


Are Participants in a Behavior Change Communication Campaign More Likely to Seek Care for Childhood Diarrhea? A Study of Caregivers of Children under 2 in Tanzania

Britton Reher¹, Shelly Cooper¹, Generose Mulokozi², Janaya Brown¹, Heather Merrill¹, Mary Linehan², Kirk Dearden², Scott Torres³, Benjamin Crookston¹, Josh West¹, Cougar Hall¹ 

¹Department of Public Health, Brigham Young University, Provo, USA

²IMA World Health, Washington DC, USA

³RTI International, Washington DC, USA

Email: coughhall@gmail.com

How to cite this paper: Reher, B., Cooper, S., Mulokozi, G., Brown, J., Merrill, H., Linehan, M., Dearden, K., Torres, S., Crookston, B., West, J. and Hall, C. (2022) Are Participants in a Behavior Change Communication Campaign More Likely to Seek Care for Childhood Diarrhea? A Study of Caregivers of Children under 2 in Tanzania. *Health*, 14, 342-354.

<https://doi.org/10.4236/health.2022.143027>

Received: February 12, 2022

Accepted: March 25, 2022

Published: March 28, 2022

Copyright © 2022 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Stunting remains a particular challenge in Sub-Saharan Africa. Despite encouraging declines in Tanzania over the past 25 years, one-third of Tanzanian children under the age of five years are stunted. Diarrhea remains one of the greatest causes of childhood stunting worldwide. Mass media has been used to improve the uptake of behaviors associated with reductions in diarrhea. This study evaluates the effectiveness of a mass media campaign in the Lake Zone region of Tanzania from 2015-2020 and positive changes in caregiver health-seeking behaviors related to diarrhea in children. Approximately 5000 households participated in a cross-sectional survey after a communications campaign. Exposure variables included hearing and seeing radio and TV spots and participating in a variety of interpersonal communication approaches. Study results indicated primary caregivers (mothers) exposed to media messages only (OR 1.66, CI 1.05 - 2.62), and to media messages and interpersonal communication (OR 2.51, CI 1.48 - 4.26), were more likely to seek advice or treatment for diarrhea from a health facility. Primary caregivers exposed to both media messages and interpersonal communication were more likely to give oral rehydration salts (OR 2.56, CI 1.72 - 3.79), zinc tablets/syrup (OR 1.74, CI 1.18 - 2.57), and homemade fluids (OR 2.02, CI 1.15 - 3.55) when their children had diarrhea. Male heads of household (fathers) exposure to mass media was not associated with care-seeking for diarrhea treatment.

Keywords

Tanzania, Diarrhea, Diarrheal Treatment, Stunting, Mass Media, Communication Campaign

1. Introduction

Stunting is a complex issue stemming from persistent undernutrition and poor sanitation [1] [2]. It is defined as height-for-weight Z score of more than two standard deviations below the World Health Organization (WHO) child growth standards for age and sex. In recent years, the prevalence of childhood stunting has declined globally; however, in 2019, 144 million children under five years of age were stunted worldwide [3]. Stunting remains a particular challenge in Sub-Saharan Africa. Despite encouraging declines in Tanzania over the past 25 years, one-third of Tanzanian children (2.7 million) under the age of five years, still experienced stunting in 2016 [4] [5].

One of the primary causes of childhood stunting is diarrheal diseases [2]. Diarrheal diseases cause an estimated 20 percent of all deaths for children younger than five years old, making them one of the leading causes of child mortality globally [2] [6]. Furthermore, multiple episodes of diarrhea in one year can greatly increase the risk of childhood stunting [7]. Guerrant and colleagues demonstrated that five episodes of diarrhea in the first two years of a child's life can lead to a 25 percent increase in stunting. Globally, an estimated 57 million disability-adjusted life years (DALYs) are due to preventable diarrheal diseases; 842,000 deaths annually, more than 360,000 of which are children under five years old [2].

Tanzania has experienced substantial declines in childhood mortality from diarrhea over the past three decades. Masanja *et al.* report declines in child diarrhea-specific mortality from 35.3 deaths per 1000 live births in 1980 to 3.9 deaths per 1000 live births in 2015. These declines are associated with increases in rotavirus vaccinations, the use of oral rehydration salts (ORS), improved breastfeeding practices, and Vitamin A supplementation [8]. Masanja and colleagues conclude that additional improvements will be made through increased access to health services and facilities; education; clean water, sanitation and hygiene (WASH); and integrated interventions focused on key childhood interventions such as the continued promotion of ORS, zinc tablets/syrup, and treatment for persistent diarrhea.

Efforts to reduce stunting and diarrhea include the use of mass media to influence key behaviors known to reduce both stunting and diarrhea incidence. Increased access to mass media, including television, radio, and social media provide relatively low-cost options for delivering child health programs. The use of mass media for health education and promotion has been well documented [9] [10]. Naugle and Hornick note that radio and television are the most frequently used channels for mass media interventions targeting diarrheal disease.

To date, however, little is known about the efficacy of using mass media for stunting prevention generally, and diarrheal diseases specifically. Alexander and colleagues found an association between access to mass media and knowledge of optimal WASH practices in Tanzania but were unable to determine the impact of exposure to mass media programming on actual WASH behaviors [11]. It is also unclear if mass media campaigns alone change behavior associated with diarrhea prevention or if mass media campaigns in combination with interpersonal communication (IPC), such as home visits from community health workers (CHWs) would have a synergistic effect of positive behavior change toward diarrhea prevention and behaviors related to diarrhea treatment. The purpose of this study was to determine whether mothers, hereafter referred to as primary caregivers, and fathers, hereafter referred to as male heads of household, who benefitted from a mass media campaign, an IPC program, or both, sought appropriate care for diarrhea in children under the age of two years.

2. Methods

2.1. Design

Addressing Stunting in Tanzania Early (ASTUTE) was a large-scale, integrated nutrition project that operated in five regions of northwest Tanzania between 2015 and 2020. It included mass media (radio and television spots) and IPC (home visits, support groups, and facility-based counselling) designed to improve children's nutritional status and other developmental indicators. IMA World Health designed the program overall and, with the government and local non-governmental organizations, implemented home visits and support groups. Development Media International (DMI) was responsible for designing and implementing the mass media campaign. Funding for all program activities came from UKaid and the Department for International Development (DFID). WASH and early childhood development (ECD) were key areas of program focus. Radio and TV spot development was based on extensive, continuous formative research and testing of messages and spots were broadcast a total of 70,000 times. Each spot ended with a consistent tagline (a baby laughing). TV spots were aired before and during the evening news on national and regional stations. IPC programming was implemented by local non-governmental organization (NGO) volunteers (for support groups), health facility workers, and by CHWs (during in-home visits). A total of 411,000 caregivers participated in support groups, 1.6 million caregivers received counselling at health facilities, and 6.4 million caregivers were reached through home visits. CHWs counseled primary caregivers and referred children with faltering growth for treatment, educated and supported primary caregivers to engage in stimulation-related behaviors such as talking, drawing, playing, naming objects, and reinforced optimal infant and young child feeding and hygiene practices.

2.2. Sample

A total of 4996 primary caregivers, and 3082 corresponding male heads of house-

hold, were surveyed across the Lake Zone region of Tanzania, which includes the five regions of Geita, Kagera, Kigoma, Mwanza, and Shinyanga. Only households with a child under the age of two years were eligible to participate in the questionnaire. A stratified, multi-stage random sample design was used to select questionnaire participants. Within the five participating regions, a total of 243 villages were selected and participants were randomly sampled within each village.

2.3. Procedure

The questionnaire was administered to female caregivers of the youngest child in the home as well as the male head of household, if available. The research firm IPSOS collected data via a field team of 10 supervisors and 50 enumerators. In total, 25 percent of questionnaires were quality-checked through revisits and phone checks. Ethical approval was granted by Development Media International's (DMI) internal IRB and Tanzania's National Institute for Medical Research (NIMR/HQ/R.8a/Vol.IX/2344). Participation was voluntary and informed consent was collected before the survey began. Respondents were told that they could stop the survey at any time. Questions were written in English and then translated into Swahili prior to being administered. The questionnaire was piloted and adjusted before being given to participants. The questionnaire contained 169 questions and required approximately 50 - 60 minutes to complete.

2.4. Measurements & Analysis

Data were collected on participant demographic characteristics, reported exposure to the intervention, and diarrheal care seeking practices.

Wealth. Household wealth was estimated using a calculated composite variable comprised of multiple questions and was adapted from a previously validated index [12]. The index was comprised of two sub-indices, including access to services and ownership of consumer durables. Access to services pertained to the availability of safe drinking water sources (e.g., protected wells, a public stand-pipe) and safe sanitation (e.g., a flush toilet). Pit latrines were not considered to be improved sanitation, per the Joint Monitoring Program of the WHO. Consumer durables included ownership of eight items: a radio, TV, bicycle, motorcycle, mobile phone, boat, or animal-drawn cart. An average of the two indices was used to calculate an overall wealth score, with possible values ranging between 0 and 1. Higher wealth scores indicate higher socioeconomic status.

Intervention Exposure. A separate exposure score was calculated for each of the radio, TV, and IPC interventions. Exposure to radio was coded "yes" if respondents reported yes to hearing the example spot(s) that ends with a laughing baby sound or reported hearing messages on the radio that gave advice about maternal/child health/child development. Exposure to TV was coded "yes" if respondents reported yes to seeing the example image frame(s) on TV or "reported seeing messages on the TV that gave advice about maternal/child health/

child development. IPC exposure was coded “yes” if respondents reported that they had received an in-home visit from a CHW who gave advice about maternal and child health and/or child development. Exposure to radio, TV and IPC was estimated for female primary caregivers. IPC primarily targeted females, so while some male respondents did participate in support groups, IPC exposure was only calculated for female primary caregivers.

Diarrheal Care Seeking Behaviors. Diarrheal treatment was assessed based on participants’ report of whether the child had diarrhea in the past two weeks. If participants answered yes, interviewers asked whether they sought treatment and if so, from whom. The most common responses for where treatment was sought included regional or district hospital, health center, dispensary, clinic, community health facility, pharmacy, or NGO. Regional hospital, district hospital, health center, and clinic were merged into a single variable (“health facility”) and dispensary or pharmacy were combined into one variable (“dispensary/pharmacy”). Questions relating to diarrheal treatment included ORS (either purchased as a packet or made at home), and zinc tablets/syrup.

Data were cleaned and recoded using STATA version 16 (College Station, Texas, USA). Survey data were analyzed to understand associations between exposure to campaign programming and key health outcomes. “Don’t know” responses in the questionnaires were recoded as “no” for binary variables. Additionally, missing data were dropped for data analysis that included key exposure variables. Likelihood Ratio Tests were used to obtain p-values, which showed the strength of the association between exposure and outcome. Sample proportions and odds ratios (ORs) were used to assess the size of the effect of exposure on the outcome (along with 95% confidence intervals). All adjusted regression models controlled for primary caregivers’ age, primary caregivers’ level of education, and household wealth.

3. Results

Demographic information for the 4996 primary caregivers, and 3082 corresponding male heads of household can be found in **Table 1**. Most households had 1 - 2 children under the age of 5. Christianity was the predominant religious affiliation (83.32%) and most women were in married, monogamous unions (77.06%). More than half of men (56.16%) and women (64.02%) had completed primary education and men were, on average, almost 6 years older than women. The wealth index score indicated the majority of participants were in the low to lower middle index score (**Table 1**).

Approximately 20 percent of primary caregivers reported that their child had experienced diarrhea within the last two weeks. The majority of them also reported that they sought care at a healthcare facility or hospital (**Table 2**).

Primary caregivers who were exposed to media messages only were significantly more likely (OR 1.66, CI 1.05 - 2.62) to seek advice or treatment for diarrhea from a healthcare facility than those with no media exposure (**Table 3**).

Table 1. Participant demographics.

	Primary Caregiver	Male Head of Household
	N = 4996	N = 3082
	Mean (SD)	Mean (SD)
Age	28.23 (7.08)	34.55 (8.49)
Wealth	0.36 (0.17)	0.36 (0.17)
Education	%	%
Less than primary	29.65	17.16
Completed primary	56.86	64.28
Some secondary or above	13.49	18.56
Children's Age (Months)	%	
0 - 6	39.11	
7 - 12	25.90	
13 - 18	21.88	
19 - 23	13.11	
Number of Children in Household Under Age 5	%	
1 child	47.32	
2 children	42.67	
3 or more children	9.89	
Religion	%	
Christian	83.32	
Muslim	10.82	
Other	5.86	
Marital Status	%	
Single-never married	4.22	
Married-Monogamous	77.06	
Married-Polygamous	9.81	
Other	8.91	

Table 2. Descriptive diarrhea-related indicators.

	%
Child had diarrhea in the past two weeks	N = 4996
No	79.44
Yes	20.56

Continued

During the diarrheal episode, the caregiver sought medical advice or treatment from any source.	N = 1027
No	32.81
Yes	67.19
Child was given:	N = 1027
ORS	40.80
Zinc tablets/syrup	40.70
Homemade fluids	12.56

Table 3. Regression analysis for primary caregiver's exposure to media and ipc and care-seeking for children's diarrhea.

Indicator	N	Media only	IPC only	Media and IPC
		OR (CI)	OR (CI)	OR (CI)
Sought Treatment				
Yes	1006	1.22 (0.90 - 1.65)	1.64 (0.84 - 3.20)	2.17 (1.39 - 3.37)*
Treatment Source				
Hospital/health clinic	677	1.66 (1.05 - 2.62)*	1.71 (0.72 - 4.03)	2.51 (1.48 - 4.26)*
Pharmacy/Dispensary	677	0.69 (0.47 - 1.03)**	0.98 (0.44 - 2.19)	0.74 (0.46 - 1.21)
Type of Treatment				
ORS	1006	1.23 (0.90 - 1.67)	1.85 (1.00 - 3.43)**	2.56 (1.72 - 3.79)*
Zinc Tablets/Syrup	1006	1.24 (0.92 - 1.69)	1.48 (0.79 - 2.75)	1.74 (1.18 - 2.57)*
Homemade Fluids	1006	1.43 (0.89 - 2.31)	0.62 (0.19 - 2.14)	2.02 (1.15 - 3.55)*

*p-value < 0.05; **p-value < 0.01. Logistic regression model controlling for wealth, maternal education and primary caregiver's age.

Primary caregivers who were exposed to both media messages and IPC were significantly more likely (OR 2.51, CI 1.48 - 4.26) to seek advice or treatment for diarrhea from a healthcare facility. Primary caregivers exposed to both media messages and IPC were significantly more likely (OR 2.17, CI 1.39 - 3.37) to seek advice or treatment for diarrhea.

Primary caregivers who were exposed to both media messages and IPC were significantly more likely (OR 2.56, CI 1.72 - 3.79) than caregivers with no exposure to give ORS when their children had diarrhea. Primary caregivers who were exposed to both media messages and IPC were significantly more likely than primary caregivers not exposed to media nor IPC to use zinc tablets/syrup for diarrhea (OR 1.74, CI 1.18 - 2.57). Similarly, primary caregivers who were ex-

posed to both media messages and IPC compared to primary caregivers who were not exposed to media nor IPC were more likely to treat diarrhea with homemade fluids (OR 2.02, CI 1.15 - 3.55). Complete results of regression analysis for primary caregiver's exposure to media and IPC and care-seeking for children's diarrhea are presented in **Table 3**.

Male head of household exposure to the media campaign only was not associated with any care-seeking behaviors for children's diarrhea (**Table 4**).

4. Discussion

The purpose of this study was to determine whether primary caregivers and male heads of household who benefitted from a mass media campaign, and primary caregivers who benefitted from an IPC program or a combination of mass media and IPC, sought appropriate care for diarrhea in children under the age of two years.

Primary caregivers who had heard at least one radio or TV spot on children's nutrition and health were more likely than primary caregivers with no exposure to the mass media spots to seek care at a health clinic or hospital for childhood diarrhea. However, exposure to the media campaign alone was not associated with the type of diarrhea treatment primary caregivers sought. This finding is similar to the results of a 35-month cross-sectional radio campaign in Burkina Faso conducted to address survival rates of children under 5 years of age [13]. That campaign developed and aired 12 short spots and 79 intense radio spots which promoted healthcare-seeking or home treatment for diarrhea, including ORS and fluids. It should be noted that the NGO that conducted the mass media campaign in Tanzania (DMI) was also responsible for the media campaign in Burkina Faso.

Table 4. Regression analysis for male head of household exposure to media and care-seeking for children's diarrhea.

Key Indicator	N	Exposed to TV or Radio Message	
		OR (CI)	p-value
Sought Treatment			
Yes	604	1.42 (0.95 - 2.11)	0.080
Treatment Source			
Hospital/health clinic	415	0.94 (0.55 - 1.61)	0.824
Pharmacy/Dispensary	415	0.87 (0.52 - 1.43)	0.576
Type of Treatment			
ORS	604	1.05 (0.72 - 1.54)	0.793
Zinc Tablets/Syrup	604	1.33 (0.90 - 1.97)	0.153
Homemade Fluids	604	1.43 (0.79 - 2.58)	0.233

Logistic regression model controlling for wealth, maternal education and primary caregiver's age.

Primary caregivers who participated in IPC activities but who had not heard nor seen radio and TV spots were no more likely than unexposed primary caregivers to treat childhood diarrhea with ORS. It is not clear why IPC interventions were positively associated with ORS treatment for childhood diarrhea while exposure to mass media was not. Indeed, mass media has been used to promote the use of ORS for diarrhea for many years. Since the introduction of ORS in the 1960s [14], mass media has been a common approach for increasing the use of ORS and zinc treatment for diarrhea [15] [16]. A campaign was undertaken in India, Kenya, Uganda, and Nigeria, to increase the use of ORS and zinc. From 2012-2016, ORS and zinc coverage in Kenya increased by 2.6 percentage points per year, and 7.1 percentage points per year in Uganda [14]. Findings from the campaign in India demonstrate both the potential for media to reach mothers in rural areas and the efficacy of media compared to interpersonal outreach [14] [17].

Primary caregivers' exposure to both mass media programming and IPC was associated with a variety of key study variables and appeared to be the most influential intervention strategy. Primary caregivers who were exposed to both the mass media campaign and IPC had more than twice the odds of having sought advice or treatment for diarrhea from any source than those primary caregivers who were not exposed to both the media campaign and IPC. This finding is consistent with previous research and subsequent program planning approaches demonstrating the use of multiple communication outlets (e.g., a combination of television ads, personal communication, and radio broadcasts) as a more effective and sustainable approach when compared to using only one health communication strategy [18] [19]. Furthermore, in a systematic review, Robinson [19] found that the combination of mass media health communication campaigns (e.g., any message intended to increase awareness of a health product, delivered through mass media, social media, or interpersonal communication) and a distribution of the product, generally at a free or discounted price, has proven more effective than mass media campaigns alone.

Findings also show that primary caregivers exposed to both mass media and IPC were much more likely to seek treatment at a healthcare facility than any other source. These results are consistent with a study conducted in Ethiopia in 2016 in which the most common choice for treatment for sick children were health facilities (74.6%), followed by home remedies (55.2%), pharmacies (27.3%) and other traditional sources. The most common sickness reported was diarrhea [20].

Mass media messaging was not associated with care-seeking behaviors or treatment approaches for childhood diarrhea among male heads of household. Mass media alone was less effective with primary caregivers than a combination of mass media and IPC. It is important to note that male heads of household were not formally involved with IPC and only had access to the mass media portion of the ASTUTE program. Research by Robinson [19] and Snyder [21], and the results of this study suggest that implementing a media campaign without a

complementary intervention centered on personal communication will have a limited effect when compared to a more robust approach. Supplementing a media campaign with additional approaches that focus on person-to-person engagements, such as IPC interactions, may improve the intended impact.

Low male engagement in maternal and child health in Tanzania has been associated with the position of men in society in general, and to a health system regarded as uninviting to men, specifically [22] [23]. Increasing male involvement in maternal and child health is a public health priority and further research is needed to understand the barriers to male engagement in care-seeking behaviors and treatment for diarrhea in children. This barrier might be attributed to lack of complementary interventions or traditional care options preferred by males.

Although not addressed in this study, further studies may be needed in determining barriers for seeking treatment for diarrheal episodes for many Tanzanians which may include financial status, the number of young children in the home, and proximity of the nearest healthcare facility. In one study, financial status was also a factor that indicated what level of treatment Tanzanians sought [24]. If multiple children under five years of age are in the home, many may also opt for at-home care or no care.

Limitations

This study is limited by several key factors. Far more study participants were exposed to mass media than IPC. While this is to be expected given the nature of each programmatic approach, the unbalanced exposure of participants to each approach limits comparison. Similarly, some variables yielded fewer responses than others, which may have weakened potential statistical inference. This study did not include a control group or measure key study variables prior to programmatic exposure, thus limiting significant results to correlation rather than causation. Finally, the ASTUTE program was implemented in five Lake Zone regions through cross-sectional analysis, which may not represent all Tanzanians. Despite these limitations the current study includes a large sample size, helps to evaluate a detailed and evidence-based multi-year stunting prevention program, addresses a significant public health issue in Tanzania, and can inform future health promotion efforts.

5. Conclusion

This study examined the association between the ASTUTE program and care seeking behaviors for diarrhea. The results of this study highlight the importance of using multiple program strategies to maximize impact. Exposure to the media campaign or IPC individually was associated with success in some areas, yet exposure to both types of programming was associated with more significant relationships. Program planners may consider only using one intervention for future projects if a specific behavior is targeted, or if resources are limited, but a combination program appears to be most efficacious for addressing childhood di-

arrheal diseases.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Caulfield, L.E., de Onis, M., Blössner, M. and Black, R.E. (2004) Undernutrition as an Underlying Cause of Child Deaths Associated with Diarrhea, Pneumonia, Malaria, and Measles. *American Journal of Clinical Nutrition*, **80**, 193-198. <https://doi.org/10.1093/ajcn/80.1.193>
- [2] Prüss-Üstün, A., Wolf, J., Corvalán, C.F., Bos, R. and Neira, M.P. (2016) Preventing Disease through Healthy Environments: A Global Assessment of the Burden of Disease from Environmental Risks. World Health Organization, Geneva.
- [3] United Nations Children's Fund (UNICEF), World Health Organization and International Bank for Reconstruction and Development/The World Bank (2020) Levels and Trends in Child Malnutrition: Key Findings of the 2020 Edition of the Joint Child Malnutrition Estimates. World Health Organization, Geneva. <http://www.who.int/publications/i/item/jme-2020-edition>
- [4] Kejo, D., Mosha, T., Petrucka, P., Martin, H. and Kimanya, M.E. (2018) Prevalence and Predictors of Undernutrition among under Five Children in Arusha District, Tanzania. *Food Science and Nutrition*, **6**, 2264-2272. <https://doi.org/10.1002/fsn3.798>
- [5] Sunguya, B.F., Zhu, S., Mpembeni, R. and Huang, J. (2019) Trends in Prevalence and Determinants of Stunting in Tanzania: An Analysis of Tanzania Demographic Health Surveys (1991-2016). *Nutrition Journal*, **18**, 85. <https://doi.org/10.1186/s12937-019-0505-8>
- [6] Black, R.E., Allen, L.H., Bhutta, Z.A., Caulfield, L.E., De Onis, M., Ezzati, M., Mathers, C., Rivera, J. and Maternal and Child Undernutrition Study Group (2008) Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences. *The Lancet*, **371**, 243-260. [https://doi.org/10.1016/S0140-6736\(07\)61690-0](https://doi.org/10.1016/S0140-6736(07)61690-0)
- [7] Guerrant, R.L., DeBoer, M.D., Moore, S.R., Scharf, R.J. and Lima, A.A. (2013) The Impoverished Gut—A Triple Burden of Diarrhoea, Stunting and Chronic Disease. *Nature Reviews Gastroenterology and Hepatology*, **10**, 220-229. <https://doi.org/10.1038/nrgastro.2012.239>
- [8] Masanja, H., Mongi, P., Baraka, J., Jackson, B., Kisiwiye, Y., Manji, K., Iriya, N., John, T., Kimatta, S., Walker, N. and Black, R.E. (2019) Factors Associated with the Decline in under Five Diarrhea Mortality in Tanzania from 1980-2015. *Journal of Global Health*, **9**, Article ID: 020806. <https://doi.org/10.7189/jogh.09.020806>
- [9] Naugle, D.A. and Hornik, R.C. (2014) Systematic Review of the Effectiveness of Mass Media Interventions for Child Survival in Low- and Middle-Income Countries. *Journal of Health Communication*, **19**, 190-215. <https://doi.org/10.1080/10810730.2014.918217>
- [10] Wakefield, M.A., Loken, B. and Honik, R.C. (2010) Use of Mass Media Campaigns to Change Health Behaviour. *The Lancet*, **376**, 1261-1271. [https://doi.org/10.1016/S0140-6736\(10\)60809-4](https://doi.org/10.1016/S0140-6736(10)60809-4)
- [11] Alexander, C.C., Shrestha, S., Tounkara, M.D., Cooper, S., Hunt, L., Hoj, T.H.,

- Dearden, K., Kezakubi, D., Atugonza, V., West, J., Crookston, B. and Hall, C. (2019) Media Access Is Associated with Knowledge of Optimal Water, Sanitation and Hygiene Practices in Tanzania. *International Journal of Environmental Research and Public Health*, **16**, 1963. <https://doi.org/10.3390/ijerph16111963>
- [12] Briones, K. (2017) How Many Rooms Are There in Your House? Constructing the Young Lives Wealth Index. Young Lives. https://www.younglives.org.uk/sites/www.younglives.org.uk/files/YL-TN43_0.pdf
- [13] Sarrassat, S., Meda, N., Ouedraogo, M., Some, H., Bambara, R., Head, R., Murray, J., Remes, P. and Cousens, S. (2015) Behavior Change after 20 Months of a Radio Campaign Addressing Key Lifesaving Family Behaviors for Child Survival: Midline Results from a Cluster Randomized Trial in Rural Burkina Faso. *Global Health: Science and Practice*, **3**, 557-576. <https://doi.org/10.9745/GHSP-D-15-00153>
- [14] Schroder, K., Battu, A., Wentworth, L., Houdek, J., Fashanu, C., Wiwa, O., Kihoto, R., Macharia, G., Trikha, N., Bahuguna, P., Dabas, H., Kirchoffer, D., Muhirwe, L., Mucheri, P., Musoke, A. and Lam, F. (2019) Increasing Coverage of Pediatric Diarrhea Treatment in High-Burden Countries. *Journal of Global Health*, **9**, Article ID: 0010503. <https://doi.org/10.7189/jogh.09.010503>
- [15] Santosham, M., Chandran, A., Fitzwater, S., Fischer-Walker, C., Baqui, A.H. and Black, R. (2010) Progress and Barriers for the Control of Diarrhoeal Disease. *The Lancet*, **376**, 63-67. [https://doi.org/10.1016/S0140-6736\(10\)60356-X](https://doi.org/10.1016/S0140-6736(10)60356-X)
- [16] Unger, C.C., Salam, S.S., Sarker, M.S.A., Black, R., Cravioto, A. and Arifeen, S.E. (2014) Treating Diarrhoeal Disease in Children under Five: The Global Picture. *Archives of Disease in Childhood*, **99**, 273-278. <https://doi.org/10.1136/archdischild-2013-304765>
- [17] Lam, F., Pro, G., Agrawal, S., Shastri, V.D., Wentworth, L., Stanley, M., Beri, N., Tupe, A., Mishra, A., Subramaniam, H., Schroder, K., Prescott, M.R. and Trikha, N. (2019) Effect of Enhanced Detailing and Mass Media on Community Use of Oral Rehydration Salts and Zinc during a Scale-Up Program in Gujarat and Uttar Pradesh. *Journal of Global Health*, **9**, Article ID: 010501. <https://doi.org/10.7189/jogh.09.010501>
- [18] National Cancer Institute (2004) Making Health Communication Programs Work: A Planner's Guide. U.S. Dept. of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda.
- [19] Robinson, M.N., Tansil, K.A., Elder, R.W., Soler, R.E., Labre, M.P., Mercer, S.L., Eroglu, D., Baur, C., Lyon-Daniel, K., Fridinger, F., Sokler, L.A., Green, L.W., Miller, T., Dearing, J.W., Evans, W.D., Snyder, L.B., Kasisomayajula Viswanath, K., Beistle, D.M., Chervin, D.D., Bernhardt, J.M. and Community Preventive Services Task Force (2014) Mass Media Health Communication Campaigns Combined with Health-Related Product Distribution: A Community Guide Systematic Review. *American Journal of Preventive Medicine*, **47**, 360-371. <https://doi.org/10.1016/j.amepre.2014.05.034>
- [20] Kolola, T., Gezahegn, T. and Addisie, M. (2016) Healthcare Seeking Behavior for Common Childhood Illnesses in Jeldu District, Oromia Regional State, Ethiopia. *PLoS ONE*, **11**, e0164534. <https://doi.org/10.1371/journal.pone.0164534>
- [21] Snyder, L.B., Hamilton, M.A., Mitchell, E.W., Kiwanuka-Tondo, J., Fleming-Milici, F. and Proctor, D. (2004) A Meta-Analysis of the Effect of Mediated Health Communication Campaigns on Behavior Change in the United States. *Journal of Health Communication*, **9**, 71-96. <https://doi.org/10.1080/10810730490271548>
- [22] August, F., Pembe, A.B., Mpembeni, R., Axemo, P. and Darj, E. (2016) Community Health Workers Can Improve Male Involvement in Maternal Health: Evidence from

Rural Tanzania. *Global Health Action*, **9**, 30064.

<https://doi.org/10.3402/gha.v9.30064>

- [23] Lawson, D.W., Schaffnit, S.B., Hassan, A., Ngadaya, E., Ngowi, B., Mfinanga, S.G.M., James, S. and Mulder, M.B. (2017) Father Absence but Not Fosterage Predicts Food Insecurity, Relative Poverty, and Poor Child Health in Northern Tanzania. *American Journal of Human Biology*, **29**, e2293. <https://doi.org/10.1002/ajhb.22938>
- [24] Kanté, A.M., Gutierrez, H.G., Larsen, A.M., Jackson, E.F., Helleringer, S., Exavery, A., Tani, K. and Phillips, J.F. (2015) Childhood Illness Prevalence and Health Seeking Behavior Patterns in Rural Tanzania. *BMC Public Health*, **15**, Article No. 951. <https://doi.org/10.1186/s12889-015-2264-6>