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SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

THE SOCIALINFLUENCE OF EBOLA ON LASSA FEVER RESEARCH INTERVENTION IN KOINADUGU DISTRICT, NORTHERN SIERRA LEONE.

BY

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A DISSERTATION SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF APPLIED HEALTH SOCIAL SCIENCE DEGREE.

October, 2020

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DECLARATION

Declaration Statement

I, Cecil Nyakeh Bockarie hereby declare that except for the precise references of work belonging to other people who have been appropriately acknowledged, this is my work. As much as I am aware of, it contains neither material previously presented by another person nor material which has been submitted in partial the fulfillment of MSc. Applied Health Social Sciences to the University of Ghana, Legon. I take full responsibility for any flaws found in this work.

22/10/2020

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(Student)

17/10/2020

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Date…………………………………..

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DEDICATION

I dedicate this research in memory of my late father, Dr. Sandy A. Bockarie (GCOOR), my beloved mother, Madam Ann-marie Katumu Nabieu for her constant support and encouragement, as well as her faith in my endeavors. Also to my lovely daughter Ann-marie Mamie Katumu Bockarie and my fiancéeMs. Adama Marie Sesay for their constant support and love, and their priceless endurance during my absence for this programme. This work is also dedicated to my foster parents Mr. & Mrs. Honorable Justices Sengu Koroma for their parental guidance, love and support through my life's journey. I pray to God that He keeps them safe and healthy! May God Almighty grant our humble family a long life in health and prosperity!

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Abstract

Background: Lassa fever (LF) is a viral disease endemic in Sierra Leone (SL). An outbreak of Lassa fever was first investigated in SL in 1972 in the southwest region. Kenema area has concentrated most of the Lassa outbreaks and such most of the research. This study seeks to explore the social ramifications of Ebola Virus Disease (EVD) on 2019 LF research studies in Koinadugu, northern Sierra Leone.

Methods: The study design was descriptive and used qualitative and ethnographic methods to carry out this study. Using purposive sampling data collection technique, with youthful to elderly age groups, in the 3 rural communities in the Koinadugu district, Northern Sierra Leone was implored to capture and explore valid and reliable data for the study. Focus group discussions, In-depth and informal interviews undertaken in Village 1, Village 2 and Village 3 were to explore some of the social factors of Post-Ebola influencing LF research intervention in northern Sierra Leone.3 participant observations were carried out in the 3 villages, 14 in-depth interviews with adults/youth/women and 3 number of focus group discussions with stake holders/health care staff and community members were carried out in 3 villages where LAROCS project is conducting research. The data collected was transcribed and coded and analysed through thematic analysis from questions the study seek to answer before analysis began. The identification, organization and interpretation of themes interpreted various aspects of the study's topic into results for discussion.

Results: the main factors that influence the resistance of LF research were the Experiences/reflections of Ebola, mistrust in the health care system, misconception/perception of LF as other common diseases, rumor spill-overs, and poor health education about viral diseases in the communities. From the study, the poor knowledge dynamics of endemic LF and first hand

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Ebola outbreak reflections with evident traces, submerged everyday risk interactions of rodents-human cohabitation. The constructs of perceived severity, susceptibility, benefits and associated barriers of denial and resistance of Lassa fever are coupled with rodent familiarity and presence in time and space in livelihood activities such as farming, trading, hunting and mining as reported by study communities' negatively shaping the ecological relationship with rodents, and then exposing them to the risk of primary transmission of LASV and potential outbreaks of Lassa fever.

Conclusion: In context of the overall view, research resistance and rejection was propelled mainly by the context of poor knowledge and misinformation of LF fueled by mistrust and misconception of the viral disease, despite been endemic. It is apparent from the results that intuition of poor community health, lack of research interest in community and local authorities, lack of health promotion activities are the main objects of community resistance. This concludes that health promotion activities, community-based actions should be taken in to account and behavioural change communications should be urgently considered in future LF research and studies.

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List of Abbreviations

CDC	Centre for Disease Control
CS	Civil Societies
CHW	Community Health Worker
DHMT	District Health Management Team
EBOV	Ebola Vaccine
EVD	Ebola Virus Disease
ETUs	Ebola Treatment Units
ECOWAS	Economic Communities of West Afircan States
FMC	Facility Management Committee
FGDs	Focus Group Discussions
GHS	Ghana Health Service
IDIs	In-depth Interviews
IPC	Infection Prevention and Control
LAROCS	LF: Guinea and Sierra Leone Rodent Control and Seasonality of Human Exposure
LASV	LFVirus
KGH	Kenema Government Hospital
MOHS	Ministry of Health and Sanitation
MRU	Mano River Union

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MS	MastomysNatalensis
NGO	Non-Governmental Organisation
PC	Paramount Chief
PHUs	Peripheral Health Units
PIs	Purposive Interviews
SECHN	State Enrolled Community Nurses
SL	Sierra Leone
TBA	Traditional Birth Attendants
USAID	United States Aid for International Development
VDCs	Village Development Committes
VHF	Viral Hemorrhagic Fever
VHFC	Viral Hemorrhagic Fever Consortium
WA	West Africa
WB	World Bank
WHO	World Health Organisation

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CHAPTER ONE

INTRODUCTION

1.1 Background:

The basic ecology of Lassa fever (LF) appears to involve zoonotic transmission of virus in commensal populations of a single murine species, Mastomy snatalensis. Lassa virus (LASV) may spill over from the rodent cycle to man by various routes (Monath, 1975). Lassa fever is an acute and occasionally severe rodent-borne viral haemorrhagic fever, with cases in humans geographically constrained to sub-Saharan West Africa. Discovered in 1969, Lassa fever is endemic to much of rural Nigeria and the countries of the Mano River Union (Sierra Leone, Guinea and Liberia (Gibb et al., 2017). In a study carried out in Sierra Leone in 1987, Lassa fever was found to be responsible for 10-16% of admissions and 30% of deaths in a major referral center. Lassa virus transmission from rodents to humans occurs through direct exposure to rodent fluids such as urine, saliva, and blood or indirect exposure via surfaces and foodstuffs contaminated by the virus (Mccormick, 2002;Monath, 1975).Humans can be infected by touching objects contaminated with rodent urine, breathing aerosolized particles, being bitten by rodents or consuming rodents. Secondary spread between humans may occur within domiciliary groups, and persons infected within the community who develop clinical disease may introduce the virus into hospital and begin a cycle of nosocomial infection(Monath, 1975).Hunting of farmhouse rodents and consumption of their meat is another important route of LASV transmission to humans residing in endemic areas of West Africa.

Deaths among nurses, doctors, and other healthcare workers occasionally occur when adherence to barrier nursing and contact precautions are not maintained (Fisher-Hoch, et al., 1995). In Sierra Leone, one of the most well-known doctors working on LF, Dr. AniruConteh, also died in

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a nosocomial outbreak in Kenema, endemic LF region (Conteh & Leone, 2004). Lassa fever research funding was increased after the terrorist attack in New York on 11 September (Richmond & Baglole, 2002). However, the disease still affected communities and there are still knowledge gaps on the drivers and needs to develop more accurate disease control strategies (Gibb et al., 2017)

Globally Lassa fever was included as a notifiable disease under the World Health Organization's (WHO) revised International Health Regulations (IHR) due to its epidemic-prone nature and potential to cause economic and social disruption (Richmond & Baglole, 2002). Awareness of LF as a public health issue is increasing, especially following the 2013–2016 Ebola virus disease (EVD) epidemic in the Mano River Union (MRU[i]), which has galvanized national and international agencies' attempts to improve the prediction of and response to disease outbreaks in West Africa. In 2015, the WHO listed LF among priority diseases requiring urgent research and development attention. (Wilkinson, 2016).

Within LF-endemic countries, these social changes are occurring in societal contexts of high levels of poverty, recent civil conflict, and poor access to healthcare, which increase the complexity of prevention and management of LF and other diseases such as malaria, cholera, yellow fever and EVD (Bardosh et al., 2017). There is thus a clear need for better-integrated knowledge of the drivers of cross-species LASV transmission, to facilitate disease forecasting and inform interventions that will reduce infection risk in affected communities (Wilkinson, 2016)

These structural and related socio-cultural conditions are not easily addressed, but it is suggested that a greater focus on inclusive institution-building and knowledge making is needed in both short- and long-term planning to build trust and resilience (Wilkinson, 2015).

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Before EVD ravaged Guinea, Liberia and Sierra Leone in 2014, the combination of persistent fever, muscular pain, nausea, diarrhea, and red eyes signaled a different but similarly feared disease: LF. Fear of LF is fueled by the scores of health workers who have died in nosocomial infections (Wilkinson, 2014).

The similarity between EVD and LF control and prevention activities are sensed by rural communities in studies as bells of Ebola reminder and reflections, in context of perceived severity of LF as Ebola, (Goba et al., 2016; Enria et al., 2016). Amidst the 2014 EVD outbreak in Sierra Leone , several members of the nursing staff had been infected with EBOV including the head nurse of the Lassa ward, who had worked with the LF program for >25 years. (Goba et al., 2016). Further attempts by the KGH (Kenema Government Hospital) team to identify additional patients in and around Koindu were resisted by the communities for several weeks. As surveillance was a key intervention activity in the first region (East). (Goba et al., 2016).

The social and oral associations made between Lassa fever and Ebola are reflections of some community members in previous LF fieldworks perceiving LF as EVD. The reality of Kenema Government Hospital LF team's intimate interactions with the Ebola prevention, control and response processes are constructs to give meaning to societal stigmatization of LF. (Goba et al., 2016). This study hinges on the aforementioned intimacy of EVD and LF knowledge in Sierra Leone.

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The focus on understanding the social interaction of two experienced hemorrhagic fevers might provide information on the ways community governance may impact, improve or lead community-driven responses not only to disease outbreaks but also to any other crisis.

This study aims, at identifying changes and influences of Ebola epidemic outbreak awareness on endemic LF in Sierra Leone. By providing some of the answers to the social ramifications of Ebola's on Lassa and by systematically understanding the current and potential future relationships and threats between the two viral fevers in Sierra Leone and how their influences generate social disruptions in their Post-settings of occurrences.

This study objectively aims to explores mistrust in Post-Ebola settings, referring to the social influences and scars left behind by the 2014 Ebola outbreak on public health intervention. These social ramifications of Ebola on current LF activities influenced by risk behaviors of rural Koinadugu community members due to mistrust. The study thus, examines the relationship of rural Koinadugu district population's knowledge of LF and attitudes of both the lay and knowledgeable individuals in the reception of LF's activities.

1.2 Problem Statement:

Localization of Lassa fever in one geographical area.

Despite growing interest in LF, the knowledge of its ecology, epidemiology, and distribution in West Africa is limited. For decades, disease surveillance has piggy-backed on biomedical research projects based in districts where LF is already recognized as a problem(Sogoba et al., 2016). The trajectory of LF in Sierra Leone is striking, in a decade it has transitioned from being a neglected, albeit renowned, tropical disease into a high priority pathogen of international importance which attracts considerable research funding (Annie Wilkinson, 2015).The problem

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was particularly severe in eastern Sierra Leone, prompting the Centers for Disease Control and Prevention (CDC) to establish a laboratory and research and (Mccormick, 2002)control program there in 1976, which subsequently provided the majority of our present-day scientific knowledge on LF (McCormick et al., 1987b). The challenge of unique operational localization of LF activities in eastern Sierra Leone is a huge challenge to activities of disease surveillance nationally, (Goba et al., 2016) this is evident by location of the national LF program is currently based at Kenema Government Hospital (KGH) in the heart of the LF endemic area and included the establishment of a treatment ward and diagnostic laboratory (Humarr et al., 2008;Bausch et al., 2004).

McCormick also explored the presence of LF in other areas in Sierra Leone areas in Sierra Leone (Fichet-calvet & Rogers, 2009). Much of the ecology of the vector comes from investigation on the neighbouring Guinea.(Fichet-calvet & Rogers, 2009)

When a case of LF fever occurs a team from Kenema Hospital goes to the village to investigate the circulation of the virus in family members and the host population. This is rightly assumed to be the case in any part of the country, the difficulty is, there is only one team based in Kenema making surveillance and diagnosis of LF difficult. Another challenge is that healthcare workers until now thought that LF was only in Kenema, so when they have cases showing symptoms matching with LF symptoms (unless red eyes) the diagnosis was other than LF. The aforementioned challenges, shows that localization and stigmatization aspects of LF knowledge gap, is not limited to the popular but also the professional sector.

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Understanding of the disease: rumors, reaction (resistance)

Rumors are narratives, often orally distributed, that serve as a means to discuss experiences; reaching beyond the facts that are generally agreed on about these experiences or combining known features in innovative ways. Therefore the rumors of LF research activities have suddenly gain mobilizing force with the experiences of Ebola situation.

The challenges of rumors are not to be overemphasized with the reality of social change hinging of Ebola awful experiences, reflections and misconceptions as evident in previous LF research interventions. Rumors can be employed to highlight problematic social ties on different levels. They often concerned national politics and ethnicity, or even international economic and political relations (Geissler & Pool, 2006).This study goes further in clearly project awareness levels and the construct of fear created by the Ebola outbreak as a key factors leading to community resistances of LF research activities. The current situation of LF in Sierra Leone makes the study to be coincidental with getting first-hand information at a critical moment for the North of the country (Tonkolili District), with Koinadugu been at the highest exposure to the virus concerning its proximity and trans-boundary activities between infected Tonkolili and exposed Koinadugu.

This study, therefore, seeks to give a thick description of the intricate interactions between LF interventions and Post-Ebola influences. Unpacking the effects of social change, arising out of conflicts, poverty, poor access to health care and their implication on the complexities of prevention and management of LF and other important diseases such as malaria, cholera, yellow fever and Ebola are yet to be clearly understood for better disease forecasting and management. These problems on understanding the complexities and complications on Post-Ebola rural

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settings concerning resisted community members will be unpacked to bring potential LF research interventions into the focus of rural communities.

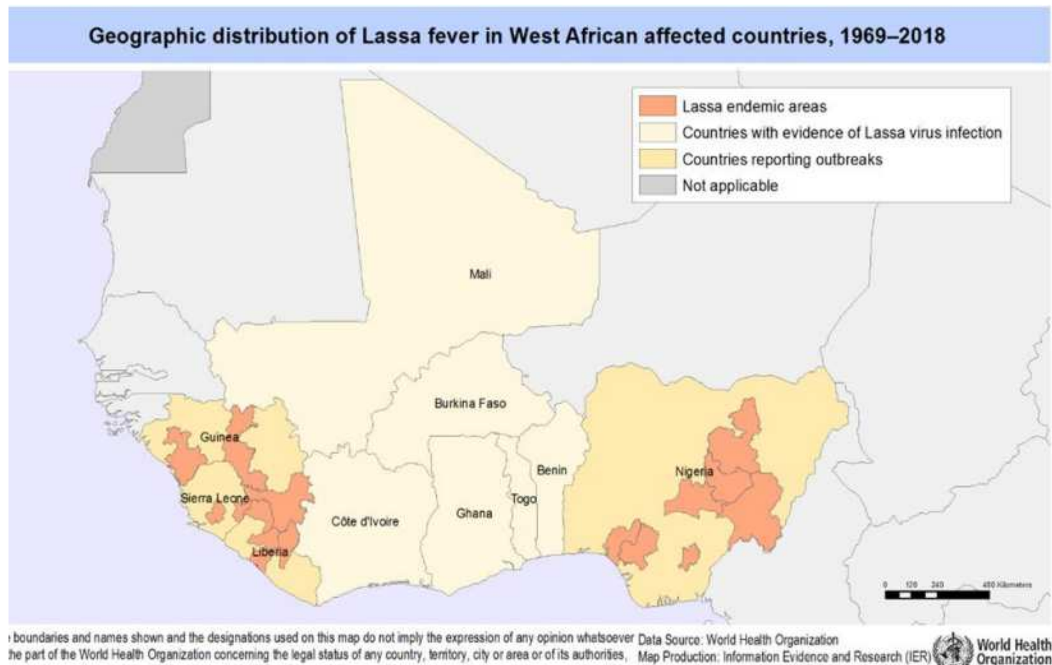

Fig.2. The map generated by WHO gives an idea of the Northeastern region of Sierra Leone positioned in the risk of endemic areas both international (Guinea) and locally (Kono, Kenema.)

1.3 Significance of the study:

The existential gap looking at the social problematic of one hemorrhagic fever on the other brings in the focus and significance of this study. Therefore, it is of immense necessity to study the dynamics, qualitatively in unpacking reasons behind LF research resistance in respect of the social influences of Ebola. This study is posited with the original exploration of the linkages and influence of Ebola on LF research in the north of the country thereby contributing the reflective

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construct of Post-Ebola's social disruptions. Thus this innovative LF study will add unto understandings of hemorrhagic fever and add to existing of literature on preparedness for emergent disease outbreaks.). As stated by Fraser DW, 1974, the world's highest LF incidence is in the eastern region of Sierra Leone. Resistance observed in Northeastern region of Koinadugu lies in the middle of endemic distribution of Lassa virus, bordered by Guinean's endemic LF region and Kono, Kenema with popular outbreak histories.

Due to the significance of the study, this study aims, at exploring the knowledge of LF identifying changes and influences of Ebola epidemic outbreak on 3 Northern Koinadugu communities with poor PHC healthcare system, in proximity with endemic LF regions in Sierra Leone. The map shown below illustrate Sites of the four laboratories included in the Mano River Union Lassa Fever Network are indicated by stars and consist of the Kenema Government Hospital Lassa Laboratory in Kenema, Sierra Leone; the Central Public Health Laboratory Service in Monrovia, Liberia; the Program on Hemorrhagic Fevers in Conakry, Guinea; and the International Center for Research on Tropical Infections in N'Z´er´ekor´e, Guinea.

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Fig.1. Map of the Mano River Union countries (Sierra Leone, Guinea, and Liberia). The approximate known endemic area for Lassa fever is shown by the dotted oval.

This study will thus set the background of understanding the inverse social relationship and misconceptions between Ebola and Lassa fever, with Sierra Leoneans perceiving the 2014 Ebola outbreak as a LF outbreak. And now LF symptoms, health education interventions and research on LF are interpreted as being Ebola. The LAVS emergence in November 2019 in Tokonlili district in the North of SL and until now, not recorded as endemic for LF makes an important and urgent call for in knowing the unknown about Lassa fever in the north of country.

This study will offer follow-ups on Post-Ebola rejection dynamics, and to understand knowledge construct of LF diseases, more specifically with regards to rodent-human interactions.

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1.4.1 General Objective:

This Study investigated the Social influence of Ebola disease on LF interventions in Koinadugu, Northern Sierra Leone.

1.4.2 Specific Objective:

1. To assess knowledge about LF in the Koinadugu district.
2. To explore the level of knowledge and attitude towards LF research interventions in the Post-Ebola era.
3. To identify the Socio-cultural factors in Koinadugu communities towards endemic LF research interventions.

1.5. Research Questions:

1. What is the knowledge about LF in the Koinadugu district?
2. What is the level of knowledge and attitude towards LF research interventions in the Post-Ebola era?
3. What are the Socio-cultural factors in Koinadugu communities towards endemic LF research interventions?

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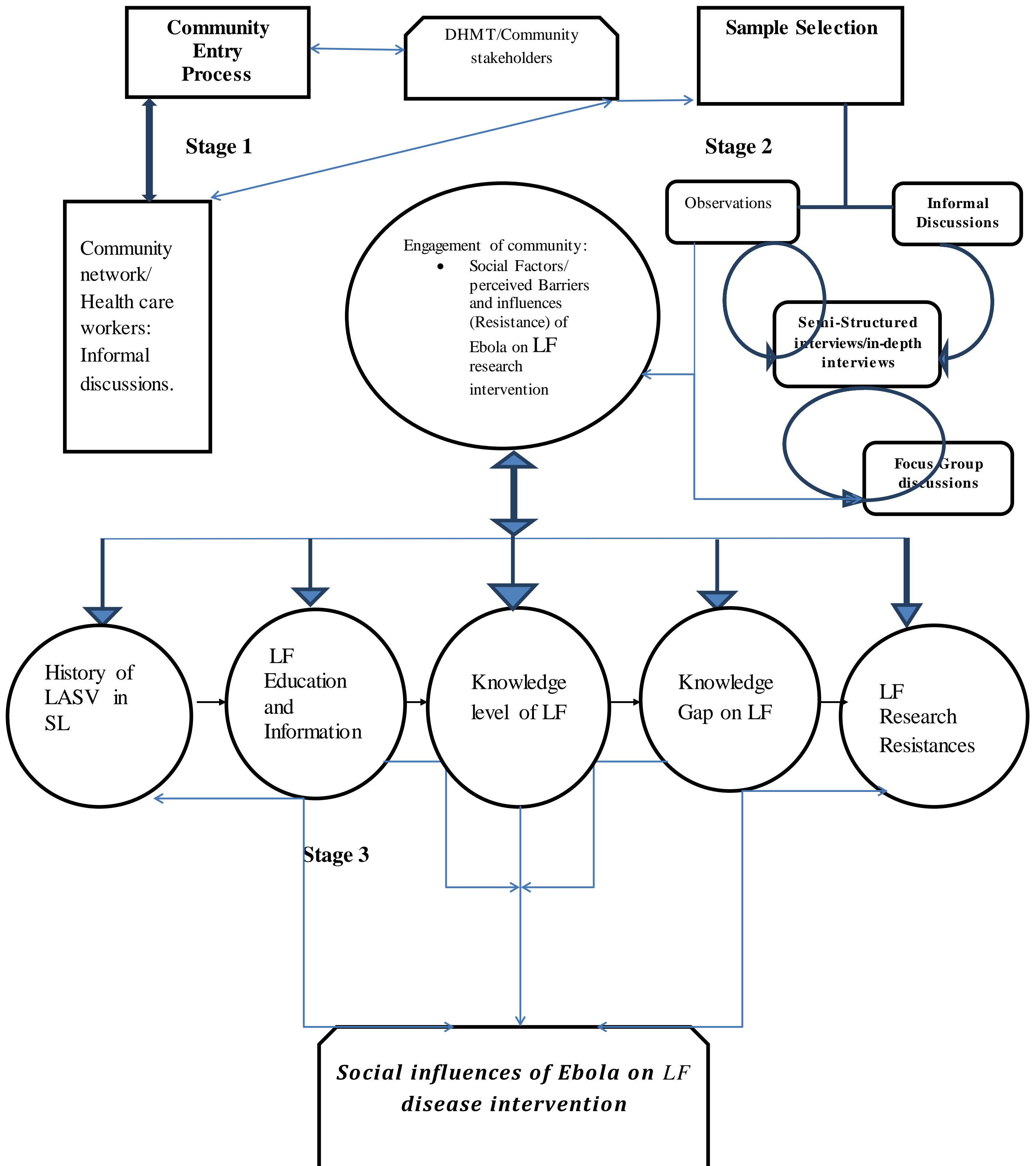
1.6 CONCEPTUAL FRAMEWORK



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1.6.1 Conceptual Framework Narrative:

This conceptual network points out the factors that motivate people to reject LF studies influence by the Ebola outbreak. Reactions to medical research are not a new event and they can be motivated by different factors. People have their own understanding of disease and events. These factors related to research conducted could influence the continuation of research needed to assess the actual LASV incidence in rodents and humans and risk factors for LASV transmission and spreading.

In the framework social factors such as History/reflections of past War, Ebola experiences, Fear of Ebola re-emergence/ mistrust, Poor Health System: low-level LF education, poor disease surveillance, fear of intentional LF infection, Knowledge level of LF/Risk of rodent cohabitation, Rumors/ poor information and socio-cultural factors/misconceptions were primarily questioned. These negative Social and influential drivers are linked and interactively influencing one another and extending from one middle factor which is poor Knowledge of LF disease in communities in the proposed study leading to an expected outcome of negative Social influences of past Ebola outbreak on endemic LF risk of exposures. Therefore, when people reject one research or health program, there is need for an in-depth understanding of what is causing that reaction.

The conceptual framework emphasized community entry, within the Sierra Leonean context of approaching sensitive and Post-Ebola epidemic settings and population. Although, formal ethical approval for LAROCS research operations from the Sierra Leone's Ministry of Health and Sanitation, the District Health Medical Health Team (DHMT) notice and clearance of working this in rural researchw site of Koinadugu District to build trust for the engagement of research sites under the district.

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Stage 1: The aforementioned conceptual framework highlights, the proposed community entry approaches, methods utilized by the study, categories of research networks and participants to be consider for exploration of the general study aim. Before community entry or just after obtaining community clearance from the District Health Medical Team, distant research networking and follow-ups with previous selected June 2019 fieldwork respondent (community networks, previous and Health care workers) who actively participated in the previous pilot were considered. These follow-up were conducted mainly through phone calls providing me preliminary information and state of affair of the sampled communities to be researched. In addition the purposes of considering initial networking construct were; to activate the selected community members in the early face of the study, by addressing concerns of previous field works, share views, expose perceived barriers to enrolment and to share information where necessary for successful outcome of the study. (Enria et al. BMC Public Health (2016).

Stage 2: As diagrammatically represented in the Framework, displayed is the enrollment patterns/sample selection coupled with data collection techniques revealing a systematic approach towards study participants a shown above. The process goes from successful observations, and informal discussions with respondents, potential respondent were mapped onward for semi-structured interviews and in-depth interviews were finally planned and spontaneous focus group discussions that occurred are all linked with engaging the community on the expected outcome of study (The Social influence of Ebola on Lassa fever).

Stage 3: The knowledge or data collection stage of the conceptual framework focuses mainly on factors projecting the role of Ebola epidemic on LF research intervention as the main theme, and outcome of the study. Stage 3 is a critical component of the framework's representation,

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chronologically linking key research constructs on which data collection was done and reviewed aspects of related literature of the study carried out. Sierra Leone's history of LASV incidence have been informed by education on LF activities linked with , Knowledge level of the disease, gap on LF knowledge leading to research resistance projecting the study aim of unpacking the these social and influencing factors of Ebola such as mistrust and resistance towards LF research intervention.

The conceptual and theoretical leanings guiding the study are formulated in context of two different theories, ecological and cultural theories. These two anthropological theories are jointly conceptualized for the holistic structuring and understanding of the main study objectives, nature and outcome of the study, which is breaking the knowledge gap on resistance to LF research.

In summary the Conceptual framework is a diagrammatic representation intertwining 3 research stages interlinked on research processes and formulated with respect to history of pervious research knowledge on resistances on LF research intervention in Northern Sierra Leone.

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Chapter Two

Literature Review:

2.1. Virus and disease in West Africa and Sierra Leone: viral, epidemiological and social factors

Viral:

LAVS belongs to the Old World complex of the family *Arenaviridae* that causes hemorrhagic fever in humans (Zong, Fofana, & Choe, 2014). LASV is a member of the family Arenaviridae, genus Mammar- enavirus. Within this genus, LASV is categorized further as a member of the Old World arenaviruses based on serology, geography, and host distribution (Hallam et al., 2018).

LAVS is endemic in Sierra Leone, Nigeria, Guinea, and Liberia. Ghana reported the first domestic LF cases in 2011 (Prescott & Mountain, 2017). The documented prevalence of antibodies to the virus in Africa has varied between 7% in Guinea, 8–52% in Sierra Leone, and 21% in Nigeria(Richmond & Baglole, 2002).

Globally LF is known five decades back, marking 50 years since the identification of the virus causing LF in the village of Lassa, in Nigeria. Up to 500,000 people are infected annually with LASV, resulting in approximately 5,000 deaths. The reservoir of infection is *mastomysnatalensis.* It is a species of rodent in the Muridae family. In 1972, the M. Natalensiswas found to be the natural host of the deadly LF virus during an investigation in Sierra Leone. (Monath, 1975).

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Biologically even though they belong to two separate families: the *Arenaviridae*, and *Filoviridae* respectively, the characteristics shared are numerous, both fevers are emerging zoonotic viruses in West Africa that cause severe hemorrhagic fever in humans (Paessler & Walker, 2015).

The biological characteristics and findings are static and only have tendencies of being dynamic with chances of viral mutation, whilst the social context is continuous as human behavioral tendencies are ever changing with respect of rodent-human interactions(Abramowitz, 2018). The gap existing is why has this same population in vehement resistances posited on LF research activities. Up till now, there is a need to better understand the interactive dynamics of Ebola on endemic LF disease in Sierra Leone.

Epidemiology

Since its discovery in 1969 in Nigeria, rural and nosocomial outbreaks have been reported to occur repeatedly in Sierra Leone: Panguma and Kenema;(Fichet-calvet & Rogers, 2009)as reported by the WHO and the Sierra Leone Ministry of Health and Sanitation November 2019 report (ECDC, 2019).From 2016 to 2018, 177, 312 and 633 confirmed LF cases were reported, respectively, in Nigeria. While the outbreak recorded the largest ever number of cases in 2018 (Dan-nwafor et al., 2019).

According to (ECDC, 2019)the importation of LF does not only stop with the current situation of Netherlands but has made historical importations in Germany and United Kingdom either with healthcare workers and pilots mostly through nosocomial infections In disease-endemic areas of Sierra Leone, Lassa fever causes an estimated 10%-16% of hospitalizations (Gayer et al. 2007).

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According to Fichet-calvet & Rogers, LF in 2009 in was mapped and primarily associated in Sierra Leone's Eastern region as the endemic setting for it incidences and prevalence. In November 2019 a nosocomial infection of LF in a hospital in the, Tonkolili District, in the northern region of Sierra Leone (WHO), where until now LF cases weren't recorded. Some of the suspected LF cases were confirmed by Netherlands' International Health Regulation (IHR).Two further cases among national health care workers, one confirmed and another suspected, were reported from Mansaga hospital in the north of Sierra Leone.(ECDC, 2019).

Lassa fever outbreak narrative highlights the sudden emergence of a new disease with the potential for mass-spread, especially across borders, and the critical role of epidemiological science in tracking and containing the disease (A Wilkinson, Parker, Martineau, Leach, & Parker, 2017).

Social

LF disease has affected the lives of Sierra Leoneans for far too long since the 1970 (Monath, 1975) Social Science aspect is crucial to understand the disease. Richards stated a number of important social factors in Ebola transmission—notably, the role of the family, marriage, funerals, migration and markets. Keeping with the social transmission patterns of Ebola stated by Richard projects the need to review socio-cultural factors referring to some of the reported socially transmitted routes, informing epidemiology of viruses in West Africa.(Richards et al., 2015).The disease has affected the lives of Sierra Leoneans for far too long since the 1970 (Monath, 1975).

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In order to unpack valid knowledge of LF in Sierra Leone, there is necessity to uncover the social ramifications affecting the knowledge of LF. In contrast to epidemiological science seen as the only or critical role to play in controlling the spread of LF signal oblivion of the social intricacies of rodent-human interactions and viral hemorrhagic fever control in Sierra Leone(Richards et al., 2015). In post-conflict Sierra Leone, (Shaffer et al., 2014) in their study of LF, the disease is seen as a major public health threat calling for enhanced case finding to ensure rapid diagnosis and treatment if mortality is to reduce. Shaffer and colleagues purely made use of the biomedical constructs of LF failing to realize the potential social constructs of Ebola's relationship and influences that can lead to LF disease exposures. Some case studies associated with the history of LF infections and importations are cobbled around the social movement especially in vehement consideration of healthcare practitioners' nosocomial context of the virus transmissions concerning Sierra Leone.

2.1.2 Ebola virus disease outbreak in Sierra Leone.

From the Post-Ebola experience of the 'continued mobilization of communities' is articulated as a principle guiding post-Ebola recovery in Sierra Leone and 'community ownership' is one of five priority pillars of the Health Sector Recovery Plan (Wilkinson et al., 2017).

The 2013-2016 Ebola virus epidemics in West Africa have unfortunately become a costly lesson in dealing with an infectious disease outbreak in situation when both the exposed population and the international community are unprepared. The invasion of Ebola in 2014, EBOV emerged in West Africa, causing an unprecedented epidemic of approximately 30,000 cases, with effects on

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regional and global public health. It caused more than 14.124 cases and 3.956 deaths in, Sierra Leone (Prescott & Mountain, 2017)

When the Ebola Virus Disease (EVD) outbreak was declared in neighboring Guinea, the Lassa team at the Kenema Government Hospital with large experience on LF was mobilized in the East of Sierra Leone to respond to any potential outbreak (Goba et al., 2016).

The identification of one case or a cluster of infections as reported in Liberia led to the identification of a wider outbreak that was ongoing as concentration on the known cluster of cases, that is those found in February 2016 as reported (Woyessa et al., 2019). In case of LF epidemics, delay and poor response and identification of localized outbreaks of LF could be related to several challenges in the post EVD settings: a poor health care system in the North with localized outbreak of LF, weakened impact of the world's largest-ever EVD, a limited confirmatory capacity of LF in-country, and a lack of investigation and surveillance of early cases needs urgent re-assessment.(Goba et al., 2016).

As reported by (Goba et al., 2016) in the event of a new Ebola outbreak in eastern Sierra Leone, the facility will serve as a triage and treatment facility until, if needed, ETUs outside of KGH is established. KGH and VHFC team members are active sponsors and in some cases members of the Kenema Ebola Survivors Association (Goba et al., 2016). A similar association for LF survivors is being established. So, therefore, the establishment of social relationships between Ebola and Lassa in the statement above makes sense of the rural communities (high illiteracy level as observed) context, to locally perceived relationships between LF's intervention and Post-Ebola reflections. The risk of perceived severity and susceptibility is visible that social and community assets of the rural communities are at high risk.

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The construct of biomedical perception of religious structures and leaders as stated in the study makes sense of promoting LF's psychosocial construct backed with the application of behavioral and social theories to better understand the psychosocial disease exposure in an endemic LF zones and post-Ebola settings. The gap significant to also make sense of in unpacking is Ebola as the popular view was partly contained by community engagement (Wilkinson, 2014), thinking about why is LF still an endemic viral disease in Sierra Leone, after victoriously containing an epidemic outbreak like Ebola, creating the construct of mistrust in the affairs of other hemorrhagic fevers.

Ebola virus disease served as not just posited a conflicting and deconstructed society with high mistrust but also additionally and inversely reconstructing a mind-set of distrust in rural communities such concept which (Campbell et al., 2017)supported above conflict thoughts in stating that conflict is thus not just about deconstruction, but also reconstruction mindsets keeping with previous Ebola experiences.

According to Bermejo 2016, stated that not only sociological and gender factors have not been taken into account in the EVD, neither the biological differences between women and men in medical treatment. However, the case might seem to be assumed as a relevant gap for study exploration, in the context of understanding the sociological and gender factors contributing specifically to a repeated pattern of resisted LF's interventions into account of this study. Pre-existing public health emergency was declared on 31 July, worsening the pre-existing structural, social and economic vulnerabilities in women and girls. Due to Ebola, women and girls are even

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more vulnerable than before. In June 2019 the aggression and resistance of women rose and presented a more interesting dynamics by some group of women threatening to shame men if they were seen participating in the manipulated Ebola intervention that is claimed to be LF. The significance of following this dynamic will aid the understanding of the current situational analysis of women in post-Ebola settings.(Bermejo, 2016).

After a vigorous exercise or community resistance, rejection, rumors of health system mistrust, and before the full adaptations of outbreak control measures to communities in Sierra Leone, Sierra Leone anthropologist Paul Richards wrote: "It is striking how rapidly communities learned to think like epidemiologists, and epidemiologists to think like communities (Richards et al., 2015). Social, Behavioral Science and epidemiological researchers can collaborate to situate communities at the center of real-time, rolling data collection to reflect disease transmission and response effectiveness. Rapid data collection systems can be pre-positioned and integrated with psychosocial, knowledge-attitudes-and-practice and intervention impact measures, and with measures of community engagement and social mobilization. Therefore, there is more need to review a broad spectrum of literature in conflicted study settings. The lesson from Ebola, then, is not that 'communities' can stop epidemics and build trust; it is that understanding social dynamics is essential to designing robust interventions and should be a priority in public health and emergency planning (Wilkinson et al., 2017).

The three countries Mano river countries share cultural ties with various ethnic groups present in all three countries, with Sierra Leone and Guinea having vehement tie of Islamic relationship majorly with popular Islamic ethnic groups the fullah and the Mandingos, despite all these

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similarities as reported, Guinea expressed a more violent behavior during the Ebola epidemic and Sierra Leone is seen as more receptive with less defiant resistance was accounted for(Annie Wilkinson & Fairhead, 2017).The question remains with whether such a receptive approach of Sierra Leoneans towards community engagement amidst the outbreak is still the case toward medical intervention.

2.2. Historical and political background

Attempts to control diseases in Sierra Leone have been mixed with other interest. The British colony was known as the 'White Man's Grave' for the high mortality and policies to control disease were also a way to practice segregation between the colonial administration staff and the local population(Phillips, 2002). But Europeans were not the only ones to suffer poor health in Sierra Leone. Medical evidence does suggest that repeated out- breaks of malaria and yellow fever had built up immunity among the indigenous people, giving them a decisive advantage over the Europeans. However, his reflection is until now reflected in envisaging the White Man as a creator of viral diseases by locals in villages in the north of the country (Phillips, 2002).

Although Sierra Leone made some strides in health and medical research during the colonial period, the post-independence period witnessed a gradual decline even in basic biomedical research, which nonetheless often promises results that could be utilized as effective tools in the prevention and control of diseases threatening public health and socio-economic viability(Wilkinson et al., 2017).

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Researching in Post-conflict settings require a conceptualization of conflict theories that acknowledges the complexity of human construction of existence, involving both the negative and the positive: "war, rebellion, resistance, rape, torture, and defiance, as well as peace, victory, humor, boredom, and ingenuity, will have to be understood together through their expression in every day" (Campbell et al., 2017).

Sierra Leone accompanied by long historical and political and structural violence's demands social and behavioural interventions in the Post-Ebola era impacting on the social fabric of Sierra Leoneans and their aggressions and resistances towards medical interventions. This direction of study provides a different notation projecting limitations in viral research studies in rural areas with poor healthcare systems and the interactive influence of large outbreaks over endemic research studies. Another study (Enria et al., 2016), stated similar factors as social drivers of research resistance in rural communities in Sierra Leone. As emphasized by (Campbell et al., 2017) "to be able to discuss violence, one must go to where violence occurs, research it as it takes place". The emphasis makes for a clear call and responsibility in immediately unpacking socio-cultural factors, knowledge levels. The notion of community resistance especially in the north of the country is not novel to the historic reaction of the Hut Tax War, revisiting colonial rule, riots and resistance of northern Sierra Leone(Ishmail Kamara, 2020).

2.3. Knowledge of Lassa fever and Ebola

Creating LF awareness of as a public health issue is increasing, keeping with the 2013–2016 Ebola virus disease (EVD) epidemic in the Mano River Union, which is recognized not only by

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researchers and academia but galvanized national and international agencies' effort to improve the prediction of and response to disease outbreaks in West Africa. In 2015, the World Health Organization listed LF among priority diseases requiring urgent research and development attention (WHO, 2017). However, in Sierra Leone, there was no previous experience with Ebola or a similar deadly epidemic. While LF (a similar hemorrhagic fever disease) is endemic in Sierra Leone, it occurs much smaller scale, has a higher survival rate and has never reached epidemic proportions in the country.

In West Africa, surveillance has been poor and the extent of LF is unknown. (Gayer, Legros, Formenty, & Connolly, 2007). Existing Knowledge gaps in LF operations in Sierra Leone was initially evident by the withdrawal of CDC's support from Ministry of Health and Sanitation in Sierra Leone during the civil war (Goba et al., 2016). CDC was the main funding body on the establishment of LF operations (1970s and 80s) and Laboratory facilities. However, it is thus absolutely right to prelude the existential gaps as results of delays in detection and reporting disease-endemic situation of LF during Sierra Leone's civil war (Goba et al., 2016). The lack of surveillance, limited significant knowledge in LF during Sierra Leone for years 10 years (1991-2001) thus, translated the closest experience people could compare the outbreak with was the civil war of 1991-2001.In disease-endemic areas of Sierra Leone, LF causes an estimated 10%–16% of hospitalizations(Gayer et al., 2007).

A study conducted in Nigeria by (Oladeinde, Omoregie, & Odia, 2015) also found that the male gender was associated with awareness of LF in all communities surveyed. Another relevant gap (Oladeinde et al., 2015)was the inability of the study to fully describe the sources and

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comparisons of knowledge level in relation to the socio-demographic aspect of the male and female gender, this study, therefore, will be set to explore this novelty. Women account for 55 to 60 percent of the deceased in the current epidemic in Liberia, Guinea, and Sierra Leone, according to UNICEF(World Bank, 2017).

As stated it is very apparent that low knowledge of LF poses a greater risk with no specific limitation to nosocomial capacity of the diseases but the society at large, from the finding of (Ijarotimi & Ilesanmi, 2018). The concentration on low knowledge in just one aspect of clinical sciences or clinic/Health Care worker-patient interaction of LF and not focusing on other spaces of rodent-human interaction for the transmission of LF the constitute the primary route of infection. This could mean that even if patients with LF present early at health facilities, they may not be diagnosed and receive appropriate treatment on time because of the limitation of the knowledge gap as among clinical healthcare workers ignoring other essential components of primary healthcare settings. The patient goes back to the society of his belongingness with the risk of infecting the community. This finding of low knowledge of LF is in contrast to that of (Ijarotimi & Ilesanmi, 2018), both of which were conducted among healthcare workers in tertiary facilities in Nigeria. The difference in the results, however, maybe since doctors and nurses constituted the majority of their respondents and the studies were conducted at tertiary. In contrast to the findings of measuring knowledge level within the health sector alone ignoring other socio-economic status and classes contributing to the acquisition.

Poor Knowledge in both local and an extensive informal knowledge of the community's profile and LF in regard to creating a healthy society is in contrast with the highlighted concerns on routine practice of IPC measures, the concentration on IPC in only clinical settings and with

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clinical staff limit the study to a singular setting and in one-way direction of human-human LF virus transmission (Ijarotimi & Ilesanmi, 2018).

Although community healthcare constituted the majority of the workforce in the healthcare facilities in this study did not focus on these Community Health Workers (CHEWs), it was however found that there was a lack of qualified health personnel at the primary and secondary health facilities that were studied. There were also a high proportion of auxiliary nurses/trainees which were not vehemently explored (Ijarotimi & Ilesanmi, 2018).

Adverse influences of LF on socioeconomic wellbeing are mediated through the inability of patients to care for themselves and their dependents, the high death rate in hospital, nosocomial transmission to staff and the subsequent loss of service, and the occurrence of hearing loss through clinical and subclinical infection (Sewlall et al., 2014). As stated, in the adverse influences stated by(Richmond & Baglole, 2002)the consequences did not include social research resistances of rural community members as a major influencing factor of the general wellbeing of resistant study settings.

In a vehement connection of community participation and Ebola containment success story were and are still held in high recognition at both national (2014 Ebola-affected countries) and international stages of the viral control center of the EVD response activities. As stated Socio-cultural aspects were thought to be fundamental to the spread and control of the epidemic. Local understanding of the disease and experience of previous disease epidemics to prevent the transmission and the capacity of communities to generate solutions were not considered at first (Abramowitz, 2018;Richards et al., 2015). The critical question of sustainability in the continuous assessment of its socio-cultural aspects that was thought to be so fundamental as

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observed can be assumed to be oblivious to the reality of community awareness due to the scars of Ebola on endemic LF research activities

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter offers an overall account of the methodological approach used to carry out this study. Sub-sections include the study setting, study design, the population and sampling process, and data collection technique. It also describes how data stored and managed and the trustworthiness strategies applied as well as the analysis process of data. Finally, ethical considerations and are also explained in this chapter.

3.2 Study site

3.2.1 General Study Area:

Sierra Leone covers an area of 71,740 km2, It borders Guinea in the north and northeast, and Liberia in the east and southeast. The Atlantic coastline stretches about 340 km. administratively; the country is divided into three provinces – Northern, Southern, Eastern – and one territory, the Western Area, where the capital Freetown is located. The Northern province is the largest, at 35,000km2 and the Western Area the smallest, at only 557km2 , although it is the most densely populated, with 1.4 million people. Each province is divided into districts (12 in total) and each district is subdivided into chiefdoms (150 in total)(FAO *Country profile – Sierra Leone*, 2005).

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Sierra Leone is located in West Africa between about 10° and 13° W and 7° to 10° N. The country's total area is 71 740 km2 and it has a north-south extent of about 340 km and a maximum east-west extent of about 300 km. Sierra Leone is bordered by Guinea in the north and east, and by Liberia in the east and south.

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Figure 3: Map generated by the Food Agriculture Organization (FAO)showing Sierra Leone gives an idea of the General Study site;

3.2.2 Specific Study Area

The study area will be in rural Koinadugu district communities, Northern Province, Koinadugu district has a population of 404,097, based on the 2015 Sierra Leone national census and has a total area of 12,121 km^2 (4,680 sq mi) (Country Profile, 2014) Koinadugu district located at the uppermost part of Sierra Leone sharing a border with Tonkolili, Bombali and Kambia district in the South, more importantly sharing an international border with Guinea in the extreme North of the country. As observed the Geography of Koinadugu is mountainous with a dense tropical forest. The major language spoken is Kranko. As observed major crop production in Koinadugu district are; Majorly Rice farming-related with small and large scale production of crops such as pepper, groundnut and cashew. Other prominent economic activities are Gold Mining, cattle and goat rearing which is predominant with a specified ethnic group of Fullas (FAO *Country profile – Sierra Leone*, 2005).

As referred to by its local, Koinadugu "A land of Powerful Mixtures" which translates into 5 Major ethnic groups in Sierra Leone amicably living together with their local authorities unified towards the development of the district. This notion in every sense signifies the socio-cultural bond among the people of Koinadugu District despite their tribes.

Northern Koinadugu District is subdivided into eleven chiefdoms with numerous villages. These 11 chiefdoms of which this study will be focusing on only 2, Diang Chiefdom and Neni

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Chiefdom, these two chiefdoms are centrally positioned in the middle of thick tropical rainforest, with mountains surrounding their settlements in regards to the previous resistance experiences by the first 3 communities, Nyawulia, Alkalia, and Kumala occurring in these 2 chiefdoms.

Nyawulia occurs in Diang chiefdom whilst the last two occur in Neini chiefdom. As observed in these three communities with a population of fewer than 1000 people with few primary healthcare facilities. The primary livelihood activities are farming, mining, and trading, farming especially rice crop production being the most common almost practiced by everyone either on a small or large scale. Among the 3 selected villages, the first lack healthcare facilities, the last 2 had healthcare facilities.

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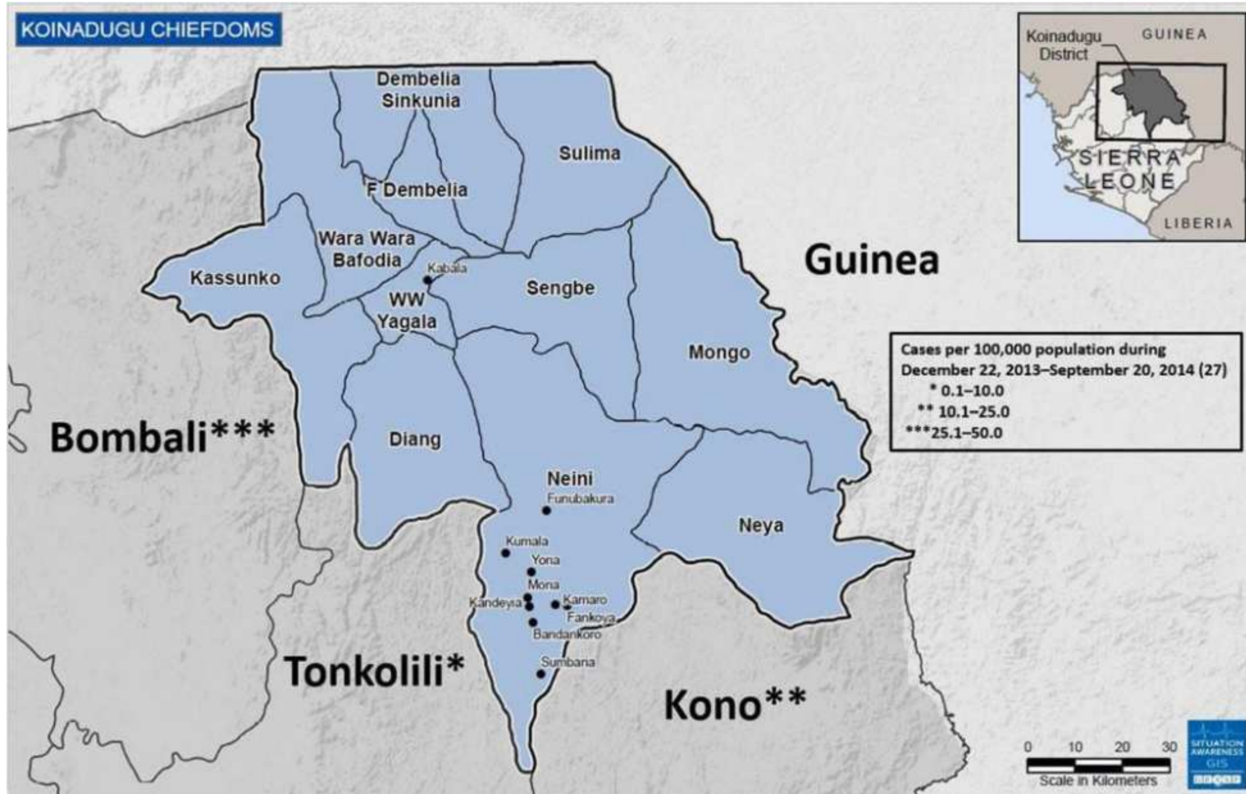

Figure 4: Map Generated Situational Awareness GIS gives an idea of the specific Study Area showing Koinadugu district of Sierra Leone and surrounding Sierra Leone districts and country of Guinea. All Koinadugu chiefdoms are represented as well as nine cities and villages: Kabala, Funubakura, Kumala, Yoria, Moria, Kandeyia, Kamaro, Fankoya, Bandankoro and Sumbaria. The cumulative numbers of cases in the surrounding Sierra Leone districts prior to the first detected Ebola case in Koinadugu are presented – Koinadugu, Sierra Leone, 2014.

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3.3Study Design

A qualitative study will use purposive, convenient and snowball sampling techniques, however the approach of the study is inductive. A preliminary study was conducted in December 2018 to June 2019. The researcher was part of a research team studying the ecology and phylogeny of the LASV in the northern region, part of the LAROCS project investigation. His aim was to capture the different human-rodent interaction and people's motilities. During this research the research team, composed of 5 members: 1 nurse, 1 driver, 2 Necropsist, 1 Social Scientist (the researcher), all Sierra Leoneans originally from Bo, faced some difficulties. This prompted the need to study in-depth the factors for the reaction of the community which are part of this investigation. An inductive and ethnographic research approaches were instituted to capture rumors, nature of the study and act of resistances. The exploration aspect fully complements qualitative methods aforementioned to ensure a viable data collection to extract data with both conveniently sampled respondents and purposively sampled participants with an ethnographic approach and different interview guide ministered. These aforementioned techniques were employed in view of validating the data collection process with reliability of the outcome of the study.

Purposive sampling technique:

Purposive sampling techniques have also been referred to as nonprobability sampling or purposeful sampling or ''qualitative sampling.'' As noted above, purposive sampling techniques involve selecting certain units or cases ''based on a specific purpose rather than randomly'' Sampling using multiple purposive techniques—involves the use of multiple QUAL techniques in the same study (Tashakkori & Creswell, 2007). Purposive sample population in this study was conducted inclusive of; District Health Medical Team, Paramount Chiefs of both

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chiefdoms if possible, Community stakeholders, community Health Care workers community leaders, Ministry of Health and Sanitation officials, members of community organizations and community members selected in rural areas of Neni and Diang chiefdoms of Koinadugu District. 5 In-depth interviews, 6 Purposive interview, 6 informal interviews, and 3 Focus group discussion were conducted in context of using the technique.

Convenient sampling technique:

Convenience sampling involves drawing samples that are both easily accessible and willing to participate in a study. Two types of convenience samples are captive samples and volunteer samples (Tashakkori & Creswell, 2007). The method employed in the study acknowledged the fragile nature and sensitivity of participants, whom might have gone through an aligned pathway of structural violence and also in consideration of assuming the intricate social relationships between the community members with experiences of Post Ebola outbreak and current pockets outbreak of LF in the new Northern region of Tonkolili District that share boundary with the proposed study area (ECDC, 2019).

3.4. Study population and sampling

Participants for this study were residents of the three villages were initially targeted for this study. Categories specified and targeted in the study villages were; Community Authorities, Community Stakeholders, Community health staff, and overall Community members of 3 villages that express reasons for the acts of research rejection and community resistance in retrospect of pervious LAROCS research activities as well few Community members that projected strong acceptance of LAROCS research were also concerned by the interviews. In addition the District Health Management Team (DHMT), which serves the official and intermediary role between the Peripheral Health Units (PHUs) and the Ministry of Health and

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Sanitation were sampled. Purposive/snowball and convenient sampling was used to select participants within these categories of people in the villages.

3.5 Data collection tools and technique:

Data was collected using: participant observations, administration of original questions and reflections were used for the following materials in collecting data from observations and with in-depth interviews lasting for 50 minutes maximum and Focus Group Discussions lasting for 1 hour 30 minutes. 1 hour was utilized for all purposive interviews, including demographic of participants, questions on knowledge and cultural beliefs on viral hemorrhagic fevers and outbreaks, specifically on Lassa fever and, information on social exposure to potential risk factors for rodent-human interaction.

Interviews were recorded interviews or field notes if preferred. There were 30 items in all equally divided into 2, that is, 15 items for purposively sampled participants and the remaining 15 for non-purposive participants, responding to in-depth interviews. Even though some demographic and sensitive items were repeated in both interviews techinques, examples of some these items were; asking What is the knowledge about Lassa, length of stay of participants in the study settings selected, what about the risk factors on human-rodent co-habitation, what are the reasons for communities rejection of research and other medical intervention in Koinadugu district? 19 questions were summarized from both purposive and non-purposive items drafted for the 3 Focus Group Discussions done in study settings. The interview guide was constructed in reference previous fieldworks done before this study in Koinaugu district.

Photos were collected if permitted by respondents. The data collected in Kuranko in some cases, translated in Krio and the in English. It was be transcribed at the end of each day if possible at the end of data collection processes. At the same time reflections during the fieldwork

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that were not taken in the site were documented and kept in a separate notebook and typed for analysis.

An assistant in the form of the local translator was used throughout the course study period in Koinadugu District. To have a fuller understanding of the social influence of Ebola on LF activities in these villages, data was collected using participant observations and ethnographic approaches included.

Three different semi-structured interview guides were used complementing the 3 techniques for this study; one was used for IDIs with community youths and adults and the other for used for PIs and a combination of these two were summarized and used for FGDs with the community. For the field notes, a word document was designed for inputting informal discussions. An audio recorder was used to record all the Interviews; IDIs (5), PIs(6), and FGDs(3) during this study. Interviews were conducted in Krio, and in some cases Kranko the main local dialect language spoken in these three villages. There was need for a translator or interpreter given that the local dialect of the participants is not the researcher's mother tongue.

3.5.1. Informal Discussions

Six (6) informal discussions were done with some community members in the villages as

Well as on their community development meetings. I participated in the sanitation meeting that first village, as well as rice harvesting in a swamp in the second village, and a captive discussion at the bike station in village 3. During these activities, informal discussions were done on community's reaction by community adult and motivating factors of this practice, upcoming information was promptly elaborated in word-file to document these activities during the field work.

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3.5.2. In-Depth Interviews

Based on preliminary data from informal discussions and previous experience in the regions, in-depth interview allowed to triangulate information by deeply discussing community authorities and their member on the social influences of Ebola in LF studies namely the triggering factors of community reaction and their knowledge on LF research studies. A total of five (5) IDIs were conducted with adults (men and women) in the three (3) villages. All the interviews were done in the villages in interviewees' houses, except one which was done in the person's swamp after a few moments passed on helping him harvesting rice.

3.5.3. Participant observations

In the villages, groups of adult participants initially accepted LAROCS research activities were identified first; then, those whom vehemently resisted the research activities were informed about the goal of the study and permission was sought from them to participate in the interview sessions. In all, three (3) participant observations (1 per village) were done in these villages. In the first village, I participated in the two (2) types of community meeting, the first was a community entry meeting done by the Welbodi network, a local NGO, was in relation to good sanitary education. In the second village; the second participant observation was a meeting was observing 2 weeks of Antenatal care in the Community health care post, to confirm the non-usage of health care facilities in village 2, which seemed to be in line with participants report respectively.

The third was observing a youth development committee meeting for the construction of feeder roads. These participant observations helped to identify and describe reasons for resistance of medical research activities.

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The activities were documented immediately after the fields as memos in note books, photographs were also taken during the, photographs were not allowed to be taken.

3.5.4. Focus Group Discussions

Furthermore, Focus Group Discussions (FGDs) were also conducted with different groups of community members. Then, one (1) FGD was done with them in each village. Only one FGD had 6 participants whilst the two (2) others had 5 participants each, making the participants 16adult participants in these three (3) FGDs. In order to raise contradictory ideas about the subject, community members who hadn't resisted or rejected LAROCS research activities were also included in the discussions to explore the reasons for which they are always willing to participate in LAROCS Research activities.

3.6. Data processing and analysis

A codebook was created in Excel based on the objectives and sensitive nature of the study, each transcript was opened and extracted in Excel and line-by-line reading and coding into of all the statements were done. Texts were physically marked-up with marginal key words or code word/ phrases, such code were reordered and organized into sub-themes. This was to reorganize and reflect the correct participant expressions and notion of chunks of interview segment. In manually applying suggestion exploration of coded data segments, that is, the transforming coded data into meaningful data, the researchers manually looked for pattern of themes and regularities as well as contrasts, paradoxes irregularities(Corbin & Strauss, 1990).This in turn aided the fuller understanding of data set. New themes might emerge during the study that will

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enhance a better understanding of the current situation on LF emergence in the North of the country that we indicate potential LF study themes and areas of research.

Addition in make sense of data reliability and validity, Interviews, observations, reflections and informal discussions were manually re-analyzed separately from into different in an organized manner for manual coding and thematic analysis. Transcription were done from Krio to English and transcripts of recorded interviews were manually re-coded or re-categorized manually into major themes and sub-themes for analysis in order to sensitively decontextualize and recontextualized major themes and sub-themes, in a back-and-front review of themes. The final analysis of research themes and results will be fully discussed in Chapter 4 and with the conclusion and recommendations added for the general utilization of Sierra Leoneans and other LF endemic areas in Sierra Leone. The researcher was the main and manual instrument of data processed and analysed in this study.

3.7. Establishing Trustworthiness in the study:

According to (Lincoln & Guba, 1985) trustworthiness involves establishing: Credibility, Transferability, and Dependability, Conformability(or neutrality), dependability. In this study, the time (6 weeks; 2 weeks in each village) spent in engaging and collecting data from participant provided meaning of how credible makes the researcher could make sense of data collected in all 3 villages in Koinadugu. The researcher ensured the construct of credibility through prolonged engagement with community members and peer debriefing. The researcher, as a member of LAROCS project team, has been visiting these villages during the last nine months before embarking on the study (November – July 2018/19); and the data was collected within six (6) weeks. Another aspect of credibility for this study was the triangulation of multiple data sources, such as Literature in context of the study, Focus Group participants for in-depth

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interviews, simple understood as "not putting all your eggs in one basket" information that is to be used should have come from different sources to ensure credibility of your results, which this study stood up to.(Lincoln & Guba, 1985). Peer debriefing was done by the researcher's supervisors in the school as well as in LAROCS project. The transferability was ensured by giving a "thick description" of methods and procedures applied in data collection and analysis. Transferability can also seen in context of socially relating the main study objectives to other viral disease dynamics and community resistance towards medical research.

Community trust in the study was envisaged as the primary route of gathering valid and reliable data from the study participants and the communities studied in general.

3.8Ethical consideration

This study is a part of a larger study and has Ethical clearance already from the ethics committee of the government of Sierra Leone. In the villages, participants received information about the research from health care workers, local authorities and pervious LAROCS networks in their communities. The study information sheet and consent forms for Purposive interviews in-depth interviews and focus group discussions were read, translated and explained to the study participants. Then, every participant was given aexposures to research incentives, in which confidentiality and written consent forms, to sign up before starting any data collection. For those who cannot sign were allowed were asked to family members, research assistants or friends sign up the written consent form and their assent was asked as well. Two participants, whom were Ebola survivors, were withdrawn in the event of crying in the cause of in-depth interviews conducted.

All the respondents were given assurance that any Information they provided was strictly going to be used solely for academic purposes and nothing else with their confidentiality well assured.

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Through the supervisor, Ethical approval for study with clearance from the University of Ghana was fully adhered in view of the originality of the study as required by the School of Public Health and University of Ghana ethics committee. The study will be in line with the ethical protocol and standards set by the Sierra Leone Ethic Committee and the University of Ghana Ethic board.

CHAPTER FOUR

RESULTS

4.1 Introduction

In this chapter, the results of this study are presented according to the research questions aforementioned. The collection of ethnographies and participant observations supported by thorough informal discussions with participants resulted into different themes that added insight to the research questions posed in this study.

16 categories of colour/tag codes emerged that were decontextulised from all interview segments and ethnographies with reference to needed data for the study. 6 Sub-themes were projected by recontextulising the emergence of the 16 decontextulised codes elicited from the study which finally resulted into 3 main themes. Examples these codes were; codes on Community entry and mobilization, Research resistance, Rodent-human interaction, Identification of risk factors, Ebola interference/influence on perception of LF fieldwork research, Livelihoods (farming, mining, trading), HealthCare System/, History of viral outbreak, Rodent Species & behavior, Socio-cultural/Traditional/ political , Spirituality, Ebola survivor, Fear of Virus, Rebel war, Migration, Rodent abundance and Control and Common meeting points for rodents. Example of the 6 sub-

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themes are; Knowledge of LF, Stigmatization and Chronicity of LF, Health System mistrust, Human-rodent interaction (Rodent Ecology), Syndemic state of LF, Social and Communiy Mobilizarion on LF, main Themes such as; Knowledge of LF, community sources of LF Knowledge, EVD as a motivating factor towards LF research activities.

4.2. Socio-demographic characteristics of participants

TABLE: 1.1

NO.	***Nature of Participants***	***Number of respondents***
1	Adult Men (Farmers)	2
2	Adult Women (Farmers)	2
3	Adult Women (Traders)	2
4	Village Youths (Hunter)	1
5	Village Youths (Famers)	2
6	Village Youths (Bike Riders)	3
7	Traditional Healers (Adult Males)	2
8	Community Authorities/stakeholder (4 Males & 2 Females)	6
9	Teachers (1 Male)	1
10	Town Criers (3 Males)	2
11	Religious Leader (Imam)	1
12	Health Care Workers 2 Males & 2 Feamales	4
Total number of respondents		**28**

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A total of 11demographic categories and 28 respondents in all participated in PIs, IDIs and FGDs respectively in these (3) research settings Village 1, Village 2 and Village 3. Adults and community youths were the main categories of respondents, and were selected in the two (3) villages; they included local authorities and stakeholders, Youth leaders, elderly people, men and women in the community who shared their knowledge and views on factors influencing the implementation of LF research activities in Koinadugu district. A minimum of 5 and maximum of 6 participants were willingly participated in (3) FGDs.

The mean age of the adult participants was 35, ranging from 25 to 70 years old. Participants were both Christians and Muslims by religion, although 20 of them were Muslims, making all three (3) the communities Islamic dominated settings. The major tribe of participants and the two chiefdoms to be specific are; Kranko, Madigos and Limbas, making up three (3) prominent tribes of Northern Sierra Leone.

All study participants were married men and women, practicing agriculture as the main livelihood activity even though some of them declared dual livelihood style, adding socio-economic activities, such For the specific case of illiterate youth, they always refer to the research assistants employed or friends in FGDs sessions to state or guess their ages which they were unaware of. Below are some direct quotations from participants of this study.

4.3. Knowledge on Lassa fever

In this study, most of the community participants involved in the in-depth interviews (IDIs) expressed that they have no knowledge about LF, although some community elders responded to

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have at least heard about the disease, especially for those who have once migrated to endemic LF areas. Most non-migrants expressed total absence of the disease in quest.

"No! I can't be telling you a lie. I have never heard of that kind of disease, I don't even know, what the disease all about is.("Community Elder,"IDI-V1).

"We don't know because we don't have that type of disease here please sir. We have told you this, for me I don't know ooo how to control LF, you can ask the others, me it the name of the disease itself that I don't even want to heart."(Adult Woman, FGD-V3).

Community knowledge of LF is highly complicated with to the long standing familiarity of common diseases, like malaria and cholera that shared similar attribute of febrile illnesses. The concerns for these diseases are renowned health care focus of the medical system in Sierra Leone despite it long endemic nature of LF disease in the country. This is illustrated by the interview segments below:

"For fever, for me, the only one I know is Malaria ooo, because that is our problem here in the community. And just look now ooo...."(Adult woman, FGD-003)

"So you see, there is no virus in this LF disease, LF is just an improve Malaria, Malaria can affect people in so many way, some malaria will catch you and then you go off. Our governments are very useless people, they don't know what sickness to tackle, this Malaria has been there since the genesis, and up to now...., all they can do is to supply us with bed net and nothing else.: I think you should go back to the nurse to let her

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answer your questions, all we know is that we don't have LF here!"(Emphasis)

(Adult Man, FGD-001.)

LF knowledge in some participants is fuelled by the mistrust, most of the study participants (both adults and community youths) interchangeably referred to LF and Ebola virus disease (EVD) during discussions, which affected the country as a national outbreak in 2014-2016. Particularly, the Ebola affected Kumala Village that was hit hardest among the (3) communities and, whose socio-cultural lifestyles were directly and greatly affected by the disease.

"For me am very happy that all these senseless law imposed on us were cancelled, we thank God for that" (Community Youth, FGD-001).

"Because you mentioned LF, since their thought is complicated that LFis like Ebola and there was a wrong rumor going around that you are here to infect them with LF." (Health Worker, PUR-002V1).

However, some respondents who expressed knowledge of LF emphasized the pocket outbreak in Koinadugu district, in a location known as Fakunaya. Even though other totally ignored the fact and associated the disease with the eastern region of the country. It was clearly stated that the disease affected a pregnant woman, who survived, leading to increased mistrust due to perceived severity of LF disease in neighbouring villages.

"but we had one or 2 cases in Fankunya. This why am just admiring my people here saying Lassa is for the Easterns, well now just look. The disease is in our nose"

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(Community elder" FGD-001-V1).

Yes, for me, since I was aware of myself as human being in Sierra Leone, I know LFexist. Before and after they have been telling us that LF is with us. The health experts did not just identify a single location of the virus in the country but they emphasized that the disease is in the country. That one, they have been informing us before and after the war. (Town Chief, PUR-001).

Even though the Knowledge of LF was observed to be very poor in all three communities, the recent 2019 November outbreak of LF in neighbouring Tokonlili district brought increased fear and misconception of the disease to community members but likewise, the incident capacitated some restoration and evidence in community knowledge of LF, Northern Sierra Leone. This is illustrated by some quotes as follows:

"I only know that LF exists as a disease. That is even recently, when we heard the our neighbouring chiefdom of Neni have a suspected case."(Community Elder-IDI-V1).

"have started hearing about it in Tonkolili killing a white doctor (Laughing)." (CommunityElder, IDI-V2,).

Recently we had a small outbreak in my home town. Ah….! I was so frustrated about it. This is a very deadly disease and we heard that it killed a white man. (Adult man, PUR-003).

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For instance, in your case, when we heard of the Magburuka's recent outbreak of LF, I went back to some of our community member and authority to tell them, that what those people were here to assist us with is a reality. Some have started realizing their mistakes. (Health Care Worker, FGD-002).

However, few respondents reported that they had heard of LF through previous LAROCS project activities and other related NGO and primary health care interventions that come either for rodent elimination or education of LF. They always referred to the project workers as "arata doctors" and to the disease as "arata sickness". Some of them were even able to explain some symptoms of the disease whilst others confused it with malaria, as we can see in these citations:

"Well, according to what the nurses told us about this LF, is that the sickness and feeling you will experience is like Malaria, they said if anyone has feelings of malaria, such as warm bodi, (High temperature), weakness, should report and test for Malaria, but they test you, and if it is not Malaria, then1 it is LF you have. So that is how I was told." (Community Elder FGD-V1).

"Since, I first heard about this disease I have never heard LF killing a white man, except in my home town, I was discussing with my colleagues the other day that the LF virus in my place is quite unique and dangerous from the others, this makes it a total threat for us because we share boundary and all other things in common"
(School Teacher-PUR-003)

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With respect to the Knowledge of LF, this construct provides a large spectrum of data adding on to the resulting sub-themes or factors of social influences affecting level of knowledge.

4.3.1Community Sources of LF Knowledge

Beyond the Knowledge of LF, the findings of this study also revealed 3 main levels of LF Knowledge sources. Media level, Health Care System level and community level.

Firstly, that most participants mentioned get their source of LF information from radio stations based in Kabala. The study envisaged the poor source LF information is at play in all three (3) communities.

4.3.2 Radio Station:

This was when most participants mentioned barriers of accessibility of radio stations as important factor in increasing the level of LF in knowledge in Northern, Sierra Leone. Overall, almost 22/28 participants emphasized the fact that they lack steady access to radio stations, which are based in Kabala. Accessibility was associated with poor coverage that undulates in between seasons of dry and wet. Some respondents stated that during the wet season they do not get coverage. The citations below provide an illustration of the context given;

> *"It is mostly through the radio station, that was before when we use to catch some radio stations here, but now we hardly get signals from the Koinadugu radio stations. So that is another huge problem here. We have a serious gap in communicating to outside Sierra Leone or the world at large."* (Community Healthcare Worker, PUR-002)

> *"Well, the most regular source I get LF information is by the radio, as you know I each district there is a surveillance team in those government hospitals, These people usually*

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go to the radio to inform the general public about outbreaks."

(Community Authority, PUR-001)

Another perspective of some participants unveiled by this study was in relation to the poor associability of media access. Some participants stated that have specific points in the community they can get coverage or accidentally comes across the neighboring district's (Kono District) radio stations.*"It is really difficult for us to catch the radio stations at Kabala, but sometimes we accidentally get the Kiodu radio station in Kono district",*

(Community youth, Informal discussions-V3)

4.3.3. Community Authorities:

Additionally, participants also emphasized that community authorities and knowledgeable members of the community, specifically previous migrants to the eastern region, were important sources of LF information. Whilst unraveling the item of LF information sources with community authorities or stakeholders, it was stated that their primary sources of information gotten the community health care worker and stakeholders.

"I started hearing from people that rats can give a sickness called LF. That is all, I have been hearing about LF."(Community Elder, FGD-V3)

"LF is a very old sickness in this country. Since I 1980 at that time I was working on Freetown, we heard about outbreaks of LF in Kenema and Kono. It has been with us for years now." (Community Authority,FGD-V2)

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You most of the people here I don't think have been to Kono or Kenema to really see the harm caused by this disease back in the days to take very serious.

(Community Elder, FGD-V2).

"LF is caused by rats, like I was saying, since 1988 I was I Kono, at that time, the white people that use to come tell us that LF disease is gotten from rats. In those days we had never had any idea about the dangers rat can cause… Hmmm…"

(Adult woman, FGD-V2).

4.3.4 Health Care staff:

This study reveals a strong dynamics of the aforementioned sources with the third and final source of LF information is reference to Community Health Care Workers, mainly Nurses. This was confirmed by nurses whilst purposively discussing with them, the laboratory technician that have served the community for over 20 years, stated there have been continuous educations on LF disease in the district.

"Yes of course, yes! (Emphasis) we regularly sensitize them about how dangerous LF is! We tell them to be careful of rodents and their activities."(Healthcare Worker PUR-V2)

"Sensitization of the people about their health status is one of my major roles in the played in the community despite the lab work I do. Sensitization efforts are not just limited to Alkalia because of their proximity or ownership of the health care facility and

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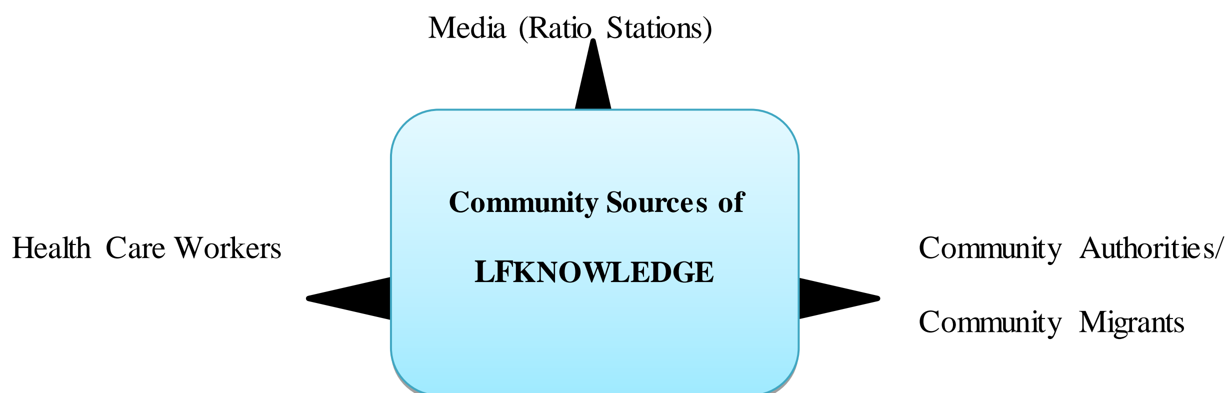
staff. But we extend our sanitizations on numerous health issues to communities like Bendukoro, Moria, Nyawulia."(Healthcare Worker, FGD-V2).

In contrast whilst discussing with the in-charge, the expectations deemed from the government demands for community health did not primarily involved LF. The interview segment provides an evidential account of this revelation.

We do our very best in seeing that we deliver the services as expected by government. Like for the deliveries, we have a huge number of women visit the clinic to give birth and attend reproductive services as you rightly mentioned, ANCs and PNCs. Only that for communities that are very remote, we hardly get visitors from these places. For the HIV, we are also conducting massive testing, especially on the pregnant women. (Health Care Worker, FGD-V2-002)



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The diagrammatic representation of is illustrated to simplify and illustrate the three major sources LF information unpacked by this study in 2communities (Kumala and Alkalia).

The third source of information that is the direct provision LF by nurses/health care workers is not applicable to the Nyawulia community, due to the lack of a health care center. The participants presented a complete lack of knowledge in LF or in worst case scenario an observed ignorance of lacking knowledge of LF. Response of some participants is cited below:

> *That is our major crisis in this community. Since my grandfather was a kid… is that we have never had not one health facility, you k now the government is so mean to us in this part of the country, but who to actually blame our chiefs here. The other time, the chiefs instructed me to tell all the youth that they should get sticks, and I think even took some money from the local tax that we pay them that they were going to build a nice health facility for us in the community.* (Community Elder-FGD-V3).

> *Pregnant women are walking more than 40 miles jus to access the Kondembaia health care central most every week sometimes with their babies, under the hot burning sun. The government does not want to know if we are dying of Malaria or not. You know the last bed net distribution that was carried out here was so chaotic.* (Community Youth leader-FGD-V3).

The study is encompassed with general finding as also reported by other studies, that the dissemination of LF information to all three (3) communities (Alkalia, Kumala and Nyawulia)

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have multiple sources of LF information, Although it was observed and revealed in the study that rumors and second handed information makes up a huge percentage of the information comes from the popular sector of the medical system.

4.4.Knowledge of Lassa fever in Health Care Workers

It may seemingly been seen as an advantage for 2 communities (Alkalia and Kumala) with health care facilities, this study noted the poor knowledge of LF is not just limited to community members; health workers in some instances have limited knowledge of the disease responsible for the health of community members. After discussing with all Health care workers interviewed on basic knowledge of LF in which they did fairly good, that did not translate a good impression about their knowledge on the disease. This study this can be illustrated in the following quotes below:

> *"Yes! Sometime when we go to Kabala for our in-charges meeting a man that comes from Kenema is in charge of teaching us about LF, its case identification, surveillance and management."* (Health worker, PUR-002).

> *"Nixon memorial hospital, my sister was in training there, so when I got pregnant, I ran to her to give birth safely. Whilst I was there in 1978, the LF program was launched in this area due to the large outbreak that occurred in that area due to LF. A lot of people from that Mano area, especially those Maraka's. They died a lot in the hands of this virus. So on my arrival of meeting this outbreak, I had no option but to self-isolate myself, I did not visit any ones house for the rest of my time there. (Emphasis). The inception of this diseases at that time was made so fearful to us. All my stay there, I didn't go to the market to buy anything, I had to be sending people, I was so fearful of this LF disease."*(Health Care Worker, FGD-V2).

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This study reveals sensitive categorizations and classification of the community health care workers, especially connecting to the 2 communities with healthcare facilities. This study, further on, communicated the distinctive knowledge level about LF between Nurses who have worked in the primary healthcare settings in LF endemic regions (Eastern Sierra Leone), and those who have spent their lives and careers in Northern or other parts of the country. The study brought out three constructs of knowledge level measured, history of the disease, etiology of the disease and seriousness associated with the disease in quest. This is illustrated in the quotations given below.

> *"I have forgotten the time now. But it has taken a long time since I heard about LF. I think it is more popular the Eastern region of the country, Tongo and Kenema areas. Some of my family members have even died of LF. My Aunty got married in that Kenema, her child and her sister's child were infected with LF and they even died."*(Health Care Worker, PUR-002.)

This study reveals, the construct of eastern migration and knowledge was also expressed by an experienced Traditional birth Attendant, who had relatives in the eastern part of the country;

> *"since I was a kid, there was a colleague TBA of my mum who died of this disease was in Tongo, also whilst delivering a pregnant woman that was sick with LF but she didn't know."*('Adult Woman, IDI-004-V2)

Another interesting finding was the evident disparity of knowledge about *LF* revealed in the health sector, is the tension in knowledge between the professional medical sector and that of the popular sector. Some participants, expressed more confidence in what some eastern region migrants, traditional or local leaders and misconnected community or individualistic beliefs held

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against LF disease. For example the study reveals that community cadres like the TBAs posed misconnected knowledge about LF. This act emphasized by the citations provided below;

> *"It is the duty of the community nurses to take care of us. They were trained to so. But instead of that they are adding up to our problem here. So now I cannot say am contributing to the health of the community. They were saying that TBAs (Traditional Birth Attendants) were killing pregnant women in the villages, which was a total lie, but now they can see, even when the have stopped us from delivering people are still dying".*(TBA, FGD-V1).

> *"I play a key role also in bringing pregnant women to the clinic to get delivered safely. In this community everyone knows me for my consistent check-ups on pregnant women and lactating mothers to the facility. I also assist to sensitize and disseminate health information to community members about their health especially about encouraging them to go the health Centre and do Malaria test anytime they feel abnormal, I work directly with the health care workers, and like the in-charge is a good person to me here, she really inspires me to work hand-in-hand with her, we are just like sisters. I am very grateful for her coming to this community."* (Community Elder, IDI-004-V1).

Discussing with participants related with the communities health and well-being, this study reveals neglect of LF disease in both professional and folk sector of the medical system. Furthermore, this extension in discussing with not only nurses and TBAS (Traditional Birth Attendants but Traditional healer as part of the folk sector to reveal their poor Knowledge level, the quotes below summarizes the illustration of the context above;

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"I don't know when people are sick if they are not in my house, you see....? So how can I organize other people's home in term of their health...? All I know is that Allah is the one who gives us all good health and sickness are from Satan, not god. So I have nothing to do with sickness.(Religious leader & Healer IDI-003-V1).

As-tah-fulia (May the Lord for bid)! Me from that kind of patient, I don't have a medicine for virus ooo...., this is not a disease for traditional healers. Even when Ebola came the government restricted us and even our (Mothers) to stop all act of traditional healing and TBA deliveries in the communities. LF and Ebola are for white doctors to handle not us Traditional healers."(Traditional Healer IDI-004-V2).

4.4.1.LF Knowledge affected by ineffective community health structures.

Discussing about existence functionality of community health structures, such as the Village development committee, Facility management Committee, and others present in the three communities which are likely to be the most essential part of the community, the ineffectiveness of the vehement contribute to the poor knowledge and community resistance towards LF activities. The illustration below gives meaning to the context above;

"The FMC structure is not working here since I came; I have been panting behind these people for a long time now to come with the old list so we can effectively revive this very essential structure in the community. Last time I called the community stakeholder for us to come and sit. It did not work. I reported the incident to the chief and we schedule a formal meeting together with the Chief participating in the setting of the date. Only a few attend and resisted the meeting that because some other important stakeholders in the community did not attend. We have postponed the meeting indefinitely. What kept me wondering is the fact that, these community authorities, do the really know the

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importance of the FMC structure. Because if they do, they will not be acting the way they are doing. For God sake, this is the most relevant structure that directly connects the health Centre to the community people. The FMC fills the gap of constant flow of information between us and the community members, which actually solidifies trust."(Community Nurse-PUR-V1).

The knowledge gap created by the inexistence or non-functionality of community health structures further on, revealed huge mistrust in the healthcare system and activities of the community health workers. This in many ways might be associated with resistant culture of communities, as one health care worker informally interpreted.

"These things were only functioning during Ebola oooo…(Adult woman, FGD-V1).

"Yes, recently before the Chief left, I asked him and he told me that the people have told him the FMC have been formed. On to now I have not seen them reporting as the formal FMC of Kumala".(Community Nurse- FGD-001).

Another set participants specifically, express appreciation of Non-Governmental Organization that have worked in the community was reported by all participants in this study.
As reported among many benefits they might have missed from the government and regardless of mistrust envisage by this study, the assistance of NGOs have worked or are working in the community it is important to note that this belief is widely shared in all the villages where this research was conducted.

"Medicos was constructing hospitals for us, most of the health centers you have been seeing in communities were constructed by Medicos."(Town Chief, PUR-001).

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> *Oxfam also brought a project about sanitation "Welbodigi long life". They contacted me and opted to volunteer in their project, despite Kumala I moved from village to village they can only take situations seriously when they see us in the lead.*
>
> (Community Authority, PUR-001).

However, another participant reported a contrasting a contrary opinion was expressed by a participant who is a Ebola survivor, asserted research fatigue of NGO on the community. The quote below illustrates this.

> *We are so tired of people coming to take our names and information, this one will come today, and that other NGO will come tomorrow, this is the way it has been for us survivors. Sometimes these meetings are just to create bad name for us that the government is taking care of us.*(Adult woman, FGD-V1).

Thus, this study serves as a revelation providing information about rapid engagement between communities by NGOs, Journalist, and other sectors of information seekers, to harnessed information ethically and unethically but inversely in refusal to exchange useful information to socially help the people deal with their health and other areas of their lives. This was emphasized by an informal exchange of information with one participant that reported suspecting selling the information they offer;

> *"All these journalist are interested in this community The thing that I hate about these Journalists that come, they think we are fools to providing us money, because they are also going to sell it to the government" without paying us we are no more involve into ideal talk and betrayal."*(Adult male, Informal Discussion-V3).

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Another participant reported disregard for the presence and activities of health care workers due to her perception of their non-functionality in the community. This is revealed by the illustration provided below;

"most of the women are not comfortable with working with these nurse in the communities but our government will send them here without knowing if they know the work or not." (Adult Woman, FGD-001).

4.4.2. Stigmatization of LF to Eastern Sierra Leone:

This study explicitly explored an insightful construct in view of the LF's study in Sierra Leone. Participants overemphasized the fact of associating LF to the eastern region. This was observed to be one of the principal driving forces of misconception and mistrust in LF research activities. The endemic nature of LF in Eastern Sierra Leone is no new idea to most participants, especially reported by adults.

it was a big lie, my brothers how can LF that has persisted in the East for so many years and have killed so many people in those places.(Adult Male, FGD-V1).

LF, yes, LF is not a new sickness oooo, but that sickness is not here, the place that the sickness is present government. The government is supposed to be sending you to the area where LF is existed. Sending you here will only create problems for you people, because the issue is we don't have that disease here so why are you coming to us, this is the reason why so many people rejected your activities. (Adult female, FGD-V2).

"Well, you people should stop thinking like that, this disease is not new, I heard of LF in the 80s and at that time, I use to go to Kono, I totally stopped and on to now.., I have not been there." (Adult Male, FGD-V2).

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Despite the emphasis place on LF has been an eastern disease, one participant contrasted this as seen in the following quotation.

> "*but we had one or 2 cases in Fankunya. This why am just admiring my people here saying Lassa is for the Easterns, well now just look. The disease is in our nose"*
>
> (Adult Woman, FGD-V1).

The results of this study identified stigmatization of LF going beyond the reference of the disease been associated with the endemic region of the east, but with ethnicity as well. Participants repeatedly referred to *LF* as a Mende disease.

> *"Whatever thing or virus is not a joke, If the SLPP government dear to make more loss of lives for the sake of money, like our own brothers did to us, we will not accept it at all, they should go to their own people in the Mende line and kill them."*
>
> (Adult female, FGD-V2).

> *"The Ebola came our region but Kialiahun and LF also came from Kialiahun and like I told you was also in my home, Kono that is these viruses are always in the Eastern region."*(Adult woman,PUR-V2).

Another participant informally reported *"Even the lab to do the test is only build in the Mende line and nowhere else; this is why our people not even engaging any LF talks"*

(Adult Woman, Informal Discussion-V2).

The above segment illustrates how the knowledge of LF is limited by the construct of both individual and community experience of the persistent nature of the disease in the East of the country. Some participants in this study were more familiar with diseases of Malaria, typhoid

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and Ebola, in the discussions made on different interviews conducted. As cited by the interview segment below;

> *"Well, like this your type of disease, No, our people don't like it at all due to but if it is Malaria, typhoid, those small, small diseases not this you big virus diseases."*
>
> (Adult Male, IDI-005-V1).

Additionally this study findings also brought up the context of stigmatization as not only limited to regional and tribal tendencies, but also linked with corruption perceived by the community members towards the community health care facilities. During in a group some participants in communities with healthcare center reported the act numerous corrupt practices leading to mistrust and stigmatization of health services. This is cited in the quotes below;

> *"You are fully involved with this fight and some orders and by-laws were even instituted by the paramount chief, It actually very hard to trust anyone."*
>
> (Adult woman FGD-002)

> *"It is the duty of the community nurses to take care of us. They were trained to so. But instead of that they are adding up to our problem here."*
>
> (Adult woman, FGD-001)

4.5.Ebola Interference on Knowledge of LF disease in Koinadugu.

The knowledge interference of Ebola virus disease and LF disease have been mentioned and established by some studies with evidence of knowledge on the responses of similarities in symptoms between these two viral hemorrhagic fevers. This study presents varying forms of dynamics in relation to Knowledge interactions on the diseases, in history and political social dimensions.

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"Whatever thing or virus is not a joke, If the SLPP government dear to make more loss of lives for the sake of money, like our own brothers did to us, we will not accept it at all, they should go to their own people in the Mende line and kill them."

(Adult female, (FGD-001).

This study explored structures at community and district, at these two levels, this study reveals poor health care delivery coupled with disorganized structural interactions was very visible in informal communication done with the finance officers at the district level. *"There is no special fund for LF activities at district level…I am telling you, we don't have a special vehicle for LF activities, if not, like when you are here it would have been so simple to assist you with a vehicle meant for the purpose. LF activities are operated by the surveillance team"*

(Informal discussion-DHMT)

This study reveals Ebola Virus Disease as the main social influence motivating the act of community rejection and resistances towards LAROCS research activities and other medical interventions implemented in all three communities researched. Making sense of this is by the quotes below:

"my brother like for here in Kumala, am telling you, dead corpses were left for days, some for weeks in their houses until the odor of their corpses made it evident for the community members to check. So these were some of the challenges and misfortunes that befell people of this community." (Adult male, FGD-001).

That is actually true, but all that stigmatization is because of fear. Our people were so so shock to see something like Ebola which they have never saw before. People are just afraid. (Adult female, FGD-001).

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Discussing the questions of the challenges posed by Ebola Virus Disease (EVD) on LF research activities to all participants, this study explored that village of Kumala is more knowledgeable about the traces left by Ebola virus diseases in comparison to the other (two) 2 communities (Alkalia and Nyawulia) which was reported by illustrations given below.

> *"No, No, No, (emphasis), the only disease that have greatly affected our community is Ebola, Ebola came in 2014, June 17, Ebola came…, and it killed 34…, No, No, 36 of our people, aggressively taking them away… in just one week! Hmmm (facial expression became saddened) (Silent)" (*community Elder, PUR-V1).

> *"I am a witness of the dangers created by Ebola in some of these, whilst I was a contact tracer during Ebola time Hmmm… (Emphasis).We know what Ebola did to our communities."*(Community Authority, FGD-V-1).

> *"imagine the president, that some of us never taught of seeing the president coming to this our small community, he actually came here to handle the situation himself, imagine! Ernest Bia Koroma entered here!!! (Emphasis)"*(Community Elder-IDI-003).

> *Oh, you were told, it no lie, but let me tell you the reason why such huge number of vehicles were initially coming here was about that time when they were coming to urgently build an isolation center here in Kumala, I don't mean the treatment Centre oooo…..i mean isolation center; where the sick Ebola patients were cared for, before they were transported to Kabala, which had a treatment center.*
>
> (Community Authority PUR-001).

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On the same vein, with respect to the Ebola interferences on LF's activities in the Alkalia and Nyawulia that were uninfected reflected on some similarities the challenges posed asimilar reaction as revealed by this study. The citation below gives meaning to the context above;

> *As for the Ebola, here in Nyawulia we did not get a single case, there was no need to go anyone, in fact we were highly restricted by the government.* (Adult female, FGD-V3).

> *government they faked a white woman's death to calm it on LF. This is even, the same story I also got from my wife that the situation was just for this current government to make money like our own people did during the Ebola crisis when they came and poisoned our communities, according to what she heard from her friends too. My brother all these Ebola and LF things are all fake.* (Adult Male, FGD-V2).

> *We did not get Ebola here oooo….! So it did not change anything here, we are living normally; it was only during the Ebola time that we suffered restriction from our government and community authorities and their conspiracy with the government to ban us. But that is just what they are saying. We are still healing our people; God gave us the herbs to heal them.*(Adult Male, IDI-003-V1).

4.5.1Knowledge of Ebola Virus Disease.

This study identified the Knowledge and reflections of 2014/15 Ebola outbreak in Sierra Leone as the key element of community rejection of medical activities in general. The study reveals the categorization of the Ebola's knowledge into two classes in view of resistance specifically towards LF research activities implemented by LAROCS as reported by participants. These categories were divided into Knowledge on the reflections and traces of Ebola and category two (2), the knowledge on the effects of poor Post-Ebola intervention. The second construct was

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overemphasized by Ebola survivors especially in Kumala community that was ravaged by Ebola and Alkalia that shares boundary. This is illustrated in the quotes below;

> *I know you might have heard the catastrophes caused by Ebola here. So if you come to a community and say you want to find out LF, even me I will be in fear that it is Ebola that you want to come with again.*(Adult Male, IDI-004-V2).

Discussing with study participants, this study reveals reflections on family separations either restrictions during Ebola or permanently by death of families were reported by all participants, the citation given below gives an illustration of this context.

> *My wife almost abandoned me and seriously threaten to run away with the kids is I ever step foot in my father's house. My brother the situation was not easy for me to handle. Can you imagine, my father will come and he will stand in a distance for us to talk without wanting nothing from him.* (Community Youth, IDI-001-V3).

Another participants, that happens to be an Ebola survivor reported the reasons, underlining the effects of Post-Ebola on her and her family; this is illustrated in the quote below;

> *Life has never ever been the same again. I am sick because Ebola did not just catch my husband and allow him to survive, but killed my happiness, killed the future of my children and… hmmm… Let me just…*(Ebola Survivor, FGD-001-V3).

During group discussion, it was reveal to the knowledge of this study, that the knowledge of Ebola is highly misconstrued by community members as stated by a health staff as seen below I the illustration;

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"this was based on the perception about Ebola was transmitted from one person to the other, and it was unknown people who brought it from labs to infect rural communities like there's." (Adult man, FGD-V2).

4.5.1.Ebola's Influence on LAROCS (LF research)community Entry and Migration:

The result of this study indicates community Entry as an important construct in understanding the reasons behind the resistance of LAROCS activity implementation in the all 3 communities. This study reveals the reasons for poor community entry approaches as envisaged by participants engaged in study due, to the resulting effects of Ebola, as given in the quote summarized below;

The greatest advantage of informing the ground health staff in time is to assist you in dissemination of your proposed activity or idea to the community members. If we are involved in such meeting and not just representatives, they people themselves will trust the intervention proposed that it was heard from the "horse's mouth" (Community health Nurse). So imagine if the activity have been communicated by the health workers and the community stakeholders the trust process will be attained easily.

(Health Care worker, FGD-V2).

A community health worker reported LAROCS research team in the 2019 fieldwork made a poor participant mapping done in a Post-Ebola community, she assumes the first point of contact should be the community as a whole and not individual health workers. This is visualized in the citation give below;

The game changed when they arrived, they only selected nurse Mojama to lead and they were faced with high mistrust and resistance of their activities here. Despite all that, this is our work, we are always willing to communicate with our people to accept. For instance, in your case, when we heard of the Magburuka's recent outbreak of LF, I went

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back to some of our community member and authority to tell them, that what those people were here to assist us with is a reality." Thank you very much for coming, because all we are doing here is under your eye, the community authorities.

(Community Elder, FGD-002).

Another participant reported an alternate interpretation of empathy with the LAROCS research team relating to the previous act of research resistances and rejection as illustrated by the quote;

I can understand how difficult it is knowing you are doing the right thing for the community and the community perceived it a doing harm to them. It is not easy.

(Adult Male, FGD-002).

Furthermore, it can be translated that most participants envisaged the activities of the LF research team in reflections of Ebola virus activities and experiences. Additionally some participants reported that, Ebola experiences are the only reason why they resist any health implementation posed at their community. The citation below makes a factual meaning as given below;

That is actually true, but all that stigmatization is because of fear. Our people were so so shock to see something like Ebola which they have never saw before. People are just afraid.(Community Elder, FGD-001).

the people ran away the moment some people heard about your arrival that you are government people some people went to the bush.(Community Youth, FGD-003);

One participant made a distinct comparison between the war and Ebola, the citation below gives support the context aforementioned;

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Ebola? Hmmm, (Emphasis), where are you going to during Ebola, Ebola was even more fearful than that the war because of how it kills, no gun shot. (Adult Male, FGD-V1).

Another participant reported a similar comparison of Ebola and the war, additionally this discussing with some participants; study reveals a distinct disparity between the effect of Ebola and war on the migration pattern of community members as seen in the quote;

The north here was very tense during the war and when we saw that we cannot make our way forward with the way the war was going in so many other places, cutting of hands, indiscriminate raping, torture we just decided to go to Guinea because this was the safest place that we could go and was very close to us. Again when we went to Guinea, my brother we suffered, the people there were not willing for us to stay in their country. The discriminated us as rebels. (Community Stakeholder, IDI-004).

As evident in the quote above, and as reported by most participants interviewed, the study identified Guinea is the primary migration route with respect to its proximity and socio-cultural relationships the study setting has with Guinea. Another participant reported mistreatment of Sierra Leoneans in Guinea during the war. This is illustrated by the quote below

Yes, like for me during the war I left here together with so many other people… we went to Guinea, we walk on foot from here to Guinea, can you imagine the distance, we walked through the forest, slept in these forest with wild animals for days before we could assess Guinea, Guinea is far ooo…Even when we entered Guinea it became even more difficult for us to survive as we were discriminated against as rebels. Even for those people to offer us place was a problem. We slept in the street for days, except when their

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government had to intervene and refugee camps were created for us to stay, food was a big problem. (Community Elder, IDI-005-V2).

It should be noted that above segment was stated by an individualistic perspectives of why the saw the community approach of the team wrong toward Post-Ebola communities. The study further on reveals the realization of the community's knowledge about LF and expression of resistant behaviours in protecting their lives and livelihoods, due to the post Ebola experiences and rumors that spilled far and fast across towns and villages going forward in June 2019 fieldwork. The revelation is illustrated by the citations given below.

When message comes from me then it is reliable for the community to take seriously. In fact this is one of the reasons why I was elected by them to represent them and serve as a source of information to their ears. No matter where the message is coming from; whether be it from government, the experts from the health centers, so I will come and share the idea I have been given to the community. Non-governmental Organization, civil societies etc.(Community Authority, PUR-001).

The study further on, reveals that community authorities have a huge role in the process of community entry as stated in the illustration given below;

Well I have numerous roles I play in my position; firstly, I serve as a representative for the government. Whatever message government has to deliver definitely pass through my office before going out to the people. I am a link or an intermediary between the government and the people. One thing, I find interesting, is educating and changing the minds of the lay people, which government is never wrong in whatever decision they make. Especially concerning our health and the guidelines we should follow, how we as

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community member should protect and teach health workers what they don't know about our culture. As a chief I attend a lot of meetings with health workers in different places in the district. What am told in these meetings related to health is exactly what I come back to my community and convey. (Community Authority, PUR-001).

Discussing with another participants, a contrasting revelation was reported as summarized in the quotes below.

" Sir, one of the reasons, why you see community members ignoring services we offer them, is the lack of association of community authorities, since the end of Ebola they think the time of sickness is over. We call them for meetings, they won't even mind us. (Community Youth, Informal conversation-V-1).

4.5.1.1. Ebola traces affecting Knowledge of Novel Tonkolili LF outbreak (interactions):

The latest November 2019 LF outbreak in Tonkolili made a social conjunction with the traces of 2014/15 Ebola virus outbreak. This study reveals novel associations between communities reactions based on Ebola reflections towards the current alarming situation of untraditional LF outbreak in northern Sierra Leone. Discussing with some participant perceived the 2019 LF outbreak in Tonkolili as Ebola Part 2, with the astonishments and mistrust is illustrated in the quotes below;

"But it was only in Kenema and Tongo but recently I have started hearing about it in Tonkolili killing a white doctor (Laughing). I was really surprise because these people are very powerful for, having all the best medicines they claim to have. I am a traditional healer, my friend if I know that the sickness I cure people from is what I have, why not cure myself. I think is foolishness for that doctor to die and not preventing herself and she was there with her colleagues but she was the only one among them that got infected and

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infecting our nurses and not her colleague. I am still confused about this LF incident that took place in our neighbouring district".(Traditional healer, IDI-004)

Further on, in this study another participant was a nurse that was recently transferred to Kumala. She added in the same vein of resistance referencing, the neighbouring district of Tonkolili as reported in the illustration below;

"I will like to reemphasize that the act of medical resistance is gradually becoming a norm; I am saying this because I have observed similar patterns of resistances in Tonkolili too. In fact in some places in Tonkolili community member fight medical investigators/researchers when they approach their communities, some time with stones."(Health care worker, FGD-002)

4.5.1.2. Ebola traces as Catalyst for Women in Research Resistance.

Additionally, in retrospect of the 2018 LAROCS resistances posed by the communities, this study itemized the construct of why women became the initiators and propellers of resistances and research rejection. This study unpacked the key findings of novel reaction of women in catalyzing and promoting the social action of resistances. Women as reported by so many studies are seen vulnerable in times of social disruptions. This study also reveals negative reflections of Ebola as a source and the irreversible gender-sensitive regulations on their cultural activities. Most female participant's reported the act of the government of banding the Bondo Society and activities of TBAs after Ebola. This context is made meaningful by the illustrations given below;

You did not hear Pa. Koroma when he was telling you that we lost 6 women instant and followed by many other that were top and dignified Bondo society women. Some contributed in delivery and even the up bring of some of us. (Adult woman, FGD-V1);

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This study reveals the context of women rejecting medical assistance that goes beyond the resistance of LAROCS and to normal medical services that have been rolled-out for years. This is cited in the quote below;

> *Like for the pregnant women, just after Ebola they were ignoring the 5 maklates used to be given to their children but now I think they are accepting. Even with the Elephtiasis drugs, they are slowly starting to accept. I will be happy to show you the number of people who accepted the drugs before you go.*(Community Authority, Pur-001).

Another female participant that posed to be knowledgeable of the disease misconnected the origin or primary source of LF infection, despite she stated one correct form of transmission.

> *"this was based on the perception about Ebola was transmitted from one person to the other, and it was unknown people who brought it from labs to infect rural communities like there's.*"(Adult Male-IDI-001-V3).

> *"We even go more disgruntled when this government is following the laws that the other government used to make get themselves out of power, now even doing the worst upholding the ban on our Bondo society".* (Adult woman, FGD-V1).

4.5.1.3. Political dynamics of Ebola traces and LF research resistance:

During this study participants also linked viral out-breaks to the political context of Sierra Leone. With various discussions done participants reported viral outbreaks of LF and Ebola Virus disease is been initiated by the two main political parties the; Sierra Leone People's Party currently in power, and the current opposition then, All People's congress. Sierra Leone has faces much structural violence in the last 3 decades, as found in many studies. The populations of these three setting were observed and as reported by most participants to be strong supporters of

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the All peoples congress in Opposition. This study identified community mistrust in the outbreaks in linkages with the change in political systems. This is strongly illustrated by the quotes summarizing the context given below;

> *"well the evidence is this community loosing 36 or even more to the disease they brought upon us. My friend we were here we saw what this virus did to our people, look at the field down there, dead bodies were line up here in just one week, what evidences do you want us to produce about the wickedness of the APC government, despite they are our own people but they simply lost the election because of their Ebola money making disease. Like I said any one more of such nonsense, we shall react negatively. APC did a bad thing to the people of this community."*(Adult male, FGD-V1).

> *"You hear about the incident of a Sowo (Head of the Bondo society) in makeni that was arrested by the police an d taken to Pademba road prisons simply because she did an initiation that is our value as women. Because of this Ebola the government uses it as an opportunity to rip us off our pride as women. We are not happy. You are a man, let me stop there."*(Adult female, FGD-001).

> *"Stop saying that, we are not here to discuss politics, let us focus the work he is here to do and stop this politics."*(Adult male, FGD-V1).

4.5.2. Risks involved with Rodent-Human Interaction in Northern Sierra Leone.

The results of this identified participant whom were see to be knowledge about the risk of having LF, whilst some participant stated poor knowledge and others reported complete absence about LF disease. This study illustrated some of the participant's description and co-habitation patterns with rodents in different contexts;

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Yes! This is even the kind of animals we are looking for, Ahhh…. (Emphasis), hmmm… but the squirrel is a very clever animal and you need to build a very special type of trap for the squirrel, it is short so low kind of trap is needed; you need to build a very special type of trap for the squirrel, it is short so low kind of trap is needed.

(Adult Male, FGD-V3).

Whilst discussing in one of the group discussion one participant describe the control mechanism in her home and describe the rodent species as illustrated below;

"They are big eye (glutinous); they will surely come there to eat the poison. Sometimes they will survive for a while and find a hidden place to die,; they die and they go unnoticed, their odor makes your entire place smelly, sometimes you can't even breath well."(Adult woman, FGD-V1).

Other participants stated reason why they consume rats, *farm rat is sweeter my brother and very easy to hunt, (FGD-003)*

The farm rat is sweeter my brother and very easy to hunt, for them they themselves will come and surrender that look at us (Laughing) on the farms. (Adult male, FGD-V3);

so even if you want to prevent them from infesting the bags, they will still go inside, they are so (Emphasis) stubborn. (Adult Male, FGD-V3).

Also sometimes if we have a good catch on our own farm, mostly share with the neighboring farm (Adult woman IDI-V3).

What was key and similar across transcripts was the participants' acceptance of rodent-human cohabitation in homes, farms and mining spots.

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During group discussion, some participant expressed cultural lifestyles and ignorance of the risk associated in the habit of eating rodents. Additional, even though some of the participants are uncertain that the eating of rodents may have adverse effects on their health, their connection with the lifestyle is in connection with culture and issues of food security as summarized in the illustration given below;

> *Is not like bush, bush, (Emphasis), their farmhouses… They were safe there. They stayed there well, ate well, and ate a lot of bush meat. (Laughing), they were enjoying ooo* (Community Elder, In-depth-int. 005-V1).

4.6. Effect of Rumors and Fear of LF associated with Ebola Virus Disease:

As observed in all discussions and with all categories of participants, a major finding spotted by the study was the construct of fear. This study found the fearful realities of the past Ebola crisis was mixed with community member's anxiety and ignorance towards medical intervention as reported by the illustrations given below;

> *They will give us their time to explain the dangers about the virus. It looks fearful when we try to compare Lassa fever on Ebola. The fear that people have for medical interventions is not limited to your project. Recently there was this onchea intervention in curing river blindness.* (Healthcare Workers, FGD-001).

> *"We did not get Ebola here like we were telling you. The Ebola came and jumped us, and was in Kumala, they were simply affected because, they will encourage whatever thing in their communities,"* (Adult Woman, FGD-V3)

Some participant related the act of fear of traditional neglect of the dead during the time of the war. She went ahead to state that her fear was "*we have not prayed for the country and the dead*

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after the war, given the reasons for the disease outbreaks the country". This is illustrated in the quotes below;

> *"What I told the Jamal even during Ebola was, we have to ask god for forgiveness in order to release us from the evil sent on us. I tell you, if it was not the intervention of Allah, all of us would have joined our ancestors by now."* (Adult Male, IDI-003-V2).

> *"If only we can reflect well on the atrocities committed during the 11 years rebel civil war, when blood was spilled on our land like a sea overflowing, this type sins against the innocent should have been looked into before all these stupid developments."*(Adult Male, IDI-004).

4.6.1. Ebola Survivors impact on LF research activities:

This study identification of Ebola's impact on LF Knowledge, is additionally illustrated by the all participants, some of which were Ebola survivors reported the neglect of Ebola survivors by the government. This is cited by the illustrations below;

> *"They both died my brother. Now just look at the burden I am left with to raise the small, small (Emphasis) you saw."(*Ebola survivor, IDI-005-V2).

> *No one in my husband's family is assisting me with them instead they are alleging me of evil and bad luck, and that I killed their child. This is not limited to the family but even our Alkalia community where I and my husband use to do people a lot of good things. Now am a witch, an evil person and a murderer."(*Ebola survivor, IDI-005-V2).

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4.7. Summary of Results:

The influence of Ebola has created dynamic social entropy within the social fabric of Sierra Leoneans, especially communities and individuals affected directly, but more so placing heavy burden on the health care system as stated by other studies. The disorderliness created is in oblivion and vulnerability affecting other important health activities and interventions rolled out to rural communities as illustrated in the result of this study.

This study overall reveals poor knowledge of LF in all community participants, in some cases including community health staff. The factors affecting the context of resistance of LF research activity in Koinadugu Northern Sierra Leone is firstly motivated by the two arms of mobilizations revealed to the study as antecedents of resistance causation with of Ebola as the driving force. The study reveals tensions and inadequacies existing in of both social mobilization and community mobilization of communities leading to poor knowledge of LF. Thus, the study divides underlying factors for act of resistance into two Antecedent causal factors: Poor Community Mobilization and Poor Social Mobilization of communities.

Information on community mobilization, as visible in the result of this study Community mobilization targeted Community Governing Bodies, Community Members, Community Health Staff Traditional Healer, whilst Social Mobilization. The construct of Social Mobilization is inclusive on gathering information on reasons for poor knowledge of LF from Ministry of health, DHMT and Journalists and Community Health Centers present in only 2 settings of this study.

Triggering factors are thus contextualized under these two broad antecedents' factors with perceived barriers of the community members observed and reported in this study. The barriers perceived and associated with the social mobilization aspect are; No special funds for LF education, its health promotion activities and research interventions, fragile Health-System,

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Inadequate dissemination of LF information, no special District mobility LF for activities, poor community attendance to Health facilities.

Those associated directly with the perceived community barriers affecting community knowledge as reported by participants of this study are; -Re-emergence of Ebola, Fear & mistranslation of LF as Malaria or Ebola Stigmatization of LF, Post Ebola traces, Traces of War, Poverty, Community Mistrust coupled with rumors and misconceptions of LF virus.

The poor Interactions of barriers posited by both the community and institutions in charge of mobilizing the communities coupled with poor level of LF leads to the factors of perceived severity of the disease and thereby initiating community mistrust on the knowledge of LF in Sierra Leone positing the risk of transmission.

The following schema below illustrate the dynamics of the factors influencing research resistance and total rejection in some communities as indicated by the study explains how these factors of barriers interact to result in the resistance of LAROCS Activities.

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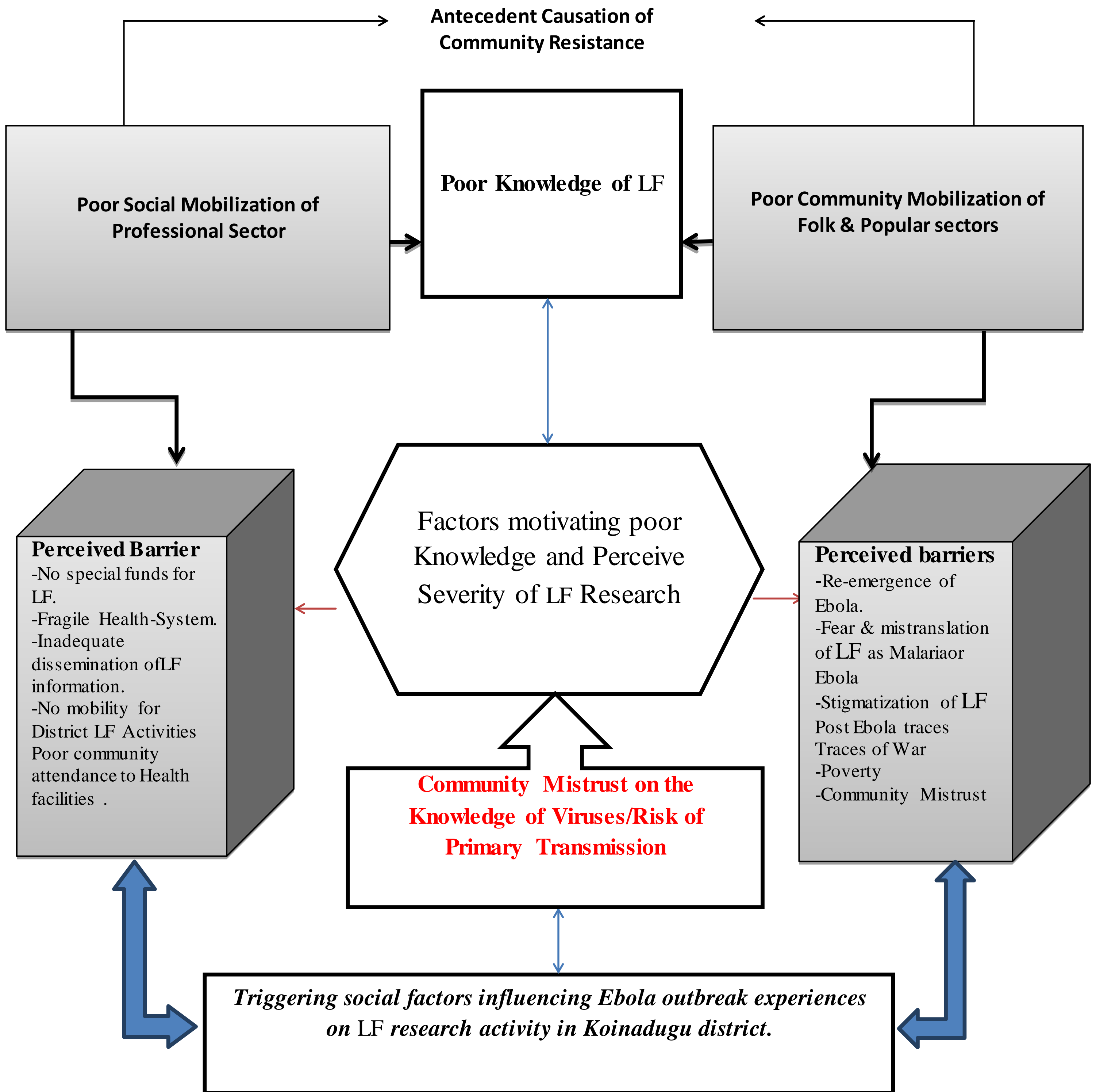

Figure 5: Factors affecting LFresearch activities in Koinadugu district.

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CHAPITRE FIVE

DISCUSSION

5.1. Introduction

This study aimed at exploring the community's reaction and social factors that influenced the acted on LF research resistance by community members in a LF prone Koinadugu district in Sierra Leone. The key findings of this study are discussed according to the specific objectives and then compared with existing studies on what is known on the topic.

5.2. Knowledge about LF affected by the Social influences of Ebola:

The results of this study indicated that the majority of participants in these three (3) villages have no idea of LF. Despite the LAROCS project research activities and interventions made by government, District Health Medical Team, and Community health staff in these villages, people still lack adequate knowledge of LF.

Knowledge of LF in communities researched was found to be manipulated and hindered by the awful experiences and traces left behind by Ebola Virus Outbreak. In all villages, a majority of interviewed persons were exited and receptive about the arrival of a project aimed at killing rodents. This study posited a different context of communities' receptions of resistances, despite the perceived benefits from controlling rodents as were cited in the interviews conducted with all participants. Additionally in contrast to what was found by LAROCS in Guinea where, people reported in three intervention villages that the product used in the intervention was effective in reducing the number of rodents. Moreover, Enria et al., 2016another study conducted Sierra Leone, Koinadugu vehemently highlighted a clear disassociation of community engagement and

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viral research interventions (Ebola Clinical trials) due to the influence of Ebola traces. What is found outstanding in this study was that the influence of Ebola is not limited to post Ebola activities but to other sensitive medical activities, as was in the case of LAROCS fieldwork. The context of poor knowledge comes at the top when LF activities are totally misconstrued by the experiences of Ebola and no knowledge of LF within community members. More so, Bonwitt et al., (2016) in southern Sierra Leone indicated in their study that the majority of respondents had already heard of LF which they described as a serious and fatal disease.

Some participants recognized that they have gained knowledge on LF through spillover of rumors of LAROCS activities in other areas of the North, emphasizing Nyawulia as the main spot of LAROCS rumors. The reality is that the initiation of LAROCS research activities was at preliminary stages of community entries in their villages.

The lack of knowledge on LF among the participants of this study could be related to the fact that LAROCS ecological research project activities of trapping rodents and socially interacting with the community was resisted due to reality of the first familiarization of LAROCS activities in their communities. The community entry activity at the beginning was limited to community health staff and local authorities. This in effect and research activities are sometimes limited to participants and people found on spot in the villages. Further on, the fact that some people still reported that they do not know the disease could be a strategy to obtain and crosscheck information from the researcher. The findings of this study are in contrast to the communities view and perception on Ebola outbreak that nationally affected the Sierra Leoneans, and submerging significant knowledge of LF in northern, Sierra Lone. Despite the endemic nature of

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and historical incidence (1980s) of LF, participants in this study expressed lack of basic knowledge of the LF as compared to their fresh experiences of 2014/15 Ebola outbreak.

The gap in knowledge as factored out by this study is highly limited in community members. This has been now corrected through the surveillance activities, large sensitizations with community members and distribution of flyers. Participants have been informed through the informed consent process but the findings of this research reveal that there is still the need to encourage and continue communicating in order to inform as many people as possible and evaluate the knowledge of people taking part in research activities.

5.3. Knowledge of LF: Syndemic state of LF in Northern Sierra Leone:

The Syndemic context of LF was established in this study in all (3) communities. So, therefore, the establishment of social relationships and interaction between Ebola reflections and previous and current LF impact and activities respectively, was emphasized by participants of this study. Factors affect the emergence, prevention, treatment, distribution, cultural experiences, and global impact of pathogens on individuals, mind and the body differ distinctively in context of Biologic, Political, Economic, Socio-cultural, and Ecologic factors. According to Singer, the observation that these factors did not merely exist in parallel, but were intertwined and cumulative, offered a branch point for clinical medicine and public health interventions. These fields have made appreciable strides in recognizing that interventions for combating and treating disease must take a more multifactorial tack, nevertheless there exists a great need and opportunity to more widely apply the principles of the syndemic approach (Singer, 2016) above makes sense of the rural communities (high illiteracy level as observed) context, to locally perceived relationships between LF's intervention and Post-Ebola reflections, in some cases commonly understood as advance malaria. In contrast to the above social establishment of Lassa-Ebola-Malaria

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symptomatic relationships and disease interactions, is reported by all participants by, resident healers and imam expressed total lack of knowledge of the disease, with disliking statements of the name s agreed that they had no remedies for this disease and that the only treatment for LF is biomedical. As originally theorized(Singer, 2016), three concepts underlie the notion of a syndemic: disease concentration, disease interaction, and the large-scale social forces that give rise to them. These theories projected by Singer, makes a holistic understanding of LF's disease status and misconception of symptoms in the community as illustrated in the results of this study. In Koinadugu there is a disease concentration of Malaria, especially in children, cholera and other common diseases. The socio-cultural settings (bad road conditions) and high rainfall (Seasonality) give rise to the high incidence of malaria, cholera, and maternal mortality, due geography and poor health care accessibility and systems, as observed and reported in the study. In specific, the construct of disease interaction as envisaged by this study is firmly based on the social intertwining of Ebola disease reflections and influences joint with the misconception of LF activities as Ebola or unnecessary malaria work as reported by participants of this study. LF causes initial symptoms such as fever or headache that are common in other diseases, such as malaria. Therefore, the focus of LF research in post conflict Sierra Leone was development of improved laboratory diagnostic assays. A major step was renovation of a preexisting building and installation of laboratory infrastructure that was completed in 2005 as stated by a study conducted by (Goba et al., 2016). Keeping with this, the popularity of LF since the 1970s to1980s, when effective interventions for LF was initiated, the blood diamond war conflicted the Knowledge of LF, creating a 20+ years gap in building the knowledge and surveillances aspect the fever. This study made effort into bring together adults of the 80s and 90s and the younger generation to project the knowledge level of the disease. So in the aforementioned years other

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diseases interacted with the people and have similar symptoms of LF (Goba et al., 2016). This study provides results of the social effect created by this gap. The third theory of large-scale social forces that give rise prevalence and incidence as brought up by this study was the force of community resistance towards LF research activities.

Concluding this discussion, a study conducted on Ebola outbreak in LF endemic areas by Goba, 2016 concluded a context that is relevant to this discussion, stating that, in responding to the challenges of confronting 2 hemorrhagic fever viruses will require continued investments in the development of countermeasures (vaccines, therapeutic agents, and diagnostic assays), infrastructure, and human resources.

5.4. Mistrust as Risk behaviour for primary risk of LF transmission

The communities were observed and reported to have a perceived severity of LF disease as one of the worst disease not having. The study made significance of the knowledge of neglect of the disease at district level and fuelled by community mistrust in stigmatizing the disease to the eastern region of the country. This study observed relationship of trust building between health staff mistrust for unethical NGOs and community mistrust for medical activities. As reported by the CHO in one of the villages, all community members have been warned not to respond to strangers that cannot produce documents. Creating the context of fear in the minds of community members with some perceiving the community health staff as hypocrites, and tends to overact with respect to the confirmation made by health staff that not all strangers are good for the community.

In this study community members perceived the health care setting as death traps in their community or villages and those entering in their villages to do health related activities. Others who have some knowledge about LF expressed concerns of poor health care system as one major

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factor mitigating the knowledge of LF. Whilst other saw that the lack of outreach activities and diagnostics of LF in Koinadugu district was a serious concerned to be noted to increase community members trust on the seriousness of the disease was to have their own diagnostic lab to do their own test. This recommendation emphasized is sustained by the reports of LF making pocketed outbreaks in the northern Koinadugu, with Fakunaya's as a case study. This thought is strongly supported by the study in understanding the cryptic nature of LF, reported Humarr et al., 2008findings stating that Lack of diagnostics has also resulted in under-reporting of LF cases, and a geographical bias in LF detections nearby to established laboratories, such as the dedicated LF Ward at Kenema General Hospital(KGH,) Sierra Leone.

The construct of Mistrust in community authorities came up strong linking with the experiences of Ebola. In this study, participants reported local authorities as the drivers of viral infections in their communities. In the study this was stated in all three communities. This clam is initiated and correlated with reflections and scars of mistrust left behind by Ebola outbreak. However, Enria et al., 2016recognizing that power is not always straightforward and that communities are fragmented is an important foundation for building more nuanced, sensitive and genuine engagement.

Also the construct mistrust in this study that initiated a link between fear of Ebola and risk of intentionally co-habiting with rodents in farms. In this study, participants collectively stated that the best way to hide from anything relating to the word virus was to run and hide in their farm houses. The risk of direct contact with rodents as stated by a study conducted by Bonwitt 2016 reported that, in the bush, many daily activities such as cooking, resting, and certain agricultural activities occur in farmhouses. The migration of community members from their home to farm

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houses to seek protection from viral activities makes community members prone to the risk of cohabiting with rodents in farm spaces.

5.4.1. Chronicity of LF attributed to East and experienced in Northern Sierra Leone:

In all three LAROCS research villages, study participant's referred and overemphasized LF as a chronic condition of the Eastern region of Sierra Leone. The construct of Chronicity has been greatly limited to the view of Biomedical and epidemiological context of disease presences over time (Becker, 1999).supported the motion of limitation of the usage of the construct "chronicity" stating than the construct of chronicity was predominant to the arena of biomedicine, capturing neither the social problematic of chronic non-lived/experience of illness(Becker, 1999).

The chronicity of LF though attributed by most participants to Eastern Sierra Leone, but rather, visible in study settings were the act of blames, illustrating the chronic state of LF in the north of the country by referring to the endemic east of the country and this can be further generalized to the country's social discourse and existing structural violence. This is so, as seen in the study that chronicity as a construct of the LF illness is more generalized nationally than reported as concentrated to the East of the country(Becker, 1999).

This study made sense of prone-chronicity of LF in the North (non-endemic) by exploring the act of community reaction/resistance and stigmatization of LF activities to East, also as observed, open-discussions of the word virus, was greatly limited due to scar and experiences of Ebola. The chronic state of LF is propelled and deeply rooted in history, culture and the social fractures of Sierra Leone(Becker, 1999). Even though health care workers reported there have been sensitizations of LF in communities studied, the community participant interviewed expresses stigmatized ideology on LF relating to the history of LF infectiousness to Eastern Sierra Leone.

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5.5. Impact on community trust in LAROCS activities the study:

The first initiation of community trust was built on the knowledge 2019 November LF outbreak in neighboring Tonkolili, which was very popular at the time of this study. It became the footstool of the study, as the popular sector was in intense anxiety of the LF issues. According to study participants, the outbreak was involved with the infection and death of a trained foreign gynecologist professional, whom worked at Mansaga. Discussing with some community members, were familiar with the "white nurse" working in Mansaga Hospital, as the main referral hospital in the remote end of the North as reported. With Local authorities citing this event in community entry meetings, brought some understanding of the reality of the LF been serious and near with evidences of killing a "white nurse". In summary community entry meetings were relevant at every stage in the transition of the study to communities. The community/local authorities and stakeholders were allowed to fully express themselves, allowing debates and clarifications.

Another icebreaker in building communities trust was communities' familiarity with the study and researcher; although this second trust building process cannot be generalized due the continuing resistance behavior towards operations of LAROCS research activities. The fact that some community members have been evidence to LAROCS activities as been less harmful, in other areas of the North that they were witness to. Assisted the study's trustworthiness, experienced community members on LAROCS activities were given time to talk briefly to share their positive experiences. Coupled with the expression and experience local authorities/stakeholders that have participated in various health care interventions and resisted ones too, set a footstool for the success of the study. In Kumala a distinctive approach in building

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trust was suggested by the Town chief of the town. He suggested using the schools in the community after a successful community entry as one of the target population in better disseminating ideas and information about the study. Keeping with the suggestion of the town chief, made an absolute sense in considering the implementation this strategy of trust building the remaining 2 communities, of Alkalia and Nyawulia that went perfectly well. This study also considered this approach as a way in encouraging youths and community members to work together to develop a greater understanding of their community and its potential prevent potential LF outbreak. In some discussions with some parents made references to their children and youths educating them about LF and the nature of the study.

The third and final influence on community trust-building was based on the chronological sense of community entry approach rigorously implemented in the study to collect data. After visiting the District Health Management Team, entering each community of study, phone call discussions were made with Local authorities, youth leaders, Community health staff, and initial contacts made in the pilot phase of the study.

Their inputs did not only contributed to the layout of the study implementation in the early stages but laid the pathway for a clear understanding behind the reasons for the strong resistances previously posed at LAROCS research activities in previous research activities.

5.6. LF research community entry and resistance of activities:

During a pilot study of risk of LASV transmission in Koinadugu District, the fear and psychosocial aspects were evidently and directly based on reflections on the violent nature of the Post-Ebola epidemic and continuous reoccurrences and pocket outbreaks of LF in Sierra Leone. Viral hemorrhagic fevers are capable of social disruption as evident in the current 2019 outbreak bring total panic and fear construct correlating with Post-Ebola experiences as observed and

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reported by various local radio stations informally discussed across the country. (Carey, Kemp, White, et al 1970). Its trajectory of familiar incidences in the east has only become new in the North referring to the 2019 LF outbreak in a non-traditional region of the Tonkolili according to WHO's current report on LF. Additionally LF's activities not being an innovation healthy intervention to the Sierra Leonean populace, it's thus right to assume the illness in context of perceived severity and susceptibilities of LF in rural communities in Sierra Leone.

The study's community entry approach, methods of the proposed intervention, expected interactive social factors that project the outcome to be considered for exploration of the general study objective. Before community entry or just after obtaining community clearance from the District Health Medical Team, distant networking and follow-ups with previously selected June 2019 fieldwork respondents (community networks and Health care workers) who actively and objectively participated in the previous pilot will be considered. These follow-ups were conducted mainly through phone calls, providing the researcher preliminary information and status of the sampled communities of study. Also, the purposes of considering initial networking construct are; to activate information of the study in selected community stakeholders and previous assistants information in the early face of the study, by addressing concerns of previous field works resistances, share views, discuss perceived barriers to enrolment of study participants and share information where necessary for the successful outcome of the study.

This networking group was entirely participant-led when meeting/communications held to gain an understanding of the communities to work in from them. An approach also communicated by the study of (Enria et al., 2016) in ensuring trust in community members whilst conducting fieldwork in Northern, Sierra Leone. As chronologically represented in the stages of community

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entry, displays the enrollment links between of responsive participants and primary data collection methods as shown in study.

The process goes from successful observations and informal discussions with initially accommodating respondent and previous resistant participants were firstly mapped before prior engagement, in some cases integrating with the farm groups and other working groups in the community of interest to gather ethnographies. Onward, these mapped respondents were approached for semi-structured and an in some cases initiation of spontaneous informal focus group discussions occurred were all linking with engaging the community on the expected outcome of the study.

The findings of study focuses mainly on the unprecedented emergence of Ebola reflections and its related misconceptions as a major theme that projected additional information on other outcomes or factors cobbled that socially influences of other perceived barriers as observed in pilot fieldwork.

In this study resulted into bringing deeper focus on other Post-Ebola challenges and Post-conflict factors such as History/reflections of past War, Ebola experiences, Fear of Ebola re-emergence/ mistrust, Poor Health System: low-level LF education, poor disease surveillance, fear of intentional LF infection, Knowledge level of LF/Risk of rodent cohabitation, Rumors/ poor information and socio-cultural factors/misconceptions emerged in the study. These negative Social and influential drivers were linked and interactively influencing one another and extending from one middle factor which is poor Knowledge of LF disease in communities of this study.

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These constructs led to outcomes of negative Social influences of past Ebola outbreak on endemic LF risk of exposures in Northern Sierra Leone. Apart from the research team based in Kenema Hospital, since 2014 an international and multidisciplinary team studies the ecology of the virus, the prevalence in human population and socio-cultural factors for human rodent interactions in Bo district. Due to vehement resistance in June 2019, LAROCS fieldwork intervention in the Northeastern Koinadugu district of Sierra Leone was hugely affected by community resistances and thus had major gaps in respect to fulfill the set time and protocol of 3 effective weeks expected to be spent by the research team for fieldwork. June 2019 research limitations and communities' resistance in fieldwork conducted were largely held on to the Post Ebola, Post War experiences with rumors of no fix stories but fear and mistrust expressed at its highest altitude by all ages in the communities partially researched. There were exceptions to a few objective people who partially participated in LAROCS ecological research. Those few willing people who openly expressed their acceptance to participate in the LAROCS research intervention were vehemently ostracized by the resistant population in the towns/villages visited.

Although, the resistant research population in Nieni chiefdom was at first seen to be ignorant with regards to the knowledge of LF, after informally interacting and discussing with some community members in an informal discussion brought the realization of the community's knowledge about LF, the presence of a LF survivor, and expression of resistant behaviors in protecting their lives and livelihoods, due to the Post-Ebola experiences and rumors that spilled far and fast across towns and villages going forward in June 2019 fieldwork. Some rumors like the research team using Lassa to infect their communities with Ebola, no differences between the dress code of LAROCS team and previous Ebola workers, research team having the virus with them.

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It became interesting in the 2019 LAROCS fieldwork on how women became projected objects and agents of community persuasion resisted LF intervention due to reflections of existential violence in per, during and after Ebola.

Positing poor Knowledge of Lassa is due to previous impacts of the Ebola outbreak and other related structural violence in Sierra Leone as observed.

5.7. Limitations of the study

In this study adult were consented to express themselves on a sensitive issues related to community resistant behaviours projected by Ebola traces in the villages and, since some FGDs were not segmented in a gender sensitive context, and mixed with some community stakeholder and local authorities urged a buckskin of information, their (Community authorities) role in community members resisting medical research, the social desirability bias could have been generated by this study if some participants had tried to hide this fustigated behavior of community members.

Additionally, the time available for collecting ethnographies and participants observation to enable the research make a thick description of socio-cultural activities and attitudinal factors mitigating on the knowledge of LF, was also limited. Further studies considering larger participants could give more information on LF in these communities. Lastly some participant still held the view of resistance so thus became difficult for participant mapping for FGDs.

The mitigations of the aforementioned limitations respectively were; though the research entails sensitive issues and questions, the researcher was able to purposively select study participants as a study technique unpacking reliable data set for the study. Additional the researcher chose an ethnographic approach to elicit sensitive information. Despite there was limited time for the

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researcher to conduct the research, the researcher made vehement use of participant observation to capture valid data especially where information about the community .

Strength of the study is this can be used to transfer and improve knowledge on the intricate state of affair on the social dynamics on viral studies.

CHAPITER SIX

CONCLUSION AND RECOMMANDATIONS

6.1. Conclusion:

The Knowledge gaps of LF in research settings is identified by the act of stigmatization of the study intervention itself and it processes, form community entry to data collection processes. To a very large extent, gaps in LF were found to be de-motivated by aligned structural violence occurring in Sierra Leone and the lack of LF education especially in the rural areas. This study was conducted in three villages in the LF prone area of Koinadugu, where social and attitudinal change, research resistances, misconceptions and denial for LF activities started with the LAROCS project research intervention in 2019 that lead to a complete and unique research reaction worth taking note of.

For instance in these villages, the activity of LAROCS research was complicated misconstrued as Ebola part 2 initiations perceived by the rural communities. This study might also shed important light on socio-cultural factors and the acceptance of such. Such an understanding may contribute to successful future global and public health policy planning and implementation of LF interventions and might also inform researchers, economists and political scientists, health

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security experts on how to develop successful rural community development strategies for rolling-out LF activities.

The antecedent causations are the motivations for the complication of perceptions between reflections and experiences of Ebola and implemented LAROCS research activities in Northern Koinadugu. Thus, the Knowledge of LF in post Ebola settings and the factors and reasons for resisting LAROCS research activities is identified by this study, the emphasis of denial and stigmatizing LF to the east of Sierra Leone by community members was worth noting as poor expression of the disease throughout the process of the study.

The attitude of resistance was by captured by fear and mistrust of community members in health institutions and local authorities. The adults during these discussion sessions largely include complete lack of knowledge and identification for the *M. Natalensis* which mostly cohabits homes, Mining spots and farm houses perceived as meat source exposing them to the high risk of primary transmission of LASV in LF prone area of Koinadugu.

There should be urgent and kin attention on community resistances toward medical intervention in general, while putting into place behavioral change communication mechanisms that can help people in these villages understand the risk encored by community resistance and find ways to socially market LF and its related risks popularizing the host vectors to the professional, folk and popular sectors of the medical system. This action should be made evident in non-endemic regions especially Koinadugu sharing borders with LF endemic area of Kono, and recent LF

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hotspot of Tonkolilli may be crucial for accurate information to define mass prevention strategies such as vaccine development.

6.2. Recommendations

The recommendations of this study attempts to offer research tactics and remedies on the act of community's reaction and resistance towards LF research activities and other rural medical interventions. The assessment of knowledge about the disease is multiple and intertwined, thus, recommendations are in consolidation with diverse connections of the entire study's outcome that would definitely inhibit or reduce risk and transmission of LF through motivation, understanding, acceptance, and enhancement of LF research studies. Based on the outcome of this study, it is thus recommended:

6.2.1. To the LAROCS project:

- A Hybrid form of mobilization and systematic community entry and its related processes and mechanisms should be fully adhered to in order to enable the project effectively perform their ecological and epidemiological aspects, do efficient follow-ups, and community sensitization.
- Social marketing strategies should be promoted with community involvement on the significance on viral or LF research/interventions and on the dynamics of risk on resistant communities reactions towards medical research should be considered;
- Conduct more formative and evidence–based research on the vector of LF before proceeding with direct interaction or engagement with the communities;

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- Consider other strategies for rodent elimination that is highly constructed by community involvement and participation;
- Study participants of this study should be communicated with regularly and encouraged to continue motivating resisted community members to be involved with research and medical activities;

6.2.2. To the Ministry of Health and Sanitation:

- Support, initiate and conduct further research on Knowledge level of LF and impact of Ebola control and traces in Koinadugu district area of the North to avoid eventual epidemics;
- Strengthen the primary health care outreaches and surveillance system with particular emphasis on LF in Koinadugu district area;
- Development of participatory community planning and evaluation of LF activities coupled with capacitated implementation of structured rural LF illness support groups in all chiefdoms, especially in prone endemic areas in the north of Sierra Leone in thereby promoting LF interventions nationally;

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APPENDICES

1. Information sheet

Title: THE SOCIAL INFLUENCE OF EBOLA ON LFACTIVITIES IN KOINADUGU, NORTHERN SIERRA LEONE"

Principal Investigator: Cecil Nyakeh Bockarie

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My name is Cecil Nyakeh Bockarie. I am a graduate student of University of Ghana, School of Public Health undertaking a research on **"The Social influence of Ebola on LFactivities in Koinadugu, Northern Sierra Leone"**

One research assistant will be assisting me in this study in each of the 3 study settings. The study seeks to identify factors and reasons that motivated community resistance towards LFresearch activities. Participants are required to share their reasons for resisting or, in some cases rejecting LF research activities Personal information that will lead to identification of participants will not be included in the interview guide. Information given by participants is anonymous (will not bear names of participants), so they will not be identified. You are free to be part of the study and decide to leave at any point you want. However, be assured that your privacy and confidentiality will be respected as assets of the study. Be assured that the research come at no risk and no cost except the precious time that you will used to respond to questions. You can choose time and place of convenience for our discussion.

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2. Consent form

LF **in Guinea and Sierra Leone: human-rodent cohabitation, control of disease, and seasonality of human exposure to rodents (LAROCS 2)**

The above document describing the meaning, risk, incentives and procedures for the research title **"The Social influence of Ebola on LF activities in Koinadugu, Northern Sierra Leone"** has been explained to me. I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent to participate in this study as a volunteer.

I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent to participate in this study as a volunteer.

Date…………Name and Signature or mark of volunteer……………………………

If volunteers cannot read the form themselves, a witness must sign here:

I was present in community meetings while the nature and purpose of this study were read to the volunteer. All questions asked were clarified satisfactorily regarding participation in this study, and volunteer gave consent to participate in this study. I have been also informed that

Date Name and Signature or mark of witness

………………   ……..……………………………

Declaration of consent for capture, utilization, and processing of your data.

I accept that the data collected in the course of this scientific study will be used by the Principal investigator of this study and may be just for the purpose of this study. I also agree that results of this study may be publish anonymously so that my identity is kept confidential if published.

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Date_________ _________________________
Name and Signature or mark of witness

I certify that the nature and purpose in this research have been duly explained to the above individual.

Date Name and Signature of Person Who Obtained Consent

_______________ _________________________________

3 Interview Guide:

3.1 Interview guide for IDIs and FGDs with study participants.

Themes	**Questions**
Knowledge about LF infection	1) Have you ever had of LF, when was the first and last time you heard of it? (probe for Date if possible) 2) In your view, what actually causes LF? (probe for rodent-human-transmission)? 3) If it is rodents, what kind(s) of rodents causes LF(probe for full description)? 4) What are the symptoms of LF(probe for knowledge of Ebola and Malaria symptoms)? 5) When last did LF affect your community if ever? Do you know of any previous outbreak in and around your communities?

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	6) How can LF be noticed on the population in your community, in your view as a leader? 7) What mechanisms have been put in place to prevent your communities against outbreak of diseases? 8) Why is LF an important Public health concerned to Sierra Leoneans and to your communities to be specific (probe for personal views)?
Ebola reflections as a Motivating factors towards LF activities	9) Do you know what a virus is? If yes, what are the kinds of viruses you know of? 10) Have you ever heard of the LF virus, if No, What about the Ebola virus? 11) If only Ebola is known, how did the previous Ebola outbreak affected cultural activities in your communities? 12) If both are known, what is the relationship between LF and Ebola disease (probe similarities and differences)? 13) Between Lassa and Ebola which one has made more virulent invasion and has impacted longer in your communities? (probe for years of outbreaks and knowledge of LF) 14) As a stakeholder who is fully aware of the community's cultural knowledge and the phenomenology of its members and environment, talk me through the impacts or changes of Post-Ebola disease on the

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	socio-cultural lives of Koinadugu people (probe for specific study locations).
Research activity Resistance	a. 15) How are the observed traces of Post-Ebola, influencing observed community resistances against medical research intervention especially in Koinadugu district? (probe for reasons for community resistance in 2018 pilot LAROCS research intervention) 16) As observed in the pilot study why are women in the lead of catalyzing and some in cases instigating community resistances in response to mentioning medical interventions (probe Mammy queen if possible)? 17) How successful have healthcare interventions, like vaccinations, Ante, and Post-natal care services, Malaria & bed net distribution, HIV interventions have been receptive by community members from the government and NGOs? 18) If resisted (other medical interventions stated above) what are the reasons for communities rejection of research medical intervention in Koinadugu district? 19) In your perspective, how do you think we can navigate fear (resistant) perceptions of community members towards Lassa research medical interventions?

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Respondent's Identity							
No	**Age**	**sex**	**Level of Education**	**Profession**	**Ethnic group**	**Religion**	**Village**

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