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Untouchability, pollution,
and latrine pits

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Understanding open defecation in rural India: Untouchability, pollution, and latrine pits

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Open defecation in rural India presents a puzzle: India has far higher open defecation rates than other developing regions where people are poorer, literacy rates are lower, and water is more scarce. Because open defecation has terrible consequences for health, it is important to understand why few villagers use latrines. This paper draws on new data to present social and cultural explanations for India's uniquely high rates of open defecation. We find that beliefs, values, and norms about purity and pollution contribute to the ubiquity and social acceptability of open defecation. More importantly, the renegotiation of caste and untouchability discourages people from using the affordable pit latrines that are promoted by the WHO and subsidized by the Indian government. Because these latrines require manual pit emptying, and because rural Indians equate manual latrine pit emptying with manual scavenging and degrading forms of labour traditionally done by dalits, the vast majority of people do not want to use an affordable pit latrine. Rural Indians use latrines with expensive pits that are either emptied by machine or never emptied, or they defecate in the open.

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1 Introduction

In this journal in 2014, we asked a question that we found puzzling: why do so many people in rural India defecate in the open, when they could instead make and use inexpensive pit latrines like the ones used in other countries? (Coffey et al., 2014) India's open defecation rates are indeed surprising: despite rapid economic growth, improving literacy rates, and widespread access to improved water sources, the 2011 Census found that 70% of rural households do not have a toilet or latrine (Government of India, 2012c). In rural sub-Saharan Africa, where people are, on average, poorer, less educated, and less likely to have access to an improved water source than people in rural India, only about 35% of people defecate in the open without a toilet or latrine. In rural Bangladesh, only 5% of people defecate in the open. In rural China, 2% of people defecate in the open (UNICEF & WHO, 2012).

The puzzle of why India has such anomalously high rates of open defecation is an important one because poor sanitation is widely recognized as a cause of poor health, especially in places with high population density. Open defecation spreads bacterial, viral, and parasitic infections including diarrhea, polio, cholera and hookworm and is an important cause of child stunting (Spears, 2013; Chambers & Von Medeazza, 2013; Coffey et al., 2013; Ghosh et al., 2014) and infant death (Hathi et al., *forthcoming*). Open defecation is also a classic example of a "negative externality" in which one person's behavior hurts other people. Public economics tells us that in situations with negative externalities, government intervention is needed to either stop the externality, or reduce its harm.

To understand why India has such an exceptional rate of open defecation, we draw on four data sources: nationally representative statistics on sanitation and human development from countries around the world; new semi-structured qualitative interviews from India and the Nepali terai; quantitative survey data of 3,200 households in five states in north India; and several years of fieldwork in villages in Uttar Pradesh, Bihar, Haryana, Madhya Pradesh, Rajasthan, Gujarat, and Tamil Nadu.

We find that widespread open defecation in rural India is not attributable to relative material or educational deprivation, but rather to beliefs, values, and norms about purity, pollution, caste, and untouchability that cause people to reject affordable latrines. We find that many people consider having and using an affordable pit latrine ritually impure and polluting. Open defecation, in contrast, is seen as promoting purity and strength, particularly by men, who typically decide how money is spent in rural households.

Perhaps the most important barrier to the adoption of affordable latrines in rural India is the unique history of untouchability and its continuing practice. Affordable latrines, such as those recommended by the WHO and subsidized by the Indian government, have pits that need to be emptied manually. Rural people equate manual pit emptying with manual scavenging and other degrading forms of labour traditionally done by dalits. Because of this, non-dalits refuse to empty their own latrine pits. Dalits, who were traditionally compelled by violence and poverty to do similar work, increasingly seek alternatives to the kinds of physically and ritually dirty jobs that have been used, for generations, to justify their oppression, exclusion, and humiliation.

The paper proceeds as follows. Section 2 documents the puzzle of widespread open defecation in rural India. Section 3 introduces our data sources. In addition to elaborating on the points described above, section 4 discusses how villagers think about open defecation and considers some of the gender dimensions of open defecation. In support of our central argument that ideas about purity and pollution related to the Hindu caste system influence defecation behavior, it also draws comparisons between the latrine use of Hindus and Muslims, and considers how the minority cases of latrine construction and latrine use that do exist reflect and reinforce beliefs that perpetuate open defecation among the majority of the rural population.

Section 5 concludes the paper with a discussion of what these findings mean for public policy. For decades, Indian sanitation policy has focused on constructing pit latrines, which, if they are actually built, are unlikely to be used (Barnard et al, 2013). In practice, government programs in rural India have paid little attention to understanding why so many rural Indians defecate in the open rather than use affordable pit latrines. Future rural sanitation programs must address villagers' ideas about pollution, pit-emptying, and untouchability, and should do so in ways that accelerate progress towards social equality for dalits rather than delay it.

2 The Indian sanitation puzzle

Table 1 presents summary statistics comparing open defecation, drinking water access, GDP, poverty, and literacy in India and other developing regions and countries. The regions shown -- South Asia, sub-Saharan Africa, and Southeast Asia -- are the three poorest regions in the world. Within those regions, we show country-level summary statistics for countries that have populations of at least 100 million people.

Table 1. Comparisons of development outcomes in India & the world's 3 poorest regions

Indicator	% open defecation	% rural open defecation	% rural drinking water access	GDP/capita (US \$)
Source	JMP, 2012	JMP, 2012	JMP, 2012	World Bank, 2012
India	48.3	65.0	90.7	5,050
South Asia				
all South Asia	38.1	52.5	89.3	4,666
Pakistan	23.1	34.3	89.0	4,360
Bangladesh	4.0	5.0	84.4	2,364
sub-Saharan Africa				
all sub-Saharan Africa	24.9	34.4	52.5	3,263
Nigeria	23.0	31.5	49.1	5,291
Southeast Asia				
all Southeast Asia	12.5	17.1	84.7	9,446
Indonesia	21.9	30.7	76.4	8,855

Source	% poverty HCR (\$1.25/day)	% poverty HCR (\$2/day)	% literate among women	% literate among men
	World Bank, mult. years	World Bank, mult. years	World Bank, mult. years	World Bank, mult. Years
India	24.7	60.6	50.8	75.2
South Asia				
all South Asia	24.8	60.4	50.1	72.7
Pakistan	12.7	50.7	42.0	67.0
Bangladesh	43.3	76.5	55.1	62.5
sub-Saharan Africa				
all sub-Saharan Africa	40.7	62.7	49.0	69.1
Nigeria	62.0	82.2	41.4	61.3
Southeast Asia				
all Southeast Asia	18.1	58.2	91.0	95.1
Indonesia	16.2	43.3	90.1	95.6

Note: Open defecation, drinking water and poverty figures are individual, rather than household level estimates. Literacy figures are shown for people 15 years and older. "JMP" figures are from the WHO-Unicef Joint Monitoring Report, 2012. "World Bank" figures are from the World Bank Development Indicators, available at www.data.worldbank.org. Regional estimates are missing data for Myanmar and Somalia. Literacy rates in sub-Saharan Africa are missing data for Ethiopia, Sudan, and south Sudan. Poverty data are missing for Brunei, Singapore, Eritrea, Equatorial Guinea and south Sudan.

Table 1 shows that sub-Saharan Africa had 65% of the GDP per capita of India, but only about half of the rural open defecation. In particularly sharp contrast to India stands Bangladesh, which has less than half of the GDP per capita, and yet only 5% of rural Bangladeshis defecate in the open.

India's high rates of open defecation are also surprising in light of its literacy statistics. Table 1 shows that women's literacy in India is similar to women's literacy in other parts of South Asia and in sub-Saharan Africa, and that men's literacy is higher in India than in these other places.

Access to an improved water source is often assumed to be related to latrine use. Yet, among these regions and countries, access to improved drinking water is *high* in rural India; more than 90% of rural Indians have access to improved drinking water. One more piece of evidence that lack of water is not to blame for India's open defecation rates is the fact that many households that have piped water nevertheless defecate in the open. Kumar et al., 2015, who analyse the 2011 census, find that almost half of rural households with piped water defecate in the open.

Table 1 suggests that explanations for rural India's exceptionally high open defecation cannot rely on differences in poverty, literacy rates, or water access. What, then, can explain the difference? What

sorts of latrines allow poor households in sub-Saharan Africa, Southeast Asia and other parts of South Asia to avoid open defecation?

Because constructing sewers and sewage treatment facilities in rural areas is very costly, many rural households in other developing countries build and use simple, inexpensive pit latrines that contain feces underground. The World Health Organization (WHO) guidelines recommend using an underground soak pit with a volume of around 60 cubic feet. A latrine pit of this size is expected to fill up after approximately five years if used daily by two adults and four children (WHO, 1996). When the pit fills up, households must either construct a new pit or empty the old one.

The Indian government endorses WHO-recommended pit latrines for use in rural India (Government of India, 2007). The latrines built under the Total Sanitation Campaign, the Nirmal Bharat Abhiyan, and the Swachh Bharat Mission are pit latrines. We will discuss pit latrine technology in greater detail below. For now, we point out that rural Indian households are unlikely to use this type of latrine. India's NFHS-2005 found that only about a fifth of rural Indian households that do not defecate in the open use a pit latrine. In Bangladesh, 94% of rural households that do not defecate in the open use a pit latrine (DHS-2012), and in Nigeria, this figure is 87% (DHS-2008).

The relative absence of inexpensive pit latrines from Indian villages suggests a puzzle: why do so many people in rural India defecate in the open, rather than adopt the affordable latrines that have played a major role in eliminating open defecation and improving health in other developing countries?

3 Data

Our findings draw on three data sources:

Qualitative data. We collected 100 in-depth, semi-structured qualitative interviews in Valsad district of Gujarat, Rewari district of Haryana, Fatehpur district of Uttar Pradesh, and Parsa district of Nepal, which borders Bihar, between November, 2013 and May, 2014. The present article is the first to publish analysis of this data. Two-thirds of interviews were carried out in households in which at least one member had switched from open defecation to regular latrine use in the 10 years prior to the survey. One third of the interviews were carried out in households in which everyone defecates in the open. The interviews focused on understanding why a few households choose to own and use a latrine and most others do not. We did extensive pre-testing of the interview guide for this study in Sitapur district of Uttar Pradesh. Further details about how these data were collected and analyzed can be found in the Study Description available online at <http://riceinstitute.org/data/switching/>.

Quantitative data. Between November, 2013 and April, 2014, we led a team of surveyors who collected data on sanitation beliefs and behavior for approximately 23,000 individuals in 3,200 households in Haryana, Uttar Pradesh, Bihar, Rajasthan, and Madhya Pradesh. The resulting dataset, called the Sanitation Quality, Use, Access and Trends (SQUAT) data, allows us to separate *households'* latrine

ownership from individual *persons'* latrine use or open defecation behavior. Coffey et al., 2014 provide a detailed description of the SQUAT survey.

Additional interviews and long-term fieldwork. In addition to the formal data collection efforts described above, this paper also draws on our long-term fieldwork in Sitapur district of Uttar Pradesh (2011-2015) and fieldwork in Cuddalore and Villupurum districts of Tamil Nadu (2015-2016). Between 2014 and 2015, we also conducted interviews in Jaipur, Rajasthan; Muzaffarpur and Sheohar districts of Bihar; and Tiruvannamalai and Vellore districts of Tamil Nadu to follow-up on findings from the quantitative and qualitative studies. The follow-up interviews were primarily focused on understanding pit-emptying and the ways in which rural untouchability practices and dalit labour have changed in recent decades.

4 Understanding open defecation

In this section, we describe how rural people think about affordable latrines and open defecation. We find that the affordable latrines used in other developing countries are not only seen as physically dirty, but also ritually polluting. Further, the continuing practice and renegotiation of untouchability in Indian villages means that emptying a latrine pit, or getting it emptied by a dalit, is subjectively impossible in the first case, and a fraught undertaking in the second. In contrast -- despite the frequent assumption of urban observers that rural Indians must find open defecation embarrassing or unpleasant -- open defecation is not only socially acceptable in places where almost everyone does it, it is seen as a wholesome activity that is associated with health, strength, and masculine vigor.¹ The kind of latrines that are built in rural India, and the people who are most likely to use them, reinforce open defecation among the many poor.

4.1 Latrines & pollution

In his research on household hygiene and purity and pollution in rural Uttar Pradesh, anthropologist R.S. Khare explains that the words "dirty" and "clean" are ritual concepts as well as physical ones (Khare, 1962). Khare describes how some objects are considered both ritually polluting and physically dirty, others are physically dirty but not ritually polluting, and still others are physically clean but are nevertheless considered ritually polluting. To an outsider, who does not know the rules of ritual pollution, these concepts can be a bit confusing. But as M.N. Srinivas points out in *The Remembered Village*, village children learn what --- and who --- is polluting from a very early age. Rules of purity and pollution are widely understood to influence how people behave and how they interact with others.

Some of the people we interviewed see latrines as polluting in a ritual sense, no matter how physically clean they are kept. One such young man, a brahmin from Haryana, misappropriates the germ theory of disease in explaining why he would not want to have a latrine at home:

If a latrine is in the house, there will be bad smells, germs will grow. Latrines in the house are like...hell. The environment becomes completely polluted. There is no benefit of lighting [religious candles and lamps], no benefit at all.

When he refers to “bad smells,” this young man is referring at least as much to ritual distaste as to physical distaste; latrines in rural India presumably smell no worse, on average, than in the many other countries where they are used. Instead, respondents frequently invoked “bad smells” as an ostensibly secular, but nevertheless unmistakable, reference to ritual pollution.ⁱⁱ

As this quotation illustrates, distaste for latrines has to do with the importance of maintaining purity in the home. When people talk about defecating in the open, they stress that it is good to walk far from home before defecating. Those households that build latrines often build them far from the house. A middle aged Gujarati man from a mid-ranking Hindu caste explains:

[A latrine] should be 25-30 feet away from the kitchen. In cities, [people] eat and shit in the same place. In our village, people don't live like that, we keep these things separate, and that's a good thing. It's filthy, no?

At first, villagers' apparent concern for the presence of feces in the home or near the kitchen seems confusing in light of fact that we observe many households in which the elderly, the handicapped, and small children defecate on the ground within the home or the compound. These feces are later disposed of outside, often by women. Most of these households could afford to build a simple pit latrine. However, disdain for latrines, together with the acceptance of the occasional need for someone to defecate in or near the private, sacred space of the home, is reminiscent of research on pollution and purity from South India that finds that people are very concerned about the *accumulation* of trash inside their homes. Based on her research in Kottar, in Tamil Nadu, sociologist Damarias Lüthi writes, “waste should not be stored anywhere inside, [so] there are no waste bins, and rubbish is simply dropped on the floor to be swept later” (Lüthi, 2010). People in villages may be similarly concerned about the accumulation, rather than the mere presence, of feces near their homes.

4.2 Villagers reject affordable pit latrines

Although some villagers, particularly upper caste Hindus, find latrines of any sort distasteful, most people feel that expensive latrines with large pits or cemented underground tanks are not polluting, but rather are a natural addition to a wealthy person's home. In contrast, latrines with smaller soak pits, such as those provided by the government, are almost uniformly viewed with disdain.

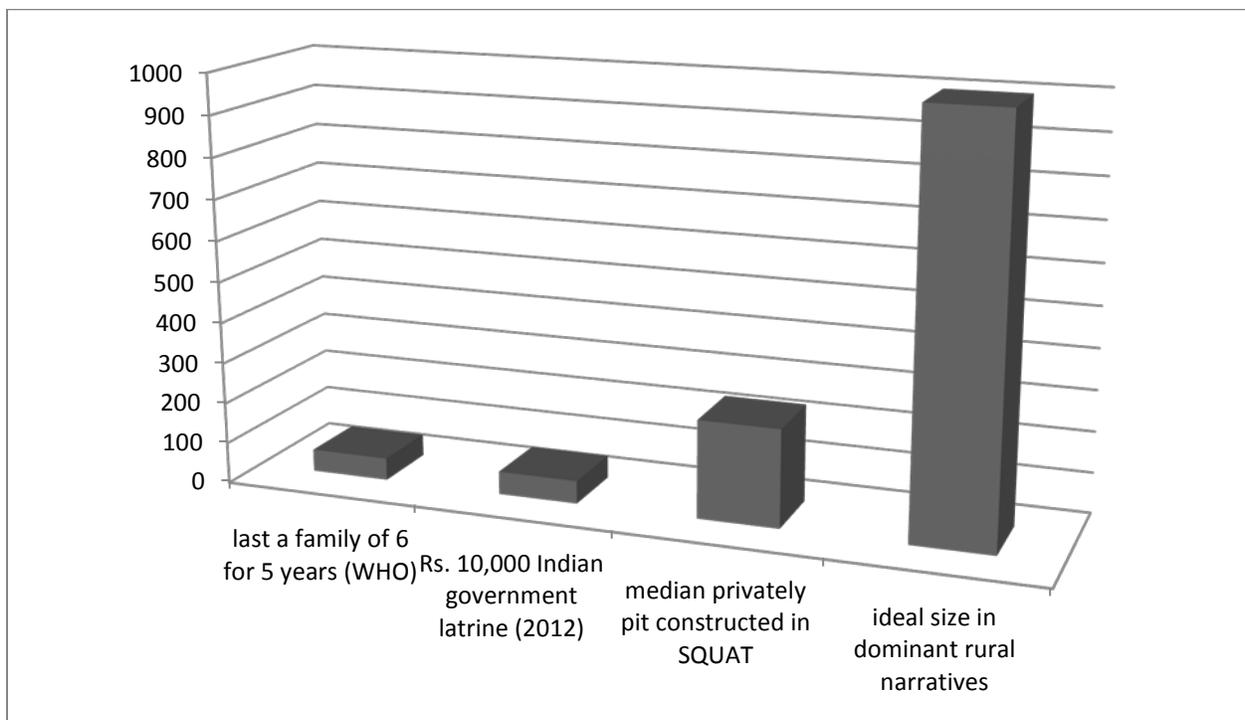
Almost all of the households that we interviewed had some exposure to affordable pit latrines because of the government's long-running latrine construction programs. Of the 78 Indian families we interviewed in the formal qualitative data set, 18, or about a quarter of them, had been recipients of government latrines, although of these only 8 families had at least one member who was using the government latrine regularly.ⁱⁱⁱ Others had seen or heard about government latrines from relatives and neighbors. One respondent had worked as a mason constructing government latrines.

The latrines that are promoted and built by the Indian government are expensive by the standards of other developing countries. While the Swacch Bharat Mission subsidizes latrines at Rs. 12,000, a Bangladeshi pit latrine costs only about Rs. 3000. Despite this, people refer to Indian government latrines as “temporary,” “fake,” or “*kaccha*.” Very often, people who receive government latrines do not use them for defecation at all; they may repurpose the materials or use the latrine superstructure to bathe or wash clothes.

In addition to believing that using a government latrine will pollute their homes, people reject these latrines because of concerns about pit emptying. We first started to understand the role of pit emptying in explaining rural India’s high open defecation rates by looking at how privately constructed latrine pits differ from the pits recommended by the WHO and the Indian government. In both the SQUAT survey and the qualitative interviews, we asked respondents about the kinds of latrines that they find acceptable and the kinds which they aspire to own.

Figure 1 shows the size of pits recommended by the WHO (WHO, 1996), those recommended by the Indian government in its 2012 guidelines (Government of India, 2012b), and the median pit size among latrines owned by households interviewed for the SQUAT survey. In the SQUAT survey, among latrines that were being used by at least one member of the household, fewer than 4% had pits that were 60 cubic feet or less. The median pit size of a latrine that is being used by at least one household member is 250 cubic feet.

Figure 1. Latrine pit volume



Villagers’ demand for large latrine pits means that the cost of a privately constructed latrine in rural India is much higher than the cost of a latrine in other developing countries. Men who answered the

SQUAT survey reported that a minimally acceptable latrine costs, on average, Rs. 21,000 (Coffey et al, 2014). This “minimally acceptable” latrine is not the one to which most people in rural India aspire. Most people want pits that are even larger than 250 cubic feet. Figure 1 also plots the size of a “10 by 10 by 10” pit, the ideal pit size described by many of the respondents to the qualitative interviews. When we asked people why they preferred such absurdly large pits, they answered that such a pit would not fill up within their lifetimes.

On the few occasions that we did encounter privately constructed latrines with pits similar to those recommended by the government or the WHO, they were built by poor families with a disabled member or by Muslim households. Hindus who owned pit latrines saw them as shameful objects. On one occasion, an upper caste Hindu household would not admit that the simple latrine they had built for their son, who had polio and could not walk, was indeed a latrine. On another occasion, an elderly Hindu man refused to show us his latrine; later, when he was no longer present, his grandson explained that he was ashamed of how simple it was. In fact, it was a serviceable and hygienic latrine that met WHO and government standards.

Most people wrongly believe that government-provided soak pits will fill up in a matter of months, rather than years, and will require frequent emptying. Mechanical emptying of these pits is impractical because the pit is designed for water to seep out and for feces to become compacted. A sewage truck operator explained that if he wanted to use a mechanical pump to empty a soak pit, he would need to put water into the pit to suck out the sewage. This would be messy and would cause him to interact more closely with feces than if he were sucking the sewage from a cemented tank. Further, affordable latrines are often built in places that are difficult for sewage trucks to access. Finally, it is quite expensive to hire sewage trucks, which now almost exclusively operate in towns and cities, to suck small quantities of sludge from village latrine pits. For these reasons, soak pits around the world are emptied by hand.

Emptying pits by hand is an unpleasant job that can be hazardous to health if emptying is done before the feces decompose. The Indian government and the WHO recommend that a pit be left unused for six months to decompose. Decomposed feces are safer to handle than fresh sludge: they do not transmit bacterial and viral infections. Under the law, hiring someone to empty a decomposed pit is not considered manual scavenging. The need to allow pits to decompose before emptying means that each latrine needs two pits.^{iv}

Although, on paper, the Indian government claims to have been promoting twin-pit systems for decades, very few villagers use this technology. Only 2.5% of in-use latrines observed by the SQUAT survey had two pits. Further, when we asked people about whether they would be willing to use twin pits, most were unfamiliar with this technology. When we explained that decomposed feces are biologically safer to handle than fresh sludge, the vast majority of people said that this would not address their concerns about pit emptying. Over and over, people asked us, “who will empty the pit?”

4.3 Pit emptying & untouchability

Why do rural Indians perceive manual pit emptying to be an insurmountable problem, when it is done as a matter of course in other countries? The answer, in a word, is untouchability. Due to the history and continuing practice of untouchability in villages, manual pit emptying presents special challenges in rural India that are not present in other societies.

In rural India, dalits have traditionally been compelled to do dirty, degrading tasks for higher caste households, often in exchange for very little compensation. Manually cleaning human feces is considered to be the most degrading of these tasks; this is assigned to the lowest among dalit castes. For generations, and still today, the fact that dalits perform “dirty” work has been used as evidence of their permanent ritual pollution, and to justify excluding them from schools, public water sources, and more dignified employment. Along with economic exploitation and social exclusion, dalits have often suffered humiliation and violence at the hands of their upper caste neighbors (Valmiki, 2003; Ambedkar, 1944).

Thankfully, the exploitation, exclusion, and humiliation of dalits are slowly being challenged in rural India. The exclusion of dalits from public places and water sources is less common than it once was. Unfortunately, though, there are still many ways in which other castes discriminate against dalits. It is still common for upper castes to refuse to eat food or take water offered by dalits and for dalits to be excluded from temples (Shah et al., 2006).

An important part of dalits’ ongoing struggle for equality and dignity has been abandoning work that is seen as dirty or degrading. Although no survey that we know of would allow us to measure precisely the decline in dalits performing untouchable work, both dalits and non-dalits report in qualitative interviews that very few dalits are willing to empty others’ latrine pits. As an NGO employee who wanted to encourage latrine use by offering pit emptying services in rural Bihar explained to us, “for [people who empty latrine pits] it is like this: if you earn well, but you can’t go to a restaurant, and you can’t go to a temple, then what is the use?”

In many places, presumably because demand for latrine pit emptying so far exceeds the supply of workers who are willing to do it, getting a pit emptied is expensive. People in remote villages in Bihar told us that it would cost 700-1,000 rupees to get a small pit emptied. A family in a village outside Lucknow told us that they paid a dalit from the city over 5,000 rupees to empty a large pit. Considering that the day wage for labour does not exceed 200 rupees, and that emptying a pit does not take more than a few hours, the cost of pit emptying is very high.

We suspect that this expense is not the primary reason that non-dalits hesitate to build the kinds of latrine pits that, they feel, can only be emptied by a dalit. Some people are uncomfortable with the practices of the past (though not so uncomfortable as to be willing to empty a pit themselves) and therefore uncomfortable asking a dalit to do this work. Others, who may not appreciate recent social progress, bristle at the idea of having to pay so much for dalit labour.

4.4 Open defecation, women, and the people who want latrines

The media and government officials often claim that open defecation makes women vulnerable to sexual assault. Urbanites surmise that if women had more decision-making power, many more households in rural India would build latrines. Our research suggests that neither of these statements is true, and our experience suggests that they distract policy makers from the caste-based social divisions that prevent the adoption of affordable latrines.^v

Of 1,046 women interviewed by the SQUAT survey, 4.3% told us that while going to defecate, they had been the victim of someone attempting to molest them. Of the same group, 7.6% reported that this had happened to them while going to the market. The point is not that these events are necessarily comparable, or that these statistics have captured the full extent of violence against women that occurs outside their homes. The point is that it is not a serious policy response to these facts to suggest that women should stop going to markets. Ending sexual violence, ending open defecation, and ensuring social access to markets for everyone are all important goals, but they will not be resolved by the same public policy or program.

Nor is it the case that if women had decision making power they would necessarily choose to build latrines. Although it is true that latrines may benefit women more than men because they are expected to clean up the feces of ailing relatives and small children, women reject affordable latrines for the same reasons that men do: they, too, are concerned about ritual pollution and pit-emptying. Further, it is no surprise, considering the restrictions on rural women's freedom of movement, that many women express positive attitudes toward open defecation. A young daughter-in-law in Haryana, whose household owns a latrine, explained that: "The reason that [I and my sisters-in-law] go outside [to defecate] is that we get to wander a bit...you know, we live cooped up inside."

In our fieldwork, we have encountered government slogans, painted on walls or displayed on posters in government offices, that promote latrine use by pointing out the apparent contradiction between practices that enforce women's modesty and open defecation. For instance, a common slogan in Uttar Pradesh is "Daughters-in-law and daughters should not go outside, make a toilet in your house."

We find these efforts to persuade men to build latrines by appealing to restrictive gender norms problematic for two reasons. First, these gender norms are stifling for women and constitute an important constraint on human development in rural India. Indeed, discrimination against women and limitations on their mobility and decision making power are widely understood to contribute to poor child health (Coffey et al., 2014). The government should attempt to dismantle, not reinforce, such norms. Second, these messages give villagers the impression that latrine use is for women, but the message that the government should be sending is that latrine use is for *everyone*. Men's feces as well as women's feces spread germs that make other people sick.

Finally, the emphasis on women's dignity in sanitation policy-making not only ignores complicated problems about women's agency and mobility, it also distracts from the needs of a group of people who would truly benefit if their households owned latrines the elderly and the disabled. Unlike for their healthier, more mobile family members, open defecation is a painful experience for people who have

trouble walking. For the old and disabled, defecating in the open is burdensome, and its alternative --- defecating on the ground in the house or courtyard, as small children do --- is humiliating. The fact that purity and pollution rules, and the renegotiation of untouchability, have made affordable latrines socially unacceptable objects means that many elderly and disabled people suffer needlessly.

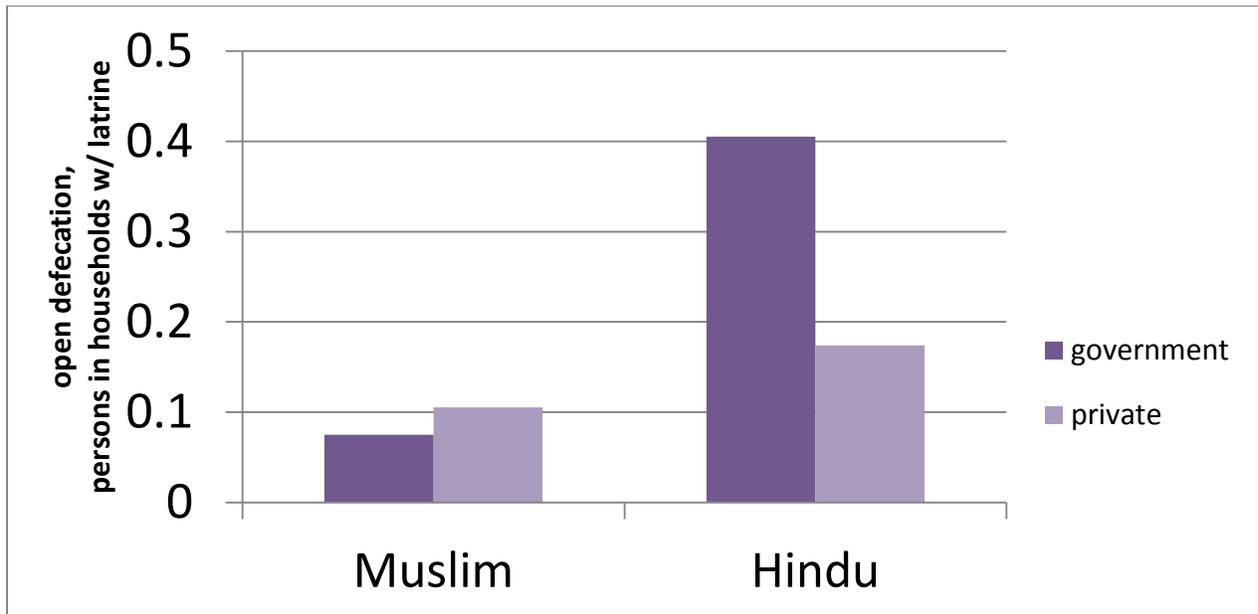
4.5 Hindus and Muslims

If ideas about pollution and untouchability that have their origins in the Hindu caste system importantly influence defecation behavior in rural India, we might expect to find differences in latrine ownership and use between Hindus and Muslims. Indeed, India's 2005 NFHS finds that rural Muslim households are 19 percentage points less likely to defecate in the open than rural Hindu households, despite the fact that they are poorer on average (Geruso & Spears, 2015). Rural Muslims are not only more likely than rural Hindus to own latrines, they are also more likely to own affordable latrines. Only 4% of rural Hindu households used inexpensive pit latrines, compared to 15% of rural Muslim households. If Hindus construe the presence of simple pit latrines to be polluting, and if, as Jeffrey (1997) and Ali (2002) suggest, Muslims often practice purity and pollution differently than Hindus, it makes sense that rural Indian Muslims would be more likely to construct simple, inexpensive pit latrines.

Data from the SQUAT survey show that Muslims are also more likely to use the latrines that they own. Figure 3 uses SQUAT survey data to show the fraction of people who regularly defecate in the open, despite owning a latrine. In other words, the figure only includes people who live in households that own a latrine. We break up these results into four groups: Muslims who own privately constructed latrines, Muslims who own government provided latrines, Hindus who own privately constructed latrines, and Hindus who own government latrines.^{vi}

For both government and privately constructed latrines, Muslims are less likely to defecate in the open, conditional on latrine ownership, than Hindus. Further, there is a large gap between the fraction of Hindus who use a privately constructed latrine, and the fraction who use a government constructed latrine; this gap is not present for Muslims. This figure is consistent with a story in which Hindus are more concerned about pit emptying than Muslims.

Figure 2. Latrine use among people in households with latrines, by religion and latrine



Note. Latrine use, among latrine owners, computed using SQUAT survey data.

It is important to note, however, that many of the Muslims we interviewed expressed the view that latrines were polluting, as well as concerns about pit emptying. In many parts of rural India, there are untouchable castes among Muslims just as there are among Hindus. Indeed, relative to Muslims in other parts of the developing world, NFHS data show that Muslims in rural India are relatively unlikely to build and use latrines. We suspect that the differences in open defecation rates between rural Muslims in India and in other parts of the world reflect the fact that rural Indian Muslims live amongst a Hindu majority for whom open defecation is normative, and for whom affordable latrines are counternormative.

4.6 Existing latrines reinforce open defecation among the majority

We have shown why rural Indians reject the affordable pit latrines that are used to reduce open defecation and improve the disease environment in other parts of the developing world. Because people want to avoid pit-emptying, those who build their own latrines construct cemented tanks, which can be emptied mechanically, or very large underground pits, which are not emptied. The desire to avoid manual pit emptying makes the latrines that are socially acceptable in rural India very expensive. These expensive latrines, and the ways in which they are used by the households that own them, ultimately reinforce the practice of open defecation among the many rural poor.

Although some conservative rural Hindus find latrines of any sort distasteful, most people feel that an expensive latrine with a very large pit or cemented tank is not polluting, but is instead a useful asset. Awareness that some rich, often high-caste, households own expensive latrines influences how poor people interpret their own sanitation options. A dalit woman who we interviewed in Uttar Pradesh received a usable soak pit latrine from the government; her two small children use it regularly. The

latrine was clearly convenient for her: she did not have to worry about her young children walking far from the house, and she did not have to clean up their feces. Yet, she said that she had not wanted to accept the latrine; she only did so because the village leader had given her no choice. She said that the children would stop using the latrine when they were old enough to defecate in the open unaccompanied. Despite the fact that latrine was functional and convenient, she viewed it with contempt and shame. She explains why:

The pradhan made this [latrine]. If we'd made it, we'd have made it the way we wanted. All of this Indira Vikas money has come, so the pradhan has made it. But he only got a very little pit dug. If we made it the way we wanted, then wouldn't we have used a whole room full of bricks? How can a poor man...? It costs 20 or 25 thousand rupees to [make a latrine].

The “room full of bricks” to which the woman refers, and which she could not afford, is the pit. She, and many other respondents, liken the investment that would be needed to build an acceptable latrine pit to the investment that would be needed to build an extra room for a house. What she received instead was a physical reminder of the inferior position historically assigned to dalits, especially in matters of sanitation. The expense required to make a latrine with a large pit, together with the social acceptability of open defecation, imply that it makes little sense for poor people to construct and use latrines.

5 Discussion: Rural sanitation policy must address untouchability

Despite the importance of sanitation for health and human development, relatively little attention has been paid to explaining why rates of open defecation in rural India are so high compared to other developing countries. Using new data from multiple states, we found that the affordable soak pit latrines that are used to reduce disease transmission in other developing countries are seen as ritually polluting and socially undesirable. India's history of caste-based oppression and dalits' present-day struggles for equality mean that latrine pit emptying poses special challenges that are not similarly present in other societies. We also found that the latrines that the wealthiest villagers build for themselves are very expensive and have cemented tanks or large pits that allow their owners to avoid manual emptying. All of these reasons, combined with a world view in which open defecation is healthy and enjoyable, and latrine use is for the weak and vulnerable, prevent the many poor from building latrines.

This now constitutes an answer to the puzzle that we reported from the SQUAT data in this journal in 2014. At the time, we asked what could explain a “revealed preference for open defecation,” using economists' technical language that emphasized that many people in rural India defecate in the open even though they have the option to use, buy, or make a latrine. These qualitative interviews and other subsequent research have taught us that a more complete description is a “revealed preference for open defecation, *when the alternative is a subjectively small latrine pit, entangled in the norms of purity and pollution and the scars of caste and untouchability.*”

Economic growth may eventually allow more rural households to slowly switch from open defecation to septic tanks or large pits in the next several decades. In the meantime, however, open defecation poses a major threat to health in rural India, and particularly to the health and human capital accumulation of

children. Indeed, open defecation is so costly in the economic sense that Lawson and Spears (2016) compute that the Government of India could spend even more per household than it plans to spend on latrine construction under the Swacch Bharat Mission and *still* see a net increase in the government budget, due to future increases in human capital and tax revenues resulting from a healthier population --- provided, of course, that such a scheme actually resulted in people switching from open defecation to latrine use. There are many reasons for the government to try to convince people to stop defecating in the open in the decades between now and when they would otherwise build latrines for themselves.^{vii}

However, prior and present rural sanitation programs have unfortunately paid little attention to the reasons why villagers reject affordable pit latrines (Spears, 2012). The government provides pit latrines without any thought to how they will be emptied, or what the social consequences will be. As a start, the government must begin to connect rural sanitation policy with efforts to eliminate manual scavenging. Employing a “manual scavenger,” someone who cleans human feces by hand, was made illegal under the *Prohibition of Employment as Manual Scavengers and their Rehabilitation Act* in some states in 1993, and in all states in 2013. The Act specifies that hiring someone to empty fresh sludge from a latrine pit constitutes manual-scavenging.

An interview that we did with a brahmin *anganwadi* worker in Bihar illustrates the ways in which sanitation policy fails to match the realities of village life. In addition to running the early childhood program, the *anganwadi* worker is supposed to promote latrine use in her village. She told us that her family received a single-pit latrine from the government many years ago, which she uses daily. After several years, the pit needed to be emptied. We asked: how was it emptied? At this point, the woman became quite uncomfortable. As a government employee, she recognized that part of her role is to represent the sanctioned messages of the government, which includes official condemnation of manual scavenging. So, she first claimed that she had hired a vacuum truck from a nearby town. When we pointed out that it would be impractical to empty a soak pit with a vacuum truck, she recanted, and admitted to having hired a manual scavenger.

What would a senior sanitation bureaucrat say the *anganwadi* worker should have done? The solution he would offer is that she should have built a twin-pit latrine and let the contents of the first pit decompose: hiring someone to empty a *decomposed* latrine pit is excluded from the definition of manual scavenging. This “sanitized” solution is technically feasible, but it is also deeply impractical. It does not account for the vast majority of existing and under-construction pit latrines that do not or will not have two pits. More importantly, it does not address the social consequences of pit emptying.

A good way to start addressing these social consequences would be for the government to begin publicizing and enforcing the anti-Manual Scavenging Act, which has simply not been done in any meaningful way to date. Despite the fact that 800,000 households reported using dry latrines in the 2011 census, not a single person has been convicted for hiring a manual scavenger since the law took effect (Hindu, 2013). In many cases, municipalities and government agencies such as the Indian Railways flout the law by hiring dalits to do dangerous and demeaning work, like unblocking sewers, de-sludging drains, and cleaning feces from railway tracks. Clearly, much needs to be done even within the

government before we can expect villagers to know which forms of cleaning work the government has deemed illegal.

Even if the government were, unexpectedly, to launch a campaign to teach villagers about the benefits of twin-pit latrines, and to clarify that emptying a twin-pit does not constitute manual scavenging under the law, it is not clear that this would diminish people's resistance to affordable pit latrines. Although we certainly think such a campaign is a good idea, the problem is not primarily one of lack of information about toilet technology, the biological processes that make decomposed feces safer to handle than fresh sludge, or the relevant legal distinctions. The problem is primarily a social one. Non-dalits claim that if they were to empty latrine pits, even decomposed ones, they would become ritually polluted and be socially ostracized. What they do not say is that avoiding dirty work, and compelling dalits to do it for them, has been an integral part of asserting their power and social rank for generations (Teltumbde, 2014).

Perhaps the best outcome in the story of the *anganwadi* worker would have been for her to empty her own, decomposed, latrine pit -- in full view of her neighbors. Such an act would have clear benefits, both for the health of children, and for the annihilation of caste. Both Ambedkar and Gandhi advocated that upper caste people do their own dirty work as a step towards dismantling the caste system; rural sanitation policy would do well to spread their message.

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ⁱ We omit further discussion of the perceived benefits of open defecation from this article because we reported survey data on this issue in Coffey et al. (2014).

ⁱⁱ Dalits and Muslims are less likely to refer specifically to ritual pollution but not physical pollution, perhaps because language about ritual pollution is often used in reference to their own bodies. However, dalits and Muslims often share with upper caste Hindus the views about affordable latrines that we describe here.

ⁱⁱⁱ Among these, 6 had invested their own money to increase the size of the pit. In the 2 households that had not invested additional money, the latrine was used by only one or two members of the family.

^{iv} We do not mean to imply that just because twin-pit works when used properly means that fecal sludge from pit latrines is always managed well. However, international data show that even imperfect management of fecal sludge reduces children's exposure to fecal germs relative to open defecation.

^v Government sanitation program guidelines invoke women's dignity as a reason to build latrines, but make no mention of untouchability (Government of India, 2012a, 2014).

^{vi} We only include latrines that at least one person is using among "owned" latrines.

^{vii} Government promotion of community latrines is a strategy for reducing open defecation that would take the burden of pit emptying away from individual households. Although more research and experimentation should be done about community latrines, we caution policy makers that many villagers are opposed to sharing latrines with people outside their immediate families. Further, we have visited many defunct government-sponsored community latrines across rural India. They were abandoned because there is little demand for their use and because managing them is fraught with similar caste issues to the ones we describe here.

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