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Original Article

## Socio-Demographic Factors Associated with the Uptake of Community Led Total Sanitation: An Empirical Study among the Residents of Isiolo County, Kenya

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#### Keywords:

CLTS,  
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Despite Kenya aiming to achieve 100% ODF status by 2030 and adopting CLTS, about 5.6 million (14%) of the population practice OD. Thus, this study was guided by the research question: What is the level of uptake of community led total sanitation among residents of Isiolo County? The study used a descriptive cross-sectional methodology and conducted among residents of Isiolo Sub-County, Kenya. The study sampled 373 household heads from population of about 21,870 household heads for the study. Systematic random sampling was used to select the participants. An inclusion and exclusion criteria-based period lived in the county and consent to participate in the study were used. Data collection instruments entailed structured questionnaires for households' heads, key informant interview (KII) guides for opinion leaders, and an observation checklist. The content validity of the tools was assessed by expert from the department of Environmental Health at Kenyatta University. The tools were piloted in Longopito Sub-location with 37 households. Reliability of the tools was assessed using the piloted data through the test-retest technique. The paired data sets were correlated, giving  $R=0.75$ . The study found an association between demographic factors and the uptake of CLTS in Isiolo county. The uptake of CLTS was found to be low with almost half of the sampled residents lacking latrines. The study concludes there were a number of demographic factors that were significantly associated with the utilization of CLTS including the highest level of education ( $\chi^2=66.866$ ,  $p = 0.001$ ), Occupation ( $\chi^2=12.690$ ,  $p = 0.002$ ), Average monthly family income (KShs) ( $\chi^2=43.373$ ,  $p = 0.012$ ) and number of household members ( $\chi^2=6.948$ ,  $p = 0.044$ ). The study also found that Isiolo County had a low uptake rate for community-led total sanitation. Only three out of ten households in the county uptake CLTS. The study recommends that the County Government of Isiolo should scale up health education programs on community led total sanitation.

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## INTRODUCTION

Community led total sanitation (CLTS) is a strategy for community mobilization in eliminating open defecation (Harter et al., 2018). This involves triggering behaviour change among members by taking an initiative to avail and use latrines and basic hygiene facilities. Instead of utilizing latrines or covered pits, those who practice open defecation dispose of their waste in the open (MoH, 2016). It is projected that 673 million people globally still faeces in the open despite an urgent need to give safe universal access to sanitation (UNICEF & WHO, 2020). In Kenya, CLTS intervention was first introduced in May 2007 (Musyoki, 2016). An ambitious rural Kenya 2013 ODF campaign roadmap was developed by the government with the aim of reducing OD (Nzioki & Korir, 2018). People who live in underdeveloped and rural areas are more at risk because it can be difficult to access even the most basic sanitation services. Sanitation facilities are used by over 4.2 billion people worldwide, leaving untreated human waste, despite the enormous efforts being made to increase access to appropriate sanitation. This threatens the health of human beings as well as that of the environment (UNICEF & WHO, 2020).

Poor sanitation is a devastating situation to the health of the public affecting economic and social development. The achievement of Sustainable Development Goal (SDG) number six on appropriate access to clean water, sanitation, and hygiene will depend on adopting good sanitation

and hygiene practices as well as ending open defecation (OD) (UNDP, 2015). This pays a greater emphasis on people in vulnerable conditions especially women and girls. Eliminating OD by 2030 requires a close examination of barriers and drivers of transitioning from OD to use of latrines (Mara, 2017).

Worldwide, numerous nations have made strides toward ensuring widespread access to good sanitation to transform lives, economy, and the environment. However, the rate of progress differs, for example, India has reduced by half the problem of open defecation that is more common among the poor through the Clean India Program. This was to increase the number of households owning and using latrines (Curtis, 2019). Although India has made a lot of progress in reducing the cases of OD, it still remains the leading country followed by Nigeria and Indonesia (World Bank, 2019). Countries such as Cambodia, Nepal and Lao People's Democratic Republic have made significant progress towards use of basic sanitation services with rates ranging from 40 to 50 percent (Mara, 2017). Governments should help communities and individuals through programs that ensure universal access to sanitation and hygiene (Umar & Varma, 2018).

There has been a decrease in the percentage of those that use OD in the world apart from Sub-Saharan Africa where there were 220 million open defecators, an increase from 204 million in the recent past (Osumanu et al., 2019). The most

affected countries in sub-Saharan Africa include Ghana with an increasing trend of OD currently standing at 5 million people without access to any toilet at all followed by Sudan (Alemu et al., 2018). In Ethiopia, there is evidence of increased OD with previously declared open defecation free villages reverting back to practicing OD (Abebe & Tucho, 2020). There is a need for African governments to devote their resources and efforts to transform their poor sanitation situation to mitigate the effects of illnesses and other health issues as a result of this. According to research by Venkataramanan et al. (2018), the behaviour-change program total sanitation led by the community significantly reduces OD. Research has demonstrated a significant influence of CLTS in behaviour change resulting to construction of toilets and increased use in communities (Alemu et al., 2018). The World Health Organization (WHO) released new recommendations on cleanliness and health which includes developing sanitation interventions that ensure full access to toilets to contain human extra by entire communities (WHO, 2018). The most widely and successful sanitation campaign applied to halt OD is the CLTS program to date (USAID, 2018).

Environmental pollution is contributing significantly to the increased burden of mortality and morbidity. This is becoming a public health menace more especially in developing states around today's world (Xu et al., 2018). It is approximated that 9 million deaths occur in the world as a result of polluted environment. This accounts for about one death in every four people with diseases related to pollution in highly affected countries. Poor sanitation, especially OD is among the leading causes resulting to contamination of water bodies and bacteria transmitted through faecal matter (Landrigan et al., 2017). This worsens in Sub-Saharan Africa.

Despite Kenya aiming to achieve 100% ODF status by 2030 by adopting CLTS, about 5.6 million (14%) of the population still practice OD. Open defecation is rated highest among the poorest populations, especially in rural areas (Njuguna, 2019). According to Busienei et al.

(2019), almost 50% of the population in rural areas lack appropriate access to basic sanitary services. Open defecation in Isiolo County stands at 44.2% despite several interventions to eliminate it (Nzioki & Korir, 2018). This has resulted in low levels of hygiene and poor protection in approximately 78% of water sources in the region exposing them to faecal contamination. It worries that 43% of families lack access to a toilet facility (Okullo et al., 2017).

Diarrheal diseases have become more prevalent as a result of open defecation. Improper faecal disposal affects water quality and increases human to human pathogen transmission (Okullo, Moturi and Ogendi, 2017). In most rural areas where OD is very common, geophagy is largely practiced. Geophagia is mostly associated with medicinal, religious, cultural, psychological, and nutritional deficiency (Ravuluvulu, 2018). Poor sanitation costs Kenya approximately 27 billion shillings annually (RoK, 2016) and diarrheal diseases account for between 7 to 13 per cent of under five deaths. Isiolo County accounts for a prevalence of 10.5% diarrheal diseases (Isiolo County Integrated Development Plan, 2013-2017).

Despite CLTS interventions proving to be effective in reducing OD, its uptake remains a bone of contention to ensure 100% ODF communities. Open defecation is more prone to nomadic and pastoral communities as is the case in Isiolo County in Kenya. Information on the implementation of CLTS in this county is scarce. Most of the studies done worldwide have focused on OD and ODF status and not uptake of CLTS. Therefore, this study's objective is to assess how widely CLTS is used by residents of Isiolo County.

## METHODS

The study used a descriptive cross-sectional design and conducted among residents of Isiolo subcounty of Isiolo county, Kenya. It was selected because it was among the sub-counties in the country with the highest incidences of open defecation (Okullo, Moturi and Ogendi, 2017).

The county is located in Upper Eastern Kenya and is bordered by seven other counties: Tana River to the south-east, Garissa to the east, Wajir to the north-east, Meru to the south-west, Samburu to the east, Marsabit to the northwest, and Kitui to the southwest. The sub-county has about 21,870 households (HHs) which practice pastoralism as the primary economic activity (Kenya National Bureau of Statistics, 2019).

Fisher's sampling formula (Jung, 2014) coupled with Cochran's correction formula were used to determine a sample of 339.15 from a population of 21,870 household heads. This was adjusted by addition of 10% to cater for non-responses. Thus, a sample size of 373 household heads was used in the study.

Ngare Mare and Oldonyiro wards (with 2904 households) were randomly selected from which 31 villages were sampled. Randomization helped in ensuring equal chances of all other wards being included in the study to avoid biasness. Systematic random sampling with every 8<sup>th</sup> sampling interval (2904/373) was used to choose households. Individual respondents from each household were selected purposively based on the head of the household but the assistant selected in cases where the head was absent as at the time of data collection. However, inclusion and exclusion criteria were based on only those who had spent at least a year living in the county and gave their consent to participate in the study. In addition, opinion leaders consisting of public health officials, community health workers, religious leaders, and local leaders were included as key informants who were purposively selected.

Data collection instruments entailed structured questionnaires for households' heads, Key Informant Interview (KII) guides for opinion leaders, and an observation checklist. The content validity of the tools was assessed by experts from the department of Environmental Health at

Kenyatta University. The tools were piloted in Longopito Sub-location in Isiolo county with 37 households (10% of actual sample) as recommended by Oribhabor and Anyanwu (2019). Reliability of the tools was assessed using the piloted data through the test-retest technique. The paired data sets were correlated, giving  $R=0.75$ .

## RESULTS

### Socio-demographic Characteristics of Respondents

The goal of the study was to ascertain how the respondents' sociodemographic variables were distributed in relation to the uptake of community led total sanitation. The results on demographics of the study participants were presented in *Table 1*.

From *Table 1*, the age distribution of the respondents revealed that 133 (36.8%) were between the ages of 30 and 39, while 106 (29.4%) were between the ages of 20 and 29. The greatest level of education acquired by the respondents was primary level education, with 116 (32.1%). 69 respondents (19.1%) were single, while 237 (65.7%) were married. Christians made up the majority of the participants with 347 (96.1%) while Muslims were 14 (3.9%). Results on the gender of respondents showed that 339 of them (93.9%) were men, while 22 (6.1%) were women. The majority of respondents, 222 (61.5%), were unemployed, followed by 109 (30.2%), who were self-employed.

Results for the average monthly household income in Kenyan Shillings (Kshs) revealed that 161 (44.6%) of the respondents made less than Kshs 5,000, while 121 (33.5%) made between Kshs 5,001 and 10,000. According to additional findings, 138 (38.2%) of the respondents had 4 to 6 household members, followed by 109 (30.2%), who had 7 to 9 household members.

**Table 1 Distribution of Socio-demographic Characteristics among Respondents (n=361)**

Variable	Respondent response	Frequency (N)	Percentage (%)
Age in years	≤ 19	22	6.1
	20-29	106	29.4
	30-39	133	36.8
	40-49	69	19.1
	≥ 50	31	8.6
Highest level of education attained	No formal education	116	32.1
	Primary	154	42.7
	Secondary	64	17.7
	Post-secondary	27	7.5
Marital status	Married	237	65.7
	Single	69	19.1
	Divorced/widowed/separated	55	15.2
Religion	Christians	347	96.1
	Muslims	14	3.9
Gender	Male	339	93.9
	Female	22	6.1
Occupation	Not employed	222	61.5
	Self-employed	109	30.2
	Employed	30	8.3
Average monthly family income (KShs)	< 5,000	161	44.6
	5,001-10,000	121	33.5
	10,001-15000	43	11.9
	15001-20,000	22	6.1
	≥ 20,000	14	3.9
Number of household members	Less than 3	50	13.9
	4-6	109	30.2
	7-9	138	38.2
	≥ 10	64	17.7

### Association between Socio-demographic Factors and Uptake of CLTS

The study sought to establish the socio-demographic factors associated with uptake of CLTS among respondents. The results were as presented in *Table 2*.

*Table 2* shows that 102 (41.5%) respondents who were between the ages of 30 and 39 had not upgraded CLTS. Age and CLTS uptake did not have a statistically significant relationship ( $P = 0.091$ ). More than half of the 129 respondents (52.4%) with primary-level education did not take the CLTS. The highest degree of education that respondents had acquired and their use of CLTS were statistically significantly correlated ( $P = 0.001$ ).

The majority of married respondents (173) (70.3%) have not taken CLTS. The respondents' marital status was substantially correlated with

their use of CLTS ( $P = 0.003$ ). The majority of Christians, 237 (96.3%), had not completed CLTS. Religion and respondents' usage of CLTS did not, however, have a statistically significant relationship ( $P = 0.109$ ). In terms of the respondents' gender, the findings revealed that 232 (94.3%) of the men had not taken CLTS. The respondents' gender and the adoption of CLTS did not have a statistically significant relationship ( $P = 0.640$ ). The results for the respondents' employment status showed that 156 (63.4%) of those who were unemployed had not taken the CLTS. The respondents' employment position was substantially correlated with their use of CLTS ( $P = 0.002$ ). 146 (59.3%) of the respondents, whose average monthly family income was less than Kshs 5000, did not take the CLTS. The averages monthly income of the respondents was also strongly related to their use of CLTS, according to the results ( $P = 0.012$ ).

Further findings showed that 95 (38.6%) of respondents with households of seven to nine people had not taken the CLTS. The respondents'

use of CLTS was statistically substantially correlated with the number of household members ( $P = 0.044$ ).

**Table 2 Socio-demographic Factors Associated with CLTS Uptake (n=361)**

Independent variable	Respondent response	Uptake of CLTS		Statistical significance
		Yes (N=115)	No (N=246)	
Age in years	≤ 19	10(8.7%)	12(4.9%)	$\chi^2=2.366$ df=4 $p = 0.091$
	20-29	39(33.9%)	67(27.2%)	
	30-39	31(27.0%)	102(41.5%)	
	40-49	29(25.2%)	40(16.3%)	
	≥ 50	6(5.2%)	25(10.2%)	
Highest level of education attained	No formal education	32(27.8%)	84(34.1%)	$\chi^2=66.866$ df=3 $p = 0.001$
	Primary	25(21.7%)	129(52.4%)	
	Secondary	38(33.0%)	26(10.6%)	
	Post-secondary	20(17.4%)	7(2.8%)	
Marital status	Married	64(55.7%)	173(70.3%)	$\chi^2=11.837$ df=2 $p = 0.003$
	Single	23(20.0%)	46(18.7%)	
	Divorced/widowed/separated	28(24.3%)	27(11.0%)	
Religion	Christians	110(95.7%)	237(96.3%)	$\chi^2=0.809$ , df=1 $p = 0.109$
	Muslims	5(4.3%)	9(3.7%)	
Gender	Male	107(93.0%)	232(94.3%)	$\chi^2=0.219$ , df=1 $p = 0.640$
	Female	8(7.0%)	14(5.7%)	
Occupation	Not employed	66(57.4%)	156(63.4%)	$\chi^2=12.690$ df=2 $p = 0.002$
	Self-employed	37(32.2%)	72(29.3%)	
	Employed	12(10.4%)	18(7.3%)	
Average monthly family income (KShs)	< 5,000	15(13.0%)	146(59.3%)	$\chi^2=43.373$ df=4 $p = 0.012$
	5,001-10,000	50(43.5%)	71(28.9%)	
	10,001-15,000	29(25.2%)	14(5.7%)	
	15,001-20,000	14(12.2%)	8(3.3%)	
	≥ 20,000	7(6.1%)	7(2.8%)	
Number of HH members	Less than 3	14(12.2%)	36(14.6%)	$\chi^2=6.948$ df=3 $p = 0.044$
	4-6	44(38.3%)	65(26.4%)	
	7-9	43(37.4%)	95(38.6%)	
	≥ 10	14(12.2%)	50(20.3%)	

**Uptake of Community Led Total Sanitation**

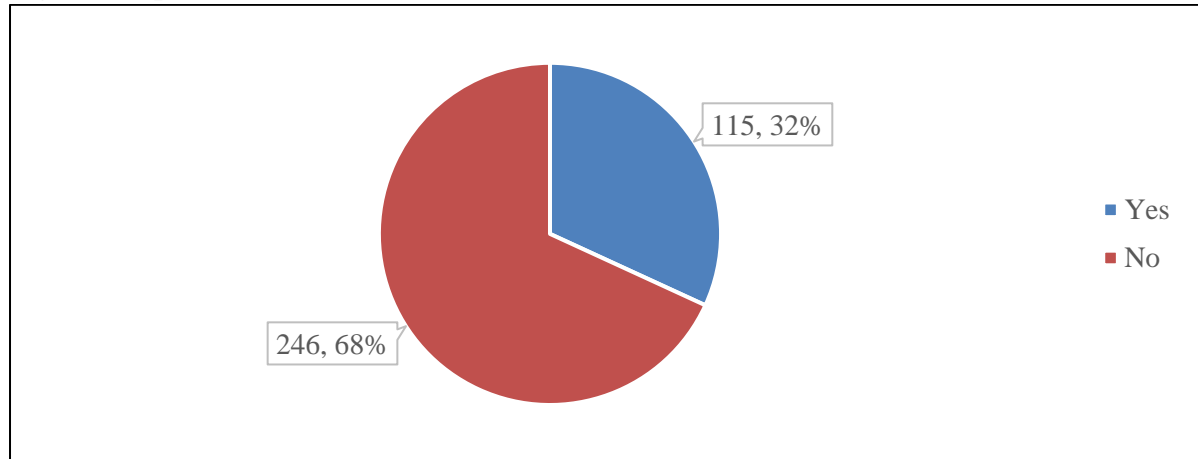
The study also focused on determining the uptake of Community Led Total Sanitation in Isiolo County in which results were presented as in Figure 1.

Figure 1 shows that whereas 115 (31.9%) of the respondents had taken CLTS, 246 (68.1%) of the respondents had not. The results were echoed by a public health officer who was part of a key informant interview session. This shows that there was low uptake of CLTS in the community with significant effects well highlighted.

*“...indeed, the rate of uptake of CLTS has been low in this county. This has led to*

*increased cases of diarrheal diseases, especially among the children. We are trying to put measures like sensitization and supporting those household heads who are willing to construct pit-latrines but are unable due to one reason or another. We will not tire until we reduce significantly the cases of open defecation in this area. The county government has been supportive together with the NGOs around here. We have reduced the cases but we can always do more. The community health and extension workers are also instrumental in these initiatives...” (KII Respondent).*

**Figure 1: Uptake of Community Led Total Sanitation**



**Utilization of the Components of Community Led Total Sanitation**

Results on distribution of the components of community led total sanitation (CLTS) were as presented in *Table 3*.

*Table 3* shows that 196 respondents (54.3%) had pit latrines, whereas the remaining 165 respondents (45.7%) did not. Regarding the evidence of pit latrine use, results showed that 209 (57.9%) of them did not show any evidence of use while the rest 152 (42.1%) showed evidence of use.

More than half 245 (67.9%) of the respondents' latrines did not have tight fitting or squatting lid on latrine while the rest 116 (32.1%) it was present. Results showed that 237 (65.7%) of the households did not show presence of faecal matter while the rest 124 (34.3%) had presence of faecal matter. Additional findings indicated that whereas 122 (33.8%) of the households had a hand washing facility, 239 (66.2%) of the households did not.

**Table 3 Utilization of CLTS Components among Respondents (n=361)**

CLTS component	Respondent response	Frequency (N)	Percentage (%)
Presence of pit-latrine	Yes	196	54.3
	No	165	45.7
Evidence of pit-latrine use	Yes	152	42.1
	No	209	57.9
Presence of tight fitting or squatting lid on latrine	Yes	116	32.1
	No	245	67.9
Absence of faecal matter	Yes	124	34.3
	No	237	65.7
Hand washing facility	Yes	122	33.8
	No	239	66.2

**DISCUSSIONS**

The goal of the study was to identify the sociodemographic elements that affected household heads' adoption of community led total sanitation in Isiolo County. The results on distribution of age showed that most of the household heads were aged 30-39 years. This is a prime age where most people have stable families

and owning homes. In contrast to these findings, a study on the effects of CLTS interventions on sanitation and hygiene in Pallisa District, Uganda, found that the majority of respondents were in their 40s (Okolimong et al., 2020). Uncertainty in the results of a second Kenyan study on the uptake of CLTS in Siaya County revealed that the majority of household heads were in their 40s and 49s (Joseph, 2020). Age and CLTS uptake did not,

however, show any statistically significant correlation. This may be as result of other factors such as culture which may be dominant thus hindering CLTS uptake. In Ghana, age was found to be a significant factor that influenced CLTS uptake across households (Radin et al., 2020).

The majority of respondents attained a primary level of schooling. This may be accounted for by the fact that the locals commonly encounter obstacles while trying to access educational institutions which causes early school dropouts. This result conflicts with a study on the factors influencing open defecation-free innovations carried out in Ghana, where the majority of persons interviewed lacked a formal education (Alhassan & Anyarayer, 2018). The use of CLTS was statistically significantly correlated with the greatest degree of education acquired. As education level rose, so did the adoption of CLTS. This is because education empowers people with information regarding the importance of observing environmental hygiene by avoiding open defecation and adopting CLTS to avoid diarrheal infections. The results concur with a Cambodian study on determinants of CLTS utilization which showed that education level predicted CLTS uptake among participant (Hendrix, 2020).

The majority of respondents were above 30 years old and were married indicating ties with their families. The findings supported a study carried out in Uganda, where it was found that most of the respondents were married. Additionally, it was discovered that the majority of married household heads did not use CLTS (Okolimong et al., 2020). This was comparable to the recent study that found a strong relationship between marital status and CLTS uptake. This is because marital status means there is an increased number of family members who could probably take matters of hygiene seriously and may have their own pit-latrines. The majority of individuals surveyed were married, according to a study on the effectiveness of a community-led complete sanitation program conducted in Kwale County, Kenya (Mwatsahu, 2022). Majority of the

participants were Christians. This shows that the study site was predominantly inhabited by the Christian religion. This is in agreement with a Ghanaian study on CLTS uptake among household heads where it was reported that most participants were of the Christian fraternity (Radin et al., 2020). However, there was no statistically significant correlation between religion and the adoption of CLTS. This is due to the fact that Christians made up the majority of the responders. This is inconsistent with a study in rural Bali in Indonesia, it was reported that religion was one of the determinants of CLTS uptake (Dwipayanti et al., 2020). In a study on the effectiveness of CLTS in Zurich, Switzerland, it was noted religion influenced the promotion of good sanitation among the majority of respondents who were Christians (Harter, 2018).

Regarding respondents' gender, the results revealed that most of them were male. This is because the study was conducted among household heads and according to the African tradition, men are the sole decision makers and heads of families across different communities. The findings were consistent with a study that was conducted in a few Kenyan counties on gender outcomes for community-led total sanitation, which found that men dominated the population (Wamera, 2019). The respondents' gender and adoption of CLTS did not have any statistically significant relationships. Therefore, CLTS uptake could have been influenced by other factors apart from gender. The findings were in contrast to a study on gender integration in community-led total sanitation done in Timor-Leste, where gender was not linked to CLTS adoption (Ashinhurst, 2020).

Most of the respondents were not employed. This could be attributed to the majority of respondents only having received elementary or no formal education, which would have an impact on their employability. This concurs with research findings from Kakamega County in Kenya, on factors contributing to sustainability of open defecation free status where it was reported that most of the respondents were not employed (Lenai



et al., 2021). However, occupational status was significantly associated with the CLTS uptake. Those who were employed were more likely to uptake CLTS among respondents. This is because they could have the resources required to ensure better CLTS uptake. Similar research on sustainable total sanitation in Nigeria found that participants' work level affected their use of CLTS (Abramovsky et al., 2019). Concerning the average monthly family income, according to the findings, the majority of respondents made less than Kshs 5,000. The results revealed that most of the respondents earned less than Kshs 5,000. These might be attributed to the difficult economic conditions in the country as well as the fact that few respondents had jobs, which constrained their alternatives for employment. Similar findings were reported by a study from Migori County in Kenya, where it was reported that most of the respondents had an average family income of less than Kshs 5000 (Aluoch et al., 2022). The average monthly income was significantly associated with uptake of CLTS as those who earned less than Kshs 5000 had not taken CLTS. This is because probably they could not afford to construct a pit-latrines and other materials associated with CLTS uptake. According to a Cambodian study, it was revealed that provision of subsidy programs in CLTS implementation led to improvement in its uptake among the poorest (Hoo et al., 2022).

Further, more than a third of the respondents had between 4 to 6 household members. This is because most of the respondents were married thus probably having children which could increase the number of household members. The findings were in opposition to a study carried out in Timor-Leste, which found that most households with more than two members did not adopt CLTS (Clarke et al., 2021). Statistics show a strong correlation between the size of the household and the uptake of CLTS. The more members were in household, the more likely it was to observe CLTS uptake. Study findings around Africa showed that CLTS uptake was low among communities where households with

extended families was more common (Musyiki, 2016).

The results revealed that the level of community led total sanitation uptake was 31.9%. This demonstrates that Isiolo County is one of Kenya's counties with a high rate of open defecation and consequently inadequate sanitation coverage. This explains the reasons behind increased cases of diarrheal diseases, especially among children in the region. The findings were in contrast to a study carried out in Siaya County, Kenya, where the percentage of CLTS implementation was limited to 83% (Joseph, 2020). In another study done on benefit-cost analysis of CLTS in rural Ghana, it was reported that majority of the villages surveyed had high uptake of CLTS standing at 63.5% (Radin et al., 2020).

The CLTS program has been rarely implemented consistently across countries with varying uptake rates. In Indonesia after CLTS triggering, it was concluded that the sub-district with the lowest ODF status was at 28% in 2018 (Pertiwi et al., 2018). Only 19.5% of Indian homes had implemented CLTS at a 100% rate, according to a survey done in villages (Mahendra et al., 2021). Lack of adequate information and support for building latrines affected the full realization of this intervention. After the local leadership was involved, there was a 30% increase in the number of individuals who had access to proper sanitation, which was ascribed to improved CLTS uptake in Zambia (Tiwari et al., 2017). This increased demand for sanitation facilities coupled with a behaviour change drive attracting its sustenance (Markle et al., 2017). The adoption of CLTS was low in pastoralist communities in Nigeria but high in other everyday groups (Abramovsky et al., 2016).

On the CLTS components, it was reported that most (54.3%) households had a pit latrine. This is supported by the fact that most of these households receive support for latrine construction. However, this may not translate to CLTS uptake since possessing a latrine may not translate to its use due to other community factors. This disagrees with a study from Kajiado County,

Kenya, where 59.2% of households lacked access to latrines facilities (Mbogo et al., 2018). In Busia County, CLTS implementation led to improved latrine coverage from 62% to 89% (Muchangi & Kimati, 2017). In Ghana, CLTS triggering led to a 67.6% latrine coverage among different villages (Harter et al., 2019). In Northwest Ethiopia, it was found in a study on CLTS and latrine ownership that 47% of households had access to latrines (Zelege et al., 2019). In Northwest Ethiopia, it was found in a study on CLTS and latrine ownership that 47% of households had access to latrines (Zelege et al., 2019).

The results also showed that only 42.1% of households had evidence of pit latrine use. Despite the presence of pit-latrine in homesteads, some households did not use them. This could be attributed to reasons such as cultural beliefs or construction of pit-latrines without full involvement of the community members (). Studies from Ethiopia reported that there is a high likelihood of people using a well-maintained latrine compared to dirty one which results to people shying off (Ashenafi et al., 2018). Latrine blockage especially in slum areas affects latrine condition resulting people to choose open defecation over latrines (Biswas et al., 2020). Despite evidence of availability of pit-latrines from villages in the rural India, its evidence of usage was low (Lee & Radcliff, 2021). There were indications of open defecation along streams in this area, according to research done in the Kyangwali refugee community (Monje et al., 2020).

Most (67.9%) of the pit-latrines in Isiolo County lacked a tight fitting or squatting lid. This contributes to low CLTS uptake by barring household members to shy away from using these pit-latrines. Contrary to a study conducted in Northwest Ethiopia, where the majority of latrines were traditional pit latrines without a tight fitting, the findings on latrines were found there. In another study from Malawi revealed that 30% of household latrines lacked a tight fitting. This prevented better CLTS uptake among the community members (Mwapasa et al., 2022).

Results showed that 34.1% of the households in the study area showed presence of faecal matter in the surroundings. This indicated that they were involved in open defecation. In contrast, a survey done in Ghana found that 18.75% of people urinated in public (Osumanu et al., 2019). Although the Nigerian government has pledged to end open defecation by 2025, this goal still faces obstacles because 26% of Nigerians still practice open defecation (Adeoti et al., 2021). In the rural areas of Ethiopia, about 37.9% and 8.7% of the rural and urban population are practicing open defecation with those previously declared ODF villages reverting back (Ayalew et al., 2018; Abebe & Tucho, 2020). In Tanzania open defecation is expected to increase from 11.8% to 12.0% of the population from 2018 to 2022 (Nyoni & Nyoni, 2020). According to a study done in Kajiado County in Kenya, 59.2% of households lacked access to toilet facilities of which 98.4% of people reported to be open defecators (Mbogo et al., 2018). In Kenya's Kisii County, only 32% of village communities were declared ODF (Trepanier et al., 2021). In the coastal regions of Kenya, Kwale County leads with 51.2% followed by Kilifi at 34.0% as open defecators (MoH, 2014).

Additionally, the data showed that 239 families, or the bulk of them, lacked a hand-washing facility (66.2%). Any practical hand washing station should provide enough water, soap, or ash to allow for thorough hand cleaning. In Nepal, it was revealed that 90% of households had adequate access to improved hand washing facilities thus increased CLTS uptake (Kafle & Pradhan, 2018). In spite of having access to a hand washing station, 10% of university students who participated in the study (Logo, 2020) admitted to engaging in OD. 70% of the households polled in a study conducted in Kenya had access to enough soap and water when using the restrooms (Mumbi & Choro, 2017). Only 36.2% of Ugandan families in the research had access to a hand washing station (Keera, 2019).

## CONCLUSION

The study concludes there were a number of demographic factors that were significantly associated with the utilization of CLTS including the highest level of education. The study found no significant association of age, religion and gender with the uptake of CLTS. The study also concludes that Isiolo County had a low uptake rate for community-led total sanitation. Only three out of ten households in the county uptake CLTS. Even though more than a half of the households (54.3%) owned a pit-latrine, there was less evidence of its use. Only a few of the latrines (31.1%) had tight fittings or squatting lids with only 33.8% having hand washing facility.

## Recommendations

The study recommends that the County Government of Isiolo should scale up health education programs on community led total sanitation especially on hand washing after visiting latrines and open defecation to improve sanitation coverage. This is specifically to target the middle-aged groups (30-39 years old), the primary education level residents, the Christians, low level incomes and the households with higher number of members.

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