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The Consequences of Open Defecation in India

The consequences of open defecation (OD) in India are devastating. Despite rapid growth and rising incomes over the past 25 years, India continues to have one of the highest incidences of OD in the world, in sharp contrast to other growing economies. This has contributed to the extraordinarily high rates of stunting and wasting among children. Nearly 40 per cent of children suffer from stunting, and one of every two is malnourished. Why is this problem so intractable?

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Introduction

Despite rising incomes and improvements in accessibility to food, why are children in India among the most malnourished and undernourished among their cohorts across the world? The

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incidence of stunting² (child is too short for its age) and wasting³ (child weighs too little for its age)⁴ in India are amongst the highest in the world.

The obvious reason is poverty. While poverty remains a cause, the prevalence of malnutrition exemplified by wasting and stunting is far higher than countries at comparable levels of development in Africa and Asia. In India, 38.7 per cent of children are stunted, while 15.1 per cent suffer from wasting.⁵ Sixty five million children, including a quarter of those from the richest 20 per cent of households,⁶ suffer from stunting.

Per capita income in India has nearly quadrupled since liberalisation in 1991, yet child malnutrition and undernutrition remain pervasive, and their prevalence remains seemingly immune to economic growth. A child growing up in India is far more likely to be malnourished than its cohorts in Niger, Madagascar or Malawi.⁷ Although improvements have been registered, the infant mortality rate has not declined to the extent expected in a rapidly growing economy.⁸ The United Nations Children's Fund (UNICEF) estimates⁹ on child mortality indicate that nearly one-quarter of deaths occur in India.

Research shows that the single main cause of malnutrition is open defecation (OD).¹⁰ The incidence of OD in India is among the highest in the world (Figure 1, Table 1). Of the one billion people in the world who do not have access to toilets and defecate outdoors, 620 million (50 per cent of the population) are in India. One hundred and thirty million households do not have toilets. Over 70 per cent of people in rural areas relieve themselves outdoors. Although this share has declined over the past decade, rapid population growth has resulted in more people than ever before being exposed to faecal waste and contamination.

² "Stunting occurs before the age of two. The irreversible effects are caused by sustained nutrient deficiencies and frequent infections. The effects include impaired cognitive functioning, delayed motor development and poor performance in school." UNICEF (2007). "Progress for Children – A world Fit for Children: Statistical Survey". https://www.unicef.org/progressforchildren/2007n6/index_41505.htm.

³ "Wasting, a strong predictor of mortality among children below 5 is due to acute food shortage and disease." Ibid.

⁴ Ibid.

⁵ Data from "Rapid Survey of Children (RSOC) National Report 2013-14. (2014). Ministry of Women and Child Development, Government of India and UNICEF.

⁶ "Socioeconomic Inequalities in Childhood Undernutrition in India: Analyzing Trends between 1992 and 2005", Malavika A Subramanyam, Ichiro Kawachi, Lisa F Berkman, S V Subramanian. PLOS One June 2010.

⁷ "India Health Report on Nutrition 2015", PHFI, IFPRI, Transform Nutrition and UK Aid.

⁸ "State of the World's Children, 2016, UNICEF, New York.

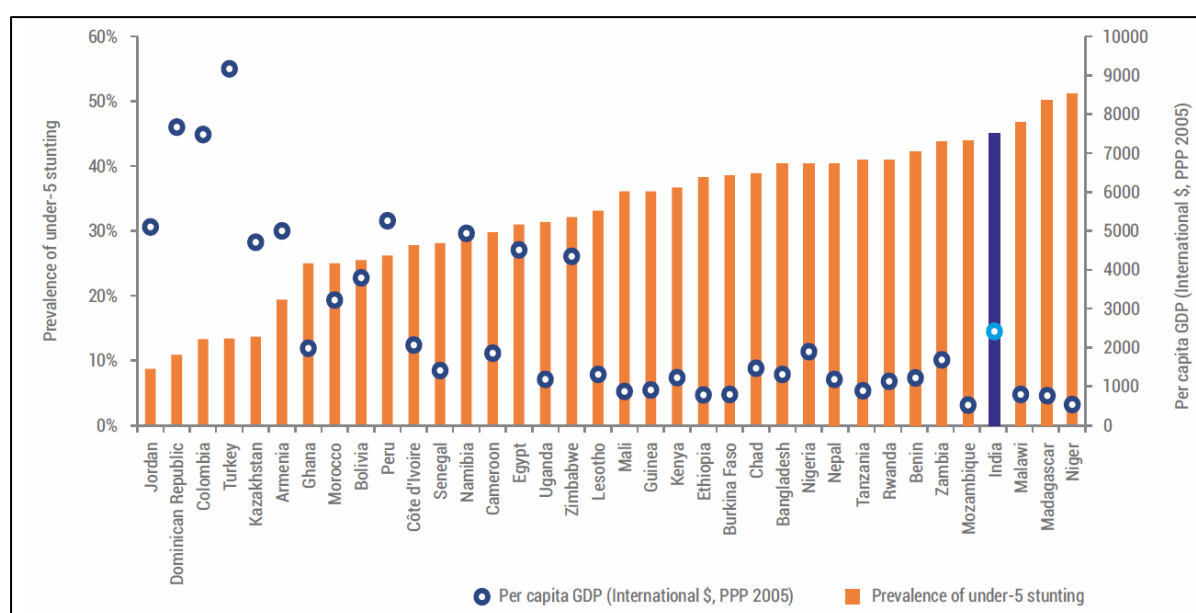
⁹ https://www.unicef.org/media/media_68359.html Accessed on 30 June 2017.

¹⁰ "Flagship Report: The Economic Impacts of Inadequate Sanitation in India," (2011). The World Bank.

The ambitious Swachh Bharat Abhiyaan (Clean India Programme) was launched by the Indian Prime Minister in 2014. It aims to eradicate OD by October 2019, a target that seems quite distant. However the programme has brought the issue of OD to the forefront and signals a greater commitment on the part of the government.

The problems with adequate sanitation are a global challenge. The Millennium Development Goal (MDG) of halving the number of people worldwide lacking access to improved sanitation¹¹ has been missed by 700 million. While there have been rapid improvements in Central, East and Western Asia, the Caucasus and Northern Africa, South Asia accounts for an overwhelming majority of people lagging behind. It is widely acknowledged that improvements in the water supply would result in a substantial fall in child mortality in the region.

Figure 1: Per Capita Income and Prevalence of Under-5 Stunting



Source: Table extracted from “India Health Report on Nutrition 2015” PHFI, IFPRI, Transform Nutrition and UK Aid.

Why is OD such an Intractable Problem?

India’s high OD rates is a puzzle for social scientists and policymakers – is higher than in countries that are poorer, have lower literacy rates, lower access to nutrition and to water. For

¹¹ “UN MDG, We can end Poverty”, <http://www.un.org/millenniumgoals/enviro.html>. Accessed on 9 July 2017.

long, this has been attributed to the deeply-embedded cultural practices of purity, pollution and untouchability that have roots in the caste system. Traditionally, the presence of faecal matter within the physical confines of the home, even if confined to a toilet, is deemed to ‘pollute’ the home. An ‘impure or polluted’ home cannot carry out everyday rituals. As a result of such beliefs, defecation in the open is deemed ‘appropriate’. Even if there is a latrine in the house, family members often go ‘outside’ to relieve themselves. Emptying pit latrines is deemed to be a task beyond upper castes and is confined to the ‘untouchables’.

In this context, it may be recalled that Mahatma Gandhi was a strong and unequivocal advocate for ending this practice, calling for the end of untouchability. In 1925, he wrote, “To me, the test of people’s knowledge of sanitation is the condition of their latrines. The cause of many of our diseases is the condition of our lavatories and our bad habit of disposing of excreta anywhere and everywhere.”¹² Nonetheless, his efforts were unsuccessful. The practice persists. The extensive Rapid Survey of Children of 2014¹³ revealed no major differences in the incidence of stunting across the major faiths in India or across caste groups. The percentage of stunted children decreases as household incomes rise. Still, one in every four children in the highest quintile suffer from stunting.

A recent survey¹⁴ found that, among 40 per cent of households with a functional latrine, at least one family member chose ‘to go to the fields’ to relieve himself or herself. A comparison across states shows that the practice of untouchability is a stronger predictor of open defecation than literacy, governance or income levels.¹⁵ OD rates in the richer¹⁶ states of Gujarat and Andhra Pradesh, where caste consciousness is deeply embedded, are little different than those for the poorer states of Uttar Pradesh and Bihar. Open defecation rates in the North-Eastern states, which have lower incomes, but are culturally dissimilar, are significantly lower. Untouchability alone explains 48 per cent of the variation in OD across states.¹⁷

¹² ‘Our Dirty Ways’, M K (Mahatma) Gandhi, *Navajivan*, 13 September 1925.

¹³ “Rapid Survey of Children (RSOC) National Report 2013-14. (2014). Ministry of Women and Child Development, Government of India and UNICEF.

¹⁴ Understanding exceptionally poor sanitation in rural India: Purity, pollution & untouchability”, 2015. Research Institute for Compassionate Economics. Diane Coffey, Aashish Gupta, Payal Hathi, Dean Spears, Nikhil Srivastav, and Sangita Vyas.

¹⁵ “Understanding Open Defecation in Rural India: Untouchability, Pollution, and Latrine Pits” *EPW*, 7 January 2017. Diane Coffey, et al.

¹⁶ States with per capita incomes significantly above the national average

¹⁷ “The puzzle of open defecation in rural India: Evidence from a novel measure of caste attitudes in a nationally-representative survey” Working Paper, R.I.C.E November 2016 Dean Spears and Amit Thorat.

Although the infant mortality rate has decreased, it continues to be high by international standards.¹⁸ Diet factors, especially the practice of feeding infants non-lacteal fluids, including ghee, water, sugar juice and cow/goat milk increase vulnerability of infants to infections and gastro-intestinal disorders. The less than universal practice of breast-feeding infants, including depriving the newly-born of colostrum, further enhances vulnerability and the risk of diarrhoea and other diseases.¹⁹ Colostrum is rich in Vitamin A, an essential nutrient for developing the immunity to reduce infection and protect eyes.

The Manifestations and Consequences of OD

The consequences of OD upon public health, especially children's health, are devastating. OD is disastrous when practised in high population density areas. Despite economic growth and a fall in OD, the incidence of stunting and wasting has declined only marginally. It is not possible to prevent harmful bacteria released by faeces from contaminating food, sources of water and human contact, especially children's hands. In rural areas, indeed, and where possible in urban areas as well, the preferred location for OD is adjacent to sources of water. The same water is used for irrigation, washing clothes and, often, even bathing. This facilitates the rapid spread of toxic bacteria present in faeces.

As a result of cultural norms and high population density, there are more people defecating in close proximity to habitat and water sources in India than anywhere else in the world. A direct consequence of OD is a medical condition known as environmental enteric dysfunction or, broadly, enteropathy, an affliction that affects the intestines and reduces the body's ability to absorb nutrients. Poor sanitation is the main cause of this condition. It is the main driver of stunting among children. Children's bodies respond to this condition by diverting nutrients away from growth and development to fighting infections. For children below the age of two, such an affliction results in permanent cognitive disabilities and impairs physical development.²⁰ Globally, each year, it results in the death of a million children under the age of five. Nearly 10 per cent of deaths in India can be attributed to poor sanitation.

¹⁸ WHO Global Data Repository, Country Tables <http://www.who.int/gho/countries/ind/en/>. Accessed on 30 June 2017.

¹⁹ RSOC (2014). Ibid.

²⁰ "Preventing environmental enteric dysfunction through improved water, sanitation and hygiene: an opportunity for stunting reduction in developing countries", Mduduzi N N Mbuya and Jean H Humphrey,

A child's height is an important indicator of health, well-being and prospects for his or her future. It is an enduring puzzle why Indian children are shorter than their counterparts in Africa. Dean Spears finds that OD alone explains 54 per cent of the variation in height.²¹ Children suffering from stunting face higher risks of diseases such as amoebiasis, diabetes and coronary problems in adult years. The UNICEF estimates that more than half of India's children are malnourished. Underweight mothers risk giving birth to stunted babies, perpetuating a vicious cycle that the country is unable to break.

The Costs of OD

A World Bank study (2011)²² estimated the costs of inadequate sanitation at 6.4 per cent of gross domestic product (GDP) in India in 2006 (Figure 3). A more recent estimate in 2015 by Oxford Economics and WaterAid puts the costs at 5.2 per cent of GDP. Over 70 per cent of the losses were due to health-related factors, with diarrhoea accounting for two-third of these costs. Other significant costs were incurred in treating related diseases and productivity losses on the account of increased morbidity. Of total economic losses due to premature mortality, 79 per cent was due to deaths and diseases in children below the age of five. Diarrhoea in children below five accounted for more than 47 per cent of total health-related impact that include the costs imposed by healthcare, premature mortality and productivity losses due to poor health and illness. The high risk of gastro-intestinal infections (often referred to as 'Delhi belly') while travelling in India keeps tourists away and hurts local economies dependent on tourist revenues.²³

Maternal and Child Nutrition, (2016), 12 (Suppl. 1), pp 106-120; Jean Humphrey. 2009, "Child undernutrition, tropical enteropathy, toilets, and handwashing", The Lancet.

²¹ How Much International Variation in Child Height Can Sanitation Explain? Dean Spears. World Bank Policy Research Working Paper ..., February 2013.

²² "Flagship Report: The Economic Impacts of Inadequate Sanitation in India", (2011), The World Bank.

²³ Domestic and foreign tourists tend to be particularly wary of street food in India, a staple for travellers in Southeast Asia and many parts of Africa that creates employment for hundreds of thousands of micro entrepreneurs.

Table 1: Cross-country Data on OD

Country	Year	Population		Sanitation		
		Urban %	Rural %	Urban OD %	Rural OD %	National OD %
Bangladesh	1990	19.8	80.2	10.3	39.8	34
	2000	23.6	76.4	5.7	23.3	19.2
	2015	34.3	65.7	0	1.8	1.2
Brazil	1990	73.9	26.1	5.7	48.1	17.8
	2000	81.2	18.8	3.4	33.6	9.1
	2015	85.7	14.3	0.2	13.3	2.1
Ghana	1990	36.4	63.6	10.3	28.8	22.1
	2000	43.9	56.1	8.9	30.9	21.3
	2015	54	46	6.8	33.7	19.1
India	1990	25.5	74.5	28.9	90.9	75.1
	2000	27.7	72.3	21.4	79.3	63.3
	2015	32.7	67.3	9.8	61.3	44.4
Indonesia	1990	30.6	69.4	18.8	49.5	40.1
	2000	42	58	16.4	40.9	30.6
	2015	53.7	46.3	13.1	28.9	20.4
Kenya	1990	16.7	83.3	3	22.1	18.9
	2000	19.9	80.1	2.8	19.3	16
	2015	25.6	74.4	2.6	15.3	12
Nepal	1990	8.9	91.1	33.5	93.1	88
	2000	13.4	86.6	22.4	70.8	64
	2015	18.6	81.4	5.6	37.5	31.6
Nigeria	1990	29.7	70.3	6.8	31.3	24.3
	2000	34.8	65.2	10.3	32.3	24.6
	2015	47.8	52.2	15.5	33.8	25.1
Pakistan	1990	30.6	69.4	8.3	67.2	49.1
	2000	33.2	66.8	5.8	52.6	37.1
	2015	38.8	61.2	0.6	21.4	13.3
Philippines	1990	48.6	51.4	7.4	22.8	15.3
	2000	48	52	5.8	17.8	12.1
	2015	44.4	55.6	3.4	10.4	7.3
Sri Lanka	1990	18.6	81.4	4.1	15.5	13.4
	2000	18.4	81.6	2.7	8.3	7.3
	2015	18.4	81.6	1	0	0.2
Uganda	1990	11.1	88.9	2	22	19.8
	2000	12.1	87.9	2.1	16.2	14.5
	2015	16.1	83.9	2.2	8.1	7.2
Total	1990	31.1	68.9	17.7	70.7	54.2
	2000	34.7	65.3	13.4	60.2	44
	2015	40.8	59.2	7.4	43.3	28.7

Source: UN Water-WHO “UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water” GLAAS 2017 Report.

Table 2: OD Rates across Indian States

Rank	India/State/Union Territory	Open defecation prevalence in rural areas (%)	Open defecation prevalence in urban areas (%)	Overall average prevalence (rural and urban) (%)
11	Andhra Pradesh	41	10.5	25.75
22	Assam	6.2	2.1	4.15
4	Bihar	69.9	13.4	41.65
5	Chhattisgarh	67.5	9.6	38.55
12	Gujarat	47.1	2.8	24.95
17	Haryana	11.4	2.6	7
20	Himachal Pradesh	8.5	0.5	4.5
Avg.	INDIA	52.1	7.5	29.8
15	Jammu and Kashmir	35.4	5.6	20.5
1	Jharkhand	81.3	23.5	52.4
8	Karnataka	53.1	13.2	33.15
25	Kerala	2.3	1.2	1.75
3	Madhya Pradesh	74.3	12.2	43.25
13	Maharashtra	42.8	6.9	24.85
23	Manipur	4.2	3.1	3.65
24	Meghalaya	3.6	0.7	2.15
27	Mizoram	0.4	0.6	0.5
26	Nagaland	2	0.6	1.3
2	Odisha	73.3	13.7	43.5
N/A	Puducherry	-	2.3	-
21	Punjab	7.1	1.8	4.45
6	Rajasthan	62.7	9.8	36.25
28	Sikkim	0	-	0
9	Tamil Nadu	54.1	9.6	31.85
16	Telangana	24.1	2.4	13.25
7	Uttar Pradesh	65.9	6.4	36.15
18	Uttarakhand	12.5	0.5	6.5
14	West Bengal	34.9	7.5	21.2

Source: Swachhta Status Report 2016, NSSO Office, Government of India.

Progress

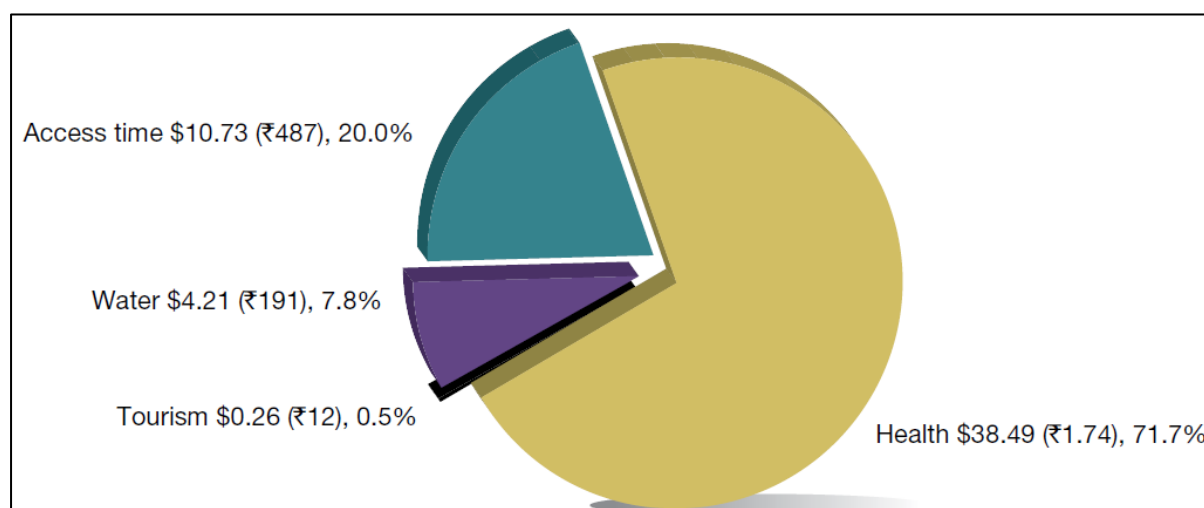
Since 1990, an additional 28 per cent of the Indian population has access to improved sanitation facilities.²⁴ The UNICEF-World Health Organization (WHO) assess this as moderate progress. The India Health Survey on Nutrition²⁵ found a decline in stunting between 2006 and 2014

²⁴ “Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment”, (2015), UNICEF and WHO.

²⁵ “India Health Report on Nutrition 2015” PHFI, IFPRI, Transform Nutrition and UK Aidlocal.

from 48 per cent to 39 per cent of all children – still a high percentage relative to other countries at similar levels of development. However, the contrast with other South Asian countries is stark. All of India’s neighbours have fared far better in reducing OD and have lower incidences of stunting and wasting. Clearly, economic growth or high population density is not the main reason. Bangladesh, with a much higher population density and lower income levels, has made remarkable progress over the past few decades, eliminating OD amongst the rich, with dramatic falls in OD amongst the poorest quintile. The explanations lie partly in economics, but also in deeply entrenched cultural practices and the ineffectiveness of policies to deal with deeply embedded behaviours.

Figure 3: Composition of Economic Impact of Inadequate Sanitation, 2006 (In Billions)²⁶



Source: Figure extracted from “Flagship Report: The Economic Impacts of Inadequate Sanitation in India,” (2011) The World Bank.

The data in Figure 3 shows significant differences across states (Table 2). While Uttarakhand, Punjab, Kerala, Himachal Pradesh and Haryana had achieved the MDG of halving the population without basic sanitation by 2015, at the progress rate in 2014, Jharkhand, Bihar, Madhya Pradesh and Uttar Pradesh lag significantly behind the 2015 targets.²⁷

²⁶ Access time refers to costs due to time lost in accessing toilets, OD sites, time lost by children searching for toilets, and for girls unable to attend school due to the absence/ineffective toilet facilities: Water alludes to cost of water treatment at home, cost of transporting water from distances.

²⁷ “Review Paper – The uneven progress of sanitation in India Arabinda Ghosh and Sandy Cairncross” (2014). Arabinda Ghosh and Sandy Cairncross, Journal of Water, Sanitation and Hygiene for Development, 04.01.

The wide differences across the states and the findings that OD is heavily concentrated in districts with a high population density²⁸ suggests that local solutions deploying technology, and, more importantly, a public awareness of the immense risks imposed by OD are imperative for dealing with the sanitation crisis.

A deep-rooted gender bias, reinforced by a strong preference for male offspring, has exacerbated the nutritional deprivation of young girls. Over half of girls aged 15 to 18 have low body-mass indices, raising the probability of the cohort giving birth to underweight babies when they later in life bear children.²⁹

Policy Issues

“India’s stunting problem represents the largest loss of human potential in any country in history, and it affects 20 times more people in India alone than HIV/AIDS does around the world.”³⁰ Shekhar et al (2017)³¹ point out that, “Unlike many other development investments, investments in nutrition are durable, inalienable, and portable. Durable because investments made during the critical 1,000-day window of opportunity last a lifetime without ever needing to be replenished. Inalienable and portable because they belong to that child no matter what and wherever she or he goes.” “Investment in nutrition are among the best in development, with a return of between US\$4 [S\$5.44] and US\$35 [S\$47.6] for every US\$1 [S\$1.36] invested.”³²

Despite rapid economic progress and remarkable achievements in industry, space technology, information technology and training skilled manpower, health-related data indicates that Indian children are more prone to illness. They are also weaker and face dismal prospects for the future on account of state failures in health and education, undermining the future of the country. The consequences of a large cohort of children suffering from malnutrition, poor education standards and a neglect of basic health and sanitation norms are severe. These children are

²⁸ Spears (2011). Ibid.

²⁹ RCOS (2014).

³⁰ Ramanan Laxminarayan, Vice President for research and policy, Public Health Foundation of India.

³¹ Shekar, Meera; Kakietek, Jakub; Dayton Eberwein, Julia; Walters, Dylan. 2017. An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Directions in Development--Human Development, Washington, DC: World Bank. © World Bank.

³² Shekhar et al (2017). Ibid.

likely to grow up with low prospects of making up for nutritional deficiencies and illness in their earliest years, unable to contribute to their own sustenance and to prospects of growing into productive citizens.

India's investment in health and education is low, compared to other countries. Expenditure on public health has shrunk further in recent years. Allocations to the flagship Integrated Child Development Scheme, the programme targeting nutrition for children and lactating mothers, was slashed by 10 per cent in 2015 with a near halving of funds for the Ministry of Women and Child Development.

Evidence shows clearly that just constructing toilets will not solve problems. In many areas, these are not connected to water sources nor have an effective waste disposal mechanism. Disposal of waste continues to be a serious challenge for reasons mentioned earlier. There is a great deal of anecdotal evidence on how newly-constructed toilets are not functional and often used for storage. A survey of newly-constructed toilets in New Delhi in July 2017³³ reveals that, although toilets are broadly welcomed, the lack of familiarity for those who have always 'done it' outdoors, fear of closed spaces, poor maintenance and a deep reluctance to change old habits are rendering newly-constructed toilets reducing OD far less than policymakers hoped for.

It is too early to infer anything about the effectiveness of the Swachh Bharat Abhiyaan, but piecemeal and disaggregated evidence, and anecdotal evidence suggest that it is having an impact on the incidence of OD in some areas but a marginal impact on children's nutrition and health. OD imposes substantial negative externalities as bacteria in faeces spreads rapidly through the water supply, impacting entire neighbourhoods and communities where it is present. For the campaign to work, OD has to be completely eliminated within geographical areas. Without challenging the cultural taboos, issues of waste management as well as conviction and support from individuals and families in the targeted areas, it is unlikely to progress beyond a well-intentioned programme yielding incremental benefits, rather than the paradigm change that is hoped for.

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³³ "Toilets in place, awareness missing", Damini Nath, *The Hindu*, 17 July 2017. <http://www.thehindu.com/news/cities/Delhi/toilets-in-place-awareness-missing/article19292756.ece>. Accessed on 18 July 2017.