

# Community Conversations: A Tool in Improving Health Outcomes and Reducing the Burden of Visceral Leishmaniasis (Kala-azar) in Isiolo County, Kenya


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## ABSTRACT

Visceral Leishmaniasis (Kala-azar) is a neglected tropical disease (NTD) caused by *Leishmania species* that affects human. Transmission is through the bite of *Phlebotomus* sandflies. Globally, WHO ranks Kala-azar as the second largest parasitic killer after Malaria. The disease poses a threat to more than a billion people on almost every continent. Approximately 90% of Kala-azar global burden is found in Africa. Major endemicity is documented in Eastern Africa (Kenya, South Sudan, Sudan, Ethiopia, and Somalia). Accurate burden of the disease in Kenya is unknown attributable to inadequate information on disease prevalence, diagnostic challenges, and spatial distribution. Additionally, morbidity and mortality levels from the disease in the Country are unknown ascribable to a low index of suspicion by healthcare workers, diagnostic challenges, and case management. An example of diagnostic challenges is a reported outbreak of 'unknown disease' akin to Kala-azar in Marsabit County in May 2023 where nine people were confirmed dead and over 80 hospitalized. This study aimed to analyze community's prioritization of causes of Kala-azar as well as community awareness of disease prevention and control. Quantitative data were collected using Participatory Epidemiology methods in purposively selected study villages. Qualitative data were collected through semi-structured interviews. Study findings indicated that 97.2% of respondents had heard about Kala-azar. Despite the awareness, a broad gap between knowledge and practice of prevention and control strategies of the disease was evident. Kala-azar was associated with human behaviour like preferences for traditional and alternative treatment approaches (45.2%), evening outdoor practices before going to bed (99.6%), sleeping outdoors (60.1%), occasional bed nets use (69.2%), and availability of domestic animals and wild animals within house yards (54.6%). Cultural beliefs and practices were noted to play a key role in augmenting the disease burden, where most cases had burn scars from traditional healers' therapeutic burns. As a consequence, they sought medical help after onset of complications, which ranged from increased severity to fatalities. Community engagement was minimal in prevention and control. In this participatory research, we propose behaviour change communication activities for the elimination of Kala-azar as a public health problem. This article serves as a base for future studies aimed at giving voice to communities while enhancing their understanding of causes of diseases, the possibility of enhanced early diagnostic techniques, and options for prevention, control, and surveillance which in turn is translated to action.

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## 1. INTRODUCTION

Neglected tropical diseases (NTDs) are various classes of communicable diseases that exist in tropical and subtropical conditions affecting hundreds of thousands of people globally, mostly people living in poverty, in close contact with livestock, infectious vectors, and without adequate sanitation. At least 1.74 billion people worldwide were affected by neglected tropical diseases in 2019, and these illnesses were linked to a high burden of morbidity and public health [1]. Visceral Leishmaniasis (VL) is one of the common NTDs in Kenya. Each year 5 million people are at risk of infection with half of them having difficulties in accessing healthcare. The majority of reported cases are children under 5 years and young adults. As some seek treatment from traditional healers, many cases go undiagnosed and unreported [2]. The exact status of the problem in Isiolo County is unstated because of low community awareness, inaccessibility of health facilities, and disease diagnostic challenges. Moreover, Counties where the disease is endemic are overwhelmed in managing Kala-azar because of limited resources. Furthermore, prevention and control measures directed to disease reservoirs are difficult to implement particularly when human reservoirs are involved. The proximity of human settlements and socioeconomic activities to vector breeding sites have sustained infections including the emergence of the disease in new foci despite the availability of control and prevention approaches [3]. At present, there is no reliable data on the prevalence of Leishmaniasis in East Africa with an estimated 66% of the global burden of which children under the age of 15 make up 53% [4]. The number of new cases varies annually because of poverty, malnutrition, poor health literacy, limited access to health facilities, environmental and climatic changes, social conflicts, population growth, and migrations [5]. Normally people typically go to their local, untrained healthcare providers first, only referring to the formal healthcare system when the illness gets worse leading to complications and fatalities [6]. Thence an indication for community initiatives that require limited resources and budgets to improve health seeking behaviors, educate impacted groups on avoiding exposure, and increase community engagement in prevention and control [7]. Community Conversations (CC) is an approach recognized to give communities the ability to analyze complex socioeconomic and cultural problems in the community. With the aid of a number of interactive learning and action resources, the strategy is put into practice through facilitated village discussions. Communities are tasked to develop community action plans to define workable steps to implement agreed-upon changes after identifying local vulnerability factors. All community stakeholders have roles clearly defined in the change action plan. For this study, a participatory research approach was used to explore effectiveness of community-based interventions in Visceral Leishmaniasis prevention and control as established to raise awareness of community on the disease and induce behavioral modification that motivates people to take preventative measures [6]. Community conversations provide a platform where community members

can collectively reflect and address Visceral Leishmaniasis risk factors in the community. In addition, they allow for opportunities to develop community action plans that ultimately lead to a change in attitude, values, beliefs, and practices. Communities who have a strong grasp of how their attitudes and beliefs affect them are better able to support initiatives without external incentives. Nonetheless, if properly planned and carried out, these approaches can significantly lower the burden of Visceral Leishmaniasis as well as enhance community health. In most recent studies, community engagement has been argued to improve community perception of disease risk factors and is essential to encourage prevention and lessen disease burden [8]. In high-burden regions, robust surveillance data, enhanced capabilities of clinical and health professionals, availability of resources, and strong community awareness of the disease should all contribute to enhanced early detection, and encourage preventive behaviors, management, and treatment outcomes [9]. The rationale for this study was to assess the effectiveness of Visceral Leishmaniasis surveillance and control strategy at the local level. Here we hypothesized that community conversations possess great potential to assist communities in realizing their potential strengths and capacities for more effective Visceral Leishmaniasis response and elimination.

## 2. MATERIALS AND METHODS

### 2.1. Study Design

The study design was a descriptive cross-sectional survey. Data was collected between September and December 2023 using a mixed-method approach. For quantitative data (n = 433) collection, Participatory Epidemiology (PE) exercises were conducted in study villages. Study methodologies were derived from participatory appraisal resources when standard epidemiological approaches do not provide adequate information required for designing effective control strategies for infectious diseases in resource-limited settings. For qualitative data collection, semi-structured interviews were conducted using community members and key informant interviews (KIIs) with County Health Management Team and Local Administration. Rationale for including qualitative research was to collect complementary information along with triangulating data collected from participatory approach exercises.

### 2.2. Study Area

Isiolo County lies between 0.3524°N and 38.4850°E. Study areas were Merti and Garbatulla Sub-Counties. Merti is situated in the Northern part of the County (Latitude 1.06141, Longitude 38.66482). Garbatulla is situated in the Southern part of the County (Latitude 0.527342, Longitude 38.512806). Study sites were purposefully selected based on an analysis of Kala-azar hotspots in Isiolo County from District Health Information System (DHIS2).

2.3. Study Population and Sample Size Determination

Participatory Epidemiology (PE) exercises were conducted in selected 18 study villages (10 in Merti, and 8 in Garbatulla). Selection of study sites was guided by interviews with County, Sub-Counties’ Health Management Teams, and Local Administrators. The sample size was calculated according to the Prevalence Formula [10] with 95% confidence based on the assumption of the prevalence of 50% and a precision of 0.05. Due to a lack of information on Visceral Leishmaniasis prevalence in Isiolo County, the sample size was calculated assuming an expected infection prevalence of 50% to obtain an optimum study sample size. Prevalence value was estimated from previous studies published in the study domain. Therefore, at 95% confidence level and 5% precision, a minimum of 385 households was required to satisfy the study objectives. In addition, an extra sample size was calculated at 10% to account for bias, refusals or non-responses, and inaccessible villages during the study period bringing the sample population to a total of 424.

2.4. Data Analysis

Most of the data produced by participatory approach methods was ordinal data and therefore statistical tests were used to summarize data using mean, median, range, and 95% confidence interval (95% CI) for the mean, and median. R Programming 4.3.2 software was used for statistical analysis and data visualization. To measure the reliability of generated data, the reproducibility of different participatory approach methods was assessed. The Researcher assumed that within a specified Ward, local conditions and livelihood activities were similar, and data generated by the various participatory approach methods employed on different study informants was equally similar. Consequently, duplicability of data was conducted by assessing the level of agreement between different informants’ groups in each of the study villages. SPSS V25—Kendall’s Concordance Coefficient *W* was used to assess this agreement between informant groups. Monte

Carlo Significance was used to predict possible outcomes of uncertain events during participatory exercises. Validity of findings was confirmed by cross-checking findings against other information sources which included key informant interviews (KIIs) and a review of literature.

2.5. Ethical Considerations

Meru University of Science and Technology (MUST) Institutional Research Ethics Review Committee (MIR-ERC), National Commission for Science, Technology, and Innovation (NACOSTI), and the County and Sub-County Departments of Health provided required study ethical review and approvals. Written and oral consent was obtained from all the study informants prior to data collection.

3. RESULTS

3.1. Community Prioritization of the Causes of Visceral Leishmaniasis

Fig. 1 illustrates the community’s prioritization of the causes of Visceral Leishmaniasis. The majority (98.8%, 428/433) of those who responded to the question: “What causes Kala-azar?” mentioned that Kala-azar is transmitted by the bite of an insect (sandfly), indicating a strong consensus in the community regarding the primary cause of the disease.

3.2. Factors Contributing to the Prevalence of Kala-azar

Table I provides an overview of factors contributing to the prevalence of Kala-azar in Isiolo County. 80.8% of those interviewed indicated that environmental factors were the major risk factors associated with Kala-azar in the County. Other responses to this question included access to treatment and lack of test kits for diagnosing Visceral Leishmaniasis in cases with suspected disease presenting at health facilities in the high endemic pockets.

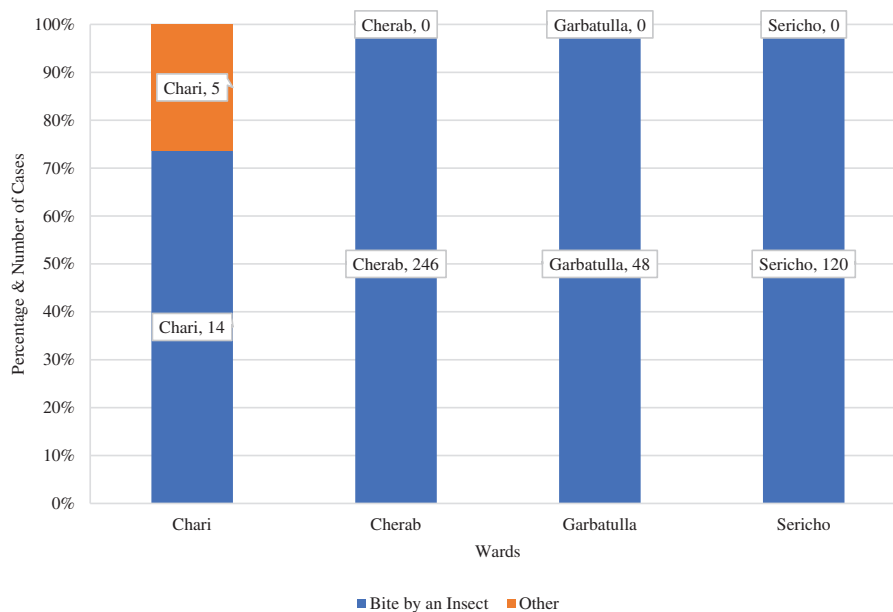


Fig. 1. Causes of Kala-azar.

TABLE I: FACTORS CONTRIBUTING TO KALA-AZAR PREVALENCE

Ward	What makes Kala-azar common in the area?					Total
	Environmental factors	Expensive to treat	I do not know	No health facility for diagnostic services	Other	
Chari	2 (10.5%)	0 (0.0%)	8 (42.1%)	0 (0.0%)	9 (47.4%)	19 (100.0%)
Cherab	214 (87.0%)	1 (0.4%)	3 (1.2%)	5 (2.0%)	23 (9.3%)	246 (100.0%)
Garbatulla	48 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	48 (100.0%)
Sericho	86 (71.7%)	0 (0.0%)	1 (0.8%)	0 (0.0%)	33 (27.5%)	120 (100.0%)
Total	350 (80.8%)	1 (0.2%)	12 (2.8%)	5 (1.2%)	65 (15.0%)	433 (100.0%)

TABLE II: SLEEPING PATTERNS AND KALA-AZAR CASES REPORTED

Is there anybody in your household who has suffered from Kala-azar in the last 5 years?	Do any of your household members sleep outdoors?		
	No	Yes	Total
No	87 (54.4%)	73 (45.6%)	160 (100.0%)
Yes	109 (39.9%)	164 (60.1%)	273 (100.0%)
Total	196 (45.3%)	237 (54.7%)	433 (100.0%)

TABLE III: EVENING PRACTICES AND KALA-AZAR CASES

Is there anybody in your household who has suffered from Kala-azar in the last 5 years?	Do any of your household members spend time outside the house in the evenings before they go to bed?		
	No	Yes	Total
No	2 (1.2%)	158 (98.8%)	160 (100.0%)
Yes	1 (0.4%)	272 (99.6%)	273 (100.0%)
Total	3 (0.7%)	430 (99.3%)	433 (100.0%)

### 3.3. Sleeping Patterns and Kala-azar Cases Reported

As can be seen from the data in Table II there was a significant positive correlation between Kala-azar incidence and outdoor sleeping patterns. Interestingly, it was observed that a higher proportion (60.1%) of households with reported Kala-azar cases had members who slept outdoors.

### 3.4. Evening Practices and Kala-azar Cases

Further statistical tests in Table III revealed that a significant proportion 99.6% (272) of respondents who mentioned that household members spent time outside the house in the evenings before they went to bed reported “Yes” to Kala-azar cases.

### 3.5. Mosquito Net Usage and Kala-azar Cases

Statistical tests in Table IV on Kala-azar cases and mosquito net usage revealed that a significant number of 131 (81.9%) respondents without a history of Kala-azar cases slept under a mosquito net at home and 29 (18.1%) respondents without Kala-azar cases reported not using mosquito nets. Surprisingly, a greater number 205 (75.1%) of respondents with a history of Kala-azar cases used mosquito nets. While 68 (24.9%) respondents with Kala-azar cases reported not sleeping under a mosquito net. The data suggests a positive correlation between the risk of Kala-azar transmission and mosquito net usage in households.

### 3.6. Mosquito Net Usage Frequency and Kala-azar Cases

As Table V shows, there was a significant positive correlation between the frequency of mosquito net usage and Kala-azar cases. From this data, we can see that study findings revealed that in most of the Kala-azar cases, 189 (69.2%) were reported among respondents who used mosquito nets sometimes, and occasionally. Taken together, these results suggest that there is an association between mosquito net usage frequency and risk of Kala-azar transmission.

### 3.7. Availability of Domestic Animals at Home and Kala-azar Cases

Cross-tabulation results in Table VI on Kala-azar cases and the presence of domestic animals at home revealed that a notable number (60.6%) of households without any reported Kala-azar cases did not have domestic animals at home. Further analysis showed that 39.4% of households without any reported Kala-azar cases had domestic animals at home. A notable proportion (45.4%) of households with reported Kala-azar cases did not have domestic animals at home. Interestingly, it was observed that a significant proportion (54.6%) of households with reported Kala-azar cases had domestic animals at home. Overall, these results indicate that there is a potential association between the presence of domestic animals at home and the risk of Kala-azar transmission.

TABLE IV: MOSQUITO NET USAGE AND KALA-AZAR CASES

Is there anybody in your household who has suffered from Kala-azar in the last 5 years?	Do you sleep under a mosquito net at home?		
	No	Yes	Total
No	29 (18.1%)	131 (81.9%)	160 (100.0%)
Yes	68 (24.9%)	205 (75.1%)	273 (100.0%)
Total	97 (22.4%)	336 (77.6%)	433 (100.0%)

TABLE V: KALA-AZAR CASES AND MOSQUITO NET USAGE FREQUENCY

Kala-azar cases	Mosquito net usage			
	Daily	Frequently often	Rarely	Sometimes—Occasionally
No	1 (0.6%)	18 (11.2%)	29 (18.1%)	112 (70.0%)
Yes	2 (0.7%)	14 (5.1%)	68 (24.9%)	189 (69.2%)
Total	3 (0.7%)	32 (7.4%)	97 (22.4%)	301 (9.5%)

TABLE VI: AVAILABILITY OF DOMESTIC ANIMALS AT HOME AND KALA-AZAR CASES

Is there anybody in your household who has suffered from Kala-azar in the last 5 years?	Are domestic animals available in your home?		
	No	Yes	Total
No	97 (60.6%)	63 (39.4%)	160 (100.0%)
Yes	124 (45.4%)	149 (54.6%)	273 (100.0%)
Total	221 (51.0%)	212 (49.0%)	433 (100.0%)

TABLE VII: AVAILABILITY OF DOMESTIC ANIMALS IN THE HOUSE YARD AND KALA-AZAR

Kala-azar cases	Animals at night in the house yard where you and your family sleep		
	No	Yes	Total
No	93 (58.1%)	67 (41.9%)	160 (100.0%)
Yes	124 (45.4%)	149 (54.6%)	273 (100.0%)
Total	217 (50.1%)	216 (49.9%)	433 (100.0%)

3.8. Availability of Domestic Animals in the House Yard and Kala-azar Cases

Further statistical test results in Table VII revealed that among households with no Kala-azar cases, there was a higher percentage (58.1%) of those with no animals in the house yard where family members slept. Conversely, households with Kala-azar cases showed a higher percentage (54.6%) of having animals in the house yard where family members slept. In summary, these results show that there is a potential association between presence of animals in the house yard where household members slept at night and risk of Kala-azar transmission.

3.9. Kala-azar Signs and Symptoms

It is apparent from Fig. 2 that fever was the most prevalent sign mentioned by 97.0% of those who were interviewed. Majority of other respondents alluded to swollen abdomen (84.8%), loss of appetite (83.1%), and general weakness (74.4%).

3.10. Kala-azar Awareness

As shown from Fig. 3, When the study informants were asked, “Have you heard about Kala-azar?” majority

(97.2%, 421/433) commented that they had heard about Kala-azar.

3.11. Kala-azar Cases and Respondents’ Awareness

If we now turn to the number of Kala-azar cases noted among study informants aware of Kala-azar, there was a significant number (48.2%) of cases reported among those who had been informed of diagnosis, prevention, and control of Kala-azar (Table VIII). Interestingly, further statistical tests revealed a significant proportion (66.6%, 233/350) of households not informed about Kala-azar reported cases. This finding has important implications for intensified community social mobilization on Kala-azar prevention and control.

3.12. Source of Information on Kala-azar

Fig. 4 provides an overview of the source of information about Kala-azar among study informants. From the chart, it can be seen that by far, the highest source of information on Kala-azar (98.4%, 425/433) is from health facilities. A minority of respondents (11.1%, 48/433) indicated the source of information as Community Health Promoters (CHPs). Together these results provide important insights



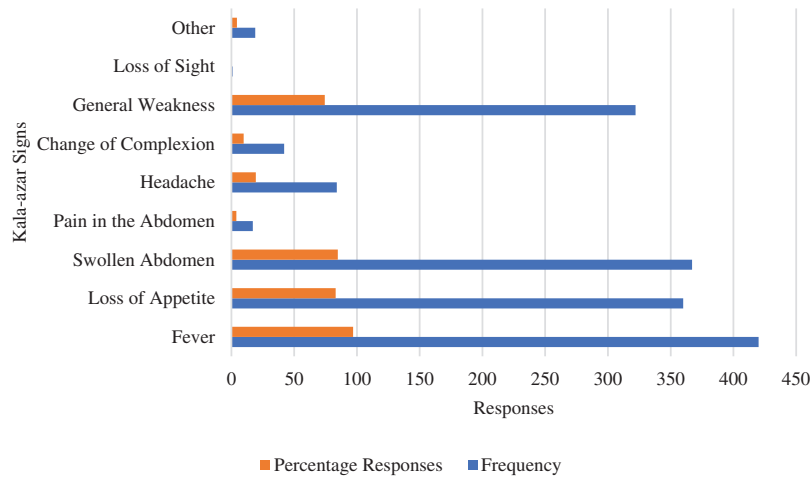


Fig. 2. Kala-azar signs and symptoms.

TABLE VIII: KALA-AZAR CASES AND RESPONDENTS' AWARENESS

Have you ever been informed about the identification, prevention, and control of Kala-azar?	Is there anybody in your household who has suffered from Kala-azar in the last 5 years?		
	No	Yes	Total
No	117 (33.4%)	233 (66.6%)	350 (100.0%)
Yes	43 (51.8%)	40 (48.2%)	83 (100.0%)
Total	160 (37.0%)	273 (63.0%)	433 (100.0%)

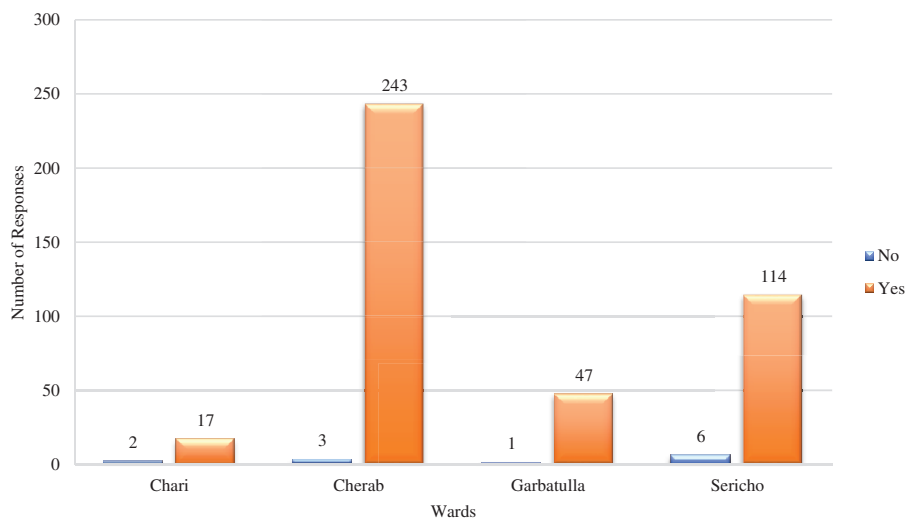


Fig. 3. Kala-azar awareness.

into avenues that the County Government can prioritize to disseminate Kala-azar prevention and control messages to the community.

3.13. Vulnerable Groups at Risk of Kala-azar

Fig. 5 compares the groups more at risk of contracting Kala-azar. Just over half (53.0%, 429/809) of those who answered the question: “Who is more at risk of contracting Kala-azar?” reported that young boys were more at risk. The response rate was almost similar (46%, 372/809) for young girls.

3.14. Interventions Used for Treatment of Kala-azar in Isiolo County

The study’s key informants reported a preference for hospitals as the most utilized intervention for Kala-azar

treatment. Fig. 6 shows an analysis of different treatment methods used for Kala-azar in Isiolo County. Hospital drugs were the most used treatment method (54.8%). However, traditional, and alternative approaches were also utilized, including herbal medicine (11.9%), traditional healers (19.0%), and prayers (14.3%). This highlights the persistence of traditional beliefs and practices alongside modern medicine in Kala-azar treatment and management in the County.

3.15. Community Protection Practices Against Kala-azar

Fig. 7 highlights the community protection practices against Kala-azar reported during household surveys across the study villages. The most common practice reported was use of bed nets, with a high frequency of

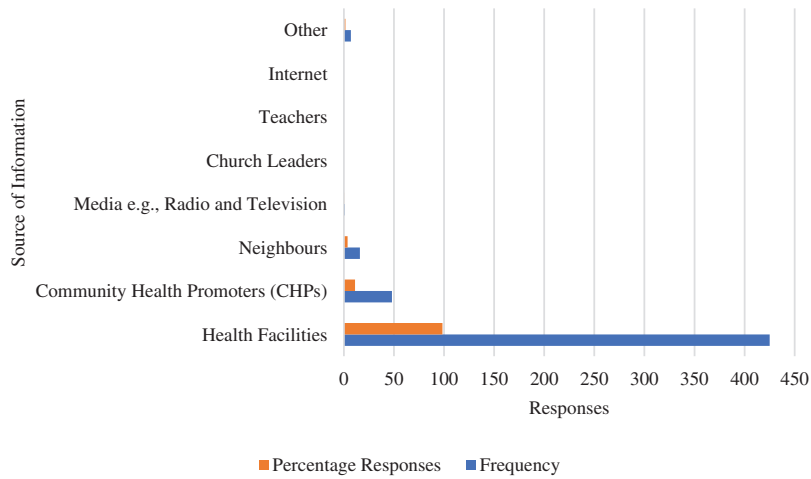


Fig. 4. Source of information on Kala-azar.

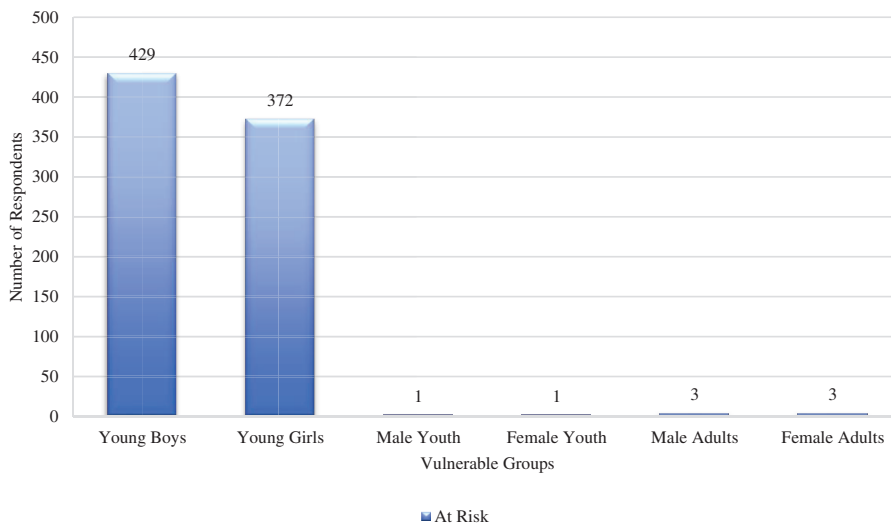


Fig. 5. Vulnerable Groups At Risk Of Kala-Azar.

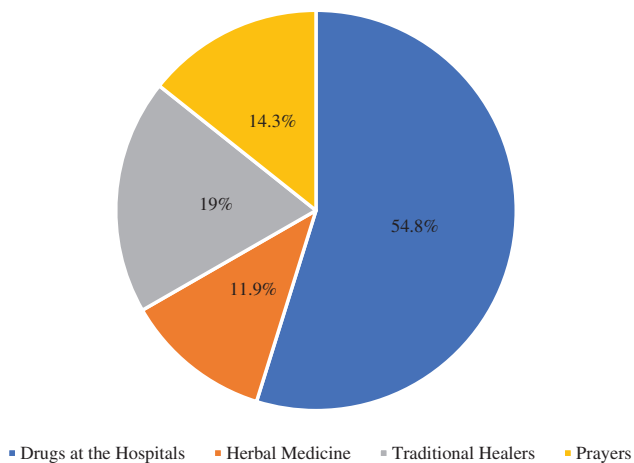


Fig. 6. Interventions used for treatment of Kala-azar in Isiolo county.

371 responses, constituting 71.9% of the total responses. A small proportion (4.7%) of respondents pointed out installing window meshes as an additional protective measure. A sizeable proportion (7.6%) of respondents reported the application of repellants on exposed skin especially in

the evenings to prevent insect bites. A notable percentage (12.4%) of respondents mentioned other practices not explicitly listed, indicating a diversity of preventive actions taken by individuals. Overall, these results indicate a need for targeted awareness campaigns in the community to promote a holistic approach to Kala-azar prevention and control.

#### 4. DISCUSSION

This study focused on determining community’s prioritization of causes of Visceral Leishmaniasis (Kala-azar) in Isiolo County. Based on scores of the question: “What causes Kala-azar?” respondents had a strong consensus that sandfly is the major vector for Kala-azar transmission in Isiolo County. Knowledge level on causes of Kala-azar was good. The community was largely aware of possible sandfly breeding sites with most of those surveyed (93.76%) citing sandfly breeding areas as cracks and crevices. One of the most important elements in creating an empowered society is community involvement. To increase community involvement, especially in Kala-azar prevention and control, more advocacy is required through

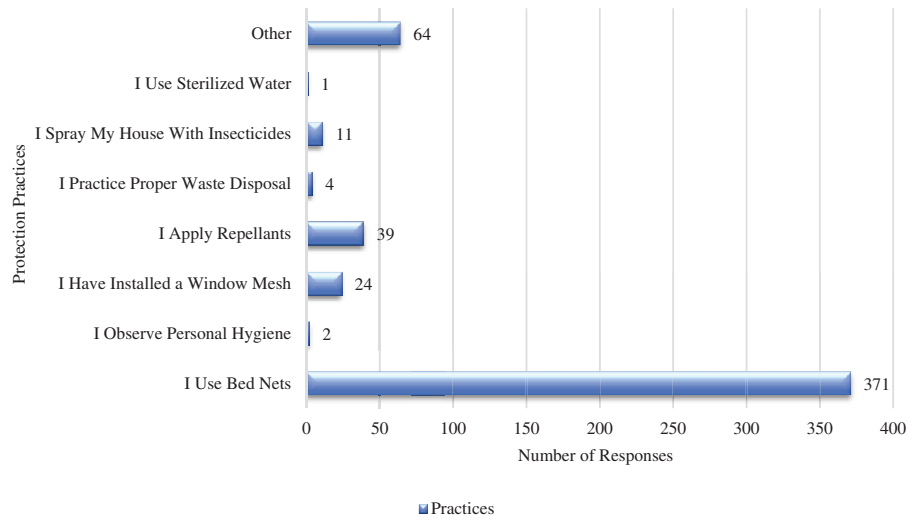


Fig. 7. Community protection practices against Kala-azar.

creating unique plans for hotspot communities that are difficult to access to guarantee that no one is left behind.

Environmental factors were the major risk factors (80.8%) associated with Kala-azar in Isiolo County. Both study areas, Merti and Garbatulla have been invaded by *Proposis juliflora* an invasive plant that was intentionally introduced in the country for its adaptability to dry conditions, and as a source of fodder for livestock. It is noteworthy that these invasive plants serve as vital olfactory cues, hiding, resting places, and drawing in blood-feeding insects like sand flies. This finding has important implications for developing local solutions involving the community for the management and control of invasive *Proposis juliflora* in the region as one of the major vector control strategies. This understanding of habitat selection may be useful in managing or controlling sand flies to stop the spread of disease, particularly in emergency epidemic scenarios [11].

This study depicted that a significant proportion (60.1%) of study informants who reported Kala-azar cases had household members who slept outdoors. The study revealed a notable association between Kala-azar incidence and outdoor sleeping patterns. A higher proportion of households with reported Kala-azar cases had members who slept outdoors. Sleeping outside or nocturnal outside activities increases chances of being bitten by sandflies and was reported as a risk factor for Visceral Leishmaniasis transmission in a study on the impact of education on knowledge and practice of Visceral Leishmaniasis preventive strategies [12]. The evidence from this study suggests that persistent activities toward behavioral change and social mobilization will enhance community awareness and encourage attitudes regarding Visceral Leishmaniasis.

Respondents agreed that sandflies are most active especially from dusk to dawn. In this study, the majority of the respondents (91.9%) mentioned that sandflies bite the most at night. An implication of this is the possibility of increased Kala-azar transmission among the population owing to the fact that sandflies are exophilic. This result may be explained by the fact that a significant number of households (54.7%) reported that at least one household member sleeps outdoors and a greater proportion

(99.2%) of the household members engage in outdoor activities in the evenings before bedtime. This combination of findings provides some support to link these sociocultural factors with increased Kala-azar transmission in the region especially during hot seasons when the majority of the community members sleep outside [4]. Therefore, a key element of Isiolo's Visceral Leishmaniasis elimination strategy should involve health communication that promotes behavior change communication interventions to encourage the community to avoid outdoor activities, especially from dusk to dawn in endemic areas.

Cross-tabulation results of data on Kala-azar cases and mosquito net usage indicated a positive association between Kala-azar cases and mosquito net usage. Therefore, public health interventions should be designed focusing on increasing community awareness of bed net usage as a protective measure against vectors transmitting Kala-azar. To further the objective of achieving universal access to mosquito nets, policy planning should also serve as a guide for government, legislators, and stakeholders as they construct strategic health communication activities [13]. Among tactics Bangladesh employed to become the first nation in the world to receive official validation for having eradicated Kala-azar, as a public health issue were integrated vector management and social mobilization. This is therefore recommended to enhance community knowledge, attitudes, and practices towards Kala-azar prevention and elimination [14].

Further investigation on Kala-azar cases and availability of domestic animals at home showed that a significant proportion (54.6%) of households with reported Kala-azar cases had domestic animals at home. These findings suggest a potential association between the presence of domestic animals and reported cases of Kala-azar. Further analysis indicated that households with Kala-azar cases showed a higher percentage of having animals in the house yard (54.6%) where household members slept at night. The presence of animals in the house yard has been associated with factors contributing to the occurrence of Kala-azar in previous studies. This analysis highlights a potential association between Kala-azar cases and the presence of animals in the house yard where household members sleep.



Future studies on a systematic review of these interconnected risk factors analyses are therefore recommended to provide direct proof to inform the design of the most effective prevention and control interventions [15].

Results obtained from analysis of Kala-azar signs and symptoms revealed valuable insights into the level of knowledge on Kala-azar in the community. This information is crucial for healthcare providers and policymakers to enhance public awareness campaigns and improve early detection and treatment. Knowledge of Kala-azar signs is important for early diagnosis which reduces cases of suffering and enhances the effectiveness of treatment and recovery. Diagnosing Kala-azar cases earlier also contributes positively to prevention, control, and elimination efforts [16].

Another significant finding to emerge from this study was that a significant proportion (97.2%) of study informants had heard about Kala-azar. It seems possible that these results are since Kenya has documented a consistent rise in Kala-azar incidents since 2017, enhanced surveillance systems put in place in endemic counties during outbreaks could have facilitated dissemination of information on the disease. Community sensitization initiatives that have been implemented have been linked to enhanced endemic population's health-seeking behavior [17]. However, variations in awareness levels across Wards in this current study suggest potential differences in information dissemination or community engagement strategies. Further exploration into these variations can help optimize social mobilization and improve overall knowledge about Kala-azar in the community.

In this study, a significant number of cases were still reported among households who had been informed on diagnosis, prevention, and control of Kala-azar. A significant proportion (48.2%) of households that had been informed about Kala-azar, reported cases indicating that there was a gap between having knowledge and practice. This is confirmed by a study by [12] in Ethiopia on the impact of education on knowledge and practice of Kala-azar preventive measures. The study respondents in this Ethiopia study exhibited a lack of knowledge and implementation of recommended practices on Kala-azar prevention and control. These findings further support the idea of health education to facilitate good levels of community awareness and practice of preventive measures. The evidence from this study suggests that community members need to receive frequent, well-organized health education to enhance their knowledge and skills [12].

On the question of "Where do you get information about Kala-azar?", this study found that most respondents (98.4%) got information on Kala-azar from health facilities with a sizeable proportion (11.1%) getting information from Community Health Promoters (CHPs). This finding confirms avenues that the County Government can prioritize to use in the dissemination of Kala-azar prevention and control messages. Social mobilization programs and awareness campaigns for community participation disseminate information to every household in the community in order to reduce the occurrence of Kala-azar. Current communication channels, including interpersonal and mass media, should be used to spread prepared messages that

take into account local context. In this sense, community platforms and health promoters can be very helpful and should be encouraged to get involved [18].

In response to the question of "Who is more at risk of contracting Kala-azar?", the majority of surveyed households indicated that young boys and young girls were most at risk of contracting Kala-azar. These findings corroborate the results of a study on social determinants of Kala-azar elimination in East Africa which reported that herding livestock and other outdoor activities in Kala-azar endemic areas are mostly carried out by young children. Therefore, when local initiatives aim to improve public health for everyone including the vulnerable groups, communities should support them [4].

Turning now to research evidence on the kind of treatment that is best for Kala-azar, strong evidence was highlighted on the persistence of traditional beliefs and practices alongside modern medicine in the treatment and management of Kala-azar. This indicates a potential gap in access to or awareness of medical care or could be associated with personal preferences for traditional approaches. Financial constraints associated with formal health systems also contribute to it [19]. Therefore, this study strongly recommends that comprehensive health education is needed in the community to promote the utilization of health facilities for early diagnosis and treatment of Kala-azar.

This descriptive cross-sectional study found that using bed nets was the most common (71.9%) community protection practice against Kala-azar. However, these results were not very encouraging because they indicated limited knowledge of integrated Kala-azar protection practices. Overall, these results suggest a need for targeted awareness campaigns in the community to promote a holistic approach to Kala-azar prevention and control.

The findings observed in this study mirror those of previous studies that have examined community engagement in research in a manner that is suitable, pertinent, practical, and advantageous to communities. To be more precise, involve and engage the community to better understand needs and experiences related to Visceral Leishmaniasis; magnify community voices and maximize their participation and empowerment; encourage translation of research findings into policy and practice in ways that benefit local communities; and, finally, improve cultural sensitivity within the research team, laying the groundwork for future community-focused Visceral Leishmaniasis and wider public health research [20].

## 5. CONCLUSION AND RECOMMENDATIONS

Our work shows that effective programming through community conversation lenses driven agenda can stimulate and sustain changes from within the community. The study has demonstrated conviction that communities are capable of analyzing their own issues, and choosing their own course of action and solutions. Including the community in prevention and control activities related to public health can result in an increase in the uptake of health services. The expected outcome of community conversations is that all members of the community actively

participate in decisions made with the Government ultimately paying attention to voices raised by communities. Furthermore, we believe community conversations are a feasible approach to increased number and sustainability of community initiatives addressing issues that communities encounter. Importantly, it facilitates a thorough comprehension of community perspectives, contexts, and viability of interventions in a manner that goes beyond present formative research methodologies. Principally, it outlines a path for wider community involvement so that common people can be involved in the advancement of research that aims to serve their interests. In conclusion, we are confident that community conversations in public health research can be implemented in an inclusive, collaborative, and equitable way based on our experiences in this Visceral Leishmaniasis Participatory Epidemiology (PE) study in Isiolo County, while also acknowledging obstacles and difficulties that we, along with other researchers in the field, will always face in doing so.

## 6. LIMITATIONS OF THE STUDY

The study was conducted in only two Sub-Counties of Isiolo County i.e., Merti and Garbatulla (Chari, Cherab, Sericho, and Garbatulla Wards) which are considered as Kala-azar hotspots.

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## CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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