A Case Study on the Nutritional and Health Outcomes of Governmental Sanitation Campaigns in Dokur Village

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Internship Research Focus
Key Question:
Does the Swacch Bharat Abhiyan lead to improved nutrition and health in Dokur Village?

Hypothesis:
The Swachh Bharat Abhiyan leads to improved health and sanitation in Dokur only if households and their surrounding communities collectively participate and possess strong motivating factors.
Research Methodology

- Weeklong Study in Dokur Village
  1. 41-44 question survey for the top female decision maker of 40 households
  2. 3 focus group discussions with adolescent girls, adult women and adult men
  3. 4 key informant interviews with the school headmaster, sarpanch, health clinic nurse and Anganwadi worker
- Use of VDSA: 2005-2014 longitudinal data from Dokur Village
The Importance of Sanitation and Hygiene
“Overall 50% of the health burden of malnutrition was [...] attributable to poor water, sanitation and hygiene.”

- Economic Impacts of Inadequate Sanitation by World Bank, 2010

- Nutrition is acknowledged as the prime indicator of health, but cannot unleash its full effect unless sanitation is adequate.
Factors Influencing Nutrition and Health

- Diversity of Diet
- Physical Condition
- Sanitation and Hygiene
- Genetic History
- Proper Nutrition
What Constitutes Poor Sanitation?

**Water**
Is it safe for drinking? Is it usable for domestic tasks?

**Foods**
Are they safely stored? Are they prepared correctly for consumption?

**Personal and Household Habits**
Does one use soap? Bathe? Comb hair? Maintain a clean house?

**Surrounding Area**
Is open defecation common? How is refuse and dung disposed? Are there flies, mosquitoes or insects hovering around certain areas?
- Waterborne illnesses and conditions
- Child stunting and wasting
- Decreased energy output
India’s Sanitation Struggles and Campaign Efforts
“Sanitation is more important than independence.”

- Mahatma Gandhi, Father of India
India’s Sanitation Dilemma=
A **HUGE** Problem

- 1 in 10 deaths in India are attributable to poor sanitation and hygiene
- 6.4% of India’s GDP (or $48 per person) is wasted annually due to inadequate sanitation
- All the while, India is on pace to becoming the third largest global economy by the end of the decade

*Convergence of human and solid waste in a stormwater drain in Mumbai (Photo by Giacomo Galli/IRC).*
600 million of the world's 1 billion open defecators reside in India.

13% of urban dwellers and 70% of villagers openly defecate.

Open defecation could explain 54% of the variation in average child height between countries and 65% when population density is considered.
Widespread Open Defecation

High Population Density

Low Demand for Toilets

MALNUTRITION and ILLNESSES
India’s Sanitation Campaigns

- Began in 1996 with the Total Sanitation Campaign, slightly modifying to become the Swacch Bharat Abhiyan (SBA) in 2014

- Provides subsidies for toilet construction to Below Poverty Line households

- Encourages refuse cleanup

- Promotes hand washing and personal hygiene habits

- Includes a sanitation program for schools

- Focuses on spreading sanitation awareness instead of simply handing out subsidized toilets

Progressively, India’s sanitation campaigns are focusing more on awareness and spreading knowledge to children than handing out subsidies.
1. Awareness campaigns to schools through “Clean India: Clean Schools”
2. Prime Minister Modi actively behind efforts
3. Toilet construction increases from 60,000 from 2014-2015 to 100,000 from 2015-2016

**Pros**

**Cons**

1. 8% of budget focuses on behavior change, compared to 15% in the past
2. 30% of toilets constructed during the campaign are currently dysfunctional
Dokur Village Description
Figure 1. The road map to Devarkadra mandal in Mahabubnagar district, where Dokur is situated.

Basic Facts About Dokur

- **Population:** 2,785 (2011 Population Census)

- **Occupations:** agriculture, livestock, milling, petty businesses, city employment

- **Government System:** Gram Panchayat (GP) of eleven members and a head sarpanch

- **Dominant Crops:**
  - Kharif (rainy season): paddy, castor, pigeonpea and groundnut
  - Rabi (post-rainy season): groundnut and paddy

- **Religion:** predominately Hindu

- **Village-Wide Challenges:** erratic rainfall, droughts, expanding wild boar population, water shortage, unclean drainage system, caste rigidities

- **Improvements:** income, nutrition, literacy

A survey respondent demonstrating how she crushes peppers for food consumption.
The majority of villagers are from the Backward Caste.

The percentage of Forward Caste and Scheduled Caste respondents switched from the VDSA timeframe to this 2016 study.

Backward Caste and Scheduled Caste peoples are underprivileged, with the Scheduled Caste being the former untouchables. They still live secluded in a remote area of the village.
Top 5 Villager Foods

1. Rice
2. Pigeonpea Dal
3. Jowar (Sorghum) Roti
4. Brinjal
5. Potato

* Villagers frequently drink tea and milk

Most Consumed Food, Dokur Village, India 2016

- Rice 73%
- Pigeonpea Dal 39%
- Jowar Roti 15%
- Meat 3%
- Brinjal 6%
- Potato 3%

Second Most Consumed Food, Dokur Village, India

- Rice 22%
- Pigeonpea Dal 39%
- Jowar Roti 13%
- Kovai 3%
- Lady's Finger 10%
- Meat 10%
- Onion 3%
Nutrition and Health Situation of Dokur
BMI Changes in Adult Women, Dokur Village, India 2010-2014

BMI Changes in Adult Men, Dokur Village, India 2010-2014
In this graph, diarrhea is not a standalone category since it is a type of waterborne illness. In other words, three out of every five households with waterborne illnesses had at least one family member whose illness was diarrhea.
Sizeable increase in toilet ownership, with 2014 levels exceeding 50%

Earliest year a survey respondent owned a toilet was 2001
Open Defecation in Dokur
21% of villagers own a toilet yet still openly defecate. WHY???
Common reasons for open defecation include:

1. **Men** go out of habit (68% of survey respondents).

2. **Women** go because they cannot access a toilet (information not quantitatively collected).

3. **Children** go because they fear using toilets and their parents do not desire them to waste water (30% and 49% of respondents, respectively).
Why Is Open Defecation Practiced Throughout the Village?

Reasons for Community Open Defecation, Dokur Village, India 2016

The total percentage equals 57% because most respondents did not cite a specific reason for community open defecation.
What Challenges Do Village Women Face While Openly Defecating?

Open Defecation Area Descriptions, Dokur Village, India 2016

- The area is losing space
- Snakes, wild boars and mosquitoes are dangerous
- Men are often in the vicinity
- The darkness in the morning and evening are the only times to go
- It is difficult to openly defecate when suffering from some illnesses
Sanitation Issues Inherent of Dokur
Perceptions of Community and Household Sanitation Problems, Dokur Village, India 2016

Drainage
- Family Sanitation Problem: 8%
- Community Sanitation Problem: 65%

Dirty Areas
- Family Sanitation Problem: 3%
- Community Sanitation Problem: 5%

Toilets
- Family Sanitation Problem: 30%
- Community Sanitation Problem: 30%

None
- Family Sanitation Problem: 0%
- Community Sanitation Problem: 0%
Defining the Sanitation Conflicts in Dokur

- **Drainage**: lanes of water flowing throughout the village often have child feces, refuse and wild boars, not to mention the mosquitoes and flies that come. The sarpanch promised to have the drainage cleaned bimonthly, but the villagers claim he is only doing it once per year.

- **Toilets**: so many people lack toilet access, and others cannot use their toilet because of water shortage or incomplete construction.

- **Dirty Areas**: overall the village does a poor job cleaning the roads and picking up trash.

- **None**: many of the respondents claimed to have no household sanitation problem, even though some of them also defecated in the open.
Villagers did not cite water shortage as the greatest sanitary problem because all their sanitation problems revolve around it. It occurs due to prolonged drought three years ago.

Water is available via personal tap once every four days in a one and a half hour interval. For villagers with large families or livestock, accessing water in this short interval is very difficult.

Many villagers fear whether the tap water is safe for drinking.

Water shortage leads to the impracticality of toilet use.
Village Involvement in Sanitation Campaigns
Toilet Subsidization Situation in Dokur Village, India 2006-2016

- Technically, 81% applied for the government sanitation campaigns and have not benefitted.
- The GP promised that if villagers construct the base of their toilet, the government will finish the rest and provide 12,000 rupees of subsidization. Villagers are still waiting for the GP to live up to their word.
Only 4 of the 40 surveyed households, or 10%, received subsidies from the government sanitation campaigns.

Ironically, none have received aid from the SBA, which put forth more promotional efforts than the other campaigns.
Characteristics of Subsidized Toilet Beneficiaries

- 3 Backward Caste and 1 Forward Caste household
- 4.25 toilet construction difficulty rating
- 50% prefer using a toilet
- 75% face significant challenges accessing water
- 25% had a family member suffer from diarrhea in the last month
- 2 respondents were normal weight and 1 was overweight (the fourth respondent’s BMI was unavailable)
Comparing Toilet Cleanliness Between Private and Subsidized Toilet Owners

Differences Between the Toilet Cleanliness of Private and Subsidized Toilet Owners, Dokur Village, India 2016

- None of the subsidized toilet beneficiaries rated their toilet cleanliness above a 3.
- Private toilet owners maintain their toilets much better than subsidized beneficiaries.
- This indicates that those with private toilets are more inclined to practice sanitary habits.
Family is the most common source of information, but usually means that respondents are “self-learned” and clean the house and bathe as their parents did.

Those with the greatest sanitation knowledge learned from school.

None of the subsidized toilet owners learned sanitation information from the government.
Income Effect on Subsidized Toilet Acquisition, Dokur Village, India 2016

Income Comparison Between Owners of Private and Subsidized Toilets in Dokur Village, India 2016
Households without toilets were asked whether they would prefer a privately constructed toilet or one built by the government. 100% of them answered that if the government provided the funds, they would prefer a toilet from them.

This is a contrast to the many households owning toilets for convenience reasons.

It can be assumed that all households with the financial capacity to construct toilets already have them.
Comparing Toilet Ownership Reasons of Private and Subsidized Toilet Owners, Dokur Village, 2016

- Most subsidized toilet owners opted for privacy/dignity.
- One subsidized owner chose government subsidies.
- Most private toilet owners chose health/sanitation, while no subsidized owners chose that category.
Community Knowledge of Sanitation Campaigns

- The GP announced the SBA through the village temple speakers and conducted a door-to-door survey asking households to consider toilet subsidies of 6,000 rupees for each phase of construction (base level, then complete construction).

- 98% (or 39/40) of the respondents knew about the campaign.

- None of the respondents learned sanitation information from the SBA, having only been asked in the door-to-door survey whether they had a toilet.

- The SBA’s involvement in schools led to students composting, tending to dust bins, and practicing toilet and hand hygiene.
Children actively participated because of the campaign’s involvement with the school.

The only survey respondents involved in the campaign were the sarpanch’s wife and a member of the GP.

Above is a cleanliness drive hosted in Hyderabad. Dokur’s government has not promoted any of these campaign activities (Photo: Press Trust of India)
A Comparison of the Health and Nutrition of Toilet Owners and Non-Owners
Toilet Ownership’s Correlation to Nutrition

Correlation between Toilet Ownership and Subjective Child Malnourishment in Dokur Village, India 2016

- The “Subjective Child Malnourishment” statistics are based on a survey question asking whether the respondent believed her children were properly nourished.

- Those who said their children were nourished usually mentioned that they consumed vegetables and green leafy vegetables from the local market, made different curries or prepared the output of their livestock. Some also spoke of quantity of food, indicating a lack of nutritional understanding.
BMI Differences Between Those Owning and Lacking Toilets

Toilet owners are typically heavier than non-toilet owners, which may be a result of greater income and its associated increases in caloric consumption.
Toilet Ownership Reasons and Their Relationship to Nutrition and Health
Comparison of Reasons Households Adopt Toilets and Whether They Believe Their Children Are Nourished, Dokur Village, India 2016

Percent of Households Who Believe Their Children Are Nourished

- **Convenience**: 88%
- **Health/Sanitation**: 63%
- **Privacy/Dignity**: 29%

Reasons to Own a Toilet
Relationship Between Toilet Ownership Reason and Adult Female BMI, Dokur Village, India 2016

Convenience
Health/Sanitation
Privacy/Dignity

Percent of Respondents from Each Toilet Reason Category

BMI

Underweight  Normal Weight  Overweight  Obese

0.00%  10.00%  20.00%  30.00%  40.00%  50.00%  60.00%  70.00%  80.00%
Relationship Between Toilet Ownership Reason and Toilet Cleanliness Rating, Dokur Village, India 2016

Convenience
Health/Sanitation
Privacy/Dignity

Percent of Respondents for Each Toilet Ownership Reason

Toilet Cleanliness Rating
BMI and toilet access increased noticeably throughout the last decade.

All respondent toilet owners are the first generation of their families to own lavatories.

Children, particularly ten to twelve-year-olds, know the most about sanitation out of any age group.

Children at Dokur’s only primary school.
Despite toilet ownership increases, there are more open defecators than toilet owners in the village.

Men are habituated to go outside and children fear toilets and waste water, while women go out of necessity.
The SBA’s efforts to hand out toilet subsidies did not change people’s attitudes or knowledge of sanitation and toilet use.

None of the current SBA applicants have received their toilet subsidies.

Very few villagers mentioned the government as their source of sanitation knowledge.
Toilet Beneficiaries

- Rate their toilet cleanliness considerably low
- Are still likely to defecate in the open
- Face sanitation and health hindrances, likely because of poor income and lack of knowledge
- Have not noticeably changed their behavior in regards to sanitation practices
Learned to compost and use toilets and dustbins because of SBA's school program

Still, they are the most likely to defecate in the open because of water shortage and parental coercion

Sanitation Change Is in the Youth's Hands
Students at the Dokur school created a WASH committee for sanitation, partly in response to the SBA.

- Learned to compost and use toilets and dustbins because of SBA’s school program.
- Still are the most likely to defecate in the open because of water shortage and parental coercion.
Current drainage lanes consist of child feces, wild boars and a conglomeration of trash.

The sarpanch cleans the drainage not frequently enough.

**Consequence:** open defecation continues strongly throughout the village, influencing all parties; cleanliness is largely ignored.
Erase the notion that a toilet should be an expensive social commodity

Show that a toilet is good for one’s health, like using a toothbrush or taking a bath

Distribute cheaper, more environmentally friendly toilets that conserve water and precious resources
Is one of most fixable dilemmas in Dokur if the proper resources and parties are involved.

One possible solution: implement rainwater harvesting structures with feasible sizes and strategic locations.

A small rainwater harvesting structure in Anantapur district of Andhra Pradesh.
Increase Literacy

- Emphasized only by sarpanch, but is a valid point.

- Happens slowly over time, but is effective. Planting the literacy seeds now will produce positive long term effects, as long as parents do not overimpose.

- Regardless of literacy, the SBA has the ability to reach people today through verbal communication and community-initiated activities.

A girl in Dokur practicing her English writing skills.
The Swacch Bharat Abhiyan did not initiate health or nutritional improvements in Dokur Village. Behavior change, combined with increased water access, is necessary for long term village sanitation enhancement. Health and nutritional improvements will inevitably result.
Thank you!