



Demand for household sanitation: The case of India



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Abstract

Worldwide, India has the highest number of people defecating in the open. In an attempt to reduce number of open defecation, a supply side initiative is underway. In 2014-2015, Government of India, constructed 8 million toilets. However, an important aspect for this supply-side initiative to become successful is to create demand for toilets. In this paper we look at household demand for toilets, and study the factors leading to open defecation. Using Demographic and Health Survey data we create a wealth index, and use it to rank household preference for toilets vis-à-vis 20 other different consumer durables. Our results suggest, among lists of household items that any individual want to have, toilets get a lower preference – ranked 12, out of 21. Additionally, we examine preference structure for using toilets among residents from various federal states in India. We find residents of North-Eastern states are more likely to use toilets. We further investigate factors leading to toilet usage among households. Results indicate a strong case for imparting education and public awareness, especially, among the female cohort.

Keywords: India, Sanitation, Toilets, Preference Structure, Logit, NFHS-3

JEL classification: C01, I18, O11

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1. Introduction

On October 2, 2014 Indian Prime Minister Mr. Narendra Modi launched the *Swachh Bharat* (Clean India) mission, aimed at creating a 'Clean India' over the next five years. The launch of the mission comes in answer to the rising perception about Indian cities not being clean. This, unfortunately, is also true to a certain extent. A number of people in rural areas still do not have access to toilets. Each day, about 100,000 tons of human faeces are found in the open (UNICEF, 2015). Certain schools in rural areas do not have access to toilets. Over 40 per cent of government schools in India do not have a functioning toilet (UNICEF, 2015). According to Census 2011, only 32.70 per cent of rural households have access to toilets. Worldwide, India has the highest number of people defecating in the open, at 597 million (WHO, 2014). In 2012, average concentration of open defecator per square kilometre area was highest in India, more than double than the world average (Coffey et al., 2014).

The *Swachh Bharat* mission is a supply-side initiative that plans to build 110 million toilets across India between 2014 and 2019. The underlying presumption is India has a large number of poor populations who cannot afford to construct a toilet, and therefore the need for government intervention. However, the social returns in terms of better health outcome will be higher provided people start using these toilets, and stop defecating in the open.

The success of government initiative would then depend upon influencing demand for toilets. This paper addresses this important aspect. As far as the authors are aware this is the first quantifiable attempt to look into household characteristics influencing his/her decision to use toilets. In fact, we rank in terms of household preference, the demand for toilets vis-à-vis 20 other consumer durables such as cot, watch, mattress, chair, bicycle, table, electric fan, television, pressure cooker, radio, motorcycle, water pump, mobile telephone, sewing machine, refrigerator, tractor, animal drawn cart, thresher, and computer.

Moreover, India is culturally diverse, and provides a natural setting to observe variation in terms of preference for toilet usage against the aforementioned 20 other consumer durables. Ergo, we examine preference structure for using toilets among residents from various states in India. We estimate the likelihood of having a toilet in a household conditional on wealth index, standard of living, household demographic characteristics, and broader cultural and religious factors.

This study takes advantage of the first large dataset – Demographic and Health Survey (DHS) data collected in 2005-2006. The Indian version of the DHS data, that is, the third round of the National Family and Health Survey (NFHS-3) data contains information about

use of toilets by various household characteristics, namely, gender, religion, area, and geography.

Our results suggest among lists of household items that any individual want to have toilets get a lower preference – ranked 12, out of 21. Results also suggest a strong case for imparting education and public awareness, especially, among the female cohort. A household in which a woman has attained *higher* education (18 years of schooling) is 3.1 times more likely to use a toilet. Area-wise, households living in urban areas are 19 times more likely to use toilet in comparison to their rural counterparts. Person with a particular religious background and culturally ingrained to certain religion are less likely to use toilet. *Hindu* (religion) households are less likely to use toilets.

The rest of the article is organized as follows. Section 2 discusses the literature survey. In Section 3 we describe the data. In Section 4 we state our empirical model. Section 5 discusses results from our analysis. Section 6 concludes with relevant policy implications.

2. Related literature

Throughout the world, poor sanitation is one of the leading risk factors for infant mortality. World Health Organization defines basic sanitation as the 'lowest-cost technology ensuring hygienic excreta and sullage disposal and a clean and healthful living environment both at home and in the neighbourhood of users' (UNICEF, 2015). Faeces contain germs that, when released into the environment, make their way onto children's fingers and feet, into their food and water, and wherever flies take them. Exposure to these germs may cause diarrhoea, and in the long term, also can cause changes in the tissues of their intestines that prevent the absorption and use of nutrients in food (Checkley et al., 2008). Every 15 seconds a child dies of a preventable disease relating to contaminated water, sanitation and hygiene (UNICEF, 2015). Recent evidence from Bangladesh and India suggest children exposed to worse sanitation environment are likely to have a stunted growth and are likely to develop enteropathy (Lin et al., 2013; Spears, 2012). George (2008) estimate for each dollar spent on sanitation it is likely to yield a return of \$7 to an individual, as he is less likely to remain absent from work (that is, remain productive) or visit a doctor. Working with district-level income data from India, Banerjee and Banik (2014), show closed drainage system has the maximum impact on income – for 1 per cent increase in a closed drainage system, the income increases between 0.96 per cent and 2.58 per cent. Given its importance in affecting income and development outcomes, 'Clean India' campaign is certainly commendable.

However, this is not the first time that the government started sanitation and hygiene interventions. In 1986, government launched Central Rural Sanitation Programme (CRSP), giving incentives in the form of full or partial funding to households for building toilets. However, this supply-driven programme met with a limited success. Banerjee and Mandal (2011) show between 1981 and 2001, average yearly expansion of toilet was a meagre 1 per cent. The cost of the setting up toilet was often unaffordable for a number of households, especially in rural areas. As economic agents such as firms and non-profit organizations (NPOs) were not involved, there was lack of awareness and generation of demand for sanitary facilities.

Keeping in view these shortcomings, the CRSP was improved. In 1999, CRSP inculcate a demand driven approach. Launched in 1999, and titled 'Total Sanitation Campaign (TSC),' the programme emphasized more on information, education and communication (IEC), human resource development, and capacity development activities, to increase awareness about better sanitation among rural people. Subsequently, in 2003, the government also launched *Nirmal Gram Yojana* (Clean Village Campaign), providing monetary incentives to *Gram Panchayats* (political subdivisions comprising multiple small villages), NPOs, and economic agents, assisting toilet coverage in villages. Unfortunately, this effort also met with limited success. Reports indicate over 40 per cent of the funds under TSC, especially those allocated under IEC remained unused, and government subsidies were often unavailable to households which required it the most (Shah et al., 2013).

Studies have examined the reasons behind limited success of TSC. Ramani (2008) attribute it to market failure. To a poor person, especially, individuals who are at the Bottom of the Pyramid (BOP), the opportunity cost of constructing a toilet is high. The term BOP is coined by Prahalad (2005) as individuals who survive on less than \$2 a day. There are no short-term benefits, as the poor care less about long-term health impact of sanitation. From the supply-side, construction of toilets are undertaken by NPOs which are particularly driven by their

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