SLURC

SCOPING STUDY ON THE URBAN HEALTH SITUATION IN SIERRA LEONE

SIERRA LEONE URBAN RESEARCH CENTRE

A Study Funded by Future Health Systems (FHS)

Joseph M Macarthy (PhD)
Abu Conteh

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List of Acronyms

ADB	African Development Bank
ANC	Antenatal Care
CBO	Community Based Organization
CHW	Community Health Worker
EVD	Ebola Virus Disease
FEDURP	Federation of Urban and Rural Poor
FCC	Freetown City Council
FHCI	Free Health Care Initiative
FHS	Future Health Systems
GDP	Gross Domestic Product
HRH	Human Resource for Health
IDP	Internally Displaced
NGO	Non-Governmental Organization
MNCH	Maternal, Newborn and Child Health
MOH	Ministry Of Health
PHU	Peripheral Health Unit
PNC	Post Natal Care
RNCH	Reproductive, Newborn and Child Health
SALWACO	Sierra Leone Water Company
SDG	Sustainable Development Goals
SLURC	Sierra Leone Urban Research Centre
TBA	Traditional Birth Attendant
WHO	World Health Organization
YMCA	Young Men's Christian Association

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Executive Summary

There is growing concern in recent times about the health burdens faced by urban populations, particularly by those living in informal settlements in Sierra Leone. Many informal settlement dwellers face a variety of health risks which are exacerbated by the rapid urbanization of cities and the subsequent overcrowded living condition of settlements. Though rapid urbanization has negative effects for all in Freetown, those in low-income and disadvantaged groups are disproportionately affected.

Unfortunately, official health statistics and surveys often do not capture sufficient detail on the range of health problems faced by the urban poor who live in slum-like informal settlements. Many health surveys collect data on an aggregate level and are not specifically designed with the urban settings in mind. The lack of disaggregated data on the different informal communities and their residents suggests that appropriate policies which clearly reflect the different demography and health situations may not be in place. Given the dearth of information on how slum living conditions are likely to impact health systems and exacerbate care-seeking barriers, this study was undertaken to provide insights on the current state of knowledge on urban health situation in Sierra Leone. The specific objectives included the following:

- To identify, describe and appraise existing research on urban health in Sierra Leone, with particular attention to informal settlements.
- To identify existing policy frameworks for urban health, and to map the range of institutions involved in urban health service delivery in Sierra Leone.
- To identify gaps and set a research agenda for SLURC's urban health programme

The rationale of the study is to provide baseline information on the state of knowledge on urban health regarding informal settlements in Sierra Leone. The study used a desk review to appraise and analyze available documents on urban health in Sierra Leone. Documents were reviewed using an analysis framework to classify key issues discussed in the texts, gaps in literature, research findings and the methods adopted by the research. Prior to this, a selection process was undertaken to ensure that documents were carefully chosen based on a set criteria. Overall, 44 documents (35 publications/ reports and 9 health policies) were included in the review. Two workshops held with stakeholders allowed the validation of findings including the identification of additional information which, hitherto, were not included in the study.

A majority (69%) of documents reviewed focused on urban health issues in Freetown. This is likely because of the growing environmental problems in the city, rapid urbanization, and the proliferation of informal settlements. Moreover, whilst the review found the use of aggregated data to be more common, the reports did not provide clear understanding of the health challenges faced, the varying burden between different populations and geographic areas, and factors that magnify health risks. While some documents presented barriers to health services as an inherent characteristic of the health inequalities in Sierra Leonean cities, most studies presented health risks in the context of poor environmental and household sanitation, air pollution, and water contamination. The barriers to care-seeking were examined under three main categories as follows: socio-cultural, economic, and health infrastructure. Other significant gaps in the reviewed documents were information pertaining to youths and the disabled. Overall, the review found that studies on urban health in Sierra Leone are relatively few. The need to fill urban health research gaps in Sierra Leone is evident, as there is a wide range of health issues needing inquiry. Gaps in knowledge relate mainly to the depth and types of issues prioritized for the study, compounded by study scale and methodology.

Additionally, the review found that there are several existing health policies in relation to urban health in Sierra Leone. However, more attention seems to have been given to improving the amount and quality of health care delivery, and increasing health care access for poor and vulnerable residents. While it

was difficult to quantify health organizations involved in urban health in Sierra Leone from the list of documents reviewed, the stakeholder workshop showed that in Freetown, there are over sixteen such organizations intervening in informal settlements. However, it was pointed out that overall, the outputs seem very low with very minimal impact on the communities.

Another key finding was that most health interventions are focused on cholera and diarrhoea response, nutrition and child care promotion, the promotion of safe sex, and the treatment of sexually transmitted infections. Moreover, it is found that while a range of actors provide urban health-related services, there is a lack of coordination between stakeholders, with quality standards for providing health services often not being met.

With regard to setting its research agenda, it was suggested by the different stakeholders that SLURC not only address the research gaps identified in the review but that the center also disseminate information to stakeholders, helping them to intervene in informal settlements in a way that is appropriate and addresses community priorities.

Section I: Introduction

1.1 BACKGROUND TO THE STUDY

There is growing concern about the health status of urban populations in Sierra Leone, particularly people living in informal settlements. Many informal settlement dwellers face a variety of risks including those associated with poor sanitation, air pollution and inadequate water supply which serves as precursors for the easy spread of disease. The risks are exacerbated by the overcrowded living condition of settlements, poor housing, poor waste disposal systems and the burning of wastes especially in the major dumpsites situated close to informal settlements. However, because data on the scale of risks faced by informal settlement dwellers are still, limited, it has proved increasingly difficult for the government and aid organizations to plan and coordinate appropriate responses to mitigate the health burden of urban dwellers.

While informal settlement dwellers in Sierra Leone are sometimes provided with formal healthcare, it is not clear whether the services they receive are appropriate, affordable, and of quality. Moreover, while data on population health is generally poor for all social and economic groups in Sierra Leone, the lack of data at local levels in urban areas has been identified as a major hindrance to answering questions critical to the health needs of the urban poor, who constitute the majority of urban dwellers in the country (Osuteye, E., Johnson, C. and Brown, D, 2007: 29). The lack of information on the health condition of those in informal settlements prevents a clear understanding of policy and programmatic actions needed to address the most pressing issues related to urban poor. As many countries are already under pressure to not only meet the growing health care needs but to also tackle health inequalities of populations, and to take action on such important global development agendas as the SDGs, there is need to develop a sound understanding of both the living conditions and the level of deprivations informal settlers face as well as, how these issues affect overall health outcomes in the city (Barrie, S and Border, P, 2017; Ken et al., 2006). As this will require collecting and analyzing “disaggregated data on urban health and its determinants” as well as taking actions (informed by best practices) to deal with it, the need for carrying out a scoping study becomes very critical.

In Freetown, official health statistics and surveys often do not capture sufficient details on the range of health problems faced especially by poor urban households who frequently live in slum-like informal settlements. Moreover, because some parts of the informal settlements are hard to reach owing largely topography, it is difficult to have a comprehensive repository of data on whole communities. Since most health surveys only collect data on the health status of a particular disease on an aggregate level, many are not specifically designed with the urban poor in mind. This inhibits plans for equitable and targeted delivery of health care services. The lack of disaggregated data also serves to limit access health care and social services to those left out in data collection processes as they will not be considered during the drafting of policy. While the Sierra Leonean government, with international support, is now taking action to deal specifically with public health challenges brought by the Ebola crisis, as well as prevent a reoccurrence of the epidemic, what seems missing is a clear understanding of how deprived and overcrowded living conditions (as with many informal settlements) give cause to the outbreak and transmission of diseases. With over 45% of Sierra Leone’s urban population projected to live in Freetown by the year 2028, there is the fear that unless urgent action is taken now to understand and reduce existing vulnerabilities, health problems are likely to be continually experienced, on a larger scale.

1.2 AIM OF THE RESEARCH

The aim of this review is to establish what evidence exists on urban health in Sierra Leone, including identifying evidence on how urbanization, citywide processes and trends, the physical environment of places of residence, and health service inequities and inefficiencies are linked to health problems in urban areas. The analysis will highlight the gaps in knowledge as they relate to poor and vulnerable groups. More specifically, the study will highlight the gap between existing knowledge on urban health systems as they relate to informal settlements and what is yet to be understood. Specific attention will be given to exploring how the environmental condition of settlements influence health outcomes that affect the population of informal settlements with implications for the city. With local information now becoming increasingly recognized in resulting in better health care services, there are recurrent calls to restructure the data collection processes in ways that not only draws on the local level knowledge and capacity but that also prioritizes local level action and use of the information gathered (WHO, UN Habitat, 2016). Other aspects of the analysis will map the actors involved in health service delivery in urban areas, and policies related to aspects of urban health in Sierra Leone. By establishing the state of existing knowledge and policy on urban health this review will contribute to setting the research agenda on urban health, and provide direction to SLURC's future research activities with the Future Health Systems Consortium (FHS).

1.3 RESEARCH OBJECTIVES

The objectives include the following:

- To identify, describe and appraise existing research on urban health in Sierra Leone, with particular attention to informal settlements.
- To identify existing policy frameworks for urban health, and to map the range of institutions involved in urban health service delivery in Sierra Leone.
- To identify gaps and set a research agenda for SLURC's urban health programme

1.4 RESEARCH QUESTIONS

This study was undertaken to answer the following research questions:

- What is the state of available knowledge on urban health in Sierra Leone, especially in informal settlements?
- Which organizations are involved in urban health delivery in Sierra Leone?
- How are urban settings included or considered in existing policy frameworks?
- What are the gaps in existing knowledge, evidence and policy?
- What are the opportunities for SLURC's future research on urban health?

Section II: Methodology

2.1 INTRODUCTION TO STUDY METHODOLOGY

We carried out a scoping review to identify and analyse the evidence base on urban health. Scoping reviews and systematic reviews differ in that systematic reviews ask narrow questions with the aim of interrogating results (and are often accompanied by meta-analyses to combine effect sizes), whereas scoping reviews ask broader questions in order to provide an overview of evidence and gaps (Colouhoun et al 2014, Miake-Li et al 2016). This review was conducted in 3 parts: 1) a review of research and evidence 2) a mapping of actors and policy 3) stakeholder validation.

2.2 EVIDENCE REVIEW SEARCH STRATEGY

To identify existing evidence on urban health in Freetown research papers were sought from the following sources:

- Electronic databases carrying published resources (Google Scholar, Medline and Web of Science)
- Data repositories by NGOs working in the health sector
- Documentations held with the Ministry of Health and other relevant environmental health agencies

Google scholar, Medline, Web of Science and JSTOR were searched between 2002 (when the civil war ended) to November 2017. Searches were limited to English language and journal articles that could not be accessed were excluded. Both peer reviewed and grey literature were included. Search terms included: urban health, environmental health, access to health, urbanization and health, urban health disaster, sanitation and health, informal urban health risks.

2.3 SELECTION CRITERIA

An inclusion and exclusion process was used to identify relevant evidence and eliminate studies that were deemed not useful for addressing the research objectives. The following guiding themes were used in the selection of research documents:

1. Published between 2002 and 2017
2. Studies or reports that contain data on the main cities, (Freetown, Makeni, Bo and Kenema), reflecting the four regions of Sierra Leone
3. Studies or reports containing:
    - broad descriptions of the urban health conditions, the environmental risk factors and, the health outcomes for disadvantaged groups living in informal settlements
    - broad descriptions of specific health problems, health disparities and the relationship between existing health care services and community health needs.
    - an assessment of the quality, efficiency and access to health services provision and use in urban areas
    - descriptions of the state of health and sanitation infrastructure in urban areas and how they impact on health

Studies were included if they met all three criteria. Details of the search results including the inclusion and exclusion data are provided in Table 1 (see Section 3.1).

2.4 DATA EXTRACTION - COMPILING, CHARTING AND SORTING THE DATA

The information contained in each of the primary research documents/reports identified for inclusion were reviewed and data was extracted on: study location, study methods, study findings. Each document was assessed in the form of a table using a common analytical framework to collect standard information. The data was then analysed and arranged according to key themes consistent with the objectives of this scoping study. The specific issues explored include the geographic spread of evidence, socio-demographic information about study participants, health risks identified, and barriers to access of health services (including socio-cultural, economic, and policy) and barriers to infrastructure services.

2.5 POLICY ANALYSIS AND PLANNING

In addition to the review of research evidence, recent policies relating to health were identified. This evidence was found searching the MOHS website for relevant policies and Google for Sierra Leone health policies. Additionally, Save the Children, Concern Worldwide, and WHO were contacted for relevant policies. The documents were reviewed to understand what the government currently prioritizes in terms of health policy, planning and programming for the country. In particular, the documents were analyzed in terms of the specific health issue(s) they seek to address and whether or not they make specific reference to urban areas and informal settlements. The documents were reviewed further, in terms of the kinds of actions they propose for dealing with some specific health issues; how health care delivery in the country is organized, and; the role of the central government in health services management. Policy analysis was included as it illustrates not only the framework for government's public healthcare provision but also its coordination, of lack thereof, with actors in the health sector. In effect, the policy review allowed an assessment of how the key health policies have influenced health care delivery and access in urban areas in Sierra Leone.

2.6 STAKEHOLDER AND SCOPING STUDY VALIDATION WORKSHOPS

To supplement the information obtained in the study review, two workshops were held with participants from informal settlements, government ministries, departments, and agencies, the Freetown City Council (FCC), civil society organizations, NGOs and CBOs working in the health sector. The first workshop aimed to inform participants about SLURC's on-going scoping study on urban health and its intent to set a research agenda to fill knowledge gaps while the second workshop focused on validating the initial findings of the scoping study and identifying if there were other key issues that should be prioritized by SLURCs in its future research activities. The two workshops were deemed necessary as they allowed for the identification of additional information on informal settlements which had not been identified from published evidence. Contributions by key officials from both the Ministry of Health and Sanitation (MOHS) and the Freetown City Council (FCC) were useful in providing additional ideas that strengthened the findings of the scoping study.

2.7 GEOGRAPHIC SCOPE OF THE STUDY

The study focused on urban settlements in Sierra Leone that are frequently associated with environmental problems with severe health implications for poor and disadvantaged groups. The main settlements on which relevant documents were reviewed include Freetown, Bo, Makeni and Kenema, the major cities in Sierra Leone.

Freetown
Located in the western urban region, Freetown is the capital of Sierra Leone. With a population of 1,055,964 (2015 Population census), Freetown is home to diverse ethnic groups and cultures. Apart from being the seat of government, Freetown hosts most economic activities in Sierra Leone. During the civil war between 1992 to 2002, Freetown experienced a high influx of internally displaced persons (IDPs) from the provinces. Coupled with natural population increase and the continued shift of population to urban areas, the proliferation of informal settlements in Freetown is currently a major issue. As informal settlements are mainly occupied by poor and marginalized groups who lack basic services and infrastructure, health risks affect residents disproportionately.

Bo
Bo is one of the foremost districts in Southern Sierra Leone with Bo city being the largest urban settlement. With a population of 195,081, Bo city is the second largest urban settlement in Sierra Leone (Sierra Leone Census report 2015). Unlike Freetown, Bo has very limited industrial and service sector activities. It is however, the main commercial hub for the south-eastern part of the country, connecting other cities and towns like Kenema, Pujehun and Moyamba. Though Bo is less congested than Freetown, the absence of basic amenities is a major cause of environmental health risks which disproportionately affect poorer households. Additionally, the city also demonstrates health inequities between rich and poor households (Kanu, 2009; Save the Children Federation, 2015).

Makeni
Located in Bombali district, Makeni is the main city in the northern province of Sierra Leone. With limited industrial activities, trading is the main livelihood engagement of the residents. The population of Makeni is 173,058 (Sierra Leone Census report 2015).

Kenema
Kenema City is the main provincial headquarter in the eastern region of Sierra Leone. The city is located in Kenema district which is well known for agriculture and trade in diamond. It is also a hub for a variety of businesses. The district has a total population of 609,891, with 271,699 living in the city of Kenema (Sierra Leone Census report, 2015).

2.8 LIMITATIONS

This study was limited by the availability of urban health research evidence in Sierra Leone. While we received support from our colleagues in both the JHU and the IDS, it was still, difficult to access published research in restricted online resources. Moreover, as organisations working in Sierra Leone do not always make their reports public we cannot be certain we have identified all existing reports and publications on urban health in Sierra Leone. Therefore, the review may not be entirely comprehensive. However, we have balanced this limitation by conducting two stakeholder workshops to validate our findings and identify priorities and gaps.

Section III: Results and Discussions

3.1 INTRODUCTION

This section discusses the results of the scoping study. A total of 3,044 search results were attained from the search process and of these 44 were included in the final review. The final 44 included 35 studies reporting evidence on urban health and 9 health related policies (see Table 1).

Table 1: Study Inclusion Procedure

Search results	
Total number of records retrieved	3,044
Excluded (did not meet inclusion criteria or were not accessible)	3,000
Final inclusion	
Total number of records	44
Total number of policies	9
Total number of studies	35

3.2 GEOGRAPHIC SCOPE OF RESEARCH

Examining the geographic spread of research coverage helps to ascertain which particular places research efforts have been concentrated over time, and which areas have been neglected in terms of research.

As illustrated by Figure 1, most of the reviewed research papers (69%) on urban health focused on Freetown. Figure 1 shows that (11%) of the reviewed research has been carried out in Bo city. However, several of these works are small scale studies which focused on a specific health problem in a given community. These relate to issues about low water quality and access, waste collection, poor sanitation and the incidence of such non-communicable diseases as diabetes, on a small scale. While only few studies (3%) were found on Makeni, no specific study that met the study criteria was found

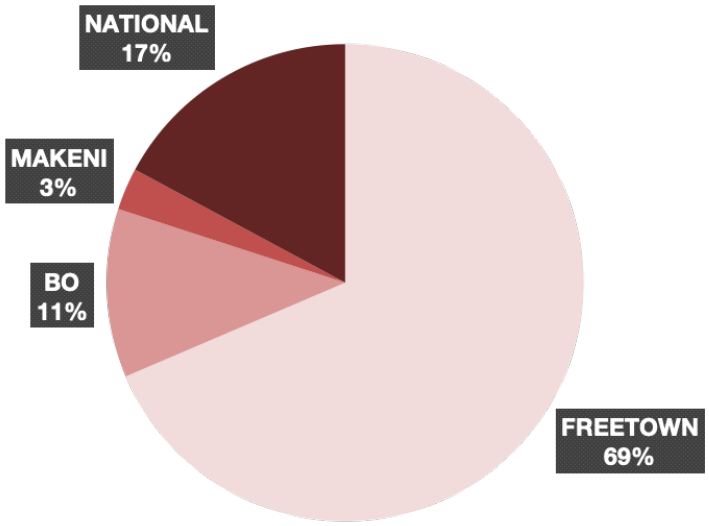

Figure 1: Scope of Research Coverage

on Kenema. There were however, a few nationwide studies (17%) that had data on all the four major cities (including Kenema) in Sierra Leone. The nationwide studies did not focus on city specific trends but contained data which was disaggregated by urban-rural settings.

3.3 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STUDY PARTICPANTS

Findings in the analysis (see Figure 2) indicate that 8% of studies focused on health problems affecting women and 6% on children. A few others (9%) however, concurrently explored health issues of interest to women and children. However, only 3% of the studies reviewed explored health concerns of the disabled, while 6% focused on pregnancy related health problems. This is surprising, since the UN ascribes Sierra Leone with high incidence of infant and maternal mortality. For instance, in 2012, UNICEF rated maternal mortality in Sierra Leone at 857 per 100,000 live births, which is still very high. Children are also privileged in a couple of the existing reports owing partly, to the country's high infant mortality rate and in part, because of their exposure to many of the environmental health risks in their neighborhoods. Already, a number of reports tend to associate the poor living conditions of people in informal settlements and the health risk faced by infants in such communities. One such report by UNICEF (2016) has signaled that if urgent actions are not taken now, Sierra Leone is likely to miss out (by 2-3% by 2030) achieving on Goal 3 of the Sustainable Development Goals relating specifically to under five mortality targets. Unsurprisingly, infant and under five mortality rates (120 per 1,000 live births) are still very worrying in most areas in Sierra Leone.

While most age groups were given attention to in the reviewed literature, only one study focused specifically on analyzing the reproductive health problems faced by disabled women. This reflects the generally limited studies in Sierra Leone which focus on exploring the health problems affecting the disabled population. Moreover, only one study examined the relationship between adult males and females on the prevalence of diabetes. Lastly, no particular study gave attention to the health problems affecting youths. This is in spite of the high levels of unemployment and deprivation faced by the youths which have potentially serious health implications. Alemu (2016) has noted that because nearly 60% of youth in Sierra Leone are structurally unemployed, with a significant portion living in extreme poverty, they are likely to face difficulty in gaining access to health care services in the country.

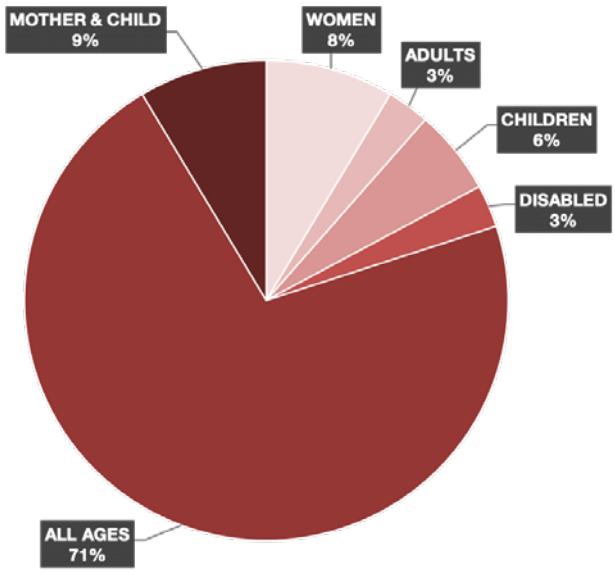

Figure 2: Socio-Demographic Coverage of Research

3.4 HEALTH RISKS OF URBAN SETTLEMENTS

This section describes studies which reported on health risks in urban areas. Out of the 35 included studies, 25 were concerned with health risks. Where possible, specific attention was given to the health risks faced in informal settlements. While many studies reported on city-wide health risks, some specifically detailed those in informal settlements. This was prioritized as there are large disparities between the rich and low-income households in informal settlements (Marx, B., Stoker, T and Suri, T, 2013). For each study, the geographic location of the study area, the research objectives, and the health risks outlined were noted (see Table 2).

Table 2: Urban Health Risks

No.	Title of study	Settlement	Health Risk	Author & Date
FREETOWN				
1	Cholera Epidemic Associated with Consumption of Unsafe Drinking Water and Street-Vended Water—Eastern Freetown, Sierra Leone.	Freetown: Kuntorloh and Wellington	Contamination of water; poor sanitation; unsafe food and water preparation practices (in households and purchase from street vendors)	Nguyen, V.D. et al (2012)
2	Environmental and Health Impact of Solid Waste Disposal in Developing Cities: A Case Study of Granville Brook Dumpsite, Freetown, Sierra Leone	Freetown	Poor waste management; air/smoke pollution; water contamination; infections from industrial and medical wastes (e.g. syringe); vector borne diseases	Sankon, F.P et al (2013)
3	Ebola Emergency Response: Evaluation and learning summary	Freetown: Slum communities	Mobility; Challenge of community engagement during health emergencies (for Ebola)	Y-CARE International (2016)
4	Rapid Needs Assessment and Freetown WASH consortium response update	Freetown (city scale)	Flooding; poor water and sanitation	Office of the National Security, Freetown City Council and Freetown WASH Consortium (2015)
5	Monitoring the levels of toxic air pollutants in the ambient air of Freetown, Sierra Leone	Freetown: Kingtom dumpsite, Kissi industrial area, Eastern police traffic area and Spur Loop	High risk of air pollution	Taylor & Nakai (2012)
6	Assessment of Anemia Knowledge, Attitudes and Behaviors Among Pregnant Women in Sierra Leone	Freetown: Five HFs in the eastern, central and western areas	High prevalence of anemia in pregnant women (from sample of 171 women); low knowledge on anemia	M'Cormack and Drolet (2012)

7	Wastewater Effluents at Sierra Leone Bottling Company Limited: Composition, Assessment and Removal Efficiency of Physico-chemical Parameters	Freetown: Dwarzack and New England	Industrial pollution; water contamination	Beah, J.M (2017)
8	Pollution along the Congo Town bay and Connaught Hospital bay, Freetown, Sierra Leone	Freetown: Congo town and Connaught hospital Bays	Poor waste management and pollution; water contamination (for humans and aquatic)	Frazer- Williams et al (2013)
9	Risk Assessment of The Kingtom And Granville Brook Dumpsites in Freetown, Sierra Leone	Freetown: Kingtom and Granville Brook dumpsites	Poor waste management; air/smoke pollution; water contamination; infections from industrial wastes; vector borne diseases	Frazer-Williams (2015)
10	A Situational Analysis of Waste Management in Freetown, Sierra Leone.	Freetown: Kingtom, Granville Brook and other illegal dumpsites	Poor waste management; pollution; high risk livelihoods depending on scavenging	Gogra et al (2010)
11	Freetown Wash Consortium: Phase two programme final report	Freetown (mainly urban slums)	Poor coverage of water supply; poor sanitation and hygiene	Nest Builders International (2016)
12	Community profiling and enumeration report	Freetown: Susan's Bay, Mabella, Crab Town, Kolleh Town and Gray Bush (CKG) and Goderich (Funkia).	High disease burden (Malaria, cholera and diarrhea); poor sanitation of toilets; widespread use of public toilets, (especially in Susan's Bay and Funkia), hanging and flush toilets emptying their wastes into the sea/ nearby streams; houses situated along stagnant waters and human wastes; risk of flooding	YMCA, CODOH- SAPA & Y-CARE INT. (2016)
13	Community profiling enumeration vulnerability and capacity assessment report	Freetown: Cockle Bay, Oloshoro, Moa Wharf & Colbot.	Poor sanitation/waste management- Household wastes disposed of mainly through open drainages, stagnant waters around houses, poor sanitation of toilet: wide use of hanging and flush toilets connected to the sea; risk of flooding	YMCA and FEDURP (2015)
14	Solid Waste Management Study for Freetown, Sierra Leone	Freetown (city scale)	Poor waste management: inefficient garbage collection and disposal, open waste burning, illegal dumping, littering of households, inappropriate disposal of industrial and medical wastes	Sood, D (2004)
15	Cholera Prevention and Domestic Water Management in Freetown	Freetown	surface and ground water contamination by human wastes, low quality of national water supply during transmission to distant locations away from treatment site, depositing of wastes from hillside communities into downstream water sources	Action Contre La Faim Sierra Leone (2008)

16	Teenage pregnancy and implications on child survival amongst mothers attending a clinic in the East-End, Freetown, Sierra Leone	Freetown	Delayed health care seeking by teenage mothers and their children, home deliveries, malnourishment of children and diarrhoea, limited knowledge of remedial care for child illness	Runsewe-Abiodun, T.I and Bondi, S.F (2013)
17	Vulnerability and Capacity Assessment of Dwarzack Community	Freetown: Dwarzack community	Poor sanitation: few functional public toilet facilities, poor waste disposal system, clogged drainage with risks of flooding, risk of erosion, poor personal hygiene and intermittent outbreak of cholera	YMCA, ONS, YCARE INT, SLRCS & CONCERN WW (2012)
18	Freetown Urban WASH Consortium sanitation evaluation	Freetown	Poor sanitation: inadequate hand washing facilities, wide use of public and shared sanitation facilities, manual emptying of toilets and exposure to diseases, inadequate sludge disposal facilities	Urban WASH Consortium (2012)
19	Prevalence of Malaria and intestinal helminth co-infection in children presenting with anaemia in Freetown, Sierra Leone	Freetown: Ola During Hospital	high prevalence of anaemia among under 5 children co-infected with malaria and worms, poor sanitation and practice of not sleeping under bed nets not sleeping under bed nets causing malaria, worms and anaemia	Kamara, L. (2013)
20	Microbiological and Chemical Quality of Packaged Sachet Water and Household Stored Drinking Water in Freetown, Sierra Leone	Freetown	Risk of cholera associated to drinking contaminated sachet water, risk of contamination higher at production and sales points, household water at significant risk of contamination than the sachet water.	Fisher, M.B. et al (2015)
BO				
21	Prevalence of diabetes in rural and urban populations in southern Sierra Leone: a preliminary survey	Bo city and Ngalu village	Limited exercise; unhealthy diets; obesity; diabetes	Ceesay, M.M. et al (2007)
22	Urban Sanitation in Bo City: A Study on Knowledge, Attitude and Practices	Bo city	Food and water contamination, poor Sanitation services, poor waste disposal and impact on health	Bawoh, B.A. and Koroma. S. (2015)
23	Water quality associated public health risk in Bo, Sierra Leone	Bo city: Kulanda Town section	Water contamination	Jimmy, D. H (2012)
MAKENI				
24	Assessment of Groundwater Quality in wells within Bombali district, Sierra Leone	Makeni city (including other towns in Bombali district)	water contamination & poor sanitation	Nwamaka, K.I and Akudo, D.A (2014)
NATIONAL/MULTI-CITY				
25	Traumatic Injuries in Developing Countries: Report From a nationwide Cross-Sectional Survey of Sierra Leone	Nationwide survey (including four study settings)	traffic accidents and injuries, leading to disability	Stewart et al (2013)

As illustrated by Table 2, most of the studies were concerned with Freetown or settlements within Freetown (n=20). Three studies were concerned with Bo, one with Makeni, and one was nationwide. The

findings in Table 2 are further discussed individually for each of the cities studied.

Freetown

The available evidence shows that Freetown faces varied health risks and vulnerabilities. Health risks mostly identified by the reviewed studies relate to poor waste collection and disposal systems, poor sanitation, water contamination, air pollution and flooding related health problems. Below, we describe common health risks found across Freetown, as well as those identified specifically in informal settlements.

Health risks related to environmental pollution and flooding were commonly investigated in the reviewed studies. Studies point out that in Freetown, pollution takes the form of poor waste disposal, emission of fumes, and underground water contamination. Gogra et al (2010:132) asserts that:

Hazardous wastes, which can be in the form of solid, liquid, sludge or even gas, contain highly persistent inorganic or organic chemicals and compounds with acute and chronic (immediate, short-term, as well as long-term) impacts on human/public health and on environment; with direct contact (such as during handling of waste) been the most common exposure route (Gogra et al 2010).

Gogra et al, attribute these waste management problems to poor waste disposal methods and institutional weaknesses to handle the accumulated waste piles and collect them on daily basis. This relates to the findings of a study by Sankoh et al (2013) detailing health conditions as malaria (because of waste-related mosquito breeding grounds), chest pains, diarrhea, cholera, irritation of the skin, nose, and eyes as some of the health impacts of poor waste burning and disposal practices on the communities around the Granville Brooke dumpsite. Some waste materials decay during the rainy season and flow into water sources.

A major environmental health risk affecting the city is air pollution caused by fumes emitted from vehicles and the burning of wastes (e.g. in the Kingtom and the Granville Brook dumpsites). In the dry season, the smoke from the incineration of the dumpsite is an important source of air pollution for people living far from the dumpsite. A recent study by Taylor (2015), which analyses the impact of urban traffic on ambient air quality, identifies respiratory tract infections, cardiovascular diseases, and infections among sensitive populations as the major health risks currently faced in Freetown.

There was some suggestion that women are usually more vulnerable to infections because of viruses associated with flies prevalent in their neighborhoods owing to waste accumulations and the poor toilet conditions. It was reported that women use toilet facilities more frequently and they are likely to be exposed to infections if toilets are in unhygienic conditions. Children are particularly at risk because they play around drainages that flow with urine and feces (UNHABITAT 2006). This is exacerbated after intense rainfall and the flooding which follows due to poor and inadequate drainage ways.

Water contamination was presented as a health risk to communities in Freetown in a couple of studies. Because of limited access to the national supply grid, the Guma Valley Water Company, many people rely on alternative water sources (springs boxes, wells, sachet water, etc). Contamination often occurs to underground water through infiltration of faecal wastes by nearby toilets. A study by Action Contre La Faim (2008) describes how contaminants interfere with water bodies like springs believed to be pure for communities, which present risks of cholera.

Springs are common in the hills of eastern Freetown. People believe that the water from spring is safe so they would always try to access this water in priority if they do not have Guma access. The only problem is that in most of the cases these springs are located along streams or river beds, and the water is actually resurgence from the river rather than pure underground water. All the rivers around Freetown are contaminated, therefore for this reason a significant number of "springs" are contaminated. People, however, still trust these "springs" and drink it since they believe it is underground water (Action Contre La Faim, 2008:26)

A study by Nguyen et al (2012) which investigated causes of a cholera outbreak in the Eastern part of Freetown outlined risks of contamination within the municipal water supply infrastructure, as well as from the drinking of unsafe street vended water, and water contaminated during and after household storage.

"Our investigation suggested three ways in which improved water supplies in Freetown could have been rendered unsafe. First, disruption of the municipal water system with frequently observed leaking pipes, widespread illegal connections for household use, and frequent power outages may have resulted in reduced pressure and back siphonage, creating opportunities for the introduction of fecal contamination into the distribution system before water reached downstream taps. Second, water from improved sources may not have been adequately chlorinated to sustain effective chlorine residual levels throughout the distribution system. Third, drinking water could have been contaminated during transport to homes or during household storage" (Nguyen et al, 2012:521).

Fisher et al (2015) compares levels of contamination between bough sachet water and household stored water (e.g. wells, springs etc). Their results indicate that contamination of sachet water does occur at some production facilities, but contamination risks are much higher during sale by street vendors. However, while packaged water does have issues of quality, stored household water (and the sources it is derived from) are significantly more contaminated than packaged generally.

At least two studies presented findings on anemia, specifically on pregnancy related anemia (M'cormack and Drolet, 2012) and for children under five years of age (Kamara 2013). Anemia risk was identified especially in low-income women who cannot afford nutritious food or meet sufficient iron intake requirement during pregnancy. Although the prevalence of this risk in Freetown is not clear at the moment, it does seem to be very worrying, due to its direct cause of 3-7% of maternal deaths in the city (M'cormack and Drolet 2012). Kamara (2013) reports that the highest levels of anemia were found among children co-infected with malaria and worms, and those conditions were associated with children from low family income backgrounds who do not sleep under insecticide treated nets and who lived in areas with poor sanitation.

Low family income of less than 50 USD per month, children not sleeping under insecticide treated nets, and the use of pit latrines and other unhygienic forms of sewage disposal, are strongly associated with an anemic child having malaria- helminth co infection (Kamara 2013:42)

A number of studies focused on health risks specifically in informal settlements (see map in Figure 3). As mentioned earlier, malaria is linked to waste accumulation and poor waste disposal which allows mosquitos to breed. Sankoh et al's (2013) study of the environmental health impacts of the Granville Brook dumpsite showed that while health hazards (malaria, chest pain, cholera and diarrhea) affects far away city residents, it is the nearby residents (Colbot slum community) that are more seriously affected. The above study features malaria as the most frequently complained illness by residents in the Colbot community.

The dumpsite in a nearby community has many impacts…the dumpsite is the breeding place for disease vectors, cause diseases, and makes the place dirty…The location of the dumpsite has considerably made the residents to suffer from various diseases with malaria being the most prevalent (Sankoh et al 2013, P669).

A major problem in informal settlements was the acute lack of basic services, including problems of accessing water and the lack of sanitation facilities. A study by UN-HABITAT (2006) in one of the biggest slums in Freetown, Susan's Bay, provides a vivid description of the sanitation challenges in the community:
The latrines that are properly maintained within the settlements are usually the ones residents have to pay a fee to use. Residents who cannot afford the charges and do not have a private latrine or toilet

defecate in the open spaces or by the sea. At night people defecate in polythene papers and throw them on the open drains, sea or garbage heaps. Such practices expose other residents to more health hazards, the most affected being children who often play around the dumping area (UN-HABITAT, 2006).

The general problem of waste disposal can have severe consequences in informal settlements. A study by the YMCA et al. (2012; 2015) pointed to inappropriate waste disposal practices, mostly in the form of open disposal in drains, as contributing to the accumulation of waste and clogging of open drains, which may expose communities to other risks, such as flooding and associated health risks. This is clearly the case for Dwarzack, one of the hillside informal settlements in Freetown, which has experienced a number of flooding disasters and other health risks in recent times.

Solid waste disposal is a major development challenge to residents of Dwarzack; and the commonest way of disposing domestic waste is throwing them into the nearby drains… Regular cleaning around the settlement and cleaning of choked drains are not commonly practiced in the settlement. The high incidence of choked drains is one of the reasons why flash flooding along the main street in the community usually occurs in the rains (YMCA et al 2012:21).

A recent related study by YMCA and FEDURP (2015) indicates that poor waste disposal practices in Dwarzack are similar to other informal settlements, such as Cockle Bay, Oloshoro, Moa Wharf and Colbot. The study identifies a lack of environmental sanitation awareness (e.g. about disease vectors, stagnated water, etc) as a factor that drives communities to indiscriminately dispose of waste.

Health risks related to water contamination (e.g. cholera and diarrhea) were also identified as a particular problem in informal communities. Often, the risks are more widespread in unstable and deprived communities, who are located either along hillslopes or in low-lying coastal fronts. A study by Beah et al (2017) based its findings on contamination of local water sources by industrial wastes at Dwarzack and parts of New England[1], two of the deprived hillside communities in central Freetown. The study found that the release of effluents from the Sierra Leone Bottling Company into nearby streams and waterways are a source of contamination for the environment and community. It also shows that polluted wastewater is discharged into nearby streams, as that the company does not recycle its wastewater to reduce the release of contaminated water. The study highlights that because water scarcity is usually a challenge to both the Dwarzack and New England communities, some resident vegetable farmers are

1 Dwarzack and New England are hillside communities in the center of Freetown surrounded by steep hills. They experience acute water shortage and related sanitation problems

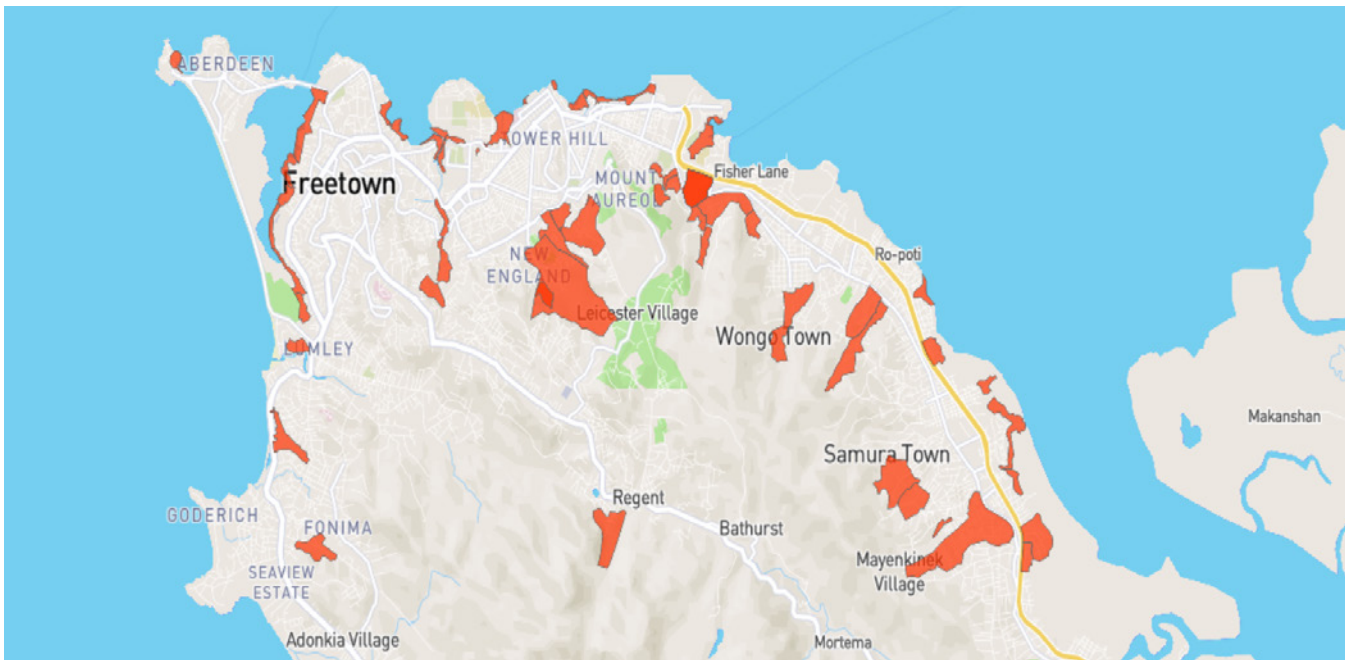

Figure 3: Map of Freetown Showing Some Informal Settlements
Source: FEDURP (2016) Citywide informal settlement profiling (unpublished)

often compelled to use the discharged waste water either for watering their plants or for other domestic purposes.

An earlier study by Frazer-Williams et al. (2013), had similar findings, and described how the bay nearby Congo Town and the Connaught hospital serves as an emptying site for major drainage systems in the Freetown municipality. The bay has huge concentrations of wastes and pollutants (metal tins, scraps and domestic sewage), causing corrosion and contamination of soil and water which has negative effects on the marine ecosystem and the health of people in the nearby informal settlements.

Bo

An important health risk in Bo city is the acute water shortage faced by most of its residents. While the main source of drinking water for most households is private-owned water wells, access for some low-income households is sometimes, a major challenge. Additionally, the quality of water from easily accessible wells is a key concern. Jimmy et al (2012) found that in Kulanda town which is one of the congested communities in Bo, 75% of all water sources for drinking are below the WHO's safe drinking water criteria. Moreover, most of the wells are less than 50 meters away from toilets. Therefore, fecal contamination is identified as one of the greatest risks related to drinking water in Bo city.

This study conducted a quality assessment of the main water resources in Kulanda Town, Bo, Sierra Leone. Only 38.9% of the water sources met the WHO microbial drinking water safety requirements (WHO 2008; EPA2009a, b). Only 30% of the wells that were reported to be used as drinking water sources were found to be safe (Jimmy et al 2012: 248)

Similar to the risk of water contamination highlighted in an earlier study (Jimmy et al 2012) in Bo city, another recent study, (Bawoh and Koroma, 2015) further links water contamination in many households to intermittent cholera outbreaks in the city. The 2015 study asserts that protected wells are the main source of drinking water for most households, which have increased risk of faecal contamination by nearby toilets. Poor waste management is also pointed as a risk that confronts residents in Bo city. In particular, the study shows that the problem of huge waste accumulation in Bo city and the limited capacity of the city authorities to address it has been exacerbated by the rapid urbanization of the city and the poor environmental practices of the local population. Another challenge highlighted is that households generally lack sufficient knowledge about waste management, which is reflected in the inappropriate disposal of their wastes, a point that is further emphasized here:

"Many households in Bo City are still continuing to dispose of their solid waste in an inadequate manner. 39.3% of households in Bo state that they are burning their waste, 29.5% are burying their waste and 23.5% are putting their waste either in the drainage system, their gardens or in other adjacent areas…" (Bawoh and Koroma 2015:5).

Additionally, diabetes was identified as a major health risk in Bo city. According to Nanyonga et al (2007), limited physical activity and increased body weight are conditions that expose a number of residents in Bo to the risk of diabetes.

Makeni

An independent assessment of the urban water situation in Sierra Leone by ADB (2015) identified water quality as an important issue for Makeni and its immediate settlements. A significant proportion of the city's residents rely on water wells both for drinking and domestic use. One of the reviewed documents in this scoping study (Nwamaka and Akudo, 2014) had generated findings predating the ADB assessment, indicating that some water sources contain contaminants that make it unfit for drinking purpose.

"…more than half of the water samples analysed did not meet the WHO standards for faecal coliform and non-coliform for potable water. Faecal coliforms may indicate the presence of pathogens mainly bacteria, which are responsible for water-related diseases such as cholera, diarrhoea, typhoid and other gastro-intestinal disorders……..."(Nwamaka and Akudo, 2014).

It was however, difficult to confirm whether any study has been done to determine the scale of vulnerability of people to such water-related diseases. As in the case of Freetown, risks of motor accident injuries and disabilities are also present in Makeni.

3.5 BARRIERS TO URBAN HEALTH SERVICES

Out of the 44 studies, 10 were identified as relating to barriers limiting access to health care services (see Table 4). We classified these barriers into three main areas as follows: socio-cultural, economic, infrastructure. Socio-cultural barriers include those posed by an individual's beliefs, perceptions, and knowledge which influence health seeking, as well as social pressures and boundaries (e.g. stigma, ethnicity, sex, disability etc.) that prevent certain groups of people from having access to health care. Economic barriers refer to factors (e.g. cost, poverty etc.) that make it difficult for poor urban households to access health services. Infrastructure barriers explain the weakness in infrastructure provision, thereby limiting access to improved health and sanitation services. The health impacts of these infrastructure barriers were highlighted in the previous section, in this section we describe the underlying drivers, e.g. of access and ownership of a toilet, poor waste disposal and toilet emptying facilities. Policy barriers are dealt with separately in section 4 which reviews health policies in Sierra Leone.

Table 3: Barriers to Urban Health Care

No	Title of study	Study setting	Barriers to care	References
1	Access to health care, reproductive health and disability: A large scale survey in Sierra Leone	Freetown, Bo, Kailahun and Koinadugu districts.	Barriers to access formal services (for disabled); care provided is not tailored to their needs (disability blind' services	Trani,. et al (2012)
2	Barriers to Uptake of Emergency Obstetric and Newborn Care Services in Sierra Leone: A Qualitative Study	Koinadugu, Bombali, Bo, Kono, Freetown and W. Rural	Barriers to access to formal services for pregnant women: cultural and religious beliefs, direct and indirect cost of service, long wait in queues	Oyerinde, K. et al (2012)
3	Health-seeking behaviour in the era of free healthcare in urban slums in Sierra Leone	Freetown: Slum communities at the back of Ola During hospital	Barriers to formal healthcare: high costs - direct and indirect specifically, for informal settlements	Wurie et al (2012)
4	Health-care availability, preference, and distance for women in urban Bo, Sierra Leone	Bo city	Distance to public health care (e.g. women - to access free health care)	Fleming, L.C. (2016)
5	Improving Access to Surgery in a Developing Country: Experience from a Surgical Collaboration in Sierra Leone	Connaught hospital Freetown	Limited availability of surgery; high costs of surgery, low availability of equipment and surgeons	Kushner, A.L (2010)
6	Willingness and ability to pay for Health Insurance among informal sector workers in Sierra Leone	Freetown, Makeni, port Loko, Magburaka, Kambia and Kabala	High costs of health care (including Out of Pocket and insurance premium for informal sector workers; High burden of disease in this sector	Kamara, J. (2015)
7	The Impact of Free Healthcare on Hospital Deliveries in Sierra Leone	Freetown, Bo, Kenema and Makeni	Barriers to health - high cost, low quality of care for women and children; high maternal mortality; young mothers and preterm babies	Samura, S.S (2016)

8	Formative Research on Care-Seeking Behaviour	Freetown	Low use of health facilities during and in the immediate Ebola recovery periods due to safety concerns, poor quality of care, high extra charges etc.	Macarthy, J.M (2015)
9	Sanitation Market assessment, Freetown Sierra Leone	Freetown	Inadequate sanitation infrastructure-high cost of construction and improvement of facilities, poor defecation practices, wide use of shared HH and public toilets, preference for manual emptying of faecal sludge	Mikhael (2010)
10	Quantifying Surgical Capacity in Sierra Leone	Freetown (5 public hospitals,	Lack of essential equipment and supplies for surgery; few trained Sierra Leonean surgeons; poor supply of water and electricity; public hospitals fall far below private ones in the provision of quality services.	Kingham et al (2009)

3.5.1 SOCIO-CULTURAL BARRIERS

Socio-cultural barriers include belief held by individuals or households which inform their decision on whether or not to seek healthcare. These barriers also include the lack knowledge by poor urban households about the availability of services and the benefits of early care seeking. According to Oyerinde et al. (2012), socio-cultural barriers have far-reaching consequences on women and children since it underlies perceptions and behaviours that undermine healthcare seeking by pregnant women and children, which has a relationship with child and maternal mortality. The work attributes the high incidence of home delivery to the negative views of households about health care centres and so, would prefer to seek care from elderly women and TBAs. The socio-cultural surroundings and experiences with the use of informal health services offered by TBAs cause many women to favour informal healthcare, which in turn serves as a barrier to seeking formal healthcare provided by health facilities.

Especially in informal settlements, health facilities are often the last resort, as elderly women and TBAs are trusted and believed to have expert knowledge relating to pregnancy. Entrenched belief in traditional care during illness is a barrier that can prevent people from early care seeking. The review identifies a range of other socio-cultural barriers that limit household's access to health care in urban areas. These barriers are manifested in different ways. According to Oyerinde et al (2012), such barriers relate to socially perceived notions of women's low social status, gender roles, and physical disability, which, often, give cause to their husbands and other relatives to make decisions for them. As the study notes, pregnant women in deprived communities are more at risk of delayed or non-access to health care since they usually require the consent of their partners or other responsible parent.

Access to health services may be delayed or denied when third parties are involved in decision making for care seeking. For the vast majority of discussants and interviewees, decision makers were husbands or male partner responsible for a pregnancy, mothers-in-law and in some cases mothers or an older male such as a woman's brother. Mothers-in-law were responsible for decision making especially for a woman's first pregnancy (Oyerinde et al 2012).

Such culturally influenced delays by pregnant women to access to health care often comes at a high cost, forcing women to deliver at home, with additional complications as bleeding, convulsion, blurred vision etc.

In terms of limited access to healthcare, Trani et al (2011) found a pattern of stereotyped behavior among health workers for disabled pregnant women seeking antenatal care. Such women mostly did not receive care at the health facilities within their communities but were often referred to tertiary hospitals for fear of complications due to their physical condition. This caused additional barriers to care due to increased costs, distance, and time to travel to referral health facilities. The study also points to inequalities in healthcare provisioning, which largely disadvantage people with disability and hinders their access to care.

Access to both public/community healthcare hospitals were lower for disabled than non-disabled individuals. Given that overall persons with disabilities are impoverished, and more likely to rely on community/community health services or public hospitals, the difference in access between disabled and non-disabled individuals is of particular concern (Trani et al 2011:7)

Additionally, persons with disabilities were more likely to use unconventional forms of medication like buying medicines in street markets and seeking cure through traditional and religious means, which in part, explains how barriers to formal health care happen.

3.5.2 ECONOMIC BARRIERS

A few texts identified economic barriers as the main factor that limits poor urban households from accessing health services. The work associates informal settlements with extreme poverty, which prevents many poor households from meeting the cost of medications and other services. Groen et al (2012) for instance, notes the high prevalence of untreated surgical conditions in Sierra Leone due to the inability of households to pay for cost of procedures. They argue that 25% of surgery-related deaths can be prevented if households are provided with easier access to emergency surgical care. Oyerinde et al (2012:7) points out that women face serious barriers to accessing maternal and emergency obstetric services due to prohibitive, and inconsistent cost of services. Inability to pay for health services is identified as among the major causes of infant and maternal mortality in Sierra Leone.

The high point-of-care out-of-pocket charges paid for health services were major barriers to the utilization of health services…. Some of the participants were concerned about the perceived inconsistencies and arbitrariness of the fees charged, fear of being charged too much and the perceived unfairness of the charges; many reported borrowing or having to sacrifice crucial family necessities to cover the charges (Oyerinde et al 2012)

Further, Trani et al, (2011) points out that while economic barriers affect women generally, it is disabled women who share the greatest burden, as they can rarely access reproductive and anti-natal care services unless it is provided by the government.

A study by Macarthy (2015) was interested in identifying causes of low clinic attendance in Freetown during and in the immediate post Ebola recovery periods. In addition to general safety concerns from patients, the high cost of direct health services and other indirect costs levied by health workers inhibited patients from accessing healthcare services. Findings of this study indicate that patients in the Free Health Care category (pregnant, lactating women and under five children) experienced financial burden during the Ebola recovery period, a time when it was believed that use of health facilities will increase compared to the Ebola period when there were fears about safety (the major deterring factor). Nevertheless, low health service utilization, especially for women and children was being affected by health economic barriers. Women who could not afford to meet those requests stayed away from the health facilities for fear of embarrassment or likelihood of not being treated by nurses:

"Other barriers to PHU visits is the financial and material (soap, Dettol, Exercise books) requests which some nurses make from pregnant women and mothers attending PHUs…" (Macarthy, 2015:16).

The issue of out of pocket payment was also explored by Kamara (2015) who did a study to assess the willingness and ability of informal sector workers (mainly petty traders, commercial bike riders, fisher men, quarry workers etc.) to pay for medical insurance. The study found that while households are willing to pay for health insurance, many do not have the financial capacity to do so. A similar study by Wurie et al. (2012) explored the impact of Free Health Care[2] on care seeking behaviors among informal settlement dwellers in Freetown. The study found delays among mothers in seeking care for their sick children owing to factors such as transport costs, lost income during care seeking, high costs of prescribed medicines, and unfixed costs of services. Fleming et al. (2016) however observed that, in Bo city, the reputation of the health facility and the affordability of treatment determines women's preferences in relation to seeking care for treatment of malaria-related illnesses. The study found that public health facilities like the Bo Government hospital and non-profit service providers like MSF were the most preferred choice because they provided quality care at low or no cost.

"Although women in Bo live only a median distance of 0.6 km from one of the healthcare facilities listed as a preferred provider by study participants, most women do not seek malaria care from the facility nearest to their homes. Instead, they named preferred providers at a median distance of more than 4 km roundtrip from home, which is a distance beyond what could reasonably be walked by an adult with malaria or another acute febrile illness that has not responded to home-based care" (Fleming et al 2016).

A key finding in Fleming et al.'s study is that while women seek low cost services in distant places, they often ignore transport and other indirect costs.

A study by Kushner et al. (2010) identified limited access by poor people (who can rarely afford to pay) to critical health care services like surgery. Samura's (2016) study in the four main urban centers (Freetown, Bo, Makeni, and Kenema) similarly showed that in spite of the introduction of the Free Health Care (FHC) system in Sierra Leone, high service cost is still an issue within the health system especially for pregnant women, lactating mothers and children aged 0-5 years. Although the service is designed for the above cohort of beneficiaries, access still remains a challenge for those who cannot pay for some critical services provided by the health facilities. An important point to note is that some services like drugs are provided for by the Free Health Care but are sometimes not available at the time of visit by patients. In that case, patients are asked to provide for themselves, which brings to question the issue of cost and affordability people who cannot meet such requests.

2 Free Health Care Initiative was introduced by the Government of Sierra Leone together with development partners in 2010 to increase health service utilization by vulnerable groups (pregnant, lactating women and under five children) and to address the high rate of child and maternal deaths.

3.5.3 HEALTH INFRASTRUCTURE BARRIERS

Two studies specifically focused on health infrastructure in urban settings. One of the studies (Mikhael, 2010) focused its analysis on Freetown, while the other study by Kingham et al, (2009) extended its coverage beyond the capital to include the other major cities earlier mentioned.

The study by Mikhael (2010) evaluates supply and demand for sanitation facilities and services. They highlight how the inadequacy of sanitation facilities gives cause to open defecation and other poor sanitation practice among adults in informal settlements in Freetown, especially where toilets are shared by several households. The study notes that while households wish to own private toilets, they are

usually constrained from doing so because of lack of funds. The study found additionally that faecal sludge emptying services in Freetown are generally inadequate and inefficient. This may explain why households prefer manual emptying methods to vacuum tankers despite its unsafe disposal practices. The supply side problems identified in this study are helpful for characterizing the underlying drivers of poor sanitation practices and related health risks which were identified in section 3.4.

The other study by Kingham et al (2010) assessed surgical infrastructure and found surgical capacity to be low. According to the study, all ten public hospitals surveyed failed to meet essential equipment and supply requirements for surgery, and had gross inadequacy of trained surgeons to meet surgical needs, especially in critical areas like emergency obstetrics. Disparities were observed between public and private hospitals in quality of care, indicating that most public hospitals in the country were largely ill-equipped to provide surgical procedures, with specific reference to the country's main referral hospital, located in Freetown.

Of the10 hospitals surveyed, all of them failed to meet the 7 requirements for essential equipment or supplies. Currently, patients are required to purchase the necessary supplies at local pharmacies and to provide them to the surgeon. This system fails to allow for emergency access to supplies once pharmacies are closed, so surgery at night is often performed with few supplies (Kingham et al 2010: 123-4).

Furthermore, the report found that while private hospitals are equipped to provide professional surgery, they are completely out of reach for the poor who cannot afford cost of procedures. There are two issues in relation to the weak surgical infrastructure; one, the poor quality of care, and two, the exclusion of the poor who cannot compete with those able to pay for the limited services.

3.6 ASSESSMENT OF RESEARCH METHODS

The review found that a significant proportion (51%) of the studies were carried out using quantitative research methods (see Figure 4). This method was probably preferred because most of the research was epidemiological and relied on the use of models to describe the disease (e.g. frequency, at risk groups and over time) or on observations and the use of experimental methods to identify the risk factors of the disease. However, several of the studies did not provide clear understandings of the complexities which urban settings present to particular health problems and how these are linked to the socio-physical environments of the people. Nevertheless, it was observed that rigorous sampling

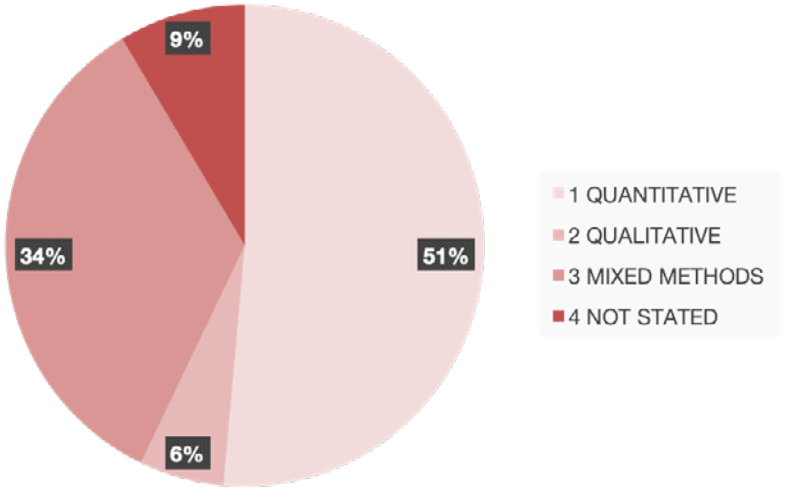

Figure 4: Methods used in research studies

frame and size selection procedures were used for most of the studies. The analysis methods were also observed to be rigorous for most of the studies. However, a couple of studies could not explain sampling procedures used to determine sample sizes. More detail is provided on the methods and analysis procedure used in each study in Appendix 3.

While nearly all the studies provided insights into urban health trends in the country, several did not show any evidence of community involvement into the research processes. Notwithstanding, the body of research knowledge generated provides useful baseline data for understanding urban health systems in Sierra Leone.

3.7 VALIDATION OF RESEARCH FINDINGS

While it was not possible to crosscheck the research findings on all the study areas, the one-day validation workshop created a useful space to verify a number research claims on Freetown with relevant stakeholders that either live or work in informal settlements in Freetown. The findings were mostly corroborated, and the discussion provided useful insight to some additional knowledge that were either left out or were not clearly articulated in the initial research findings. These relate clearly to the environmental risks factors found to be associated with the prevalence of certain kinds of diseases that affect people in informal urban settlements. Key among these are the following:

- High prevalence of Sexually Transmitted Infections
- High prevalence of teenage pregnancy, with huge outcomes for maternal and child deaths
- High rate of malnutrition among children under five years and women of child bearing age
- Maternal and child deaths and morbidity
- Overcrowding
- Poor housing conditions
- Occupational hazards
- Poor waste disposal methods and practices
- Water pollution/contamination
- Flooding disasters and health related risks
- Poor drainage systems
- Poor early warning systems for disease outbreaks
- Low environmental awareness

Section IV: Policy and Institutional Mapping

4.1 INTRODUCTION

Our review also identified and analyzed a collection of health policies in terms of the focus areas of the policies; the particular health issues they prioritize; the policy framework for the delivery of health care services, and how these arrangements articulate the health needs and priorities of informal settlements. Nine health policies were identified as of relevance. The policies were sought through search in Government of Sierra Leone's Ministry of Health portal which holds a number of health policies in Sierra Leone. The policies were analyzed with respect to their framing contexts, current status and gaps in terms of articulation of problems in urban health settings.
Additionally, institutional mapping was also done to identify government agencies, NGOs, and CBOs intervening in urban-health related areas in informal settlements and to map-out the exact intervention areas of the organizations in their attempt to improve the wellbeing of informal settlement dwellers.

4.2 REVIEW OF HEALTH POLICIES

The policies were reviewed in view of their articulation of key health improvement plans and how they relate to access to health. More attention seems to have been given to improving the amount and quality of health care delivery including widening access to it especially by poor and vulnerable residents.

The Community Health Workers (CHW) policy for instance, makes provision for community health workers supervision by Public Health Units (PHUs) and the provision of incentives to allow them make regular household visits with a view to influence positive health behavior among households. However, it came out at the CHW policy review workshop in January 2016 in Freetown that demotivation of CHWs to carry out their tasks was largely driven by lack of incentives due to funding gaps. Moreover, while the Human Resource for Health (HRH) policy seeks to ensure the retention of a well-trained, motivated and efficient workforce[3] in the health sector, there is still problem of staff retention and motivation, a problem that affects service delivery, especially to poor and vulnerable groups at the community level. There is also the Reproductive Newborn and Child Health Strategy (RNCH) which makes specific commitments towards increasing funding to RNCH activities; reducing inequality in accessing healthcare, as well as; reducing maternal and under five deaths. Another notable health policy is the Free Health Care Initiative (FHCI) which is an attempt by the government to make healthcare services more accessible to pregnant women, lactating mothers. However, its implantation has been fraught with a number of corruption-related challenges, resulting in unofficial charges, thereby limiting its impact on the poor and disadvantaged people it was intended for. Similarly, while the Nutrition and FHC policies also promises to address the poor nutritional status of children from low income households; their access to health services, and; the high incidence of nutrition-related mortality among children under five years, the outputs seem low with minimal impact on the communities.

A key observation from nearly all the policies however, was that because the health sector in Sierra Leone has been slow to realize the particular problems which rapid urbanization present to health care delivery in urban areas, all the health policy provisions seems very general with no specific reference to urban health. More especially, the policies did not only seem to be silent on the specific health problems and needs of informal communities but many did not recognize communities' roles in health care delivery. This is in spite of the partnership they have usually forged in scaling up local initiatives in line with government approaches to improving health care. Only a few policies such as the CHW policy were perceptibly open to community inclusion in health care delivery. In particular, the CHW

3 A workshop organised by the Ministry of Health's National CHW Steering Committee in Freetown to validate the reviewed the 2012 CHW policy

policy emphasizes the recognition of local ownership in all health care initiatives through the inclusion of community leadership structures and other relevant groups. This is in an attempt to ensure that the health needs of such marginalized groups as children and women are prioritized.

Another notable observation was that a number of policies did not make reference to environmental health including the potential for communities and their groups to work collectively with the government (central & municipal) to mitigate environmental health risks. The few policies that highlighted the need to address environmental health risks only briefly referred to it. These policies include the national CHW and Nutrition policies. The CHW policy for example, recognizes how social factors impact environmental health, and therefore highlights training of CHWs as a part of its strategy for addressing problems of sanitation and hygiene, health emergency preparedness and response.

The nutrition policy also considers poor hygiene as a reinforcing problem to inadequate nutrition of poor and vulnerable households. However, the policy focuses principally on access to improved water sources and water treatment methods. With regards to increasing access to improved water sources, the policy is not clear on what specific actions to take in informal settlements faced with the challenge. Additionally, it is also not clear to what extent informal settlement dwellers are aware about these policies since their knowledge about its relevant provisions can considerably allow them to hold health organizations accountable for their activities in their communities including, shaping the interventions to meet community needs. Largely as a result of this reality, the reviewed CHW policy (2016) now puts community ownership at the center of CHW activities with the specific aim to strengthen community structures to provide oversight and to promote local health delivery systems while putting into context their own local health realities. At the same time, the policy ultimately places CHW supervision at the hands of PHU staff. However, the limited work force in most PHUs coupled with the huge demand for their time in the respective health stations may prevent them from successfully carrying out this role.

There is also the National Health Promotion Strategy which was developed in 2016 with the intent to not only strengthen the health education infrastructure within the Ministry of Health and Sanitation (MOHS) but to also build synergies between that ministry and the local communities. The strategy targets a number of audiences including adolescents, CHWs, health workers, health sector policy makers, NGOs and voluntary groups given the high influence they have in promoting positive health behaviour in the community. However, the strategy does not sufficiently recognise the consequence such social determinants as - traditional or religious values, the perceived value of health services, sense of personal health risks, family influence in personal health decision and the availability of quality health services - may have on health awareness and the promotion of positive health seeking behavior in the communities. Table 4 below provides a brief description of the main policies reviewed in this study.

Table 4: Barriers to Urban Health Care

No	Name of policy	Date of publi-cation	Policy context	Comments
1	Reproductive, Newborn and Child Health strategy	2011	Provision of equitable and quali-ty, and child health care to tack-le high rates of maternal and child deaths	Equitable and quality health care to women and children is still a huge challenge, especially for poor residents of informal communities who cannot afford to pay extra charges for services
2	National Health sector strategic plan	2009	Strengthen the health system and increase health access to mothers, children, poor and other vulnerable groups, and to reduce potentials for disease outbreaks	Availability of health services and utilization are still inadequate across the board, especially for vulnerable groups like pregnant women whose need for emergency obstetric services are lim-ited by poor ambulance services.

3	Human Resource for Health Policy	2006	To maintain well trained, motivated and efficient health workforce to provide efficient health services.	The HRH policy has not been fully implemented to improve staff motivation, causing problem of retention and low commitment to duty, breach of professional ethics and barriers to vulnerable groups who cannot afford cost of services.
4	The Free Health Care Policy	2010	Increase access to healthcare for pregnant women, children under five years and suckling mothers through the removal of user charges, to address maternal and child mortality	The policy is important for addressing barriers to health access by vulnerable categories of people, but has been inundated by huge gaps, as user fees are still being charges in many health facilities, limiting access to poor people who rely mainly on public health services
5	Community Health Workers Policy	2012	To improve the health of women and children at community level by promoting health education on maternal and child health, personal and environmental hygiene	The policy has been largely affected by funding gaps to roll it out, which has affected the motivation levels of CHWs to reach out to households with health messages that promote safe health behaviours that reduce maternal and child deaths.
6	National HIV/ AIDS Policy	2002	To address the impact of HIV/ AIDS through a multi-sectoral prevention, care and control programme with open access to basic social services	Prevalence of HIV has been low for over a decade, but there are still knowledge gaps in terms of risky sexual behaviours and exchange of drug infusion instruments
7	Sierra Leone Food and Nutrition Security Policy	2012	To improve the nutritional status of people, especially children, pregnant women and lactating mothers as part of efforts to improve immunity to diseases and reduce maternal and child deaths	Achieving improved nutrition of vulnerable groups like children and pregnant women remains a huge task, as malnourishment remains high among children especially those whose parents are of poor socio-economic backgrounds, with implications for high child mortality
8	National Community Health Worker Policy	2016	The 2016 CHW policy was developed to build on the gains of the 2012 policy to strengthen and harmonize community-based primary health care. The implementation of the policy was affected by the Ebola outbreak when household contacts with beneficiaries became limited, due to involvement of CHWs in Ebola related activities.	The policy recognizes that inadequate provision of job aides to CHWs and related supplies greatly affects their motivation and efficiency, with potential for clients' lack of trust in the overall health system. Providing wider health coverage for particularly hard to reach communities with vulnerable populations is key, but that is contingent on how well the CHWs are motivated through supportive supervision and provision of job related supplies.
9	National Health Promotion Strategy of Sierra Leone	2016	The National Health Promotion Strategy was developed to build a high-quality health promotion roadmap for improving community health. The policy among other things seeks to re-organize the role of health promotion in the health sector; place families and communities at the centre of planning, establish the building blocks of enhanced health promotion capacity.	The Health Promotion Strategy draws its strength from the 2000 Health Education Policy and the 2010 National Health Promotion strategy to create a synergy between the Government's Health Education division and communities in utilizing appropriate tools to enhance the resilience of communities to reduce disease outbreaks or mitigate risks during such outbreaks. However, some social determinants such as traditional or religious values, availability of quality health services, perceived value of health services, sense of personal health risks and family influence in personal health decision are factors that may affect health promotion to attain positive health seeking.

4.3 INSTITUTIONAL MAPPING OF ORGANISATIONS WORKING IN URBAN HEALTH

A mapping exercise was done to identify institutions that are involved in urban health-related activities in Sierra Leone including their specific areas of intervention. This was intended to determine the range of providers of health services in urban areas, the appropriate levels at which they deal with the different health problems and to also specify the health needs that they address and where.

While it was difficult to identify with certainty, all the health organizations involved in urban health in Sierra Leone from the list of documents reviewed, the stakeholder workshop (See Annex 2 for list of participants) showed that in Freetown, there are over thirteen of such organizations (central government ministries and agencies, the Freetown City Council and NGOs) currently intervening in informal settlements. Apart from the Ministry of Health and Sanitation (MOHS) and its key agencies (e.g. Medical Stores, Environmental Health Division etc.) which operates entirely at the national level, nearly all the other actors (mostly NGOs and a few CBOs) operate at the subnational level. However, it was pointed out that overall, the outputs seem very low with very minimal impact on the communities. According to them, this is partly because of the uncoordinated response by organizations and in part, because of the duplication of efforts since their interventions are rarely guided by evidence-based knowledge. There are also concerns about how standards are maintained across the different actors. This raises questions about how to effectively organize health care delivery in ways that makes it not only accessible but also beneficial to the urban poor.

Another key finding from the mapping was that most health interventions are focused on cholera and diarrhoea response, nutrition and child care promotion, the promotion of safe sex, and the treatment of sexually transmitted diseases. However, not much interventions are directed towards dealing with environmental health threats, health education, mental health and occupation related health problems at the community level.

Table 5: Institutional Mapping For Informal Sector Health Interventions

No	Organization	Intervention areas
1	Save The Children	Health education; Support to health facilities; waste management; Infection Prevention and Control; Water and Sanitation (WASH) activities; Maternal and child health promotion
2	GOAL-Sierra Leone	WASH activities; waste management; nutritional support to malnourished children; support to health facilities; Infection Prevention and Control
3	ACF/Action Against Hunger	Nutritional support; waste management; disaster response; Reproductive, Maternal, Neonatal and Child health promotion
4	YMCA, CODOHSA-PA, Restless Development, BRAC, YDM (Pull Slum Pan Pipul partnership)	WASH activities; urban health research; rehabilitation of health facilities; environmental health education; peer education on sexual reproductive health and gender awareness
5	OXFAM	WASH activities; environmental health education
6	Sierra Leone Red Cross Society	Disaster response
7	CARITAS	Nutritional support; health emergency response
8	e-health	Health risk alert; disease surveillance
9	Partners In Health	Clinical health capacity building of health facility staff; health education

10	Freetown City Council	Environmental health education; coordination of health NGO activities;
11	Office of National Security	Coordinate disaster response
12	Concern Worldwide	WASH activities; disaster response; Maternal and child health promotion; support to health facilities
13	Ministry of Health and Sanitation	Health sector governance; health financing (including supply of drugs and equipment and staffing); immunization campaigns; articulation of health policies; response to disease outbreaks; health oversight functions; recruitment and training of Community Health Workers

Section V: Research Gaps And Setting the Research Agenda for SLURC

5.1 GAPS IN URBAN HEALTH KNOWLEDGE

Although the review shows that a great deal of knowledge already exists on urban health in Sierra Leone, there are observable weaknesses in the knowledge base. Gaps arise largely as a result of the scale[4] of the studies; the specific problems researched; the appropriateness of methodology; the depth of knowledge, or; the kinds of issue prioritized for the study. While some studies discussed the health burden of poor urban households the actual reasons for the health differentials among individuals/ households/ groups/ communities in such places are less explored. Beyond a few notable exceptions e.g. the Cobalt community living near the Granville Brook dumpsite and those living in Dwarzack affected by pollution from the Sierra Leone Bottling Factory, it is not clear which environmental risk factors in urban settings are associated with the high prevalence of particular kinds of diseases (e.g. diarrhea, cholera etc.), and in which specific areas. Moreover, although the scoping study observed that a range of health problems facing urban areas have been investigated, there is no known study that has attempted to bring perspectives together on the range of problems, contexts and approaches to generate a reflection to the wider urban health community of practice.

A few studies outlined the general environmental conditions in the urban areas but were not able to link them reliable prevalence data on specific health problems. Moreover, while some studies (Eckert and Kohler, 2014; Godfrey and Julien, 2005; Moore et al, 2003) tend to associate rapid urbanization with the emergence of slum-like settlements (crowding, poor sanitary condition, poor and inadequate housing), there is no detailed understanding about how the living conditions in the informal settlements accelerate the spread of diseases i.e. social and political determinants of health in urban areas. Studies provide basic descriptions and associations but do not analyze drivers. Also, less is understood about how the varied health problems in urban settings are linked to each other (if any). It was notable too that the studies included in this review mostly investigated pre-defined health issues and that there has not been widespread effort to ascertain the priorities and concerns of community members themselves. Headline gaps in the published literature can thus be summarised as relating to:

- Limited information on communities' own voices and perspectives, especially about their challenges and priorities
- Limited health outcome data, in particular how the risks and barriers identified in studies lead to health outcomes and inequalities
- Limited disaggregation by group e.g youth and disabled populations, and by settlements for a nuanced picture of urban health
- Limited exploration of environmental risk factors across a range of settings

An important finding from the mapping was that most health interventions are focused on cholera and diarrhoea response, nutrition and childcare promotion, the promotion of safe sex, and the treatment of sexually transmitted diseases. There were fewer interventions directed towards dealing with environmental health threats, health education, mental health and occupation related health problems at the community level.

Further insights were drawn from stakeholders (representatives from communities and their groups, NGOs, Local and national governments) in two separate workshops to validate the initial findings of the scoping study and to draw from the experiences of participants on existing issues in the communities that may not have been covered in the study. Organised into two separate groups and, supervised by the trainers, the workshop participants deliberated cooperatively to identify the key issues they deemed to have been less explored about informal settlements in urban Sierra Leone and which, SLURC should consider taking up in its future research.

4 Some studies involved large-scale research that did not focus specifically on urban areas and so, did not explore the range of constraints urban settings present to particular health problems. A few small-scale studies did not address themselves to the intra-urban differentials in the health status of urban residents.

These included:

- Need for malaria prevention, nutritional support,
- Increased health access for women and children
- Increase community health education/awareness
- Capacity of health workers for improved health service delivery
- The health effects of improper waste management and poor sanitation
- Procurement and the supply of drugs to health facilities
- Health policies and need to address current and emerging health needs
- Flooding and the health effects of poor drainage systems on informal settlements
- Improved sanitation and good hygiene practices to avoid the spread of diseases
- Nevertheless, the following were identified by participants as areas requiring urgent attention in terms of research both in the short and medium term:
- What makes specific categories of people in informal settlements more vulnerable to epidemic diseases (e.g. cholera and diarrhea) than others?
- Why the high preference for Traditional Birth Attendants (TBAs) over trained health professionals in informal settlements?
- Why the high prevalence of maternal and child mortality in informal communities?
- The impact of Sexual and Reproductive Health services on teenage pregnancy levels in Freetown
- Impact of poor housing conditions on health outcomes in informal settlements

5.2 FUTURE RESEARCH AGENDA

In identifying knowledge gaps this review has outlined a future research agenda for urban health in Sierra Leone, and for SLURC specifically. Moreover, it found that while a range of actors provide urban health-related services, there is a lack of coordination. From the workshop discussions, SLURC is expected by the different stakeholder organizations to not only address the research gaps identified in the study but to also provide them with trainings relating to a range of health issues that are pertinent to their work. With regards to the gaps in knowledge, SLURC would need to work with stakeholders to priorities the kinds of research to do in view of the knowledge required for policy, planning and programming. However, because the health situation in informal urban settlements in Sierra Leone are often complex and dynamic, it will be critical to explore the explicit link between the living conditions of people in different settlements, the threats to the physical environment as a result of the rapid urbanization of the city, and the possible interrelations with health problems. This will require SLURC to work more closely with the Policy, Planning and Information Directorate of the Ministry of Health, which generates health data for urban areas and the entire country.

To add to the list of knowledge gaps there are some specific research priorities for SLURC given their unique position working across urban research, policy and practice. This includes:

- Bridging the gap between national health priorities and the needs of informal settlements. A key question is how are national priorities and agency agendas set and do they really reflect informal settlement needs?
- How can intersectoral policy making around health be encouraged, for example environmental health, waste management, health systems and disease prevention, and land management.
- How can communities and their priorities be better included in policy development? Relatedly, how can community capacity for engagement in health system planning be strengthened? What spaces and opportunities are there, including through participatory research?
- How can existing community based action on health issues be supported and strengthened?
- To explore issues of accountability and governance and how to coordinate and connect efforts underway by different institutions (NGOs, city mgmt., MOH, etc)

Annexes

ANNEX 1: LIST OF RESEARCH REPORTS REVIEWED

No	Title of study	Study setting	Reference and date of publication
1	Cholera Epidemic Associated with Consumption of Unsafe Drinking Water and Street-Vended Water—Eastern Freetown, Sierra Leone.	Kuntorloh and Wellington, Freetown	Nguyen, V.D. et al (2012)
2	Environmental and Health Impact of Solid Waste Disposal in Developing Cities: A Case Study of Granville Brook Dumpsite, Freetown, Sierra Leone	Granville Brook and surrounding communities in Freetown	Sankon, F.P et al (2013)
3	Ebola Emergency Response: Evaluation and learning summary	Slum communities, Freetown	Y-CARE International (2016)
4	Prevalence of diabetes in rural and urban populations in southern Sierra Leone: a preliminary survey	Bo city and Ngalu village	Ceesay, M.M. et al (2007)
5	Rapid Needs Assessment and Freetown WASH consortium response update	Freetown (city scale)	Office of the National Security, Freetown City Council and Freetown WASH Consortium (2015)
6	Water quality associated public health risk in Bo, Sierra Leone	Kulanda Town, Bo city	Jimmy, D. H (2012)
7	Monitoring the levels of toxic air pollutants in the ambient air of Freetown, Sierra Leone	Freetown-Kingtom dumpsite, Kissi industrial area, Eastern police traffic area and Spur Loop	Taylor & Nakai (2012)
8	Assessment of Anemia Knowledge, Attitudes and Behaviors Among Pregnant Women in Sierra Leone	Five HFs in the eastern, central and western areas of Freetown.	M'Cormack and Drolet (2012)
9	Wastewater Effluents at Sierra Leone Bottling Company Limited: Composition, Assessment and Removal Efficiency of Physico-chemical Parameters	Dwarzack and New England in Freetown	Beah, J.M (2017)
10	Pollution along the Congo Town bay and Connaught Hospital bay, Freetown, Sierra Leone	Congo town and Connaught hospital Bays in Freetown	Frazer-Williams et al (2013)
11	Risk Assessment of The Kingtom And Granville Brook Dumpsites in Freetown, Sierra Leone	Kingtom and Granville Brook dumpsites, Freetown	Frazer-Williams (2015)
12	A Situational Analysis of Waste Management in Freetown, Sierra Leone	Kingtom, Granville Brook and other illegal dumpsites in Freetown	Gogra et al (2010)
13	Assessment of Groundwater Quality in wells within Bombali district, Sierra Leone	Makeni city (including other towns in Bombali district)	Nwamaka and Akudo (2014)
14	Freetown Wash Consortium: Phase two programme final report	Freetown (mainly urban slums)	Nest Builders International (2016)

15	Traumatic Injuries in Developing Countries: Report From a nationwide Cross-Sectional Survey of Sierra Leone	Nationwide survey (including four study settings)	Stewart et al (2013)
16	Community profiling and enumeration report	Freetown: Susan's Bay, Mabella, Crab Town, Kolleh Town and Gray Bush (CKG) and Goderich (Funkia).	YMCA, CODOHSAPA & Y-CARE INT. (2016)
17	Community profiling enumeration vulnerability and capacity assessment report	Freetown: Cockle Bay, Oloshoro, Moa Wharf & Colbot.	YMCA and FEDURP (2015)
18	Solid Waste Management Study for Freetown, Sierra Leone	Freetown (city scale)	Sood, D. (2004)
19	Urban Sanitation in Bo City: A Study on Knowledge, Attitude and Practices	Bo city	Bawoh and= Koroma (2015)
20	Cholera Prevention and Domestic Water Management in Freetown	Freetown	Action Contre La Faim Sierra Leone (2008)
21	Teenage pregnancy and implications on child survival amongst mothers attending a clinic in the East-End, Freetown, Sierra Leone	Freetown	Tamramat I. Runsewe-Abiodun and Sahr F. Bondi (2013)
22	Vulnerability and Capacity Assessment of Dwarzack Community	Freetown: Dwarzack community	YMCA, ONS, YCARE INT, SLRCS & CONCERN WW (2012)
23	Freetown Urban WASH Consortium sanitation evaluation	Freetown	Urban WASH Consortium (2012)
24	Prevalence of Malaria and intestinal helminth co-infection in children presenting with anaemia in Freetown, Sierra Leone	Freetown: Ola During Hospital	Kamara, L. (2013)
25	Microbiological and Chemical Quality of Packaged Sachet Water and Household Stored Drinking Water in Freetown, Sierra Leone	Freetown	Fisher, M.B. et al (2015)
26	Access to health care, reproductive health and disability: A large scale survey in Sierra Leone	Freetown, Waterloo, Koinadugu, Bombali, Bo, Kono (urban & peri urban)	Trania, J. et al (2012)
27	Barriers to Uptake of Emergency Obstetric and Newborn Care Services in Sierra Leone: A Qualitative Study	Freetown, Bo, Kailahun and Koinadugu	Oyerinde, K. et al (2012)
28	Health-seeking behaviour in the era of free healthcare in urban slums in Sierra Leone	Slum communities at the back of Ola During hospital, Freetown	Wurie et al (2012)
29	Health-care availability, preference, and distance for women in urban Bo, Sierra Leone	Bo city	Fleming, L.C. (2016)
30	Improving Access to Surgery in a Developing Country: Experience from a Surgical Collaboration in Sierra Leone	Connaught hospital Freetown	Kushner, A.L (2010)
31	Willingness and ability to pay for Health Insurance among informal sector workers in Sierra Leone	Freetown, Makeni, port Loko, Magburaka, Kambia and Kabala	Kamara, J. (2015)
32	The Impact of Free Healthcare on Hospital Deliveries in Sierra Leone	Freetown, Bo, Kenema and Makeni	Samura, S.S (2016)

33	Formative Research on Care-Seeking Behaviour	Freetown	Macarthy, J.M. (2015)
34	Sanitation Market assessment, Freetown Sierra Leone	Freetown	Mikhael (2010)
35	Quantifying Surgical Capacity in Sierra Leone	Freetown (5 public hospitals,	Kingham et al (2009)

ANNEX 2: LIST OF WORKSHOP PARTICIPANTS

No	Name of participant	Organization/Community
1	Hannah Kanneh	George Brooke Health Center
2	Massah Kallon	Federation of Urban and Rural Poor (FEDURP)
3	Andrew Tholley	Concern Worldwide
4	Marie Smith	Iscon Child Health Post
5	Neneh Galleh Bah	Cockle Bay
6	Aminata K. Dumbuya	Cockle Bay
7	Rugiatu Kargbo	Federation of Urban and Rural Poor (FEDURP)
8	Mohamed Kallon	Save the Children
9	Sulaiman Zainu Parker	Environmental officer, Freetown City Council
10	Francis Koroma	Environmental Health Dept. Ministry of Health and Sanitation
11	Idrissa O. Brima	Environmental Health Dept. Ministry of Health and Sanitation
12	Sulaiman Kamara	SLURC
13	Lawrence Babawo	Consultant/Facilitator
14	Yirah O. Conteh	Federation of Urban and Rural Poor (FEDURP)
15	Jalikatu Cotay	CODOHSAPA
16	Richard Bockarie	CODOHSAPA
17	Matella Baio	George Brooke Health Center
18	Mohamed Lamin Tarawali	Restless Development
19	Abu Conteh	Urban Health Research Assistant-SLURC

ANNEX 3: ASSESSMENT OF RESEARCH METHODOLOGIES OF REVIEWED DOCUMENTS

Document	Focus of document	Communities studied	Data collection methods	Data collection procedure	Analysis procedure
Doc. 1	Risks relate to unsafe drinking water	Slums of Wellington & Kuntorloh, Freetown	Quantitative	Laboratory tests of sample stools; interviews	Procedure not well explained
Doc. 2	Waste disposals & environmental health problems	Granville Brook & surrounding environment	Quantitative	Self-administered questionnaires	No detail account of analysis procedures
Doc. 3	Health emergency response in slums	Slums of Freetown	Not stated	Not explained	Not explained
Doc. 4	Prevalence and risks of diabetes	Bo city & Yamandu village	Quantitative	clinical tests of blood samples; structured questionnaires	Laboratory and statistical analysis
Doc. 5	Humanitarian response to flooding	Freetown, including vulnerable informal communities	Qualitative	Key Informant Interviews, Focus Groups & observations.	Not explained
Doc. 6	Health risks related to poor water quality	Kulanda town, Bo city	Quantitative	GIS to identify contaminated water sources; water testing equipment	Analysis well explained
Doc. 7	Air pollution due to burning of wastes, emission of car fumes	Freetown-Kingtom dumpsite, Kissi industrial area, Eastern police traffic area and Spur Loop	Quantitative	use of equipment to collect air samples for analysis	Not quite clear
Doc. 8	Prevalence of anaemia among pregnant women	Five health centers in eastern, central and western parts of Freetown	Mixed-Qual & quant	Testing of blood samples & semi-structured interviews	Laboratory and statistical analysis
Doc. 9	Community exposed to untreated industrial waste water	Dwarzack & New England	Quantitative	Use of equipment to collect water samples for analysis	Not clear
Doc. 10	Pollution through littering of wastes	Congo town & Connaught hospital bays	Quantitative	samples of soil, sediment and water collected to test toxicity levels.	Analysis procedures well explained
Doc. 11	Risks related to poor waste disposal	Kingtom and Granville Brook Dumpsites	Quantitative	Risk Index Analysis Approach to determine the level of toxic and chemical risks	Analysis procedures not explained

Doc. 12	Situational analysis of waste management system	Freetown	Not stated	Not explained	Not explained
Doc. 13	Risks related to poor groundwater quality	Bombali, including Makeni city	Quantitative	water samples collected from wells	Analysis well explained
Doc. 14	End-line evaluation of water & sanitation service situation	Selected slums in the East, central and west of Freetown	Mixed; Qual-Quant	Survey, key informant interviews and Focus groups	Analysis procedures well explained
Doc. 15	Injuries related to road accidents and related risks	Nationwide (including selected study cities)	Quantitative	Cross sectional survey	Not explained
Doc. 16	Env. and sanitation risks profiling	Susan's Bay, Mabella, Crab Town, Kolleh Town and Gray Bush (CKG) and Goderich (Funkia).	Mixed methods	Focus groups and individual interviews	Not explained
Doc. 17	Environ. & sanitation risks profiling	Cockle Bay, Oloshoro, Moa Wharf & Colbot in Freetown	Mixed methods	Focus groups and individual interviews	Not explained
Doc. 18	Poor environmental sanitation	Freetown	Not stated	Not stated	Procedures for analysis not explained
Doc. 19	Poor environmental sanitation	Bo city	Quantitative	Surveys and secondary data	Not explained
Doc. 20	Water and sanitation risks related to cholera	Freetown	Mixed methods	Interviews, sec. data & mapping areas vulnerable to cholera	No mention of procedures for analysis
Doc 21	Health care seeking among teenage mothers and effects on child survival	East of Freetown	Mixed methods	Cross sectional survey and key informant interviews	Epi-info software used for analysis
Doc. 22	Environmental and sanitation risks	Dwarzack, central Freetown	Mixed methods	Focus groups, individual interviews, & GPS mapping of high risk areas	FGD data analyzed using relevant themes and use of SPSS for quant data
Doc. 23	Risks related to inadequate public and HH sanitation facilities	Selected slums of Freetown	Mixed methods	Household surveys and key informant interviews	Analysis procedures not explained
Doc. 24	Prevalence of anaemia related to malaria and poor hygiene among under five children	East of Freetown	Quantitative	Laboratory test of blood and stool samples of children	Laboratory & statistical analysis
Doc. 25	Water contamination and risk of cholera	Freetown	Quantitative	Surveys and sample analysis of HH stored water, water production & dist. Points	Data analyzed using STATA

Doc. 26	Access to maternal and child health (especially disabled women)	Freetown, Bo, Kono, Bombali (urban areas)	Mixed: Qual-quant	Cross sectional surveys and interviews	Analysis done with use of STATA
Doc. 27	Barriers to Uptake of Emergency Obstetric and Newborn Care Services in Sierra Leone: A Qualitative Study	Freetown, Bo, Kailahun, & Koinadugu (disaggregated data collection for urban and rural)	Qualitative	Focus groups and interviews	Qualitative software used for analysis
Doc. 28	Health seeking in informal slum household	Freetown: Slum communities at the back of Ola During hospital	Qualitative	Focus Groups & interviews	Not explained
Doc. 29	Use of distance and cost by women to make healthcare preferences	Bo city	Quantitative	Interviews; use of GIS to measure distances between preferred health facilities	Analysis explained in detail
Doc. 30	availability of surgery; cost of surgery and equipment	Connaught hospital, Freetown	Mixed method: qual-quant	Interviews & review of operating procedures	Analysis not explained
Doc. 31	Willingness and ability of informal sector workers to pay for health insurance	Freetown, Makeni, port Loko, Magburaka, Kambia and Kabala	Quantitative	Structured interviews	Analysis procedure well explained
Doc. 32	Impact of Free health care on quality and accessible health service	Freetown, Bo, Kenema and Makeni	Quantitative	Secondary data from MOH	Freetown, Bo, Kenema and Makeni
Doc. 33	Low use of health facilities by mothers and children	15 PHUs in Freetown	Mixed methods	Surveys & Focus groups	Statistical and thematic analysis of quant and quanl data
Doc. 34	Assessment of sanitation facilities	Freetown	Mixed methods	household surveys and community validation meetings	Analysis not clear
Doc. 35	Quantifying Surgical Capacity in Sierra Leone	Freetown (5 public hospitals, Makeni, Bo (and 2 other urban cities)	Quantitative	structured interviews	Analysis procedures not explained

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ABOUT UCL/DPU

The Development Planning Unit, University College London, is an international centre specialising in academic teaching, research, training and consultancy in the field of urban and regional development, with a focus on policy, planning management and design. It is concerned with understanding the multi-faceted and uneven process of contemporary urbanisation, and strengthening more socially just and innovative approaches to policy, planning management and design, especially in the contexts of Africa, Asia, Latin America and the Middle East as well as countries in transition. The central purpose of the DPU is to strengthen the professional and institutional capacity of governments and non-governmental organisations (NGOs) to deal with the wide range of development issues that are emerging at local, national and global levels. In London, the DPU runs postgraduate programmes of study, including a research degree (MPhil/PhD) programme, six one-year Masters Degree courses and specialist short courses in a range of fields addressing urban and rural development policy, planning, management and design. Overseas, the DPU Training and Advisory Service (TAS) provides training and advisory services to government departments, aid agencies, NGOs and academic institutions. These activities range from short missions to substantial programmes of staff development and institutional capacity building. The academic staff of the DPU are a multi-disciplinary and multi-national group with extensive and on-going research and professional experience in various fields of urban and international development throughout the world. DPU Associates are a body of professionals who work closely with the Unit both in London and overseas. Every year the student body embraces more than 45 different nationalities.

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ABOUT IGDS/NU

The Institute of Geography and Development Studies (IGDS) represents one of the four innovative academic structures of the School of Environmental Sciences at Njala University (NU). The Institute runs both undergraduate and postgraduate programmes as well as provides opportunities for professional development and research. Its main concern is about promoting sustainable forms of development in Sierra Leone. The IGDS has a remarkable experience in the delivery of world leading research and teaching in Geography and development (urban and rural) issues. Its staff have engaged with practitioners, organizations and UN agencies through consultancies and other community outreach activities. It was as a result of the initiative of the IGDS to establish an urban planning unit to further their work on issues affecting people living in informal settlements that the Sierra Leone Urban Research Centre (SLURC) was formed.

ABOUT SLURC

The Sierra Leone Urban Research Centre (SLURC), based in Freetown, is a globally connected research centre created through a partnership between the Bartlett Development Planning Unit (University College London) and the Institute of Geography and Development Studies (Njala University) with funding by Comic Relief. SLURC aims to strengthen the research and analysis capacities of urban stakeholders in Sierra Leone; make urban knowledge available and accessible to those who need it, prioritizing residents of informal settlements; and, deliver world-leading research in order to influence urban policy and practice. However, SLURC was established as a financially independent centre within Njala University with a view of further integration in future. It was also thought that the SLURC could become a model of good practices that other part of the university could adopt.

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