

# The Context of Rabies in Bombali District, Sierra Leone

## Final Program Outcomes Monitoring Assessment

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## Acronym List

aOR	Adjusted odds ratio
FAO	Food and Agriculture Organization
OM	Outcome monitoring
USAID	United States Agency for International Development

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# Executive Summary

The emergence of several zoonotic diseases around the world, including the 2014 Ebola virus outbreak, has demonstrated the critical need for a coordinated, harmonized, targeted, and effective global response to public health emergencies. Rabies is a severe and understudied zoonotic disease that is endemic to Sierra Leone. A priority focus of the government of Sierra Leone is to reduce the prevalence of rabies in animals and humans and increase awareness and knowledge of rabies risk and prevention among the general population. This effort includes an examination of the individual- and community-level behaviors that influence the practice of positive rabies prevention behaviors, as well as reporting and treatment recommendations.

The Johns Hopkins Center for Communication Programs, through the USAID-funded Breakthrough ACTION program, worked with the Sierra Leone One Health sectors (the Ministry of Health and Sanitation, Ministry of Agriculture and Forestry, Environment Protection Agency, and other partners) to develop and implement a high-quality communication campaign for dog bite and rabies prevention under the broader concept of *Healthy Animals, Healthy People*. This national- and community-level campaign promotes healthy behaviors for living safely with animals and aims to increase awareness about the dangers of dog bites and rabies, how to prevent dog bites, and what to do if bitten, as well as strengthen reporting channels within and between sectors for improved surveillance of and response to dog bites. Community engagement and information dissemination via mass media activities are essential to the *Healthy Animals, Healthy People* campaign, which includes print and radio products designed to promote community ownership of health outcomes and access to information about rabies risk.

The Breakthrough ACTION program in Sierra Leone collected data to monitor program outcome indicators related to individual- and community-level behaviors, including awareness and general knowledge of rabies, risk perception and risky interactions with animals, prevention of rabies in animals and humans, appropriate response to high-risk interactions with animals, appropriate reporting channels, and exposure to Breakthrough ACTION program activities. Outcomes monitoring data were collected using a rapid assessment survey of community members. The overall aim of the outcomes monitoring activity was to collect information about knowledge and behaviors from the target population to monitor the status of program indicators, inform campaign effectiveness, and at endline, assess campaign impact. Two waves of data collection were conducted over the course of program implementation: a baseline collection in June 2018 and an endline one in July 2021.

This report summarizes the results of outcomes monitoring at baseline and endline and in relation to exposure to the prevention campaign. The endline data collection and analysis were conducted about six months after implementation of the campaign.



## Monitoring Results of the Rabies Prevention Campaign

Two community-based, household-level, rapid assessments were conducted in 2018 and 2021, each including a cross-sectional sample of 1,312 adult participants at least 18 years of age. The following outcomes were achieved at endline for key program indicators.

### Knowledge of how Rabies is Transmitted in Human–Animal Interactions

The proportion of participants with high knowledge of transmission of rabies increased at endline. Baseline estimates, which were already very high, further increased to near 100% for all constituencies at endline. In addition, general awareness of rabies increased from 38% at baseline to 77% at endline.

### Knowledge of Rabies Risk

The baseline estimates for knowledge of risk associated with rabies varied widely, with a high of 98% in constituency 31 but only 69% in constituency 35. At endline, at least 90% or more of participants from all participating constituencies had high knowledge of risks associated with rabies.

### Knowledge of Rabies Prevention

Baseline estimates were moderate for knowledge on how to prevent rabies, with 69% of overall participants demonstrating high knowledge. At endline, the proportion with high knowledge of rabies prevention increased to 84% overall.

### Knowledge of When and Where to Report Suspected Rabies

Baseline estimates were moderate (67%) regarding participants' knowledge of when to report suspected rabies. At endline, this proportion increased to 88% overall, with 96% of participants in constituency 31 showing high knowledge, compared to 75% of participants in constituencies 37/38.

Baseline and endline results were very high (97% and 98%, respectively) for correct knowledge of reporting channels for suspected rabies. However, only 13% of participants at baseline and 55% at endline correctly identified the community animal health officer (AHO), veterinarian, or livestock officer as the individuals to whom sick animals are reported.

### Awareness and Reporting of Suspected Rabies in the Past 12 Months

The proportion reporting high-risk incidents remained unchanged between baseline and endline. Overall, 26% at baseline and 28% at endline reported being aware of someone in their community who had been scratched or bitten by a dog or had signs of sickness from an animal. Among participants who were aware of such incidents, 75% at baseline and 74% at endline reported the incident to a health worker, animal health or livestock officer, or the 117 toll-free hotline.

## High-risk Interactions with Animals Linked to Rabies in the Past 12 Months

The proportion of individuals who reported high-risk interactions with animals linked to rabies decreased at endline, compared to baseline. At baseline, 77% of participants reported having a high-risk interaction, ranging from a low of 43% for constituency 37/38 to a high of 94% for constituency 34. At endline, high-risk interactions dropped to 69%. Constituency 34 had the highest proportion at 86%, compared to a low of 43% among participants from constituency 35. Nonetheless, the proportion of individuals who reported a high-risk interaction with animals linked to rabies remains high, perhaps in part due to eating (65%) and preparing (46%) bushmeat.

## Treatment Seeking After High-risk Interaction in the Past 12 Months

Overall, the change in the proportion of individuals who sought care after a high-risk interaction with an animal linked to rabies was highest for constituency 37/38, which showed a 10% increase in care seeking.

## Awareness of Communication Campaign on Rabies

Overall, awareness of the communication campaign *Healthy Animals, Healthy People* was very high. At endline, 90% of participants reported they were aware of the campaign tagline, radio jingle, or song. The proportion of individuals who were aware of the campaign was highest in constituency 35 (99%) and lowest in constituency 37/38 (78%).

## Correct Recall of Program-related Health Messages on Rabies

Program recall was very high and closely mirrored participant awareness of the *Healthy Animals, Healthy People* campaign. At endline, 89% of participants correctly recalled, unaided, a specific rabies-related campaign message. Recall ranged from 99% in constituency 35 to 77% in constituency 37/38.

## Background and Rationale

Johns Hopkins Center for Communication Programs is the lead organization for Breakthrough ACTION and is funded by USAID. Breakthrough ACTION aims to use state-of-the-art evidence-based approaches to increase adoption of healthy behaviors and normative change worldwide. Breakthrough ACTION Sierra Leone works with the government of Sierra Leone and Global Health Security Agenda implementing partners to improve the risk communication capacity of government and partners and address specific behaviors in the population associated with selected high-priority zoonotic diseases.

## Zoonotic Diseases in Sierra Leone

The largest-ever Ebola virus disease epidemic occurred between 2014 and 2016, resulting in over 28,600 cases and 11,300 deaths in Guinea, Liberia, and Sierra Leone (Ordaz-Neameth et al., 2017). Before the outbreak, the health system in Sierra Leone was poorly funded, understaffed, and ill-equipped, which (along with poverty) contributed to the scale of the epidemic (Shoman et al., 2017). In the post-Ebola

environment, studies demonstrate significant decreases in the use of health care services and corresponding increases in non-Ebola morbidity and mortality (Brolin Ribacke et al., 2016). Sierra Leone cannot afford another large-scale outbreak.

The 2014 outbreak highlighted the need for a coordinated, harmonized, targeted, and effective global health response to public health emergencies. It is essential to strengthen and maintain Sierra Leone's capacity to prepare and respond to future health events through improved risk communication. Understanding the epidemiology and culture of zoonosis in Sierra Leone will provide a strong foundation for effective responses to (and prevention of) another large-scale epidemic of zoonotic illness.

## Rabies in Sierra Leone

In 2017, Sierra Leone held a One Health zoonotic disease prioritization exercise and ranked rabies as the second-highest priority zoonotic disease (after viral hemorrhagic diseases). Rabies is a zoonotic viral infection transmitted by contact with the saliva of infected mammals, mainly through bites. The virus attacks the central nervous system, targeting the brain and spinal cord, and if untreated, is fatal. Rabies is endemic in Sierra Leone; however, poor reporting and surveillance have resulted in gross underestimations of cases and mortality. Children are especially vulnerable to rabies, with four out of every ten rabies-related deaths in the African continent occurring in children under the age of 15 (World Health Organization, 2018). Very little information is available about community-level perceptions and behaviors that influence transmission of rabies in Sierra Leone.

## Program Approach

Breakthrough ACTION collaborates on zoonosis projects with the Ministry of Health and Sanitation Health Education Division, and other One Health and USAID Global Health Security Agenda partners, including the Ministry of Agriculture and Forestry, Environmental Protection Agency, Food and Agriculture Organization of the United Nations Emergency Center for Transboundary Animal Diseases project, World Health Organization, and International Federation of Red Cross and Red Crescent Societies' Community Epidemic and Pandemic Preparedness Program. Breakthrough ACTION and partners collaborated to design and implement a communication campaign to increase knowledge and awareness about the connection between animal and human health and promote behaviors to protect and maintain the health of both humans and animals interacting in the same environment. The results of formative research and baseline outcome monitoring (OM) assessment, as well as other program activities, informed the design of a high-quality communication campaign strategy. Strategic interventions in English and the predominant local languages spoken in Sierra Leone relayed information on rabies to community members.

Breakthrough ACTION trained Global Health Security Agenda and One Health partners to use the project outputs to effect change at the community level. Groups trained included community animal health workers, community health workers, health facility workers, Red Cross volunteers, religious and traditional leaders, teachers, traditional healers, and members of village development committees and

facility management committees. The program expects to increase community members' awareness and knowledge of rabies and its causes, symptoms, prevention, and reporting.

Breakthrough ACTION conducted OM to inform project strategies and track project performance. The OM activity involved collecting data on project indicators at baseline and endline. Breakthrough ACTION selected awareness and knowledge as outcome indicators, which occur early in the behavior change continuum and are based on simple concrete information, such as expected response and reporting processes that are easy to remember. This report shares the results for baseline and endline indicators related to individual- and community-level behaviors, specifically knowledge and awareness of zoonosis with an emphasis on rabies, including high-risk interactions with animals, perceptions of health providers and health services for rabies, and exposure to project-developed health communication interventions for rabies. Based on previous use of this method, Breakthrough ACTION is confident the project content, combined with the duration of activities, will support improvements in key outcome indicators.

Breakthrough ACTION research activities focused on Bombali district to align communication interventions with ongoing Global Health Security Agenda partner efforts in the district to strengthen laboratory, surveillance, and workforce capacity for prioritized zoonotic diseases.

### *Healthy Animals, Healthy People Campaign*

Breakthrough ACTION conducted formative research to provide information on community members' knowledge, attitudes, and perceptions related to zoonotic diseases, as well as factors influencing risk of illness, prevention behaviors, reporting, and uptake of treatment and support services. The research provides high-quality data to inform evidence-based risk communication and behavioral communication programs and campaigns for zoonoses, including rabies, in Sierra Leone. Breakthrough ACTION has implemented a *Healthy Animals, Healthy People* Campaign, with focused efforts in Bombali district, to increase awareness of the risks of dog bites and rabies and provide information on bite prevention and what to do if bitten. The campaign initially focused on behavior change and prevention of dog bites, in part due to the chronic limited availability of vaccines (both canine and human) in the country. It also focused on strengthening reporting channels within and between sectors for improved surveillance and response to dog bites.

The campaign included radio, print, WhatsApp, and community engagement activities. Radio materials included a song, three 3-minute spots covering key messages, and two 5-minute spots answering common questions raised during engagement. Print materials included a poster for the general public with key messages, a reminder card for community leaders covering key messages and steps to report dog bites, and a job aid poster for health workers including key messages and a step-by-step guide for managing and reporting dog bites and cases of suspected rabies. A WhatsApp number for the campaign was shared through radio and community engagement activities. Individuals could send a hello message to the number to receive all campaign materials. Community engagement activities included a one-time community outreach on ferry boats and through road shows; a six-month community-based

engagement with Red Cross volunteers; and monthly constituency-level meetings with paramount chiefs, section chiefs, and community leaders across 16 communities in Bombali district.

## Study Aims

Breakthrough ACTION works to improve the risk communication capacity to address high-risk behaviors associated with zoonotic diseases in Sierra Leone. The overall aim of this study was to assess achievements over the life of the program. Specific objectives included data comparisons at baseline and endline regarding the following:

- Awareness and knowledge of health risks from animal–human interactions
- Knowledge of rabies (high-risk behaviors in animals and humans, symptoms in animals and humans, prevention strategies, and reporting mechanisms for animal bites or suspected rabid animals)
- Personal experiences with animals that have a high risk of rabies
- Accepted sources of information on rabies in the community
- Impact of the project campaign on individual rabies knowledge, risk interactions, and reporting

# Study Methods

## Overview of Study Design and Methods

The team conducted quantitative cross-sectional household surveys among adults aged 18 years and older to collect monitoring data and track changes in project outcome indicators. This baseline assessment was conducted with the FR in June 2018, and the endline assessment was conducted in July 2021.

## Sample Size and Justification

The team collected survey data from 1,312 different participants for each of the OM baseline and endline assessments. At the time of the survey, there were no population estimates for zoonosis-related knowledge or behaviors, which are outcomes of interest for the OM. As we expect average behaviors to vary by constituency, urban/rural location, ethnicity, and individual characteristics, we selected 0.50 as  $p$  to provide maximum variability in calculating the sample size using the Stata *sampsi* command. The formula for the sample size calculation implemented by Stata with continuity correction was as follows:

$$N = \frac{[Z_{1-\frac{\alpha}{2}} \sqrt{2\bar{P}(1-\bar{P})} + Z_{1-\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)}]^2 * DEFF}{(P_2 - P_1)^2},$$

where  $Z_{1-\alpha}$  is the Z value associated with a 95% significance level;  $Z_{1-\beta}$  is the Z value associated with a power of 80%;  $P_1$  is the indicator at baseline; and  $P_2$  is the indicator at end-line.  $\bar{P}$  is calculated as  $(P_1+P_2)/2$ , and DEFF is set to 2.

To calculate the sample size required to determine a modest 15% change in behavioral variables of interest, we estimated the initial value for the characteristic of interest ( $p_1$ ) at 0.50 and the change  $p_2$  at 0.65. At an alpha level of 0.05, power of 80%, and design factor of 2.0 to correct for any sampling inefficiency related to the multi-stage cluster sampling design (as sampling does not occur from the universe of participants), we required a sample of 294 individuals per constituency. We oversampled by 10% to account for non-responses and compensate for any unusable surveys, increasing the sample to 327 individuals per constituency. We rounded up to 328 individuals to provide equal distribution among the four communities per constituency (Table 1).

TABLE 1: SAMPLING DISTRIBUTION FOR OUTCOMES MONITORING SURVEYS					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	
# sampled	328	328	328	328	1312

For constituency-level comparisons, we multiplied the target of 328 individuals by four program constituencies for a total of 1,312 rapid survey participants per wave of data collection. Research and

monitoring activities occurred in four purposefully selected constituencies in Bombali District, identified in collaboration with the Ministry of Health and Sanitation and the Bombali District Health Management Teams.

## Selection of Constituencies

Stakeholders from the Ministry of Health and Sanitation and the Bombali District Health Management Team, Ministry of Agriculture and Forestry, Environmental Protection Agency, and Bombali District Council in Sierra Leone provided input for selecting constituencies based on the following guidelines:

- Recent history of reported dog bites
- Urban locale with a high number of stray dogs
- Market, agrarian, or hunting locale that contributes to supply and demand for bushmeat, livestock, or dogs for hunting
- Increased risk of bites or scratches from animals that may serve as potential sources of rabies
- Geographically well-defined and accessible locale
- Large enough community to allow random recruitment of the required number of participants for OM
- Located within the Breakthrough ACTION program area

## Community Selection

The team selected 16 communities (four each in four constituencies) for FR and OM activities (Table 2).

TABLE 2: CONSTITUENCIES AND COMMUNITIES SELECTED FOR FR AND OM ACTIVITIES			
Constituency 31	Constituency 34	Constituency 35	Constituency 37/38
Gbendembu	Binkolo	Kanekay	Makama
Kalangba	Kagbo	Karena	Matinka
Kotohun	Kapethe	Kayanko	Ropolon
Masongbo-Loko	Masongbo-Limba	Manjoro	Stoko

## Participant Section

Participants for OM were randomly selected residents aged 18 years and older living in one of the 16 participating communities listed in Table 1. To be eligible, participants had to: be 18 years or older at the time of the OM survey; have lived in the selected community for a least one year; provide voluntary informed consent; and understand and speak English or Temne. Individuals who did not meet these criteria were excluded.

## Outcome Monitoring Indicators

OM data were collected using a rapid assessment method to track changes in the project's outcome indicators. Community members completed a short quantitative survey about the following indicators:

- Percentage with correct knowledge of transmission of rabies from human-animal interactions
- Percentage of individuals with correct knowledge of risk of rabies
- Percentage of individuals with correct knowledge of prevention of rabies
- Percentage with correct knowledge of when to report suspected rabies
- Percentage of individuals with correct knowledge of reporting channels for rabies
- Percentage who reported a suspected rabies case in the past 12 months
- Percentage who had high-risk interactions with animals linked to rabies in the past 12 months
- Percentage change in individuals who had a high-risk interaction with animals linked to rabies in the past 12 months and sought treatment
- Percentage who were aware of the Breakthrough ACTION campaign on rabies
- Percentage who correctly recalled project-related health messages on rabies

## Data Analysis

The data were analyzed descriptively to characterize the sample and provide prevalence estimates for each variable. Descriptive characteristics of the sample were compared for baseline and endline data. Z-tests were used to assess differences in proportions at baseline and endline, overall, and by constituency. Composite score variables were created for general knowledge of zoonosis and for transmission, prevention, and risk of rabies. Distribution analysis was used to create new variables indicating high or low knowledge for each composite score. Tests of significance for changes in the overall proportions were conducted between baseline and endline estimates and among those exposed to the project's behavior change campaign and those who were not.

In addition, multivariate regression models were developed to estimate correlations for several predictors of key outcome indicators of the campaign. The main outcome of interest, appropriate response to a potential rabies exposure in the past 12 months, was defined as self-reporting one of the following positive behaviors that are an appropriate response to a high-risk interaction regarding rabies.

- reporting a personal scratch or bite to an animal health officer
- Seeking care promptly for a personal scratch or bite at a health facility
- reporting a known community scratch or bite to an animal health officer

Although this combination of positive outcome behaviors ensures the highest possible sample for a robust multivariable regression model, the final sample size was not adequate to power models for outcomes of high-risk interactions in the last 12 months or prompt and appropriate care-seeking among those with high-risk interactions.



# Results

This section summarizes the OM rapid assessment conducted in four constituencies (31, 34, 35, and 37/38) in Bombali District, Sierra Leone. The data for endline monitoring were collected from the four program constituencies about three years after collection of baseline data.

## Sample Characteristics

For the baseline conducted in June 2018, 1,319 adult participants (52% men and 48% women) aged 18–95 years (mean of 37.9; standard deviation of 13.4) completed the OM survey. Most (72%) were married or living with a partner, and their main occupations were crop farming (44%), trading (22%), vocational (9%), and professional (7%) jobs; 11% were unemployed.

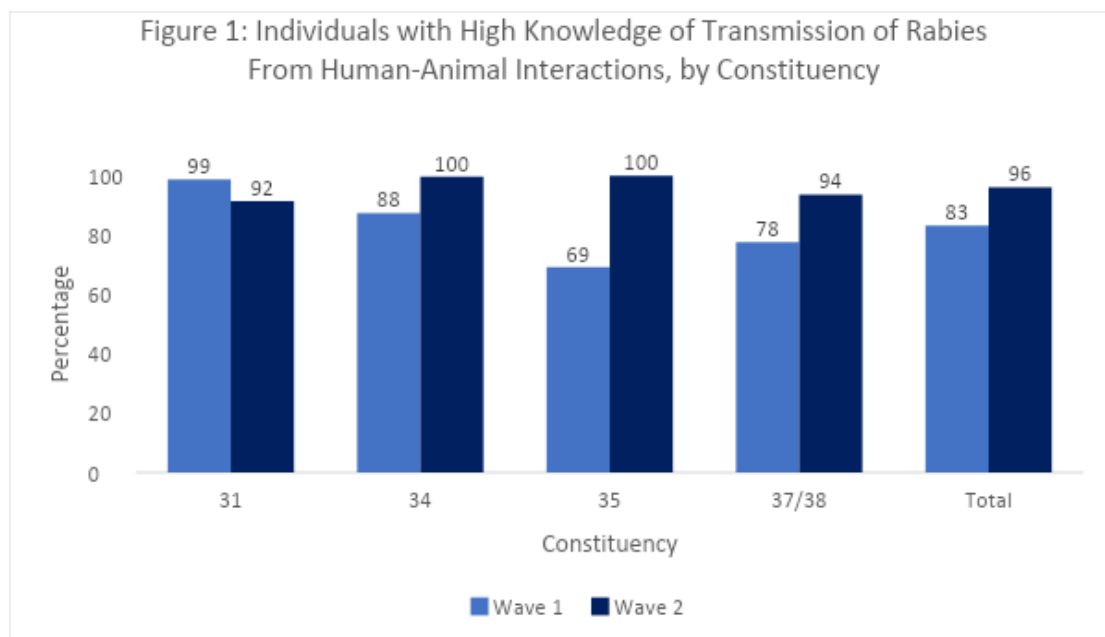
For the endline conducted in July 2021, 1,312 adult participants (51% men and 49% women) aged 18–89 years (mean of 38.9; standard deviation of 14.8) completed the OM survey. Most (74%) were married or living with a partner, and their main occupations were crop farming (49%), trading (21%), professional (10%) and vocational (6%) jobs; 11% were unemployed. Table 3 summarizes the characteristics of the two independent samples, which shared similar demographic characteristics.

TABLE 3: CHARACTERISTICS OF SAMPLE FOR OUTCOMES MONITORING										
	WAVE 1 (%) N=1319					WAVE 2 (%) N=1312				
	CONSTITUENCY					CONSTITUENCY				
	31	34	35	37/38	Total	31	34	35	37/38	Total
Age										
18-24	21	8.5	16.2	17.1	15.7	29	14.9	8.8	13.1	16.5
25-34	31.4	29.3	27.5	29	29.3	22.3	30.2	19.2	43.9	28.9
35-44	25.3	23.5	29	26.2	26	17.1	21.6	23.2	26.5	22.1
45+	22.3	38.7	27.2	27.7	29	31.7	33.2	48.8	16.5	32.5
Male	52.1	52.6	52.1	49.4	51.6	51.2	50.9	48.8	51.5	50.6
Marital status										
Married	50	62.6	71.9	59.5	61	59.1	66.8	70.1	61	64.3
Single/never married	16.5	6.7	11.1	21.3	13.9	21.6	15.5	7	16.8	15.2
Widow	7	15.2	6.6	6.1	8.7	9.5	10.4	16.2	3.7	9.9
Living with a partner	22	12.2	7.5	4.6	11.5	8.2	4.3	1.8	13.4	6.9
Divorced/separated	4.6	3.3	3	8.5	4.9	1.5	3	4.9	5.2	3.7
Occupation										
Unemployed	14.3	5.8	3.6	18.9	10.6	17.7	5.2	11.9	8.8	10.9
Crop farmer	37.2	68.1	58.1	11.6	43.8	46.3	64.9	61.9	20.7	48.5
Trader	26.8	8.8	13.5	37.8	21.7	19.5	14.3	12.2	39.3	21.3
Professional	3	4.9	7.8	11.6	6.8	5.5	7.6	8.2	16.8	9.5
Vocational	10.4	6.4	8.4	10.1	8.8	7	5.5	1.8	9.8	6
Laborer	0.6	0.3	1.8	4	1.7	0.6	2.1	1.5	2.1	1.6
Animal care	4	2.1	5.1	0.6	3	0	0.3	2.1	1.5	1
Transportation	2.4	2.4	1.8	4.3	2.7	1.8	0	0.3	0.3	0.6
Hunter	1.2	0.9	0	0.6	0.7	1.5	0	0	0.6	0.5

## Results of Outcomes Monitoring

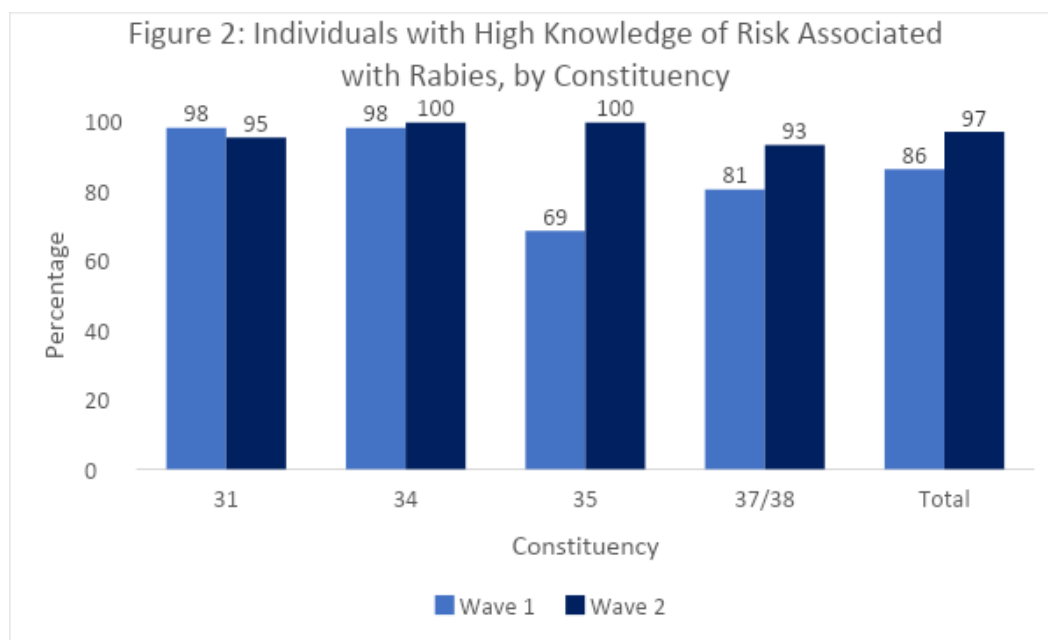
### Knowledge of Rabies Transmission

Figure 1 shows that overall, almost all participants (96%) had high knowledge of transmission of rabies from interactions with animals, a highly statistically significant ( $z=-3.320$ ,  $p=0.000$ ) increase from the baseline estimate of 83%. All participants from constituencies 34 and 35 had high knowledge of transmission on all questions. The proportion with high knowledge of transmission of rabies increased in three of the four participating constituency groups. Constituency 31 had the highest proportion with high knowledge at baseline (99%), which decreased to 92% at endline.



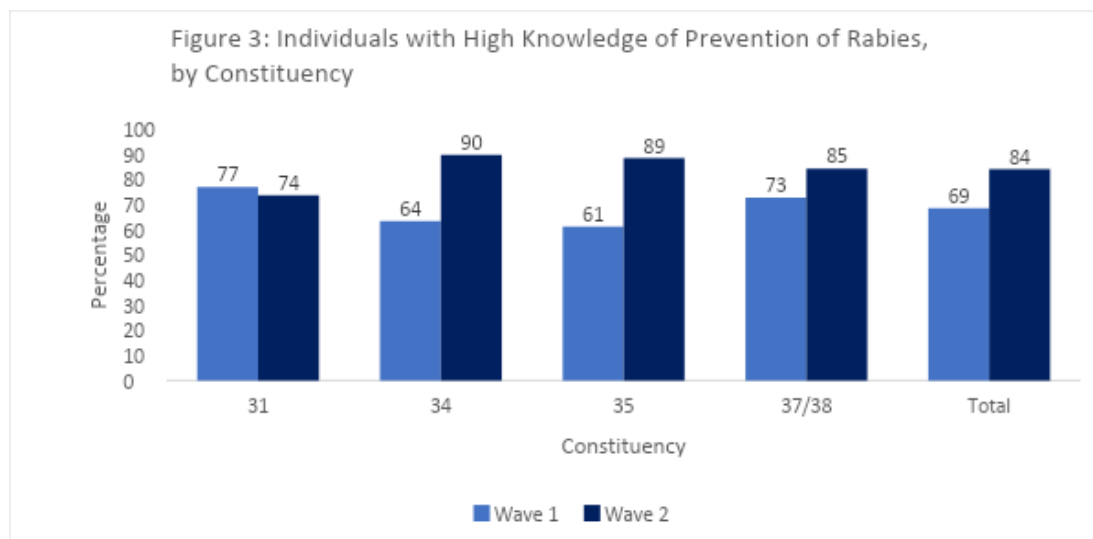
### Knowledge of Rabies Risks

Results for responses to questions about activities and behaviors that increase risk of rabies are summarized in Figure 2. Overall, 97% had high knowledge of behaviors that increase risk of acquiring zoonotic diseases, representing a statistically significant increase from the baseline estimate of 86% ( $z=-2.757$ ,  $p=0.006$ ). All participants from constituencies 34 and 35 had high knowledge of risk on all questions. The proportion with high knowledge of transmission of rabies increased in three of the four participating constituency groups. The proportion with high knowledge for constituency 31 decreased slightly from 98% at baseline to 95% at endline.



### Knowledge of Rabies Prevention

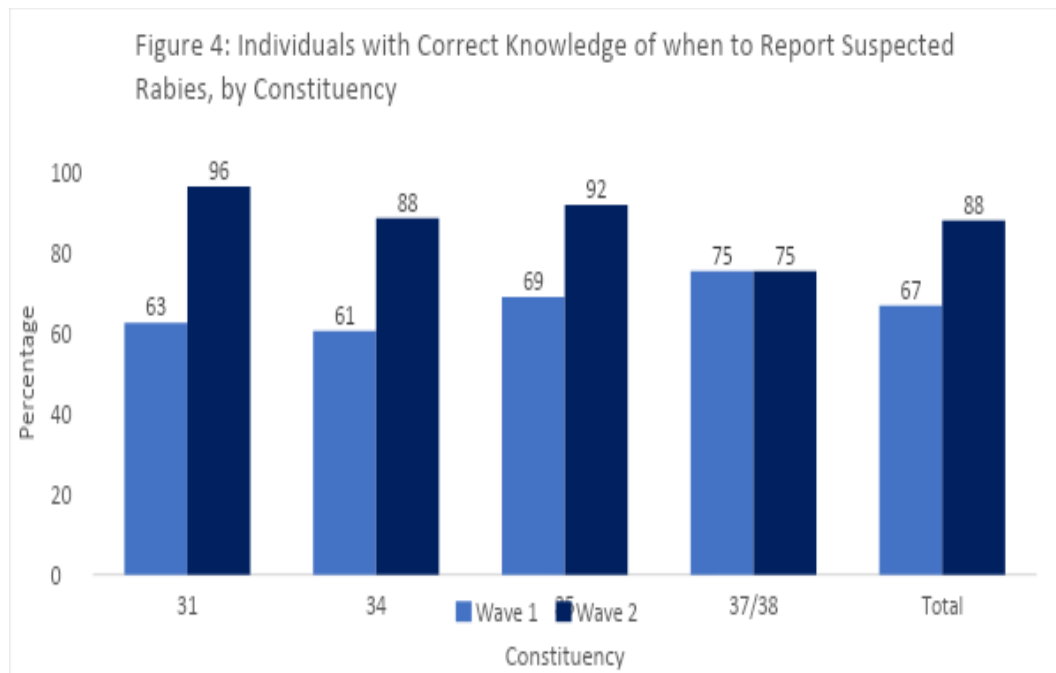
Participants responded to questions about how to prevent rabies in animals and in humans. The results are summarized in Figure 3. Overall, the endline results showed a substantial increase in the proportion with high knowledge of prevention of rabies ( $z = -3.984$ ,  $p < 0.000$ ). High knowledge of prevention at endline ranged from 90% in constituency 34 to 74% in constituency 31; results were similar to baseline results for constituency 31.



### Knowledge of When to Report Suspected Rabies

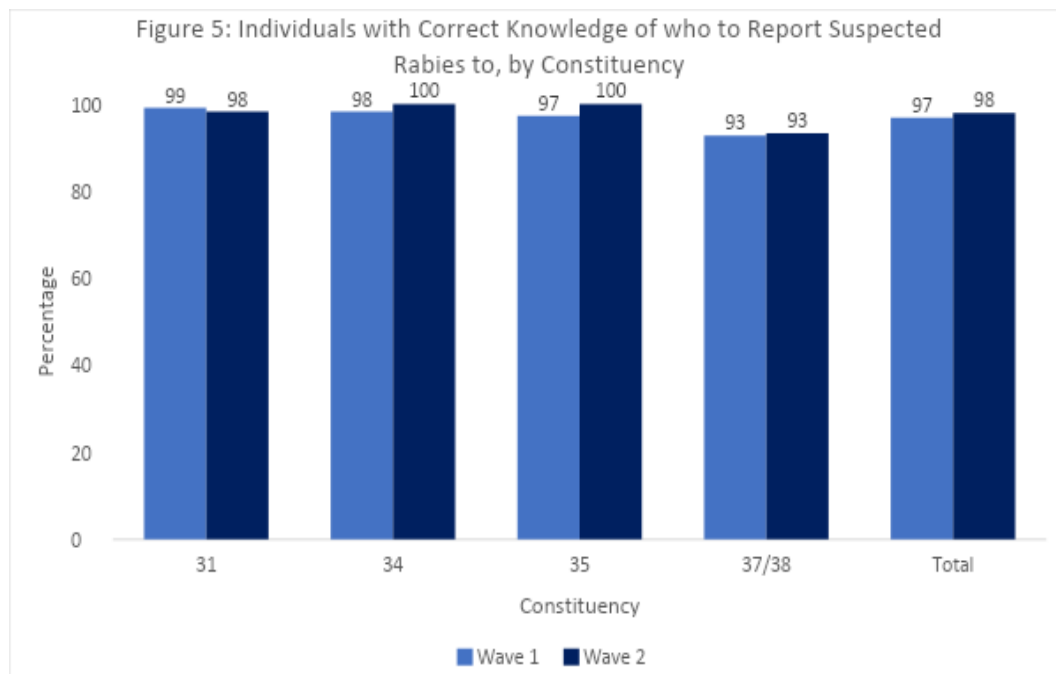
Figure 4 presents the results for knowledge of when to report suspected rabies. Overall, correct knowledge responses increased from a baseline of 67% to 88% ( $z = -5.428$ ,  $p < 0.000$ ) at endline. A higher proportion of participants had correct knowledge of when to report rabies in three of the four

participating constituency groups; the proportion with correct knowledge remained unchanged for constituency 37/38.



### Knowledge of Reporting Channels for Rabies

Figure 5 shows results for correct responses to a question about who to report suspected rabies to in their community. Participants sustained high levels of correct knowledge about the appropriate channels for reporting suspected or actual rabies. Almost all (98%) participants from all constituencies had correct knowledge on this item. Most (79% in wave 1, 82% in wave 2) knew to go to a health facility if scratched or bitten by an animal that may have rabies, and many (56% in wave 1, 62% in wave 2) also knew to go to a community health worker. The largest growth between wave 1 and wave 2 was for knowledge about reporting sick animals: only 13% of wave 1 participants identified the community animal health or livestock officers, compared to 55% of wave 2 participants.



### History of High-risk Interactions with Animal Linked to Rabies in the Past 12 Months

Figure 6 summarizes the results for reporting high-risk interactions related to rabies. Overall, the proportion of high-risk interactions decreased from 77% at baseline to 69% at endline ( $z=1.947$ ,  $p<0.051$ ); however, further improvement is needed. At endline, three of the four constituency groups demonstrated decreases in proportions of high-risk interactions. Constituency 35 reported a reduction in risky interactions by almost half (from 84% to 43%), whereas constituency 37/38 reported a substantial increase from 43% to 75%. The data suggest this may be due to the high percentage of participants from constituency group 37/38 who reported getting scratched by their pet (23%), relative to the other constituencies (0.5%), at endline. More than a quarter (27%) of participants from constituency 37/38 also reported preparing dog or cat meat for consumption or sale in the last 12 months, compared to only 1.9% on average for the other three constituencies.

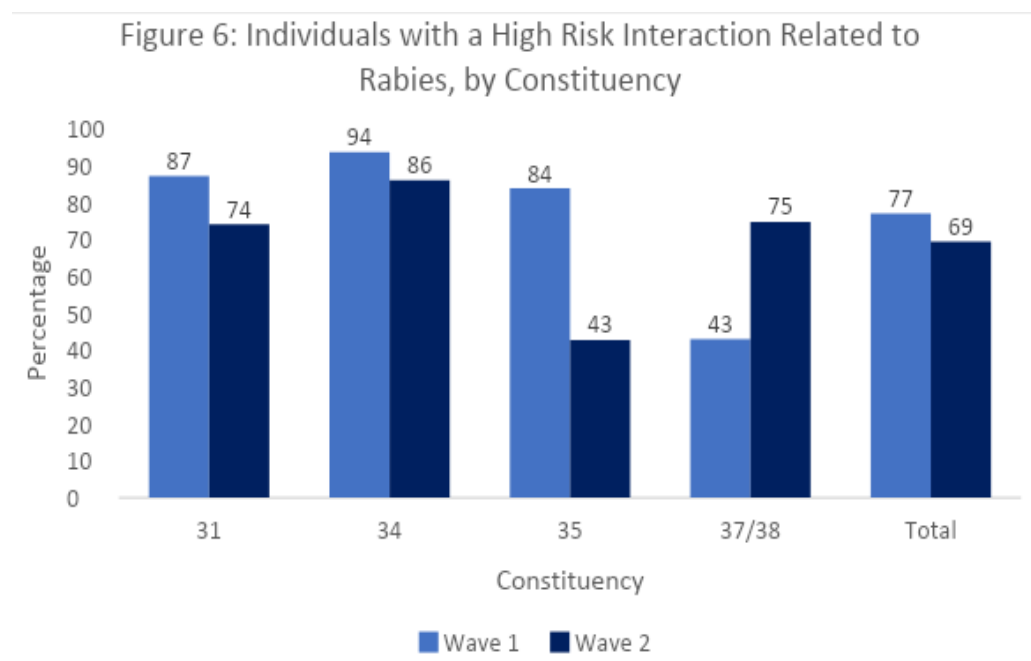


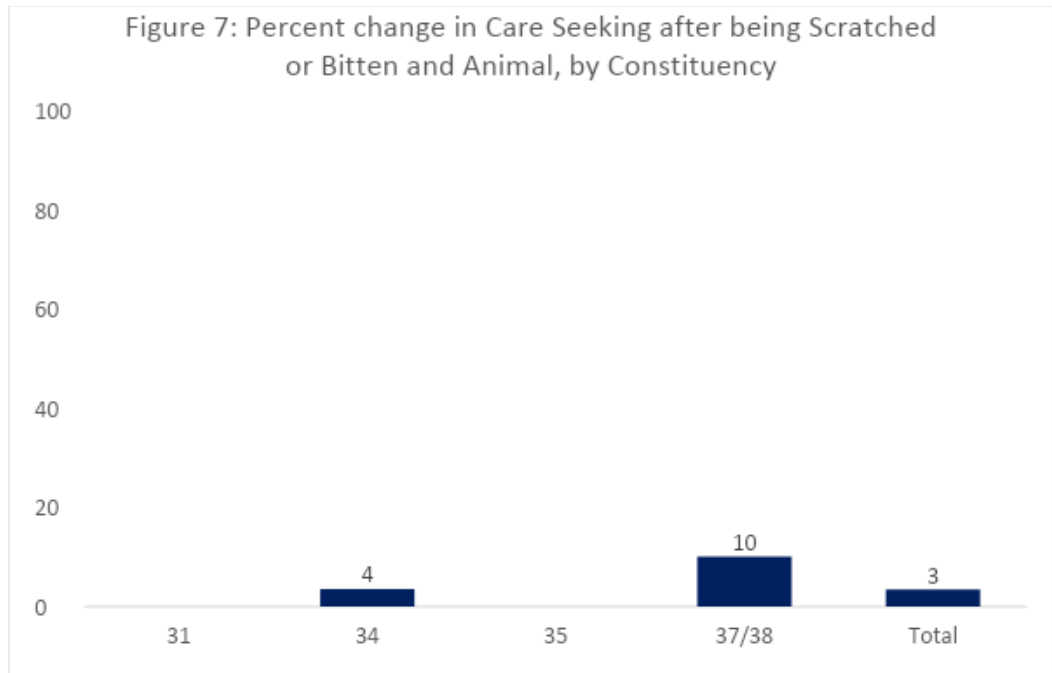
Table 5 shows that most high-risk interactions reported by participants at endline were related to eating (65%) and preparing (46%) bushmeat. The focus of some of the behavior change messaging in the campaign addressed high-risk interactions attributed to pet or stray animal scratches or bites in the 12 months prior to the survey, which decreased from baseline (17%) to endline (11%).

TABLE 5. PROPORTION OF HIGH-RISK INTERACTIONS IN THE LAST 12 MONTHS, BY SURVEY WAVE.		
Values	Baseline (N = 1319)	Endline (N = 1312)
Ate bushmeat	71	65.3
Prepared bushmeat	51.5	46.3
None (no high-risk interactions)	23	30.5
Hunted animals from the bush	12.2	13.9
Killed and ate a sick animal	21.4	9.1
Ate dog or cat meat	15.7	8.1
Handled a sick animal	14.6	6.3
Scratched or bitten by pet	9.6	6.2
Handled an animal that died of illness	3.3	5.7
Scratched or bitten by stray animal	4.9	3
Scratched or bitten by sick animal	1.4	0.9
Scratched or bitten by an animal that died	1.3	0.8
Don't know	0.5	0.3

### History of Seeking Treatment for High-risk Interaction With Animal Linked to Rabies in the Past 12 Months

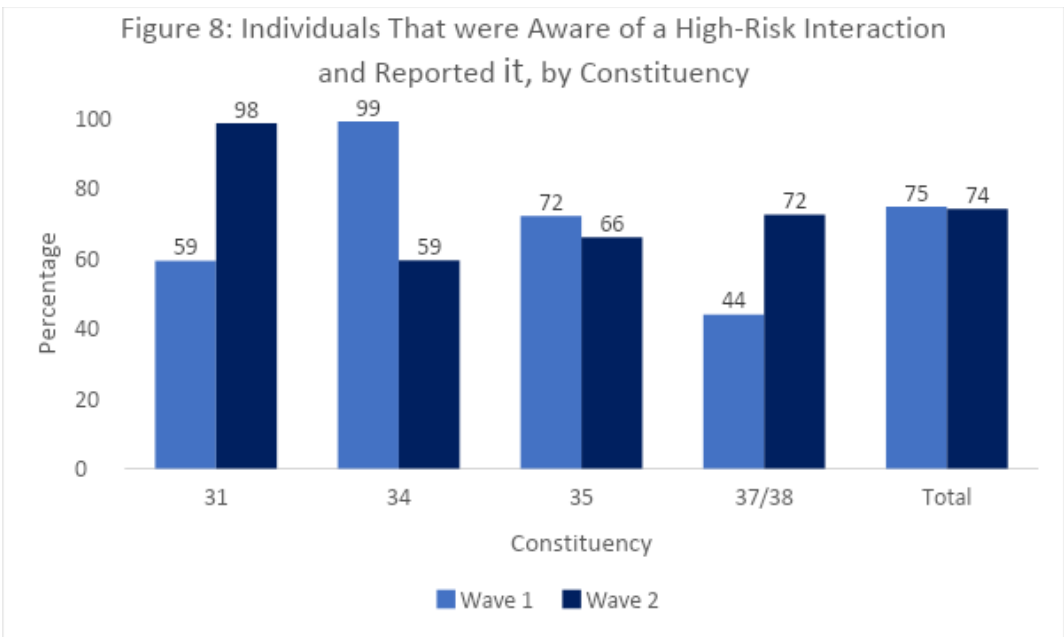
Participants who reported a high-risk interaction (scratched or bitten by a pet, stray animal, or animal that died shortly after) in the last 12 months were asked if they had sought treatment. As summarized in Figure 7, 3% more participants sought care for animal scratches or bites at endline, compared to the

baseline estimate. The largest difference was observed in constituency 37/38, which increased from 87% to 97%. Notably, constituency 37/38 also reported the most high-risk behaviors.



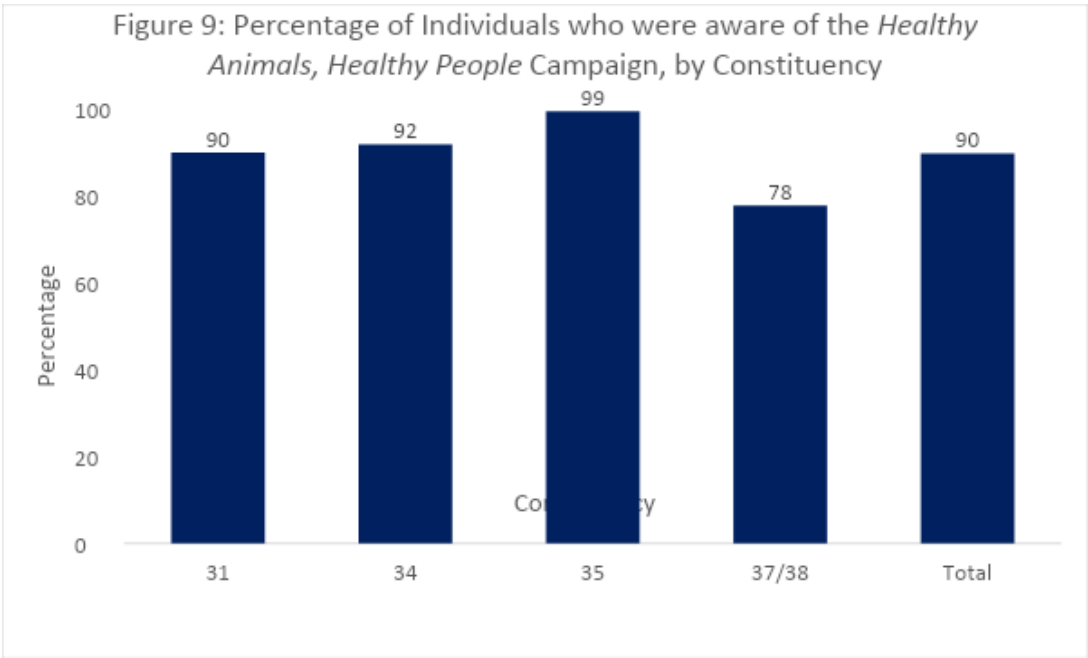
**Awareness and Reporting of any High-risk Rabies Interaction in the Past 12 Months**

Figure 8 summarizes the results for reporting of suspected high-risk interactions (bite, scratch, or signs of sickness after interaction with a sick animal) in the past 12 months among those aware of high-risk interaction in the community. Estimates varied across constituencies from baseline to endline, but the total estimate for this indicator remained stable.



**Awareness of Breakthrough ACTION Campaign on Rabies**

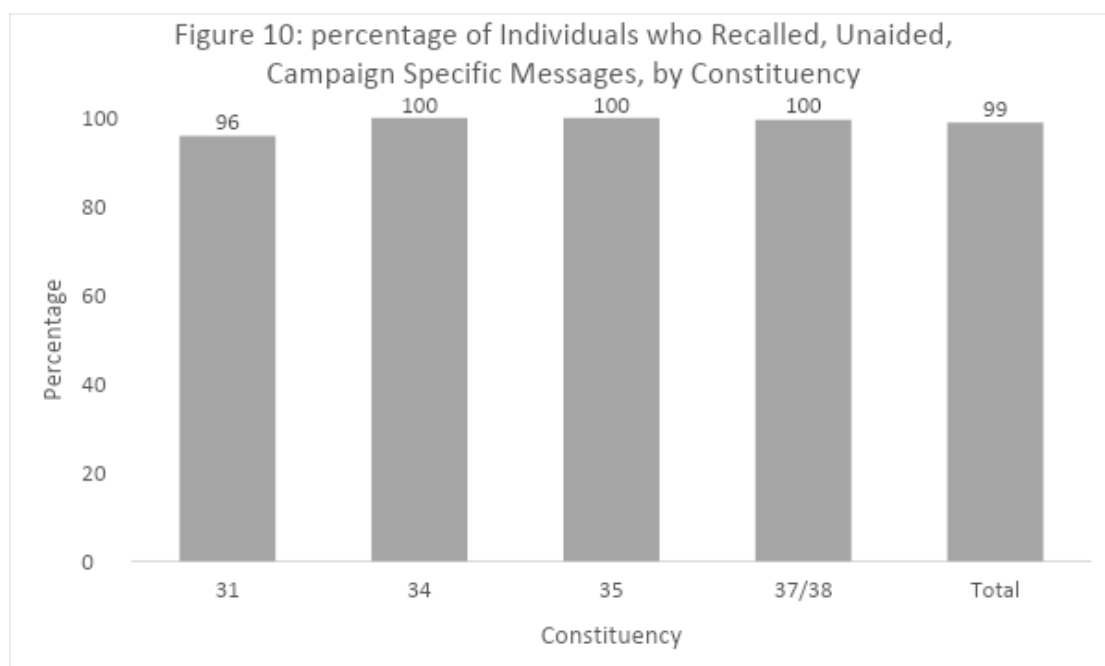
Breakthrough ACTION Sierra Leone implemented the *Healthy Animals, Healthy People* campaign to promote safety while living with animals, primarily in preventing dog bites. Exposure to the campaign was assessed by reported *awareness* of the campaign slogan and unaided recall of any campaign messages. Figure 9 summarizes the results. Overall, 90% of participants reported awareness of the *Healthy Animals Healthy People* campaign, including recall of the slogan, radio spots, jingles, posters, and WhatsApp messages. Level of awareness ranged from a high of 99% in constituency 35 to a low of 78% in constituency 37/38.



**Correct Recall of Project-related Health Messages on Rabies**

Participants aware of the *Healthy Animals, Healthy People* campaign reported unaided recall of specific campaign messages from the radio, posters, and WhatsApp. As shown in Figure 10, generally, correct recall of campaign messages was very high, with only Constituency 31 (96%) reporting less than 100%.





### Impact of *Healthy Animals, Healthy People* Campaign

Program impact was assessed by analyzing key behaviors, such as knowledge scores and high-risk interactions among participants who recalled or did not recall the *Healthy Animals, Healthy People* campaign. Table 6 summarizes the results.

TABLE 6. EXPOSURE ANALYSIS			
	Unexposed (%) (n= 135)	Exposed (%) (n=1312)	Total (%) (N=1312)
High general knowledge of rabies***	57.8	83.3	80.7
High knowledge of prevention***	51.1	87.7	83.9
High knowledge of reporting***	51.9	88.1	84.4
Overall high knowledge score***	45.2	87.5	83.2
Recently had a high-risk interaction	20.7	23.4	23.1
High concern for rabies***	46.7	80.6	77.1
	(n=15)	(n=83)	(N=98)
Correct response to high-risk interaction	93.3	97.6	96.9

Note. \*\*\*  $p < 0.000$

Significantly higher proportions of those exposed to the campaign exhibited behaviors of interest, compared to those who reported no exposure. Specifically, significantly higher proportions of individuals familiar with the campaign had high knowledge of rabies prevention, transmission, and reporting requirements, compared to those unfamiliar with the campaign ( $p < 0.000$ ). A higher proportion of participants from the exposed group reported a high-risk rabies interaction, compared to those in the non-exposed group, but this difference was not statistically significant.

Despite differences in knowledge about rabies among campaign-exposed and non-exposed groups, most responded correctly regarding high-risk interactions involving an animal bite or scratch (98% among campaign exposed and 93% among non-exposed). This result may be more related to individuals seeking treatment for a traumatic injury rather than specifically for prevention of rabies.

### **Healthy Animals, Healthy People Campaign Impact on Care-seeking for a Potential or Actual Community-level or Personal Exposure to Rabies**

Table 7 displays the results of three multivariable logistic regression models from baseline and endline data and among those exposed to the *Healthy Animals, Healthy People* campaign. Sociodemographic and behavioral predictors were regressed on the outcome of interest, appropriate response to high-risk interactions for rabies, or potential rabies exposure. The results show that age was negatively correlated with an appropriate response to high-risk interactions at endline (adjusted odds ratio [aOR]: 0.97, 95% CI: 0.96 - 1.00) and among those exposed to the SBC campaign (aOR: 0.96, 95% CI: 0.95 - 0.99), compared to baseline. Specifically, with increasing age, individuals were less likely to report an appropriate response to high-risk interactions.

<b>TABLE 7. SOCIODEMOGRAPHIC AND BEHAVIORAL PREDICTORS OF RESPONDING APPROPRIATELY TO A HIGH-RISK INTERACTION REGARDING RABIES</b>			
	<b>Wave 1 (n= 388) Adjusted Odds Ratio (Confidence Interval)</b>	<b>Wave 2 (n=390) Adjusted Odds Ratio (Confidence Interval)</b>	<b>Exposed (n=350) Adjusted Odds Ratio (Confidence Interval)</b>
Sex			
Male (Ref)	1	1	1
Female	1.02 (0.62,1.67)	0.70 (0.43,1.18)	0.68 (0.40,1.19)
Age	0.98* (0.96,1.00)	<b>0.97*</b> (0.96,1.00)	<b>0.96 **</b> (0.95,0.99)
Occupation			
Engages with animals frequently (Ref)	1	1	1
Does not engage with animals	<b>0.38***</b> (0.22,0.65)	0.61 (0.36,1.07)	0.71 (0.39,1.29)
Constituency			
31(Ref)	1	1	1
34	<b>0.15***</b> (0.07,0.29)	<b>0.14***</b> (0.05,0.42)	<b>0.18***</b> (0.06,0.53)
35	<b>2.39 **</b> (1.25,4.57)	0.68 (0.32,1.45)	0.85 (0.39,1.87)
37/38	0.56 (0.22,1.38)	0.96 (0.48,1.94)	1.08 (0.52,2.27)
Level of concern			
Not concerned (Ref)	1	1	1
Somewhat or very concerned	0.34 (0.10,1.11)	0.79 (0.14,4.35)	8.64 (0.83,89.96)\
General knowledge score	<b>1.61***</b> (1.27,2.05)	<b>1.64**</b> (1.10,2.46)	<b>1.91**</b> (1.21,3.00)
Prevention knowledge score	0.83 (0.68,1.02)	0.87 (0.54,1.44)	0.72 (0.35,1.47)
Reporting knowledge score	<b>1.35*</b> (1.01,1.81)	<b>3.83***</b> (2.62,5.62)	<b>5.29***</b> (3.31,8.46)
*p<0.05, **p<0.01, ***p<0.001,			

Participants' constituency was correlated with responding appropriately to a high-risk interaction at baseline, endline, and among those exposed to campaign messages. Individuals in constituency 34 were significantly less likely to respond appropriately to a high-risk interaction, compared to individuals in constituency 31, and this did not change much between baseline (aOR: 0.15, 95% CI: 0.07,0.29), endline (aOR: 0.14, 95% CI: 0.05,0.42), and among those exposed to the SBC campaign (aOR: 0.17, 95% CI:

0.06,0.53). Individuals in constituency 35 were more likely to respond appropriately to a high-risk interaction, compared to those in constituency 31, but only at the baseline (aOR: 2.39, 95% CI: 1.25,4.57).

General knowledge of rabies (causes, signs, symptoms, transmission) was positively correlated with an appropriate response to a high-risk interaction. The results showed higher odds of responding appropriately to a high-risk interaction at endline and among those exposed to the SBC campaign. Specifically, among individuals exposed to the SBC campaign, each additional point in the score for general knowledge of rabies corresponded to a 1.9 increase in overall odds to respond appropriately to high-risk interactions (aOR: 1.90, 95% CI: 1.21,3.00), and this was higher than for individuals at endline (aOR: 1.64, 95% CI: 1.10,2.46) and baseline (aOR: 1.61, 95% CI: 1.27,2.05).

Knowledge of appropriate reporting of rabies was also positively correlated with appropriate response to a high-risk interaction, where among individuals exposed to the SBC campaign, an increase in knowledge of reporting corresponded to much higher odds (aOR: 5.29, 95% CI: 3.31,8.46) of conducting the appropriate response to a high risk-interaction at endline (aOR: 3.83, 95% CI: 2.62,5.62) and at baseline (aOR: 1.35, 95% CI: 1.01,1.81). Knowledge of prevention of rabies and level of concern for rabies were not significantly correlated with an appropriate response to high-risk interactions for rabies.

Additional analysis explored knowledge by media channel. Figure 11 shows the density of total knowledge score by radio broadcasts. Total knowledge was scored on a 17-point scale and included general knowledge of rabies, prevention, and reporting. As participants heard more radio broadcasts, they clustered more towards the highest knowledge score.

Figure 11: Total Knowledge Score and Number of Program Broadcasts Heard by Participants at Endline

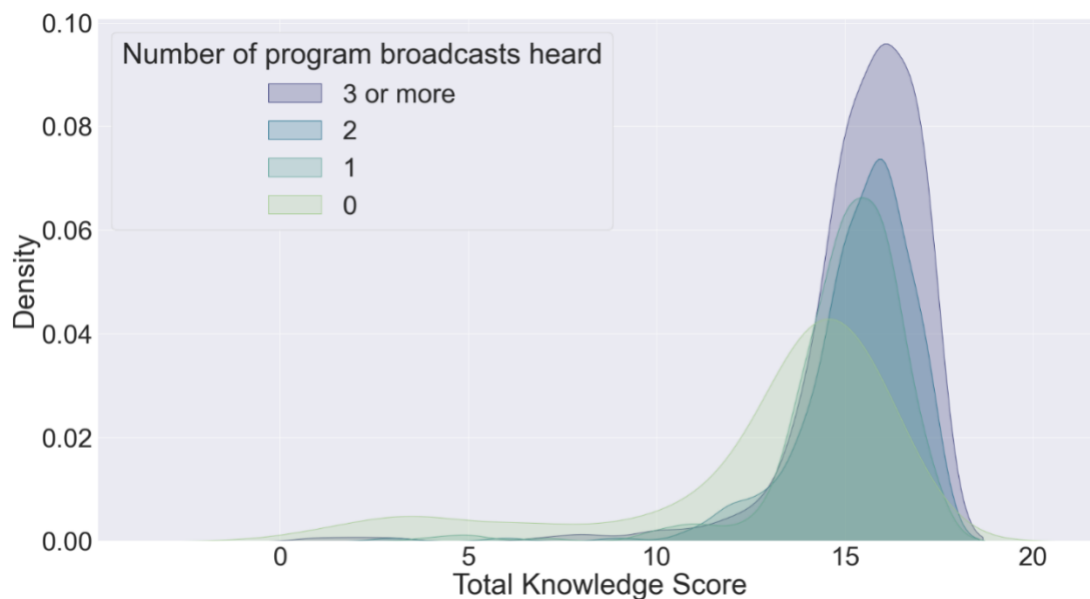
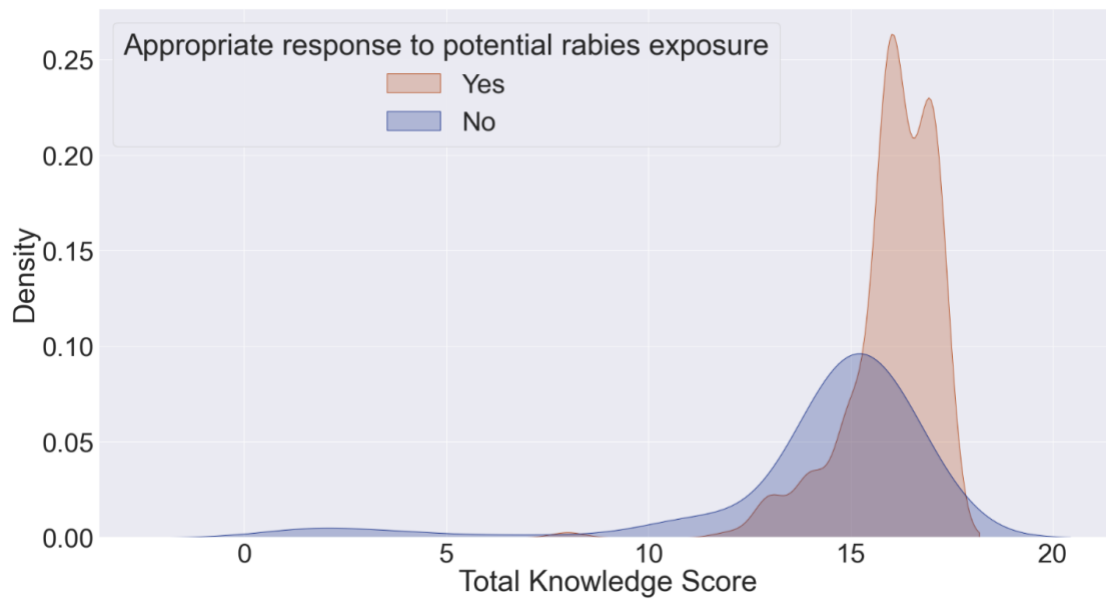


Figure 12 shows the total knowledge score and densities of participants who knew appropriate responses to potential rabies exposure. Those who did not know the appropriate response were spread

out more along the spectrum of total knowledge, and almost all who responded appropriately had higher knowledge.

Figure 12: Total Knowledge Score for Appropriate Response to Rabies Exposure, at Endline



# Recommendations

Based on results of this report, which describes results from two cross-sectional OM surveys on rabies-related content conducted in Bombali district (a baseline survey in 2018 and an endline in 2021), the following implementing strategies are recommended for sustaining high levels of awareness, knowledge, and behavior change among community members via a socio-behavioral lens.

## Promote Rabies Awareness, Risk Reduction, Prevention, and Reporting

Positive changes in key behavioral estimates were observed at the endline assessment. Interventions to promote awareness, risk reduction and prevention behaviors, and appropriate reporting of dog bites and suspected rabies cases in animals and humans is the logical next step to secure long-term health of community members and extend the achievements of the program. Use of informative and easy-to-interpret videos and case stories to supplement written information and discussions may help convince individuals that rabies is real and has consequences.

Continued support of interventions that shift ownership and management of rabies prevention activities to community members may help increase accountability for health promotion. The *Healthy Animals, Healthy People* campaign promotes behavior change for living safely with animals and preventing dog bites. As vaccines become available, the campaign should consider expanding its focus to other areas of prevention, such as responsible animal ownership (e.g., registering, licensing, and vaccinating dogs) and receiving the post-exposure vaccine if rabies is suspected. These additional topics may make the campaign more important or relevant to some individuals. Community radio, town criers, and community social structures (churches, women and youth groups, local clubs, counselors, and associations) may be appropriate channels for sustaining these messages.

## Explore Opportunities to Scale up the Rabies Campaign to Other Districts

Program achievements at endline showed that mass media and community engagement can increase awareness, knowledge, and behavior change for rabies prevention. Density maps show a relationship between radio broadcasts listenership and higher knowledge scores. Expanding the program to other districts and partners beyond Bombali district may complement ongoing rabies prevention activities by sharing rabies-related information resources and campaign materials with institutions and organizations. Consider focusing awareness and prevention information near national borders and entry points with a high occurrence of dogs crossing borders and in southern areas of the country where the prevalence of dog bites is higher.

Distilling lessons learned from program experiences to improve design and delivery of the program prior to scale-up may also be beneficial. Incorporating lessons and successes from community-level activities (e.g., dog registration and licensing, identification of stray animals, accountability systems) may also

influence the success of scale-up activities. In addition, though not included in the original rabies campaign, pharmacists were identified as a common point of care for dog bites and represent an opportunity for engaging other influential individuals within the community, in rabies prevention.

## Adapt the Approach for Prevention of Other Zoonoses

Adapting the program strategy and interventions for application to prevention of other priority zoonotic diseases in Sierra Leone, such as Lassa fever and anthrax, may help facilitate reach of Sierra Leone's joint risk assessment goals for these diseases. The nature of this behavior change program allows for easy adaptation to other key messages and environments. The program could also be adapted to support rabies prevention in neighboring countries.

## Continue to Strengthen Focus and Activities on Risk-reduction Behaviors in Communities

The program made substantial achievements in awareness, knowledge, and reporting of high-risk incidents. Yet, high-risk interactions with animals linked to rabies remained high overall and even increased in proportion in one constituency. This means that the risk of contracting rabies may remain high in some areas, requiring interventions aimed at identifying and reducing risky behaviors. For example, consumption of dog meat was highly prevalent in constituency 37/38 and inflated the estimates for high-risk indicators. Also, developing rabies prevention strategies and risk reduction messages specifically for young children and school-age populations may help reduce risk among vulnerable populations. Rabies prevention information may be integrated into academic curricula or school clubs and activities, and schools may participate in canine vaccination drives as children are often the ones who provide care for animals in their home.

Targeting rabies prevention activities among older individuals may be necessary, as the results show decreased odds of responding appropriately among older individuals and that their knowledge of prevention is not correlated with expected behaviors. Complacency among older individuals, who may be used to seeing stray dogs in their communities and used to living with animals, may explain this finding. Activities that increase a sense of vulnerability and risk may be beneficial to this group.

Community dialogue and specific messages focusing on safe preparation and consumption of dog and bush meat (and avoiding dead animals) may help decrease risk of illness. Integrated farming and animal husbandry campaigns focusing on improving diets in these areas also may help curb these behaviors. Additional information about risk and appropriate safety measures when handling, preparing, and eating dog and bush meat may be warranted.

## Explore Context for Constituency 37/38

Constituency 37/38 showed the largest increase in estimates for the number of high-risk interactions between baseline and endline, particularly for dog bites and scratches. Understanding potential changes

in the community environment and context can identify and address factors that may influence this increase and may help in preparing for program scale-up.

## Target Small Groups with High-risk Behaviors

Overall estimates for knowledge and appropriate behaviors were high, and it is important to sustain this high coverage by identifying and providing information to high-risk and hard-to-reach groups within the larger community, such as those with close and frequent contact with dogs or dog meat, hunters (especially younger males), butchers, and meat vendors. These groups may constitute populations at increased risk of rabies exposure.

## Reinforce Reporting and Surveillance Mechanisms

Increased focus on timely data capture, sustained reporting, and data can help proactively identify areas exhibiting changes in risk profiles for quick investigation and interventions, as well as opportunities to sustain current positive results. Those individuals with direct responsibility for coordinating OneHealth activities in each district (at the chiefdom, constituency, and community levels) and for surveillance and data management should be supported. For instance, district-level One Health focal points could be key to improving coordination by bringing together Ministry of Health and Sanitation and Ministry of Agriculture and Forestry surveillance information, investigations, and reporting.

Opportunities to engage with other community influencers should be explored to reinforce appropriate reporting and care-seeking strategies for dog bites. These influencers include traditional healers, medicine and herbal vendors, pharmacists, and chemical sellers. This effort may require additional training.

It is important to critically review existing guidance for reporting dog bites and canine rabies to ensure it provides clearly defined instructions for how and when to contact the community, health workers, and animal health officers. This effort should include strengthening these communication mechanisms, especially feedback loops for rabies surveillance, reporting, and communication, and sharing guidance documents widely with community leaders and human and animal health workers. Also consider including expectations from the rabies reporting pathway in the National Rabies Strategy.

## Update National Guidance Documents

It is essential to establish the National Public Health Agency with a mandate that includes topics of animal health and zoonosis. This effort must incorporate new evidence, lessons learned, and related recommendations into policy, regulatory, and guidance documents for rabies, including the National Rabies Strategy. Communication pathways should prioritize guidance regarding animal and human interactions; rabies prevention, surveillance, and reporting; roles and responsibilities, especially at district and lower administrative units; and health promotion and behavior change for each of these components.

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## Appendix A: Characteristics and Distribution of Participants at Endline

	CONSTITUENCY 31	CONSTITUENCY 34	CONSTITUENCY 35	CONSTITUENCY 37/38	TOTAL
	<b>n=328</b>	<b>n=328</b>	<b>n=328</b>	<b>n=328</b>	<b>1,312</b>
Age					
18-24	29	14.9	8.8	13.1	16.5
25-34	22.3	30.2	19.2	43.9	28.9
35-44	17.1	21.6	23.2	26.5	22.1
46+	31.7	33.2	48.8	16.5	32.5
Gender					
Male	51.2	50.9	48.8	51.5	50.6
Female	48.8	49.1	51.2	48.5	49.4
Marital status					
Currently married	59.1	66.8	70.1	61	64.3
Living with a partner	8.2	4.3	1.8	13.4	6.9
Divorced/separated	1.5	3	4.9	5.2	3.7
Widow	9.5	10.4	16.2	3.7	9.9
Single/never married	21.6	15.5	7	16.8	15.2
Occupation					
Unemployed	17.7	5.2	11.9	8.8	10.9
Crop farmer	46.3	64.9	61.9	20.7	48.5
Animal care	0	0.3	2.1	1.5	1
Laborer	0.6	2.1	1.5	2.1	1.6
Trader	19.5	14.3	12.2	39.3	21.3
Hunter	1.5	0	0	0.6	0.5
Vocational	7	5.5	1.8	9.8	6
Professional	5.5	7.6	8.2	16.8	9.5
Transportation	1.8	0	0.3	0.3	0.6
Refused to answer	0.0	0.0	0.0	0.0	0.0

# Appendix B: Rabies-related Awareness and Knowledge at Endline

## Awareness of Rabies

HAVE YOU HEARD OF THE SICKNESS CALLED RABIES? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	n=1,312
No	11	0.6	2.1	6.7	5.1
Yes	89	99.4	97.9	93.3	94.9

## Knowledge of Causes of Rabies

WHAT DO YOU THINK CAUSES RABIES IN HUMANS? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Spirits, witchcraft, gods	0.3	0	0	4.6	1.2
Germes, rubbish	10.4	0	4.9	14.3	7.4
A virus that makes animals sick	74.1	81.7	80.5	70.1	76.6
Comes through the family line	0.3	0	0	0	0.1
Feces, urine	0.3	0	0.3	2.4	0.8
Other	0.9	0	0	0	0.2
Don't know	13.7	18.3	14.3	8.5	13.7

## Knowledge about Rabies Transmission

HOW CAN RABIES BE TRANSMITTED? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Bite of a rabid animal	64.9	88.1	91.2	80.5	81.2
Scratch of a rabid animal	1.2	1.5	2.4	5.5	2.7
Contact with saliva of a rabid animal	14.3	7	1.8	6.1	7.3
Eating/touching the meat of a rabid animal	3	2.1	4.6	1.5	2.8
Eating/touching the brain of a rabid animal	0.3	0	0	0	0.1
Petting a sick animal	5.5	0	0	0	1.4
Don't know	10.4	1.2	0	6.4	4.5
Other	0.3	0	0	0	0.1

## Knowledge of Rabies Transmission

WHAT ANIMALS CAN TRANSMIT RABIES? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Dog	88.7	99.1	100	91.5	94.8
Cat	16.2	32.3	42.4	38.4	32.3
Rat	13.1	26.5	7.3	54.9	25.5
Bush rat	13.1	25.3	18	26.2	20.7
Squirrel	3	26.8	3.4	14.3	11.9
Bat	16.8	26.8	38.4	28.7	27.7
Chicken	7	15.2	6.7	10.7	9.9
Cow	0.3	0	5.2	4.9	2.6
Goat	7.3	17.4	10.4	16.2	12.8
Monkey	19.8	25	9.8	20.1	18.7
Don't know	8.8	0.9	0	5.8	3.9

## Knowledge of Rabies Signs and Symptoms

HOW WILL A PERSON KNOW THAT AN ANIMAL MAY HAVE RABIES? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Animal behaves like it is sick	58.2	48.2	65.2	59.1	57.7
Animal does not act normal	66.8	74.4	84.5	63.7	72.3
Animal is aggressive	51.8	96.3	86	71.6	76.4
It's a stray animal	7.3	42.7	47.3	33.8	32.8
Animal does not eat	2.1	33.5	7	4.6	11.8
Animal does not drink	2.1	34.1	18.9	2.7	14.5
Animal not vaccinated	8.8	2.1	7.6	14	8.2
Animal salivates excessively/foams in mouth	27.7	47.6	56.7	28	40
Animal was bitten by a sick animal	2.7	0	15.2	10.7	7.2
Cannot tell if animal has rabies	0.3	0.3	0	1.5	0.5
Animal afraid of water	0.3	22.6	11.9	4.3	9.8
Don't know	5.8	0.9	0.6	7	3.6
Other	0	0.9	0	0.3	0.3

## Knowledge that Rabies in Animals can be Prevented

RABIES IN ANIMALS CAN BE PREVENTED (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
False	5.5	2.4	9.8	5.2	5.7
True	79.6	91.8	89	85.1	86.4
Refused to answer	0.3	0	0	3	0.8
Don't know	14.6	5.8	1.2	6.7	7.1

## Knowledge of Rabies Prevention in Dogs and Cats

WHAT CAN BE DONE TO PREVENT RABIES IN DOGS AND CATS? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=261	n=301	n=292	n=279	N=1,133
Vaccinate dog/cat	64	81.4	87	90.3	81
Keep pets within compound	71.6	40.5	59.9	54.5	56.1
Don't let pets mix with strays	59.8	46.8	42.5	40.1	47
Report sick animals to animal health worker, livestock officer, or vet	34.1	39.5	45.5	36.9	39.2
Report animals bitten to animal health worker, livestock officer, or vet	8	4	35.3	25.4	18.3
Report sick animals to community leader	1.5	19.5	23.8	24.4	17.3
Do nothing	0	0	0	0	0
Don't know	1.1	2.3	0	0	0.9
Other	1.1	1	0	0	0.5

## Knowledge That Rabies in Humans Can Be Prevented

RABIES IN HUMANS CAN BE PREVENTED (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=326	n=330	n=328	N=1,312
False	4.6	0	0.6	2.1	1.8
True	79.9	97	98.8	90.5	91.5
Refused to answer	0	0	0	3.4	0.8
Don't know	15.5	3	0.6	4	5.8

## Knowledge of How to Prevent Rabies in Humans

WHAT CAN BE DONE TO PREVENT RABIES IN HUMANS? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=262	n=318	n=324	n=297	N=1,201
Wash hands	33.6	46.5	65.7	53.9	50.7
Avoid stray animals	41.6	61	67	59.3	58
Avoid animals that are not behaving normally	78.6	88.1	94.1	78.8	85.3
Avoid half eaten fruits	55.3	40.3	63.9	46.1	51.4
Vaccine	19.1	46.5	20.4	40.4	32
Don't eat bushmeat	4.2	33	36.7	27.3	26.3
Can't do anything	1.5	0	0.6	6.1	2
All of the Above	0.4	0	0	2	0.6
Don't know	1.9	1.9	0	0.3	1
Other	0	0.6	0	0	0.2

## Knowledge of Correct Action to Take After Potential Rabies Exposure

WHAT SHOULD A PERSON DO IF THEY ARE BITTEN OR SCRATCHED BY A SICK ANIMAL? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Nothing	2.1	0.6	1.5	10.7	3.7
Wash wound	21	39	72.6	42.1	43.7
Spirit	26.2	58.5	47.6	44.5	44.2
Go to health facility	16.2	58.2	53.4	50.6	44.6
Go to community health worker	74.1	92.1	88.1	75.3	82.4
Go to pharmacy	30.8	29.6	33.5	26.5	30.1
Go to chemical seller	0	0	1.2	17.4	4.6
Go to traditional healer	1.5	0.6	0	10.1	3
Confine animal	4.6	0.3	1.5	10.7	4.3
Kill animal	2.1	0.6	14.9	12.5	7.5
Report to animal health worker, livestock officer, vet	3	17.4	20.1	16.5	14.3
Don't know	2.1	0	0	1.2	0.8
Other	0.9	3.4	0	0.3	1.3

## Knowledge of Appropriate Reporting of a Sick Animal

WHEN SHOULD A PERSON REPORT A SICK ANIMAL THAT MIGHT HAVE RABIES? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Immediately/less than one day	96.3	89	91.8	76.8	88.5
Within one week	0.3	9.5	3.4	11.9	6.3
If animal's sickness gets worse	0.3	1.5	2.1	1.2	1.3
If animal dies from sickness	0	0	0.3	1.5	0.5
Other	0	0	0	1.8	0.5
Don't know	3	0	2.4	6.7	3

## Knowledge of When to Report a Bite or Scratch

WHEN SHOULD A PERSON REPORT A BITE/SCRATCH THEY GET FROM AN ANIMAL? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Immediately/Less than one day	97	98.8	100	89	96.2
Within one week	0.3	1.2	0	0.9	0.6
If the wound gets worse	0	0	0	5.8	1.4
When the person feels sick	0	0	0	2.4	0.6
Other	0	0	0	0.3	0.1
Don't know	2.7	0	0	1.5	1.1

## Knowledge of Proper Reporting Channels

TO WHOM SHOULD YOU REPORT AN ANIMAL BITE OR SCRATCH? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Animal health worker, livestock officer, or vet	48.2	46.3	51.5	49.4	48.9
Community health worker	56.1	75	56.7	58.2	61.5
Health facility worker	61	31.1	67.4	49.7	52.3
Traditional healer	7.6	0.3	0.3	6.7	3.7
Pharmacist	0.3	0.3	0.3	6.4	1.8
Chemical seller	0	0	0	9.1	2.3

TO WHOM SHOULD YOU REPORT AN ANIMAL BITE OR SCRATCH? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Community leader	4	28.7	75	28	33.9
Owner of the animal	3.4	31.7	57.3	40.9	33.3
Hotline	7.6	0	21.6	0.6	7.5
No one	0.3	0	0	0.9	0.3
Don't know	1.2	0	0	0.3	0.4
Other	0	0.9	0.3	0.3	0.4

IF YOU SEE AN ANIMAL THAT LOOKS SICK, WHOM SHOULD YOU REPORT IT TO? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Community animal health officer, livestock officer, or vet	51.8	53.7	50.9	62.5	54.7
Community health worker	47.6	35.1	54	42.4	44.7
Health facility-based worker	29	26.5	55.8	29	35.1
Traditional healer	7	0.3	0.6	11	4.7
Pharmacist	0	0	0.3	5.8	1.5
Chemical / herb seller	0	0.6	0	8.8	2.4
Community leader	16.5	81.1	76.5	37.5	52.9
Owner of the animal	13.4	74.7	63.7	47.3	49.8
Call 117 Hotline	11.6	0.9	19.5	0.9	8.2
Do not report to anyone	0	0	0	0.3	0.1
Other	2.4	0	0	3	1.4
Don't know	1.2	0	0	0.9	0.5

# Appendix C: Rabies-related Perceptions, Attitudes, and High-risk Interactions

## Perceived Risk of Rabies

HOW CONCERNED ARE YOU THAT YOU CAN GET RABIES FROM AN ANIMAL? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Very concerned	80.8	98.2	73.8	55.8	77.1
Somewhat concerned	12.5	1.5	15.9	31.7	15.4
Not concerned at all	5.2	0	10.4	7	5.6
Not sure/Don't know	1.5	0.3	0	5.5	1.8

## History of High-risk Interactions

HAVE YOU BEEN INVOLVED IN THE FOLLOWING HIGH-RISK INTERACTIONS WITH ANIMALS? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Hunted bushmeat	4.6	23.5	6.7	21	13.9
Prepared bushmeat	49.7	56.1	30.5	48.8	46.3
Ate bushmeat	71.3	81.1	36.9	72	65.3
Ate dog meat	0.3	5.5	0	26.5	8.1
Killed and ate a sick animal	7	13.7	0.9	14.9	9.1
Scratched or bitten by a pet	0.3	1.2	0	23.2	6.2
Scratched or bitten by stray animal	0	0	0	12.2	3
Scratched or bitten by a sick animal	0	0	0	3.7	0.9
Scratched or bitten by an animal that eventually died	0.3	0	0	3	0.8
Handled a sick animal	0.9	18.6	0.9	4.9	6.3
Handled an animal that died	1.2	19.2	0.3	2.1	5.7
All of the Above		0	4	0.3	1.1
Don't know	0.3	0.6	0.3	0	0.3
None	25.6	14	57	25.3	30.5



## Attitudes Towards High-risk Interactions

WHAT DID YOU DO AFTER YOU WERE SCRATCHED OR BITTEN? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=2	n=4	n=0	n=92	N=98
Nothing	0	0	0	3	3
Washed the wound	0	25	0	68	65
Spirit	0	50	0	78	76
Went to a health facility	100	25	0	80	79
Went to a community health worker	50	50	0	54	54
Went to the pharmacy	50	0	0	38	37
Went to a chemical seller	0	0	0	30	29
Went to a traditional healer	0	0	0	35	33
Confined the animal	0	0	0	34	32
Killed the animal	0	0	0	38	36
Reported to the animal health worker, livestock officer, or vet	0	0	0	15	14
Other	0	0	0	0	0

## Appendix D: Sources of Information on Rabies

THROUGH WHICH SOURCES HAVE YOU GOTTEN INFORMATION ON RABIES? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Television	0.9	0	0	18.6	4.9
Radio	78	76.8	91.5	76.5	80.7
Poster	14.9	24.7	34.1	9.1	20.7
Newspaper	1.8	0	0	4.6	1.6
Internet	2.1	0.9	0.3	10.4	3.4
Animal health worker, livestock officer, or vet	9.8	46.6	5.2	35.4	24.2
Community health worker	12.8	36.9	23.8	26.5	25
Health facility worker	7.3	31.1	15.2	28.7	20.6
Traditional healer	0	0	0	3	0.8
Pharmacist	0	0	0	1.5	0.4
Chemical seller	0	0	0	3	0.8
Community leader	1.2	28.7	51.2	20.1	25.3
Community meeting	32	32	57	20.4	35.4
Community member	4.3	56.1	46	17.7	31
Family member	5	51	7	16	20
Friend	1	48	3	7	15
All of the Above	0	0	1	0	0
Don't know	7	2	0	9	4
Other	0	1	0	0	0

## Appendix E: Campaign Message Recall

### Exposure to *Healthy Animals, Healthy People* Campaign

HAVE YOU HEARD OF <i>HEALTHY ANIMALS, HEALTHY PEOPLE</i> (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
No	36.6	19.8	2.1	22	20.1
Yes	63.4	80.2	97.9	78	79.9

### Source of Exposure to *Healthy Animals, Healthy People* Campaign

WHERE DID YOU FIRST HEAR <i>HEALTHY ANIMALS, HEALTHY PEOPLE</i> ? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Radio	78.8	68.1	78.5	71.5	74.2
Community	11.1	4.2	10.6	8.2	8.5
Animal health officer	1.4	12.9	1.2	7.4	5.7
Poster/bulletin/ billboard/flyer	3.8	6.5	6.2	0	4.3
Community health worker	1	6.8	2.2	4.7	3.7
Facility based health worker	1	0.8	0.9	5.9	2.1
Other	1.9	0.4	0.3	2.3	1.1
Don't Know	1	0.4	0	0	0.3

### Exposure to any Song about Living Safely With Animals

IN THE PAST 3 MONTHS, HAVE YOU HEARD ANY SONG ON THE RADIO ABOUT LIVING SAFELY WITH ANIMALS? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
No	39.6	20.1	6.4	25	22.8
Yes	60.4	79.9	93.6	75	77.2

## Recall of Song Lyrics

WHAT LINES DO YOU REMEMBER FROM THE SONG? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=198	n=262	n=307	n=246	N=1,013
<i>Animal well body na mortal man well body</i>	41.4	76	71.3	62.6	64.6
<i>Mortal man well body na animal well body</i>	67.7	64.9	70.4	53.3	64.3
<i>We for tap rabies</i>	14.1	40.1	15.3	44.3	28.5
Did not remember any	16.7	7.6	0.7	21.5	10.7

## Song Recognition

PARTICIPANT RECOGNIZED SONG AFTER IT WAS PLAYED (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
No	19.8	15.9	3	25.9	16.2
Yes	80.2	84.1	97	74.1	83.8

## Recollection of Radio Jingles

HOW MANY DIFFERENT RADIO JINGLES ABOUT DOG BITES AND RABIES HAVE YOU HEARD IN THE LAST NINE MONTHS? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Zero	24.1	19.2	3.4	25.0	17.9
At least one	64.6	70.7	96.6	71.0	76.5
At least two	58.8	59.8	87.5	58.2	66.0
At least three	38.4	54.9	80.8	52.1	60.1
At least four	12.2	42.1	60.7	40.2	43.8
At least five	6.1	24.4	32.6	21.0	21.0

## Recall of Information in Radio Jingles

WHAT WAS THE INFORMATION THAT YOU HEARD IN THE RADIO JINGLES? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=249	n=265	n=317	n=246	N=1,077
What is rabies	17	62	58	70	52
Why dog bites are dangerous	51	87	76	83	75
How to know if a dog has rabies.	59	73	73	66	68
How to stop dog bites	50	63	73	52	60
What to do if you are bitten by a dog	35	73	77	47	59
Where to get rabies vaccine for people	10	10	65	30	31
Where to get the rabies vaccine for dogs	10	6	31	36	21
The kind of soap to use when washing a dog bite	7	6	41	23	20
Whether you can eat an animal that was bitten by a dog with rabies	4	2	20	20	12
Whether calling 117 hotline after a bite gets you free medical care	6	2	38	9	15
Other	5	0	0	1	1
All of the above	14	2	0	0	4

## Able to Complete Radio Jingle

PARTICIPANT COMPLETES RADIO JINGLE (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=249	n=265	n=317	n=246	N=1,077
No	22.5	22.6	11.7	37.4	22.8
Yes	77.5	77.4	88.3	62.6	77.3

## Exposure to Radio Messages About Dog Bites and Rabies

WHAT MESSAGES ABOUT DOG BITES AND RABIES HAVE YOU HEARD ON THE RADIO (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
<i>If we tap dog bet, dat go ep tap rabies</i>	40	53	64	52	52
<i>Nor ambog dog. More lek way den day sleep or den day eat or way den day wit den pikin</i>	52	78	88	54	68
<i>Take tem pass or go insai yard usai dog day.</i>	50	70	61	38	54
<i>Nor go near dog way day behave funny funny or look sick</i>	26	44	74	37	45
<i>Call you animal or community well body woke man or call 117 for advice</i>	14	4	51	20	22
<i>Na for was usai di dog bet quick wan wit soap en water 20 tem</i>	13	16	60	15	26
<i>After you don was di bet 20 tem, go quick wan na ospital</i>	12	20	79	13	31
Rabies is a very serious sickness that both animals and people can get.	4	40	35	17	24
Rabies is in the spit of an animal with rabies.	2	27	20	9	15
Almost everyone who gets rabies gets it from the bite of a dog that has rabies.	1	27	2	8	9
All of the above	12	0	0	10	5
None of the above	16	11	1	26	13

## Exposure to Messages About Dog Bites and Rabies through Posters or WhatsApp

WHAT MESSAGES ABOUT DOG BITES AND RABIES HAVE YOU SEEN ON POSTERS OR THROUGH WHATSAPP? (%)					
	Constituency 31	Constituency 34	Constituency 35	Constituency 37/38	Total
	n=328	n=328	n=328	n=328	N=1,312
Stopping dog bites helps stop rabies.	43	52	62	46	51
Do not disturb dogs, especially when they are sleeping, eating, or with their young.	55	77	73	43	62
Take time when passing or entering where a dog lives.	45	67	51	34	49
If you see a dog that is acting strange or looks sick, stay away and call an animal health worker, community health worker, or 117.	24	14	82	38	40
Wash the bite right away with soap and water 20 times.	13	22	68	11	29
Then, go quickly to the hospital.	10	52	64	13	35
Rabies is a very serious sickness that both animals and people can get.	21	13	63	27	31
Rabies is in the spit of an animal with rabies. (on reminder card)	0	18	19	6	11
Almost everyone who gets rabies gets it from the bite of a dog that has rabies.	1	25	1	5	8
All of the above	8	0	0	11	5
None of the above	22	12	14	32	20