Chiengi District, Zambia Open Defecation Free after 1 Year of Community-Led Total Sanitation

Rabson Zimba,¹ Vernon Ngulube,² Chinyama Lukama,² Abel Manangi,² Amy Tiwari,¹ Nicolas Osbert,³ Alexandra Hoehne,³ Sarah Muleya,² Leonard Mukosha,² Philippa Crooks,² Cade Chikobo,² Benjamin Winters,^{1,4} and David A. Larsen^{1,5*}

¹Akros, Lusaka, Zambia; ²Ministry of Local Government and Housing, Lusaka, Zambia; ³United Nations Children's Emergency Fund Water and Sanitation Unit, Lusaka, Zambia; ⁴University of Montana School of Public and Community Health, Missoula, Montana; ⁵Department of Public Health, Food Studies and Nutrition, Syracuse University, Syracuse, New York

Abstract. Nearly one quarter of Zambians lack access to sanitation facilities. In rural communities, the government of Zambia adopted community-led total sanitation (CLTS) to address this problem. One year after the implementation of a mobile-to-web monitored CLTS intervention, Chiengi District, Zambia, was verified as open defecation free with complete 100% coverage of household-level latrines. Chiefs and traditional leaders led the achievement. Impacts on individual health are yet to be measured in a robust way.

Open defecation poses a great danger to human health, promoting the spread of sanitation-related diseases such as cholera, dysentery, typhoid, and bilharzia as well as facilitating the spread of zoonotic parasites such as helminths.¹ In addition, diarrheal diseases are a contributing cause of malnutrition, which eventually leads to stunting in children.² Women and girls are particularly affected by a lack of sanitation facilities as they are compelled to defecate early in the morning or late at night due to social norms and fears of gender-based violence.³ Lack of sanitation facilities contributes to absenteeism at school—many girls miss 3 days every month during menstruation.⁴ These maladies are all too common in Zambia, where 40% of children under 5 years of age are stunted and 17% of women have experienced sexual violence.⁵

Across rural Zambia, only 44% of households have access to improved sanitation as estimated by the World Health Organization/United Nations Children's Emergency Fund (UNICEF) Joint Monitoring Program (JMP) and estimates on the proportion of households that practice open defecation range from 14% (JMP) to 26.8% (Zambia Demographic and Health Survey 2015). Traditional social norms promote open defecation in some areas. For example, male in-laws are not allowed to share a toilet with their female in-laws and without extra facilities males are prompted to defecate in the bush; men are not supposed to be seen going to the toilet as the act of defecation is shameful; and anecdotally defecation is enjoyed more in the open where there is space and fresh air.

Previous to 2007, the Zambian Ministry of Local Government and Housing (MLGH) subsidized the construction of shared latrines in villages by providing SanPlats,⁶ which are improved latrine slabs but not necessarily structural slabs. SanPlats are designed with smooth surfaces to make simple latrines hygienic. They are made in fine concrete, a material which is long lasting and easy to keep clean. Although subsidizing SanPlats provided access to a shared latrine, the approach did not address the behavioral norm of open defecation. Furthermore, funding was not sufficient for the number of people needing latrines in Zambia, and when a latrine collapsed or filled the community waited on the government to provide another SanPlat before they reconstructed and returned to open defecation in the meantime.

In 2007, the Zambian MLGH adopted and introduced the community-led total sanitation (CLTS) approach. CLTS is an

interactive methodology that provides zero subsidies for latrines and instead promotes communities to take ownership over the behavior change to stop open defecation.⁷ In the CLTS approach, volunteers called community champions conduct a village-level triggering, which includes mapping defecation sites and showing tangible paths of disease transmission. This triggering event then promotes behavior change through a process of social awakening. The focus is on the whole community rather than individuals, and highlights the effect of each individual's sanitation decisions on the larger community. The triggering process invokes feelings of shame, disgust, and fear around open defecation as well as pride, dignity, and solidarity in sanitation with the desire to end open defecation and clean the surroundings. In Zambia, CLTS was piloted in the Macha chiefdom of Choma District in Southern Province. CLTS showed impressive results as communities constructed latrines without any external help or subsidies and every single household in Macha chiefdom had access to a household-level latrine, and therefore, the chiefdom was designated as open defecation free (ODF). However, despite initial success in Macha chiefdom and general acceptance toward the intervention,⁸ scale-up of CLTS had limited effect throughout the rest of the country.

In March 2014, Akros, with support from Department for International Development, United Kingdom Aid Network, and UNICEF in partnership with MLGH, trained volunteer community sanitation champions in Chiengi District (Figure 1) to report village-level sanitation coverage using a mobile-to-web (M2W) platform developed for District Health Information System 2 (DHIS2) (Markle and others, in preparation). DHIS2 easily supports monthly reporting of aggregate village-level data, and the use of mobile phones to submit reports on latrine coverage by village improves both data quality and flow immediately. Following the data collected through the M2W platform, real-time reports showed that only 12% of households in Chiengi District had access to an improved sanitation facility, far less than previously assumed (Figure 2). After the realization that the district was performing so poorly, the three government gazetted chiefs of Chiengi, Chieftainess Lambwe Chomba, Senior Chief Puta, and Senior Chief Mununga, were able to hold village headmen accountable to improving latrine uptake while the district officials held community champions accountable to maintaining high reporting rates. Initially subtle competition between the three chiefs drove the villages toward ODF, but as complete district-wide ODF became closer, the chiefs worked in solidarity. Finally in March 2015, MLGH and UNICEF officials verified that every household in the district had a latrine, and the district was therefore declared ODF.

*Address correspondence to David A. Larsen, Department of Public Health, Food Studies and Nutrition, 344D White Hall, Syracuse University, Syracuse, NY 13244. E-mail: dalarsen@syr.edu

FIGURE 1. Chiengi district is one of the most remote districts in Zambia lying > 400 km from the capital city of Lusaka, Zambia. It lies on the shore of Lake Mweru and is characterized by water-logged sandy soils.

With a functioning monitoring tool in place, the three chiefs also propelled Chiengi District to attain ODF status by engaging communities and government officials in various ways. First, the District Water, Sanitation and Hygiene (WASH) Committee and stakeholders held regular meetings with the chiefs to review monthly ODF progress and place attention on villages not building latrines. Second, chiefs conducted monthly inspections in villages, prioritizing areas lagging behind in ODF progression. Third, community champions were given monthly targets to achieve. Fourth, the chiefs required payment, often in the form of goats or chickens, as penalty from those households who did not construct latrines and therefore continued the practice of open defecation. Because the chiefs were so actively involved, the people in their communities responded positively. The achievements in Chiengi District prove how agents of change can be empowered through an effective M2W, community-level surveillance system. More importantly, they provided valuable lessons on becoming ODF, and Chiengi will always be the first in Zambia to achieve this momentous feat.

The impact that becoming ODF has on health in Chiengi District is yet to be rigorously measured. However, the Ministry of Health reports of no single confirmed case of cholera in Chiengi District in 2015, an area that had previously experienced yearly outbreaks. Furthermore, robust analyses of health impacts are planned. In particular, these evaluations are needed as in Chiengi District ODF status was conferred upon the dis-

trict when every single household had access to a household-owned latrine. We did not completely sweep the district for human feces, and some may criticize that open defecation as a behavior may still be occurring. Importantly, however, previous results from CLTS interventions have shown a 14% reduction in stunting prevalence when defecation was not measured,⁹ and we hope to see a similar improvement in health in Zambia over time. The government has thus far trained six provinces in the management of the WASH monitoring system, and plans to scale it to the rest of the country. This scale-up is integral, as it allows for the system not only to become a central core function of the government's key efforts in achieving an ODF nation, but also allows for the incorporation of other health-related indicators into a framework that has been proven to work. Akros is currently working to expand the functionalities of the existing system by including village-level water access indicators, with the goal of creating a full water and sanitation surveillance system, and strengthening the network of data entry specialists across the country for this purpose.

The ODF celebration in Chiengi District was attended by many villagers from within the district, but also by chiefs, government officials, and partner representatives from other parts of Zambia. By being able to bear witness to the success, a final incentive to attain ODF status was established as attendees from other districts were challenged to emulate what Chiengi District accomplished. As a result, there has

FIGURE 2. Only 12% of households in Chiengi District had access to a latrine when the community-led total sanitation intervention first started. Within a year, access to sanitation increased to 100% of households. Latrine collapses during the rainy season and construction of new housing units led to decreased coverage in April 2015, but full coverage quickly rebounded.

now been a large increase in the number of verified ODF chiefdoms across the country. For instance, Luapula and Copperbelt provinces are currently competing to becoming the first ODF province not only in Zambia, but in all of sub-Saharan Africa.

Received March 15, 2016. Accepted for publication May 31, 2016.

Published online July 11, 2016.

Authors' addresses: Rabson Zimba and Amy Tiwari, Akros, Lusaka, Zambia, E-mails: rzimba@akros.com and atiwari@akros.com. Vernon Ngulube, Sarah Muleya, and Cade Chikobo, Republic of Zambia Ministry of Local Government and Housing, Lusaka, Zambia, E-mails: vernonngulube@yahoo.com, sarah45muleya@gmail.com, and cadechikobo@yahoo.com. Chinyama Lukama, MER Unit, Republic of Zambia Ministry of Local Government and Housing, Lusaka, Zambia, E-mail: chinyamalukama@yahoo.com. Leonard Mukosha, National CLTS Trainers, Republic of Zambia Ministry of Local Government and Housing, Lusaka, Zambia, E-mail: humililylcm@yahoo.com. Abel Manangi, Ministry of Local Government and Housing, Lusaka, Zambia, E-mail: manangiabel@yahoo.co.uk. Nicolas Osbert and Alexandra Hoehne, UNICEF Water, Sanitation and Hygiene Unit, Lusaka, Zambia, E-mails: nosbert@unicef.org and ahoehne@unicef.org. Benjamin Winters, Akros, Lusaka, Zambia, and University of Montana School of Public and Community Health Sciences, Missoula, MT, E-mail: bwinters@akros.com. David A. Larsen, Akros, Lusaka, Zambia, and Department of Public Health, Food Studies and Nutrition, Syracuse University, Syracuse, NY, E-mail: dalarsen@syr.edu.

REFERENCES

1. Mara D, Lane J, Scott B, Trouba D, 2010. Sanitation and health. *PLoS Med* 7: e1000363.
2. Merchant AT, Jones C, Kiure A, Kupka R, Fitzmaurice G, Herrera MG, Fawzi WW, 2003. Water and sanitation associated with improved child growth. *Eur J Clin Nutr* 57: 1562–1568.
3. Sommer M, Kjellén M, Pensulo C, 2013. Girls' and women's unmet needs for menstrual hygiene management (MHM): the interactions between MHM and sanitation systems in low-income countries. *J Water Sanit Hyg Dev* 3: 283–297.
4. Sommer M, Sahin M, 2013. Overcoming the taboo: advancing the global agenda for menstrual hygiene management for schoolgirls. *Am J Public Health* 103: 1556–1559. Available at: <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2013.301374>.
5. Central Statistical Office (CSO) [Zambia], Ministry of Health (MOH) [Zambia], and ICF International, 2014. *Zambia Demographic and Health Survey 2013-14*. Rockville, Maryland: Central Statistical Office, Ministry of Health, and ICF International.
6. Brandberg B, 1997. *Latrine Building: A Handbook for Implementing the SanPlat System*. London, United Kingdom: Intermediate Technology Publications Ltd (ITP).
7. Sigler R, Mahmoudi L, Graham JP, 2014. Analysis of behavioral change techniques in community-led total sanitation programs. *Health Promot Int* 30: 16–28.
8. Lawrence JJ, Yeboah-Antwi K, Biemba G, Ram PK, Osbert N, Sabin LL, Hamer DH, 2016. Beliefs, behaviors, and perceptions of community-led total sanitation and their relation to improved sanitation in rural Zambia. *Am J Trop Med Hyg* 94: 553–562.
9. Pickering AJ, Djebbari H, Lopez C, Coulibaly M, Alzua ML, 2015. Effect of a community-led sanitation intervention on child diarrhoea and child growth in rural Mali: a cluster-randomised controlled trial. *Lancet Glob Health* 3: e701–e711.