that may be related to SD reporting. We find that those districts that reported any SD figures (approximately two-thirds of districts) had both a higher state Ease of Doing Business score¹³¹ and higher local government employment per 10,000 population. Thus, reporting SD figures are likely a reflection of both local administrative capacity and state institutional quality.

We also test whether SD data was more likely to be reported in districts that also prioritize another major sector: education. As a measure of focus on education, we use district-level student-to-teacher ratios in public schools.^{xxi} If districts that tend to report SD data also have lower student-to-teacher ratios, it would suggest that they simply have strong administrative capacity across multiple sectors. If districts that reported SD data do not also have lower student-to-teacher ratios, however, it would suggest that these districts gave sanitation higher priority relative to other sectors (or at least relative to education). We find that districts with *higher* student-teacher ratios were actually more likely to report SD data. This suggests that reporting SD data was not just a function of higher administrative capacity

^{xx} Since Swachhata Doots are volunteers, they should impose no direct salary cost that would impact spending.

^{xxi} Data from National University of Educational Planning and Administration, New Delhi – District Report Cards: <http://www.dise.in/drc.htm>. In our tests we control for poverty levels, state income level and a variety of demographic factors (religion, scheduled caste, scheduled tribe, etc.). All things equal, lower student-teacher ratios in public schools indicates higher per-student educational outlays and thus serves as an indicator of relative prioritization of education spending.

across all sectors, but likely also reflects the fact that these districts specifically prioritized sanitation.

Our analysis thus provides evidence that districts with greater administrative capacity spent more on sanitation, as did those that prioritized sanitation relative to other sectors. This is an intuitive yet problematic result. If capacity and interest are significant barriers to sanitation spending, translating SBA funds into a reduction in OD rates will be challenging.

There is a clear need to build administrative capacity and motivate decision makers to prioritize sanitation. Reaching those goals, however, will take time. In the interim, both GOI and State-level SBA plans must take these constraints into account and look for ways to ensure that every dollar that *is* spent is used as effectively as possible.

IEC Spending Preferences. In addition to looking at absolute levels of per-capita sanitation spending, our analysis also examined IEC spending as a proportion of overall sanitation spending. The SBA guidelines recognize that latrine construction is not a sufficient strategy for ending OD and that behavior change must also be a priority. The only spending component that directly addresses behavior change, however, is IEC spending. IEC spending as a percentage of overall sanitation spending can therefore be seen as a rough measure of the district focus on behavior change strategies.

We find that districts with higher OD density spent a higher proportion of available sanitation funding on IEC in the 2013-2015 period. This is encouraging because it indicates that districts with pressing sanitation needs also spend a higher proportion of available funds targeting behavior change. Less encouragingly, however, we find that preference for IEC spending was lower in districts with higher rates of illiteracy. The reason for this is uncertain, but it may be because higher rates of illiteracy limit the types of IEC materials districts can use. Posters and messages painted on walls are relatively simple to implement, but decision makers may see them as ineffective in areas with high rates of illiteracy. With their options limited to complex manpower-driven approaches (such as street plays), district officials may simply opt to spend less on IEC and more on non-IEC components.

Looking at spending across years, we do not find an increase in IEC preference in the immediate transition between NBA and SBA (between the 2013-14 and 2014-15 fiscal years). This is somewhat surprising given the emphasis the SBA guidelines put on the need for more focus on behavior change. It may be that spending patterns are simply slow to adjust and that IEC preference will rise over time, but we do not see an immediate increase in focus on spending related to behavior change in SBA's first year.

Conclusions on Spending. Our analysis suggests several important determinants of sanitation spending. Although districts with greater sanitation needs tended to have higher per-capita sanitation spending, we found only limited evidence that spending was higher in areas likely to have behavioral barriers to ending OD. If SBA is to succeed, more focus should be put on areas where behavior change is a significant problem. Encouragingly, districts with greater sanitation needs did spend more of their sanitation budgets on IEC (the spending component most directly focused on behavior change). Less encouragingly, however, the proportion spent on IEC was lower in districts with low levels of literacy. This is problematic

because low-literacy areas are already less likely to adopt improved sanitation facilities. As evidence of this, we test the determinants of changes in OD rates (latrine coverage) between 2001 and 2011, and find that low-literacy districts were significantly less likely to see improvements in OD rates than higher literacy districts.^{xxii}

We also find evidence that administrative capacity impacts sanitation spending. Capacity constraints put real limits on what SBA can accomplish, and as a consequence GOI/state/local governments need to invest more to develop their sanitation capacity. The capacity-building component of SBA funding comes out of the (already limited) IEC budget and is capped to 1% of district total project costs.^{xxiii} Given the limitations capacity constraints impose on SBA implementation, GOI should strongly consider raising this cap and increasing the IEC component proportionally^{xxiv}.

That will not happen overnight, however, so in the near-term, decision makers must take these constraints seriously and plan according to what they can do. This is particularly important because greater capacity is not only correlated with higher sanitation spending, but also with better sanitation outcomes. Districts that reported more *Swachhata Doots* per 10,000 population, for example, had significantly greater reductions in OD rates (measured by increased latrine coverage) between 2001 and 2011 than other districts. If India is to reduce OD, it must both target sanitation funds as efficiently as possible and build its sanitation capacity for the future.

4.2 Measurement And Evaluation

Accurately measuring behavior is a difficult proposition for policy makers, particularly personal behaviors that are unseen, irregular, highly varied, and/or intimate. Defecation practices and preferences in a diverse country of over 1.3 billion people meet all of these complexities. Prime Minister Narendra Modi's high-profile pledge for the SBA program to make India ODF by 2019 poses a number of data measurement, reporting, and evaluation challenges.^{132,133} Yet, without precisely collecting the relevant data, policymakers will be unable to tell if the \$23 billion SBA campaign had any effect on OD practices. Though there have been some attempts to measure OD through observational techniques, the scale and scope of the data necessary to confirm ODF status, combined with the private nature of this behavior, necessitates surveying people about their private habits.

The Indian government splits SBA into separate urban (SBAU) and rural missions (SBAG) and, while the challenges are different in important ways, both versions face critical measurement and evaluation challenges. This section discusses the complexity of survey measurement of OD, previous attempts and lessons from surveying OD in India, and the ways in which actors, particularly government agencies, have attempted to measure and report data more recently under SBA.

^{xxii} Census 2001, 2011 data. Tests were run using the same standard control variables used throughout the spending analysis.

^{xxiii} Of this, 0.75% is to be spent at the district level and 0.25% is to be spent at the state level.

^{xxiv} Funds for the increase in capacity-building budgets could, for example, come from the much larger IHHL component.

4.2.1 Challenges to Survey Design and Measurement

The difficulties associated with measuring OD in India are as old as attempts to stymie the practice. Most attempts to measure OD rely on household surveys, although there are challenges to this method. Since OD is associated with poor health outcomes and stunting from the spread of water-borne disease¹³⁴, improvements to rural health require community-wide commitment to ending OD.

Similarly, while urban communities generally have lower OD rates, the density of living quarters increases the potential for transmitting water-borne infections, making adherence to latrine use even more critical.¹³⁵ Like rural OD rates in India, urban OD rates are exceptional in the global context: nearly 50 million urban Indians who OD represent 48% of the global urban population.¹³⁶ Yet, these numbers likely understate the practice because of the prevalence of counting community toilets (where usage and functionality is unclear), the acceptance of OD by young children, and the tendency for official population counts to greatly understate the population density of informal settlements and non-notified slums.¹³⁷ Moreover, even when an entire household chooses not to OD, feces may still contaminate the community if disposed of improperly, such as emptying feces into sewer manholes and public drains or through faulty home toilet drainage systems.^{xxv138}

Thus, in both urban and rural contexts, the precision of monitoring methods (i.e. how often does a subject openly defecate and, in urban settings in particular, where do the feces ultimately reside) is even more important than in many other intervention measurements.

Electronic Monitoring. Other evaluators have attempted to gather observational non-survey data in a variety of ways. A 2015 study combined electronic monitoring using Passive Latrine Use Monitors (PLUMs) and interviews in 258 rural households in West Bengal and Himachal Pradesh to measure defecation behavior. The PLUMs were installed in a household toilet and recorded when someone entered and exited the space. While the PLUMs provided “reliable, quantitative verification,”¹³⁹ the authors concluded PLUMs are “not appropriate for wide-scale measurement of toilet usage in India, given the diversity of behaviors and beliefs across small geographic areas.”¹⁴⁰ One issue is permission to install the monitors, which carries concerns of bias towards households that are open to it and use their latrines already, as well as potential behavioral change in response to being monitored (the so-called “Hawthorne effect”¹⁴¹). Another is expense: PLUMs cost about \$60 in components¹⁴², plus assembly and maintenance costs, which is prohibitively high for wide-scale deployment in poor, rural areas. Other methods of observation include constructing indirect and incomplete indicators for observers to report, like the presence of flies or feces in the toilet or surrounding environment. These are at best ancillary supporting data, since their collection is limited to what is visible to a particular observer.

^{xxv} For instance, 2008-2009 National Sample Survey Organization data show 81% of India’s estimated 93 million slum residents had inadequate basic sanitation.

In-depth Interviewing. Qualitative research faces similar constraints. Structured interviewing of villagers requires language and cultural training of interviewers, plus extended time to complete the interviews. These requirements can be costly, and can make the method difficult to scale. Furthermore, the particularly private nature of defecation may make obtaining even qualitative data difficult, and various situational and design factors may contribute to under- or over-reporting.

Electronic monitoring, indirect observation methods, and qualitative interviewing can offer insights into behavior and usage on a local level, but are at best only ways to explore particular contexts in the support of larger, household survey efforts to evaluate national SBA results.

Household Surveys. Household surveys have advantages in terms of cost and coverage but, like other methods, are also constrained by the nature of the behavior they attempt to measure. There are costs and difficulties associated with interview training and competency that intensify at larger scales. Sampling at even the household level can be difficult, given that a) different members of the household may open defecate at different rates and b) anecdotal evidence suggests that young children often open defecate the most and yet are unlikely to be suitable interview subjects. In general, household surveys are conducted by selecting one member of the household to respond on behalf of others. In an analysis of eight studies on sanitation in rural India released between 2013 and 2014, disaggregation among household members, the nature of the presentation of responses, and whether the surveyor personally inspected the latrine were all found to elicit differential reported rates of OD behavior.¹⁴³ This suggests substantial variability in measuring rates of OD depending on survey design and interviewer training, including potentially even the interviewer's own attitudes toward OD.

Total Sanitation Campaign Monitoring. The World Bank completed the most recent and comprehensive evaluation of national OD efforts in India in 2012, calling the 1999-onward Total Sanitation Campaign (TSC) “one of the most effective programmes in rural sanitation across the world” based on a performance scale that tracked eight TSC indicators.

However, the report unfortunately leaves policymakers with little data on actual toilet usage. In the districts surveyed by the World Bank, only one-third of stakeholders reported monitoring toilet usage in the village. Of that one-third, half of the stakeholders reported doing so only on an ad hoc basis.¹⁴⁴ Even among villages awarded the TSC Clean Village Prize for reaching ODF status, 59% reported no regular monitoring undertaken, with 22% reporting regular monitoring and 19% reporting ad hoc monitoring.

Despite those dismal results, there are at least two reasons to suggest the usage rates may be over-reporting performance. First, the sample was drawn from 22 districts based on location and benchmark performance on previous TSC measures by the Government of India. The latter means that only districts that previously reported OD measures were surveyed in the World Bank report. Second, stakeholders were selected to be interviewed based on “representing a key implementer at the district or block level” and having participated in the TSC program for at least six months. In other words, 22 senior-level stakeholders from

districts that had previously submitted data on the TSC and who had personally worked on the program for at least six months reported on household level usage data. Only five stakeholders reported that regular village level usage monitoring existed. Data on the accuracy of monitoring and actual usage rates were not collected. The report concludes by recommending monitoring of long-term indicators “to ensure that there are no slippages.”¹⁴⁵

4.2.2 SBA Surveying: Provisions, Practices, and Contradictions

Given the past monitoring gaps and the present difficulty in measuring OD practices, what does measurement in the SBA look like going forward?

First, Indian policymakers are aware of the need for and difficulties in obtaining accurate usage data. The SBA rural guidelines include provisions for monitoring and evaluation, stipulating that SBA should measure four components:

1. Whether adequate activities have been carried out for behavior change
2. Whether toilets have been constructed as reported
3. Whether constructed toilets are being used
4. Whether OD free communities have been created¹⁴⁶

These data are to be gathered in a nationally organized annual monitoring survey as well as concurrent community-level monitoring, overseen by specialized monitoring units at the gram panchayat, cluster (where required), block, and district levels and carried out by independent monitoring agencies or civil society organizations. The SBAU guidelines have similar, if less detailed, monitoring stipulations.¹⁴⁷ The SBAU guidelines stipulate that the government will try to incorporate service level benchmarking and city sanitation rankings using household level surveys; however, these efforts face similar concerns to the SBAG efforts due to on-the-ground measurement challenges and subjectivity inherent to the ranking system.^{148,149}

Despite these guidelines, the Indian government made little public progress in the first year to suggest more rigorous usage monitoring would accompany the high-profile SBA efforts. Instead, most released data measured latrine construction, which is far from a critical statistic for reasons noted elsewhere in this report. Moreover, latrine construction figures suffer from their own reporting challenges; namely, the data is reported by the contractors paid to build toilets rather than independent monitors.¹⁵⁰ As in past campaigns, the presence of toilets was erroneously associated with total usage of those toilets.

In June 2015, the Joint Secretary of the rural SBA issued a directive to all states with a universal definition of ODF status, defined by “no visible faeces found in the environment/village and every household as well as public/community institutions using safe technology option for disposal of faeces.”¹⁵¹ Indicators include no contamination of surface soil, groundwater, or surface water, no handling of fresh excreta, excreta inaccessible to flies and animals, and freedom from odor and unsightly condition. This is an important step, since the SBA guidelines stipulate the primary measure of success to be toilet usage as reflected in the creation of ODF communities.¹⁵²

There are, however, reasons for concern. The results from a National Sample Survey Office (NSSO) rapid sample survey conducted between April and May 2015 are not promising. The Economic Times of India reported that less than half of newly built toilets were being used in rural areas and about half were being used in urban ones (46% and 50% respectively).¹⁵³ The NSSO responded to the report with a press release citing “at least 95% of family members in rural areas and around 99% household members in urban areas used toilets, which had access to toilets.”¹⁵⁴ An infographic accompanying the release states that 95.6% of rural households with toilets and 98.7% of urban households with toilets report usage of the toilet by all members, while the broader OD rate was 55.4% in rural areas and 8.9% in urban areas.

It is difficult to reconcile the recent NSSO estimates with most other evaluations citing much lower usage rates, and it is unclear if the survey methodology and data will be released publicly. The World Bank and the Government of India are currently finalizing the design of a new national sample survey to improve on previous monitoring attempts. In addition to ground-level data collection concerns, a separate issue for survey measurement is the sampling strategy and practice. The NSSO has substantial expertise on developing sampling plans. Despite this technical expertise, the NSSO must overcome misunderstandings on sampling strategies among the bureaucrats whose buy-in is necessary to complete the survey and translate the results into better interventions.^{xxvi} It is important that the new survey incorporates best practices at all levels, including on sample design, interview techniques, and usage indicators.

5. RECOMMENDATIONS

Learn From History

Previous sanitation campaigns have failed in large part because of a limited focus on development of IEC materials and behavior change communication efforts, administrative delays, perverse governmental incentive structures and an emphasis on supply-side techniques. To avoid repeating past mistakes, the GOI should reflect on its history as well as draw on insights from Bangladesh’s successful sanitation campaign.

- *Improve Advocacy from Central to State Government:* The central government should establish a post capable of institutionalizing its commitment to ending OD across all levels of government, similar to the Sanitation Secretariat that was established in Bangladesh to oversee all OD-related activities.
- *Greater Focus on Community Integrated Efforts:* The Bangladeshi campaign successfully made the effort a "genuine social movement" by introducing community led total sanitation efforts (CLTS). As the CLTS is only used in a few select districts in India, overall efforts may benefit from expanding CLTS-based approaches throughout the country.

^{xxvi} This was a common theme among interviews conducted with representatives from the Water and Sanitation Program, the Niti Aayog (planning agency), and the ministries.

Acknowledge Heterogeneity

Latrine use in India does not follow a simple and negative relationship with education and wealth. Rather, complex and at times competing religious and social factors, as well as gender dynamics and other unobserved regional characteristics, drive or at least influence household sanitation decisions. Recognizing this heterogeneity, we recommend:

- *Prioritize Addressing Cultural Barriers to Latrine Use:* Hindus, in spite of being richer and more educated, are more likely to practice OD than Muslims. Beliefs on purity and pollution are widespread, tied with the Hindu religion, and discouraging of latrine use. Members of scheduled castes and tribes remain the most vulnerable; areas with more caste conflict also have higher rates of OD, possibly because of the implications that the eventual emptying of a pit latrine has for both high and low caste households. As long as sanitation campaigns do not address widespread notions of ritual impurity and casteism that underlie sanitation decisions of rural Indians, ending OD among all households seems unlikely.
- *Latrines Should Not be Sold as a Women's Issue:* There are more urgent threats to women's safety than OD and public attention on building latrines as a way of protecting women diverts attention away from the root causes of gender-based violence. The fact that women are more likely to use latrines does not necessarily mean they have a higher demand for latrines; it could instead reflect the fact that they have little power to decide defecation habits for themselves. In the very least, female preferences for latrine use are complex, varying with age, status in the home, and status in the community. At the very worst, building household latrines and encouraging women to use them could further seclude women in their homes, rather than promoting their empowerment.
- *Design Latrines to be Responsive to Both Varying Conditions and Perceptions:* Just as latrine designs must be appropriate for the cultural beliefs particular to rural settings, urban settings also require customized and tailored approaches to latrine construction capable of addressing their highly uneven and inconsistent past development, water levels, and sewage system infrastructure.

Incentivize Front Line Workers

Successful execution of a behavior change campaign is contingent on the motivation and training of key actors. In the case of SBA, these actors include community health workers (CHWs), particularly Accredited Social Health Activists (ASHAs), as well as Village Health, Sanitation and Nutrition Committees. We recommend that SBA officials:

- *Provide for a Cadre of Financially-Incentivized Sanitation Promotion Workers:* Studies show that activities ASHAs are paid for are more likely to be completed. Currently, ASHAs are overburdened with numerous tasks and have been forced to prioritize certain activities over others. Considering this, GOI should

effectively train a new cadre of community-based sanitation workers who are incentivized for the completion of sanitation activities. Incentivized outcomes must adequately reflect the overarching goal of ending open defecation, be measurable, and avoid any unintended effects contrary to that goal. The government should be willing to experiment with new metrics and refine them to improve worker performance throughout the mission.

Allocate Resources To Demonstrated Needs

Our analysis of sanitation spending patterns has implications for sanitation policy in India and suggests the following broad recommendations:

- ***Continue Targeting Sanitation Needs:*** Districts with greater sanitation needs tended to spend more per-capita on sanitation over the periods we studied. This indicates that, broadly speaking, funds are being targeted effectively. For SBA to be a success, it will be critical for decision makers to continue targeting funds towards high-need areas.
- ***Prioritize Difficult Areas:*** Sanitation spending (and in particular, IEC spending) has not been significantly higher in areas that are more likely to have behavioral barriers to eliminating OD. Decision makers should increase the focus on these “difficult” areas – not just in terms of budgetary allocations, but in terms of actual spending. Failure to deal with these challenges will leave SBA little possibility of achieving its goals.
- ***Increase Focus on IEC:*** Districts with more pressing sanitation needs tended to spend more of their budget on IEC than other districts. This is a positive sign and should be encouraged. Districts with lower literacy rates, however, tended to spend less of their budget in IEC. Carrying out IEC activities in areas with low literacy rates may be challenging, but is essential for changing OD behaviors. State and GOI decision makers should develop IEC materials that are effective and easy to use in these contexts. Given the evidence that behavior is a major driver of OD, state decision makers should also encourage districts to dedicate a higher proportion of their sanitation budgets to IEC activities, and GOI should consider raising the current IEC spending cap.

Acknowledge And Address Capacity Constraints

Our analysis suggests that administrative capacity constraints likely put limits on districts’ ability to transform SBA allocations into program outlays. These system-level issues cannot be changed overnight. State, GOI and district decision makers should:

- ***Work as Effectively as Possible Within Capacity Constraints:*** This requires decision makers to learn what the most effective and administratively feasible approaches are to reduce OD in their areas of responsibility.

- *Increase Investment in Sanitation Capacity Building:* The capacity-building component of SBA funding comes out of the (already limited) IEC budget and is capped to 1% of district total project costs. Given the limitations capacity constraints impose on SBA implementation, GOI should strongly consider raising this cap and increasing the IEC component proportionally. This will not solve the capacity issue immediately, but in the longer-term can build sector-specific sanitation capacity needed to carry out SBA more effectively.

Refine Monitoring

SBA guidelines stipulate that the campaign’s primary measure of success should be toilet usage, and includes among its four measurement components “whether constructed toilets are being used” and “whether ODF communities have been created.” Yet, data thus far has been nonexistent or conflicting. We recommend that the government:

- *Devote Sufficient Resources and Political Will to Accurately Measuring OD:* Simply counting the number of household latrines constructed does not inform latrine use in rural areas. For urban areas, measuring OD is particularly difficult in non-notified, informal settlements that rely on multi-family sanitation facilities.
- *Continue to Refine and Deploy a National-Level Household Survey:* This requires using independent monitoring teams and incorporating best practices in both interview techniques and observational data gathering.
- *Release the April-May 2015 NSSO Rapid Sample Survey Methodology and Data*
- *Re-sample ODF-certified Villages:* This will help prevent lapses in progress by informing whether behavioral change has stuck or incentives need to be revised.

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