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The Impact of On-Ground Activation Events on Improved Toilet Coverage: A Case Study From the Tanzania National Sanitation Campaign “*Nyumba ni Choo*”

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ABSTRACT: In 2017, Tanzania was one of the countries in the world with the lowest proportion of households having access to improved toilets. Between 2017 and 2021, the government launched a national sanitation campaign under the brand *Nyumba ni Choo*. The objective of this paper is to assess the impact of one component of this campaign, “direct consumer contact” events, on the coverage of improved household latrines in Tanzania. Secondary data from both the National Sanitation Management Information System (NSMIS; <https://nsmis.moh.go.tz/>) and internal project reports were used to extract data on coverage and dates of events, respectively. Regression estimation models were used to estimate impact at ward and regional levels. The study used quarterly panel data from all 26 regions between 2017 (baseline) and 2020 (endline) for estimation purposes. The study shows that direct consumer contact events had a significant positive effect on the rate at which households subsequently improved their toilets at both small and large scale in Tanzania. On average, the rate of household latrine improvement increased by 12.91% at ward level and 14.17% at regional level. These results testify to the importance of designing an effective behavioral change campaign to achieve significant improvements in sanitation coverage.

KEYWORDS: Tanzania, sanitation, direct consumer contact events, intervention implementation

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Introduction

Sanitation problems such as open defecation remain a global problem. Over 494 million people practice open defecation globally.¹ The bulk of the problem is observed in low-income countries, especially in sub-Saharan Africa. For instance, 2 out of 10 people are reported to lack proper toilets in this area.² This lack of hygienic sanitation is likely to cause health problems such as diarrhea, cholera and increase mortality rates.^{3–5}

The Household Budget Survey of 2017/18 reported that two-thirds of households in Tanzania used poor sanitation and hygiene facilities.⁶ Further, in 2017, nearly 80% of the rural population in Tanzania did not have access to quality toilets.⁷ Several efforts have been made to address the need for better sanitation and hygiene in Tanzania. A new phase of the National Sanitation Campaign was designed in 2017 and launched in 2018 (The National Sanitation Campaign (*Nyumba ni Choo*) Phase I was implemented from 2017 to 2021 with the aim of transforming communities to construct and use improved toilets rather than the traditional toilets that were built during the earlier *Mtu ni Afya* Campaign.). It was a behavior change campaign that used a wide range of methods to influence hygiene and sanitation behaviors. Communication channels included mass media (television and radio), digital media (Instagram, Twitter, YouTube, Facebook, and WhatsApp), and display materials/collaterals.^{8,9} They delivered and amplified communication messages geared to promote the construction of improved toilets by households in the country. *Nyumba Ni Choo*

engaged a wide range of stakeholders, including heads of households, business owners, government officials, celebrities, and local leaders.

Community engagement is also reported to be effective in behavioral change,¹⁰ so *Nyumba ni choo* also implemented local events to directly engage with target audiences. This on-ground activation—sometimes known as Direct Consumer Contact (DCC)—has been one of the channels used in behavior change communication programs to reach specific target audiences for many years now. Such events are also called “roadshows,” since they often combine entertainment with educational goals to attract large audiences, and take place “on the road.” Roadshows can include the use of drama (both from the contacted group and community), football demonstrations, video shows, cultural events, music, and poetry.¹¹

Such roadshows were one of the communication channels employed in delivering behavioral change communication messages to both the primary target audience (heads of household) and secondary target audience (government officials) during the implementation of the Tanzania National Sanitation Campaign (*Nyumba ni Choo*). The on-ground activations were conducted in neighborhoods, workplaces, and at service delivery points, engaging the target audience and key influencers such as government officials in fun activities, contests, testimonials, and quizzes geared to create memorable experiences about products and services. Roadshow activities included mobile theater with a famous singer, Mrisho Mpoto (Mjomba); football matches; toilet makeovers; marketing support trade



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promotions that targeted sanitation investors who were within those localities; and raising the flag by local government officials to the level equivalent to the sanitation status of their administrative areas as the way to promote improved sanitation. The target audience got an opportunity to interact directly with the officials and their fellow attendees. Further, the target audience shared their understandings, ask questions as well as get feedback on their questions or understandings. As part of the activation, collateral materials such as *Nyumba ni Choo* branded T-shirts, reflector vests, notebooks, stickers, pens, flash drives and other items were distributed. Through such on-ground activation, the target audience acquired personalized and lasting memories that encouraged them to engage with the communication messages. Simultaneously, testimonials and event activities were recorded for later distribution through mass and social media such as the campaign YouTube (@nyumbanichoo5479), Facebook (Usichukulie Poa. Nyumba ni Choo) and Twitter (@sanitationtz) accounts.

This study is intended to uncover the impact of activation events on households' practice of improving their toilets. The findings of the study will be instrumental to both behavioral change communication practitioners and policy makers in the sanitation and hygiene sector.

Study Design and Methods

Mass media and digital media were important components of the National Sanitation Campaign, providing opportunities to deliver the campaign's communication messages to all target audience groups in Tanzania. However, not everyone has access to such media, especially in remote areas. In comparison, on-ground activation events have limited coverage, but can be more engaging. Hence, the areas with low sanitation coverage and with high population were considered for conducting on ground activation activities.⁸ By December 2020, the campaign managed to conduct on-ground activation activities in 10 regions out of 26 regions on the Tanzania Mainland.

Selection criteria

The sole selection criterion was roadshow visits. Regions visited by the roadshow were enrolled as treatment areas while those not visited for the study period were enrolled in the control group. Thus, this study utilized data from 16 regions as controls, including Arusha, Dar es Salaam, Iringa, Katavi, Kigoma, Kilimanjaro, Lindi, Manyara, Morogoro, Mtwara, Pwani, Rukwa, Ruvuma, Singida, and Tabora. However, the Njombe region was excluded from the control group due to its exceptionally high performance in terms of households with latrines. As of December 2020, the roadshow campaign had not reached any of these 16 control regions. The study selected 10 treated regions where the roadshow had been conducted during that period, which were Dodoma, Geita, Kagera, Mara, Mbeya/Songwe, Mwanza, Shinyanga, Simiyu, and Tanga (see Figure 1).

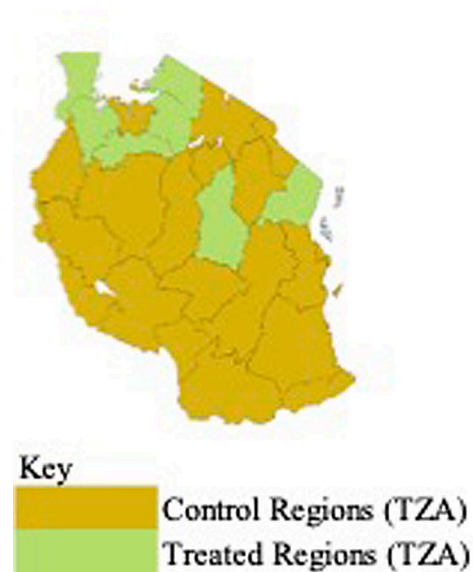


Figure 1. Tanzania map showing treatment and control regions.

Model estimation

Data collection. The study used panel data extracted from the National Sanitation Management Information System (NSMIS) (<https://nsmis.moh.go.tz/>). The Tanzanian Ministry of Health collects sanitation and hygiene data on a monthly basis at the household level and publishes them quarterly in the NSMIS. The National Health Management Information System (NHMIS) in Tanzania, of which NSMIS is a part, follows a standardized procedure for data collection on latrine facilities. At the village level, community health workers and volunteers are responsible for collecting data using forms which have been designed specifically for this purpose. Once these forms have been completed, they are submitted to the ward level for compilation using another form, which are also standardized. At the ward level, the Ward Health Officers are responsible for compiling data from all villages and submitting it to the district level. At the district level, the District Health Officers collect the compiled data from all the wards using a third form, which are then uploaded into the NSMIS system. This process ensures that data is collected in a standardized manner and is easily accessible for analysis and reporting purposes.

Quarterly data from the first quarter in 2017 to the last quarter in 2020 were extracted from the NSMIS website. The study employed data from 2017 as the baseline data since in this year the NSMIS was updated and improved. Also, digital data collection commenced from all regions in Tanzania Mainland. Further, all regional Tanzania Mainland regions have complete sanitation data. The data from January/March, 2017 to October/December 2020 were then verified through roadshow visits (as explained above) and also through Project CLEAR Consortium in February to April 2021. The Ministry of Health collects sanitation and hygiene including latrines (outcome) data on a monthly basis at the household level and publish them quarterly in the NSMIS.

Table 1. Assignment of Wards: Summary statistics showing selected treated and control wards from 10 regions.

	REGIONS	TREATED WARDS	CONTROL WARDS	TOTAL
1	Songwe	303 (24%)	936 (76%)	1239 (100%)
2	Geita	381 (24%)	1182 (76%)	1563 (100%)
3	Shinyanga	394 (22%)	1334 (77%)	1728 (100%)
4	Tanga	729 (21%)	2711 (79%)	3440 (100%)
5	Mbeya	340 (20%)	1337 (80%)	1677 (100%)
6	Mara	413 (20%)	1642 (80%)	2055 (100%)
7	Simiyu	335 (19%)	1459 (81%)	1794 (100%)
8	Dodoma	526 (18%)	2475 (82%)	3001 (100%)
9	Mwanza	410 (16%)	2158 (84%)	2568 (100%)
10	Kagera	358 (7%)	4468 (93%)	4826 (100%)
	Grand Total	4189	19702	23891

Source: Project CLEAR internal records.

Data verification. The CLEAR project team utilized an in-house call center to conduct phone interviews with local leaders in the areas where the road show was being performed. The in-house team had access to NSMIS data, which was compared with reported data from the local officials' own records. Thus, before the road show team went to each area, preliminary data was extracted for 2 purposes. Firstly, to identify the poorly performing wards that the road show had to visit. Secondly, the team contacted local leaders, especially village chairs, to confirm the data uploaded from the NSMIS system. By doing so, the team ensured that the information provided during the road show was accurate and reliable.

Selection of regions and wards. All the regions visited during the study period were selected as treatment areas for the purposes of this analysis; non-participating regions were used as controls (see Table 1). Within the 10 regions visited by the campaign, a total of 4189 treated wards and 19 702 control wards were available for analysis, as shown in Table 1.

Dependent variables. The outcome variable is the proportion of households with improved toilets at regional or ward level. "Improved" in this context means a toilet characterized by a washable floor, with 4 solid walls, door and covered with a roof. In this study, household data was extracted quarterly from the NSMIS database for 2017 to 2020. The year of 2017 is considered as the base year; it was only in 2018 when mass media, social media, the direct contact consumer events started. Since the national campaign covered the whole country through multiple channels and platforms, the campaign years (2018–2021) are regarded as treatment years while the prior year (2017) is considered as control (no national campaign).

Independent variables. Treat and Visit are 2 independent variables included in the model. Treat is a dummy variable indicating whether or not on-ground activities took place in that area during the project period (ie, between 2018 and 2021). It controls for any differences in the average level of toilet coverage between treatment and control areas. Visit is a second dummy variable which indicates the period in which the DCC team moved into a ward or region. The Visit variable measures the effect of the campaign on the rate of change in toilet coverage after the campaign has been in an area.

Data analysis methods

A multiple regression model was employed to test the effect of the roadshow intervention on improvement of household toilets in the selected regions and wards. Treat and Visit were regressed on the proportion of household with improved toilets. STATA was used to conduct this regression analysis.

Below is the equation of the fixed effects model used to estimate region- and ward-level effects:

$$Y_{iT} = \alpha_i + \beta_1 * Treat_{iT} + \beta_2 * Visit + e$$

Where

- Y_{iT} is the outcome variable (improved toilet coverage (%)) where i = unit and t = time.
- α_i is the slope for each ward/region
- β 's are the coefficients of predictors
- Treat = 0 or 1 depending on whether a roadshow event occurred in that ward or region between 2018 and 2020.
- Visit = 0 until the quarter of the year in which the DCC team moves into a ward or region, when it becomes 1.
- e = residual variation

Table 2. Model results.

	(1)	(2)
	IMPROVED HOUSEHOLD TOILETS: WARD LEVEL	IMPROVED HOUSEHOLD TOILETS: REGIONAL LEVEL
Treat	0.0782 (0.437)	-4.369*** (1.395)
Visit	12.91*** (0.370)	14.17*** (1.359)
Constant	44.49*** (0.247)	48.69*** (1.151)
Observations	23891	416
R-squared	0.059	0.235

Robust standard errors in parentheses.

*** $P < .01$. ** $P < .05$. * $P < 0.1$.

Results

The impact of roadshows was analyzed at both ward and regional level (see Table 2). The following table shows the effect of both the treatment variable and period of visiting on households with improved toilets.

The findings show the difference in outcome (percentage of households with improved toilets) between treatment and non-treatment ward level was statistically insignificant estimated at 0.078. At regional level, the Treat effect was negative compared to regions where roadshows did not occur. This was likely caused by the fact that regions were selected for intervention with roadshow events by the CLEAR consortium because of their lower overall coverage with improved latrines.

Contrary to the Treat variable, Visit had positive and significant effect on the improved toilets at both ward and regional level. This implies that when roadshows moved into a ward at the respective quarter, household with improved toilets increased by 12.9% compared untreated wards. At regional level, the treated regions experienced positive and significant effect estimated at 14.17% compared to untreated regions at the time the roadshow event occurred.

Discussion

The common insight from the model results at both ward and regional levels is that the roadshow events had a significant positive effect on the rate at which households in that area subsequently improved their latrines. Roadshows, or direct contact consumer events, have become critical interventions for behavioral change campaigns. Mass media alone may not become effective especially in remote areas that media do not reach. Galiani et al¹² conducted a study on the effect of large-scale mass media and community level intervention on promoting handwashing behavior in Peru. Both mass media plus direct contact consumer intervention were studied and findings indicate that direct contacts have more significant effect in knowledge and behavioral compared to mass media. Equally, in 2018, roadshows were employed in Indonesia to promote healthy

homes and clean environment.¹³ The results reveal that the roadshows in various villages increased access to sanitation facilities and promoted behavior change related to handwashing and toilet use.

Further, Scott et al¹⁴ studied the impact of different communication channels on reported handwashing behavior of women in Ghana, including both mass media and community events. The findings showed direct contact consumers had impact to those who were exposed to community events and at least one media channel. The authors further indicated that the advantage of using community events such as roadshows is the ability to reach people with low income and those living in remote regions.

Limitations

There are several important limitations to the interpretation of these results, however. The first lies in the fact that the selection of wards and regions in which to perform roadshow events was not random. Instead, selection was typically of areas where existing coverage of improved sanitation was lacking relative to other wards in the region or regions in the country. This makes sense in terms of the program's objective to have maximal impact on sanitation coverage, but does violate one of the assumptions of a scientific trial: "treatment" and "control" areas are not directly comparable in terms of social and economic factors.

Another limitation is that NSMIS data is believed not be collected systematically in the same way in all areas of the country, which could reduce their overall quality in terms of representing the actual state of sanitation coverage at a particular moment in time. However, the system has been designed for monitoring and verification.

Third, r-squared values from the estimated models are quite low, indicating that many other factors not included in the models are necessary to explain the pattern of differences in sanitation coverage across Tanzania. This is not surprising, as roadshow events took place at a particular location on a particular day, and thus were only able to attract a limited number of people to attend. (Project CLEAR internal records indicate average attendance was about 1000 individuals.) Thus, less than 5% of Tanzanians ever attended a roadshow event. Nevertheless, there was an up-tick in coverage in the areas surrounding these events after they had occurred.

Despite NSMIS having extensive data, the system does not capture crucial characteristics such as household income and other demographic features that could be utilized as control variables in the analysis; nor is it known whether relevant government officials were present or absent at the ward level, which might have had an impact. As a result, these data were not available for analysis in this study. Incorporating such important variables into the NSMIS system would enhance the system's effectiveness and provide a more comprehensive understanding of the community being studied.

All of these limitations reduce our ability to interpret the results as indicating the observed differences in rate of coverage can be attributed to the roadshow events occurring in those areas. Nevertheless, this is the best indication we have of these impacts, given the difficult conditions under which to evaluate this program.

Conclusion

Overall, evidence shows direct consumer contacts had a significantly positive effect on the rate at which households improved the quality of their toilets across Tanzania. We cannot be sure as to what mechanism is responsible for the impact of these events—whether they convince local and regional officials to put greater efforts into sanitation promotion, or simply inspire local residents to take action themselves, only that there was a desired impact from them on sanitation coverage. This result suggests that, to be effective, especially in remote areas where accessibility to mass media is challenging, behavioral change campaigns can include direct consumer contacts or roadshows as part of their repertoire.

Author Contributions

JM: Designed and conducted the statistical tests; Helped write the paper. ES: Collected the data; Helped write the paper. RA: Conceived of the study; Helped write the paper.

Ethics

Participants were informed about the study and that their opinions would be anonymized at an individual and organizational level. Written consent was provided by each participant. Ethical approval for the study was provided by the London School of Hygiene and Tropical Medicine (Document ref: 17832) and the National Institute of Medical Research

Tanzania (Document ref: NIMR/HQ/R.8a/Vol IX/3364). All data will be provided to legitimate parties on request.

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