A Scoping Study on Non-Communicable Diseases (NCDs) in Sierra Leone

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Executive Summary

Background

Non-Communicable Diseases (NCDs) are the leading cause of morbidity and mortality, as well as disability burden worldwide, disproportionately affecting people in low- and middle-income countries (LMICs). Without commensurate measures to mitigate the increasing burden, morbidities and mortalities attributable to NCDs are projected to continue, particularly in LMICs where NCD-related mortalities could increase to 41.8 million by 2030 compared to 30.8 million in 2015. A cross-sectional population-based survey found high prevalence of NCD risk factors (e.g. tobacco use, alcohol consumption, raised blood pressure, unhealthy diet, and physical inactivity) among adult (aged 25-64 years) Sierra Leoneans. Nonetheless, there is dearth of research evidence on burden, as well as interventions and policies to mitigate the observed NCD trend in Sierra Leone, as in other LMICs.

Aims

The National Institute for Health Research (NIHR) Research Unit on Health in Fragility at Queen Margaret University (QMU), Edinburgh seeks to identify sources of resilience within formal health systems and local community processes to facilitate effective provision for health priorities – particularly mental health and NCDs– in situations of fragility. This scoping review therefore aims to provide an evidential base to support the identification of priority research and intervention areas to address NCD needs in Sierra Leone.

Methods and findings

To address the overarching aim, a predefined set of search terms was used to search several data sources (PubMed, Google Scholar, grey literature etc.) to identify relevant documents. Twenty-eight documents met the inclusion criteria and were included in this review. Of these, 23 were peer reviewed articles, while four were reports and one was a Ministry of Health and Sanitation (MoHS) strategy document. The majority of the documents were published over the last decade, with two documents from the early 1900s. Overall, the review found a substantial gap in the current evidence on NCD burden and issues with the implementation of policies in Sierra Leone.

Studies on the prevalence of hypertension in Sierra Leone indicate a gradual increase in prevalence, as well as low levels of awareness across the country, especially in the rural areas. Similar to hypertension, diabetes prevalence is on the increase rising from 2.4% in 1997 to 7.0% in 2014, predominantly higher in men than in women. Recent studies on cancer prevalence in Sierra Leone seems scant, with publications dating back to the early 1900s; however, a relatively recent
The study estimates the prevalence of breast mass in at 3.3% (2.9% women and 0.4% men), with almost half (49.1%) of women with breast mass being 30 years of age or more.

The STEPwise survey in November 2009, the first major national study of its kind, established high prevalence of risk factors for NCDs among 4,997 adult Sierra Leoneans (aged 25-64 years) as follows: use of tobacco at 34%, alcohol consumption at 17%, and average consumption of less than five servings of fruits/vegetables per day at around 90%. Regarding physical activity, 16% and 75%, respectively, Sierra Leoneans engage in low and moderate levels of physical activity, while 31% engage in a sedentary lifestyle. Additionally, a higher proportion of the participants shared three or more risk factors, mostly those within the 45-64 age group. The 2014 NCD Country Profile for Sierra Leone by the WHO provides further information on NCD-attributable mortality, increasing from 18% in 2008 to 26% in 2012. Specifically, total number of mortality cases attributable to cardiovascular diseases was at 9%, chronic respiratory diseases 1%, diabetes at 2%, cancers at 2% and other NCDs at 12%. The age-standardised mortality rate estimates due to NCDs in males (808/100,000 cases) and females (769.9/100,000 cases) in Sierra Leone are higher than the averages of 756 per 100,000 for males and 565 per 100,000 for females in LMICs.

Furthermore, the review critically assessed the existing national health policies and identified gaps which are indicative of government’s political-will in policy implementation. The Sierra Leonean Ministry of Health and Sanitation developed a National NCD Policy and a National NCD Strategic Plan (2013-2017) aimed at addressing the growing NCD burden, albeit noting limited financial resources to support detection, monitoring, management and control of NCDs. The evidence suggests that the Sierra Leonean government is making concerted efforts to review and update the existing policy and strategy documents informed by research evidence.

The review found scant data on interventions targeting NCDs in Sierra Leone. One of the few examples of such interventions was implemented by the NGO Goal which adopted a community engagement approach to address substance use among children and youths in slum and disadvantaged communities in Sierra Leone. However, there seems to be lack of interventions or service deliveries for secondary and tertiary prevention in the reviewed documents. As per the barriers to NCD service provision and utilization, the review identified key factors including inadequate health care professionals and financial resources, as well as low levels of knowledge and awareness of NCDs in general.

Evidently, the existing health care system in Sierra Leone is fragile and unequipped to address the growing concern of NCD burden, which if not urgently addressed could further worsen the existing burden and associated health, social and economic effects. The scoping review provides the required updates on NCD burden and state of available policies, as well as evidence to inform subsequent research activities. Indeed, research evidence is required to support the Sierra
Leonean NCD directorate’s and key stakeholders’ strategies to improve the current health system and inform public health interventions.
1. Introduction

1.1 Background

The inadequate response to the rising global burden of non-communicable diseases (NCDs) and the associated mortality and morbidity burden is of concern, particularly in low- and middle-income countries (LMICs), even more so in fragile states with weak health systems. Sixty-three per cent (63%) of global deaths in 2008 (36 million of the 57 million global deaths) were attributable to NCDs, and nearly 80% of these deaths occurred in LMICs (World Health Organization, 2010; WHO, 2013). In addition, in these settings, NCD prioritisation is in competition with communicable diseases, overstretcheding the already fragile health systems. Importantly, the poorer population groups often bear the highest burden of NCDs, largely due to lack of knowledge of preventative measures/care and inability to access or afford on-going treatments (Wurie and Cappuccio, 2012). In addition to the burden of NCDs, evidence suggests that fragility poses a major barrier to health and socioeconomic development for over 2 billion people, with communities living in fragile contexts set to approach 60% by 2030 (OECD, 2015). Fragility affects health systems and recipient health care communities in two ways. First, health service delivery may be compromised due to limited financial and human resources or exposure to prolonged conflict and violence. Second, health seeking mechanisms across diverse populations may be severely disrupted due to political marginalisation, systemic inequalities or exposure to extraordinary events, such as natural disasters and epidemics (Martineau et al, 2017). Thus, as the burden of NCDs continues to rise in LMICs, disproportionally affecting the poor, it is pertinent to invest in identifying gaps in NCD prevention and control interventions to aid future planning—a major component of socio-economic development—and to achieve universal health coverage for all. At the international level, policies have been put in place to address the NCD epidemic. In 2011, the United Nations convened a meeting at the end of which the World Health Organization (WHO) was tasked with delivering an agenda, the WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020, to reduce premature mortality due to NCDs (Wurie and Cappuccio, 2012; WHO, 2013). This renewed attention is reflected in the Sustainable Development Goals (SDG), with SDG 3.4 aiming to reduce premature mortality from NCDs by one third by the year 2030 (United, Nations 2015). Achieving this will require concerted global, regional and local partnerships to address this epidemic using an evidence-based approach.

There is dearth of data and information on NCD burden in Sierra Leone and no systematic review and synthesis of available evidence has been carried out thus far. However, taking into consideration the available data and the limited implemented strategies in-country to address, and the global and LMIC trends, it is safe to assume that the burden of NCDs is growing and it may compromise efforts to improve health service delivery for NCDs, which in turn can compromise
efforts to strengthen the overall health sector in a holistic approach. Due to the shocks experienced by the health sector in Sierra Leone, related to the decade-long civil war and the recent 2014 Ebola Virus Disease (EVD) outbreak, it is important that the rebuilding process is evidence-based to ensure that resilient and responsive health systems are constructed.

The NIHR Research Unit on Health in Fragility (RUHF) at Queen Margaret University (QMU), Edinburgh seeks to identify sources of resilience within formal health systems and local community processes to facilitate effective provision for health priorities - particularly mental health and non-communicable disease (NCDs) - in situations of fragility. Current framings of fragility have principally focused on ‘fragile states’ or ‘vulnerable communities’ in isolation and neglected to examine the interdependencies (or the ‘situations of fragility’) arising at the interface between community and health systems. At this level, social networks, community integration, trust in health care providers, the right to health, and coordinated and well-resourced service delivery efforts are likely to be strong predictors of health care access, utilization and population health. RUHF research seeks to understand how and why the interaction of those elements is compromised or absent and to identify ways to strengthen such connections. Understanding what health care delivery models work best in such situations and identifying promising approaches for engaging patient and wider communities is critical to both improving population health and enabling legitimate, appropriate and high-quality service delivery.

RUHF’s research programme is carried out in collaboration between researchers at QMU, Edinburgh, UK, the American University of Beirut (AUB), Lebanon, and the College of Medicine and Allied Health Sciences (COMAHS), University of Sierra Leone, Sierra Leone. The first phase includes the present scoping study, which aims to provide the evidential basis for our focus on specific NCDs, contexts, interventions and challenges associated with service delivery in situations of fragility.

1.2 Aim and specific objectives of the scoping study

This study aims to provide an initial understanding of the NCD landscape in Sierra Leone, assembling existing published evidence on prevalence, risk factors, the policy environment, actors and the health care delivery system. The scoping review will provide the basis for further research or support to NCD interventions in Sierra Leone. More specifically, we aim to identify data relating to the:

1. Burden of NCDs in Sierra Leone and associated risk factors
2. Existing official NCD policies, strategies and interventions designed, including:
   i. evaluation and assessment of the current challenges in the organisation of service delivery for NCDs
ii. integration into the health system and the broader context (including features of fragility) at community, district and national level

2. The key actors involved in service delivery for NCDs in Sierra Leone.

2. Methods

2.1 Data collection

2.1.1 Search strategy

A search of the published and grey literature on NDCs relevant for Sierra Leone at national and regional levels was undertaken. Relevant studies were identified using multiple databases including PubMed, Ovid MEDLINE, CINAHL, Scopus and Google Scholar. Additionally, manual searches were conducted on specific websites, including the WHO and NCD Alliance. Finally, requests, via email and telephone calls, for grey literature, policies and strategic plans on NCDs were sent to relevant stakeholders. A snowball approach was taken to the follow-up of relevant stakeholders for further documents, while complete manual search of references of all the eligible studies was undertaken, up until the 7th of December 2017. The search strategy used the following key terms: "Non communicable disease*" OR "NCD" OR "diabetes*" OR "cardiovascular disease*" OR "cancer" OR "chronic respiratory disease" OR "chronic" AND "Sierra Leone".

2.1.2 Eligibility criteria

Title (at first) and (for potentially relevant documents) abstract screening was conducted for all documents retrieved. Documents were selected for full appraisal based on the following eligibility criteria:

- Published literature, policy documents and any links or websites that detail interventions related to NCDs in Sierra Leone or sub-region
- Documents focusing on any or all of the four main NCDs (cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes) in Sierra Leone or sub-region
- English language documents
- No restriction on dates of document publication

Duplicates identified during title and abstract screening were eliminated.

2.1.3 Study selection

Table 1 shows the total number of documents that were retrieved after data searches, while the PRISMA flow diagram in Figure 1 (below) illustrates the study selection processes. In total, 239 records were retrieved from both internet and manual searches; 59 duplicates were identified and
The remaining 180 records were then independently screened by two members of the research team (AK, MB) to check their eligibility according to the eligibility criteria, and 28 documents were retained for full review and data extraction.

Table 1: Number of documents retrieved by database

<table>
<thead>
<tr>
<th>Database</th>
<th>Initial search results</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDLINE</td>
<td>86</td>
</tr>
<tr>
<td>PubMed</td>
<td>(76)</td>
</tr>
<tr>
<td>CINAHL</td>
<td>18</td>
</tr>
<tr>
<td>Scopus</td>
<td>74</td>
</tr>
<tr>
<td>Google Scholar (first 5 pages)</td>
<td>50</td>
</tr>
<tr>
<td>TOTAL</td>
<td>228*</td>
</tr>
</tbody>
</table>

* Excluding PubMed search which produced a subset of MEDLINE search

Figure 1: PRISMA flow diagram showing the selection of study documents
2.2 Data extraction and analysis

2.2.1 Data extraction

A data extraction form was developed by the research team listing all the variables that needed to be extracted (Table 2). The table builds on the original Terms of Reference for this study, but also on the insight and feedback gathered during the presentation of preliminary findings during the launching of RUHF in November 2017 in Edinburgh. Data extraction was carried out by AK with support from HW, using the Microsoft Excel database that was developed, with documents by row and themes by column. This allowed for a comparative analysis of the data extracted by theme across all documents.

Table 2: Elements and themes included in the data extraction form

<table>
<thead>
<tr>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of publication</td>
</tr>
<tr>
<td>Title</td>
</tr>
<tr>
<td>Type of document (e.g. policy, strategy, M&amp;E framework, intervention guideline, report, publication, etc.)</td>
</tr>
<tr>
<td>Source / link</td>
</tr>
<tr>
<td>Category of NCDs considered</td>
</tr>
<tr>
<td>Geographical focus (e.g. SL, areas of SL)</td>
</tr>
<tr>
<td>Population considered (e.g. general pop, older population, women, children, etc.)</td>
</tr>
<tr>
<td>Period / events considered (include dates considered in the document -- and, if relevant, specify if document refers to war, post-war, Ebola, etc. periods)</td>
</tr>
<tr>
<td>Information on epidemiological &amp; burden of disease data (data on incidence, prevalence, morbidity, mortality, etc.).</td>
</tr>
<tr>
<td>Information on risk factors (including prevalence of risk factors)</td>
</tr>
<tr>
<td>Information on barriers identified for access to NCDs treatment and prevention services and current challenges to service provision: both in access to and quality of services</td>
</tr>
<tr>
<td>Does the document present (i) a policy/strategy, (ii) an intervention, or (iii) simply presents a situation analysis?</td>
</tr>
<tr>
<td>Key design issues of policy or intervention (aims, objectives, theory of change, activities included/nature of intervention, level of care, costing, roles and responsibilities, pop focus/areas of coverage, etc.)</td>
</tr>
<tr>
<td>Is the policy/intervention focused on treatment or prevention of NCDs? (provide detail)</td>
</tr>
<tr>
<td>Health care delivery organisation (how are services provided according to the policy/intervention examined? At what level? Who is responsible? Etc.)</td>
</tr>
<tr>
<td>Coverage of the policy/intervention (population, geographic and health care level focus)</td>
</tr>
<tr>
<td>Key actors involved (e.g. service delivery organizations and actors, funding bodies, responsibility for implementation/evaluation, etc.)</td>
</tr>
</tbody>
</table>
Role of the community and community engagement (is there anything about the community discussed in the document?)

Information on implementation (where, when, by whom, funded by whom, etc.?)

Evaluation and assessment (incl. strength/successes, challenges and bottlenecks in the organization of service delivery, was it successful in addressing barriers to access?…)

Quality of services provided (any comment or evaluation?)

Info on integration (integration in the health system and in the broader context at community, district and national level)

2.2.2 Analysis and reporting

Analysis was carried out by theme, based on the extracted data and predefined codes. For reporting, a preliminary outline was prepared which summarized and reorganised the main themes of the data extraction form. The analysis and write up was developed by HW and AK, and preliminary findings discussed with all research team members.

2.3 Description of documents reviewed (bibliometric analysis)

In total, 28 documents were fully analysed and are included in this study. Bibliometric analysis reveals that most of the documents (23) are published research articles, while only 4 are reports and 1 is a Ministry of Health and Sanitation (MoHS) strategy document. The majority of the documents (n=23) were published over the last decade (2007-2017), while only a few (n=3) were published between 1997 and 2006. Two very old documents dating back to the beginning of the 20th century, during the colonial period, also met the study eligibility criteria (Figure 2).

![Figure 2: Documents analyses by year](image)
In terms of disease focus, 11 (39.3%) documents refer to NCDs in general (more than one condition), while nine (32.1%) focus on cancer. Two (7.1%) documents are focused on cardiovascular diseases (CVDs), diabetes, hypertension and palliative care (Figure 3).

Figure 3: Documents analyses by topic

It is worth noting that the vast majority of the documents retrieved and analysed (n=23) presents a situation analysis concerning NCDs in Sierra Leone, usually based on a quantitative survey or on a qualitative study, three present an analysis of the implementation status of policies and strategies (e.g. concerning palliative care, cancer advocacy and tobacco control), one is a MoHS policy, and only one article describes and assesses an actual intervention.

Figure 4: Documents analyses by type of study
3. Results and Discussion

3.1 Prevalence of NCDs in Sierra Leone

There is some anecdotal evidence that the prevalence of NCDs such as hypertension, diabetes, cardiovascular diseases, stroke, and cancer is on the increase in Sierra Leone. This was based on the MoHS’s National STEPS’ Survey document of 2009 in which the prevalence of NCD risk factors among adult population (aged 25-64 years) was profiled. Overall, hypertension was noted to be the most prevalent NCD condition, while the number of those classified as smokers, having inadequate diet and living a sedentary lifestyle was substantially high.

3.1.1 Prevalence of hypertension

The earlier studies on the prevalence of hypertension in Sierra Leone date back to the 1990s. The first report in 1993 looked at the records of 87 stroke patients on hospital admission in Freetown and reported a prevalence of 68% (59/87 patients) with the peak age for hypertension being 40-59 years (Lisk, 1993). The study concluded that 'more research on hypertension and stroke in populations such as these may reveal important clues to the aetiology and pathogenesis of these serious vascular disorders.' Another study conducted in 1994 found that about 25% of the population in Freetown and over half of the population aged 50 and above were hypertensive (Lisk, 1996). In a review of 25,119 death certificate records in Freetown over a nine-year period (1983-1992) conducted by Lisk & McEwen in 1996, it was reported that 20% and 16% of all deaths in males and females respectively were hypertension-related, with 13.7% of deaths occurring in those aged 40 years and above. The authors further noted that hypertension-related deaths appeared to show a steady increase over the 10-year study period in this urban setting. The findings also suggest that, in the same period, hypertension accounted for about 7.5% on average of all deaths in Freetown (Lisk & McEwen, 1996). Williams & Lisk 1998 assessed the prevalence of hypertension (in terms of mean systolic and diastolic BP) and possible risk factors in two rural regions in Sierra Leone and reported the prevalence as 24.8 and 17.6%, with a mean prevalence of hypertension of 22.4% in the two settings. Whilst these figures are higher than those recorded in similar contexts in sub-Saharan Africa, the findings need to be interpreted with caution given the sample size and peculiarity of the study populations. As well as being underpowered, the prevalence of hypertension recorded by Lisk (1993) was based on 87 stroke patients on admission, meaning the recorded prevalence might have been over-estimated given the positive correlation between hypertension and stroke. For example, high blood pressure is often recorded

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1 STEPS survey conducted in November 2009 by the MoHS and funded by the WHO. This is the first major national study conducted to establish prevalence of risk factors for NCDs in the country and the collected data serve as a baseline which can inform formulation of policies to tackle NCD problems, as data on the current risk factors of NCDs would promote the better use of scarce resources to address NCDs in an effective manner.
in at least 75% of patients with acute stroke (Appleton, Sprigg and Bath, 2016). Other studies (Lisk and McEwen, 1996; Lisk, Williams and Slattery, 1999) compared the prevalence and awareness of hypertension, as well as its determinants in rural and urban Sierra Leone. The age-adjusted prevalence of hypertension in the urban (Freetown) and rural (Port Loko) areas was 23.4% and 14.7%, respectively; the level of awareness mirrored that of prevalence. Among 3,944 individuals presenting to a hospital in Bo, Meehan and colleagues (Meehan et al., 2011) in 2011 reported an age-adjusted hypertension prevalence of 19.6% in those between 15 and 19 years, and 23.6% for those aged ≥20 years. Overall, the prevalence of hypertension significantly increased with age for both male and female study participants. However, despite sample size, the findings have limited generalisability as the health profile of the study participants at the health facility might be different than that of the general population. Notably, more recent studies have reported a significant increase in the prevalence of hypertension in Sierra Leone. Higher prevalence rates of hypertension (> 40%) were reported in males and females by Awad and colleagues in 2014 (Awad et al., 2014). A more recent study by Jobe and colleagues in 2017, including urban adults from The Gambia and Sierra Leone, showed a much higher prevalence of 44.8% in Sierra Leone compared to the population-based studies published 10-20 years earlier.

### 3.1.2 Prevalence of diabetes mellitus

The review found very little evidence on the prevalence of diabetes in Sierra Leone. A study by Ceesay et al. 1997, published over two decades ago, reported prevalence rates of 0% and 2.4% for diabetes in rural and urban Sierra Leone, respectively. Recent WHO estimates predict a 5% prevalence rate in Sierra Leone in 2014 as reported by Sundufu et al. 2017. However, they documented an overall prevalence of diabetes at 6.2% of the 694 study participants, with significant differences by gender – 5.2% among females and 7.4% among males. The prevalence was also found to increase with age, from 0.8% (2/256) among those aged 18 to 29 years, 3.9% (8/204) among the 30 to 39 year age group, 8.4% (11/131) among the 40 to 49 year age group, 19.0% (12/63) among the 50 to 59 year age group, and 25.0% (10/40) among the 60 years and older age group. Following adjustment for age and sex distribution of the national population, the standardized prevalence of diabetes reported in 2014 was 7.0%, indicating an absolute increase from the 2.4% rate reported in 1997.

### 3.1.3 Prevalence of cancer

Breast cancer is now recognised as the leading cause of cancer among women worldwide, including in many developing countries. Two studies on cancer prevalence in Sierra Leone included in this review date back to the early 1900s, reflecting the situation during the colonial era and gives a historical perspective. Renner (1910) reported on a number of admission cases of ‘malignant new growths’ at a hospital within a thirty year period, 1870-1900. He found 20 cases of
‘malignant new growths’ out of the 22,453 treated cases at the hospital within the stated time frame. Renner (1914) also reported 8 cases of malignant disease in the year 1910, with a total of 30 cases between 1900 and 1910.

A more recent study estimates the prevalence of breast mass reported in Sierra Leone at 3.3% (2.9% women and 0.4% men), with 49.1% of women with breast masses reported as being over 30 years of age (Ntirenganya et al., 2014; Bolkan et al., 2015). Apart from these, our review found no other studies on cancer prevalence in Sierra Leone2.

3.2 Prevalence of NCD risk factors

The WHO 2009 STEPS survey established high prevalence of NCD risk factors among the adult population (aged 25-64 years) in Sierra Leone: 34% use tobacco, 17% use alcohol and around 90% consumed less than 5 servings of fruit/vegetables on average daily. With regards to physical activity, 16% and 75% engaged in low and moderate levels of physical activity respectively, while 31% were not engaged in vigorous activity (sedentary lifestyles) (Sierra Leone STEPS Survey 2009). Table 3 below shows that of the 4,997 adults included in the STEPS survey, about 35% of both men and women had high blood pressure (BP) or were currently on medication for high BP, with over 90% of participants having a high BP but not on medication, highlighting a high unmet need.

Table 3: Physical measurements from a population-based survey of adults aged 25 – 64 in Sierra Leone

<table>
<thead>
<tr>
<th>Physical Measurements</th>
<th>Both Sexes</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean body mass index - BMI (kg/m²)</td>
<td>23.1 (22.5 – 23.6)</td>
<td>22.4 (21.9 – 22.9)</td>
<td>23.7 (23.1 – 24.3)</td>
</tr>
<tr>
<td>Percentage who are overweight (BMI ≥ 25 kg/m²)</td>
<td>22.4% (19.2 – 25.6)</td>
<td>16.2% (13.3 – 19.2)</td>
<td>28.7% (24.2 – 33.1)</td>
</tr>
<tr>
<td>Percentage who are obese (BMI ≥ 30 kg/m²)</td>
<td>7.8% (5.7 – 9.8)</td>
<td>4.8% (3.0 – 6.6)</td>
<td>10.8% (8.0 – 13.7)</td>
</tr>
<tr>
<td>Average waist circumference (cm)</td>
<td>--</td>
<td>76.6 (73.5 – 79.7)</td>
<td>81.7 (79.1 – 84.2)</td>
</tr>
<tr>
<td>Mean systolic blood pressure - SBP (mmHg), including those currently on medication for raised BP</td>
<td>130.8 (129.1 – 132.4)</td>
<td>132.7 (130.7 – 134.8)</td>
<td>129.0 (127.2 – 130.9)</td>
</tr>
</tbody>
</table>

2 However, during the drafting of this report, we became aware of data on cervical cancer available at the Well Woman’s Clinic in Freetown. This will be requested for, reviewed for relevance and added to the report at a later date.
Mean diastolic blood pressure - DBP (mmHg), including those currently on medication for raised BP

<table>
<thead>
<tr>
<th></th>
<th>80.3</th>
<th>80.0</th>
<th>80.6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(79.4 – 81.3)</td>
<td>(78.7 – 81.4)</td>
<td>(79.6 – 81.6)</td>
</tr>
</tbody>
</table>

Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)

<p>| | | | |</p>
<table>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>34.8%</td>
<td>36.6%</td>
<td>33.1%</td>
</tr>
<tr>
<td></td>
<td>(31.2 – 38.4)</td>
<td>(31.6 – 41.6)</td>
<td>(29.8 – 36.5)</td>
</tr>
</tbody>
</table>

Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg) who are not currently on medication for raised BP

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>93.2%</td>
<td>94.1%</td>
<td>92.4%</td>
</tr>
<tr>
<td></td>
<td>(91.4 – 95.2)</td>
<td>(92.0 – 96.4)</td>
<td>(89.6 – 95.1)</td>
</tr>
</tbody>
</table>

**Source:** (Sierra Leone STEPS Survey 2009, no date)

Note: 4,997 adults participated in the survey and the overall response rate was 90%

Table 4 shows that only a small percentage of participants had none of the risk factors, with a higher percentage of participants sharing three or more risk factors. Participants within the 45-64 age group were the most affected.

**Table 4: Summary of risk factors of NCDs in a population study (STEPS Survey 2009)**

<table>
<thead>
<tr>
<th></th>
<th>Both sexes</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage with none of the above risk factors</td>
<td>1.4% (0.5 – 2.2)</td>
<td>1.1% (0.3 – 1.9)</td>
<td>1.7% (0.2 – 3.1)</td>
</tr>
<tr>
<td>Percentage with three or more of the above risk factors, aged 25 to 44 years</td>
<td>22.7% (18.2 – 27.2)</td>
<td>27.2% (21.6 – 32.7)</td>
<td>18.6% (12.4 – 24.8)</td>
</tr>
<tr>
<td>Percentage with three or more of the above risk factors, aged 45 to 64 years</td>
<td>37.2% (29.9 – 44.4)</td>
<td>39.9% (30.8 – 49.1)</td>
<td>33.6% (25.5 – 41.7)</td>
</tr>
<tr>
<td>Percentage with three or more of the above risk factors, aged 25 to 64 years</td>
<td>27.0% (22.9 – 31.2)</td>
<td>31.5% (27.4 – 35.6)</td>
<td>22.6% (16.5 – 28.6)</td>
</tr>
</tbody>
</table>

**Summary of combined risk factors**

- current daily smokers
- less than 5 servings of fruits & vegetables per day
- low level of activity
- overweight (BMI ≥ 25 kg/m²)
- raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)

**Source:** (Sierra Leone STEPS Survey 2009)

**3.2.1 Prevalence of risk factors associated with hypertension/cardiovascular disease**

Many of the risk factors for NCDs are generic across the NCD spectrum. Risk factors including obesity, stress, smoking, low potassium intake, high sodium and alcohol intake, familial and genetic influences, low birth weight are associated with, and, may contribute to the development
and persistence of primary hypertension. Research has shown that people of African origin are more susceptible to psychological stress which in turn contributes to a higher risk of CVD in those individuals, making stress a high contributing factor related to hypertension prevalence in this context as reported by Awad and colleagues (Awad et al., 2014) in 2014. Smoking is another CVD associated risk factor and increases the risk of hypertension by two-to three-fold, with gender disparities. In 2011, the prevalence of smoking in Sierra Leone was reported as 19.7% in females and 48.4% in males (World Health Organization - Cancer Country Profiles, 2014). Another study which looked at a 15-year window reported the age-standardised prevalence of daily smoking in 2015 as 3.8% in females and 21.7% in males; and annual rate of change in age-standardised prevalence from 1990–2015 as -0.9 and -0.5 for women and men respectively (Reitsma et al., 2017). Alcohol consumption is another risk factor associated with CVD and hypertension. Research shows that, in 2005, the total alcohol consumption among adults, aged 15 years and over, in Sierra Leone was 6.5% as compared to 2.4% in the Gambia (Awad et al., 2014).

3.2.2 Prevalence of risk factors associated with diabetes

Risk factors associated with diabetes are centred on lifestyle choices, e.g. obesity and lack of exercise. A study in 1986 found 5% of all subjects (501 subjects; 256 rural adults in two villages and 245 urban adults) to be obese in Sierra Leone (Ceesay et al., 1997). More recently, Sundufu et al. 2017 found 15% and 27% men and women, respectively, to be overweight, which is in line with global trends of strong positive correlation between obesity/overweight and type 2 diabetes. Both population growth and aging may also contribute to the increasing rates of diabetes, in addition to the increases in the age-specific prevalence rate that may occur with lifestyle changes, e.g. diet/nutrition, physical activity levels, and other health behaviours.

3.2.3 Prevalence of risk factors associated with cancer

Smoking is a significant risk factor associated with the occurrence of lung cancer, with 71% of global lung cancer deaths attributable to smoking (World Health Organization, 2012). African countries have experienced a tremendous increase in smoking prevalence (Brathwaite et al., 2015). Current prevalence rates for heavy tobacco smoking in Sierra Leone (defined as smoking ≥10 cigarettes a day) is reportedly higher in males (14.3%) than in females (1.4%) (Winkler et al., 2013). The share of moderate current smokers (less than 10 cigarettes per day) increased to 28.8% of the male population and 11.9% for the female population. More recent estimates referring to the 2007-2012 period estimated the nationwide smoking prevalence in Sierra Leone at 25.8%, with gender disparities as before (Brathwaite et al., 2015). This was informed by the aforementioned nationwide STEPS survey, and combined both heavy and moderate smokers (Brathwaite et al., 2015). This study also reported that smoking prevalence increases with age in Sierra Leone.
3.3 Mortality due to NCDs

The WHO reported in 2008 that NCDs accounted for 18% of all deaths as shown in Figure 5 below, with CVDs accounting for 7% of the total deaths, cancer for 3%, chronic respiratory disease for 2%, diabetes for 1% and other NCDs accounting for 5% (Alwan et al., 2011).

![Proportional mortality (% of total deaths, all ages) chart]

NCDs are estimated to account for 18% of all deaths.

Figure 5: 2008 estimates or proportional mortality due to NCDs in Sierra Leone Source: (Alwan et al., 2011)

The more recent NCD Country Profile for Sierra Leone (World Health Organization (WHO), 2014) provides further information on the burden of NCDs as per mortality. The estimated percentage of deaths attributable to NCDs increased from 18% in 2008 to 26% in 2012 (Figure 6), with cardiovascular diseases accounting for 9% of total deaths, chronic respiratory diseases (1%), diabetes (2%), cancers (2%) and ‘other NCDs’ (12%).
The overall NCDs age-standardized death rates for all ages in low- and middle-income countries were 756 per 100,000 for males and 565 per 100,000 for females. The estimated age-standardised death rates attributable to NCDs in Sierra Leone were reported as 808 per 100,000 deaths for males and 769.9 per 100,000 for females. In Sierra Leone, CVDs and diabetes (421.0 per 100,000 deaths for males and 458.6 per 100,000 deaths for females) account for the majority of these deaths, followed by cancer and chronic respiratory diseases, as shown in Table 5 below (Alwan et al., 2011)). However, these estimates were reported to have a high degree of uncertainty because they were based on a combination of country life tables, cause of death models, regional cause of death patterns, and WHO and UNAIDS programme estimates for some major causes of death (not including NCDs). Currently, national NCD mortality data (which could provide more reliable estimates) is lacking.

Table 5: Estimates of NCD mortality (Adapted from Alwan et al., 2011)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total NCD deaths (000s)</td>
<td>7.2</td>
<td>7.6</td>
</tr>
<tr>
<td>NCD deaths under the age of 60 (percent of all NCD deaths)</td>
<td>53.8%</td>
<td>58.1%</td>
</tr>
<tr>
<td><strong>Age standardised death rate per 100,000</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All NCDs</td>
<td>808.0</td>
<td>769.9</td>
</tr>
<tr>
<td>Cancers</td>
<td>101.1</td>
<td>100.8</td>
</tr>
<tr>
<td>Chronic respiratory diseases</td>
<td>117.1</td>
<td>69.5</td>
</tr>
<tr>
<td>CVD and diabetes</td>
<td>421.0</td>
<td>458.6</td>
</tr>
</tbody>
</table>
Figure 7 below shows data (not based on national NCD data, but estimated from other sources) on age-standardised death rates from 2000 to 2012, which shows a peak during the conflict, a steady somewhat downward trend post conflict, albeit higher rates, but in some cases a slight upward trend (e.g. cancer).

![Age-standardized death rates](image)

**Figure 7: Age standardised death rates due to NCDs from 2000 to 2012**

Source: (World Health Organization (WHO), 2014)

As shown in Figure 8, the probability of dying in the socio-economic productive years (i.e. 30 to 70 years) from the four main aforementioned NCDs in Sierra Leone was reported as 27% in 2012, with 'other NCDs' and CVD accounting for the majority.

![Premature mortality](image)

**Figure 8: Premature mortality due to NCDs in Sierra Leone**

Source: WHO Sierra Leone NCDs country profile 2014

The WHO also provides data on cancer mortality, age-standardized death rates and incidence for cancer in Sierra Leone, shown in figure 9 below, with 900 deaths in males and 1300 deaths in females reported. Liver cancer accounted for the majority of the deaths in males (with
approximately 34% of the deaths attributed to it), followed by others (32.9%) and prostate cancer (17.8%). Among the females, cervical cancer was the major contributor to the reported deaths (29.2%), followed by others (27%) and breast cancer (21%). The trends from the age standardized mortality rates showed no increase in the mortality rates in general, but an upward trend for breast cancer and prostate cancer. However, as there are currently no national data available on these rates, available figures are based either on national incidence estimates and modelled survival or on national incidence estimates from neighbouring countries (World Health Organization - Cancer Country Profiles, 2014). Winkler et al. (2013), using a projection model, reported the male lung cancer mortality rates in Sierra Leone as 13.5 per 100,000, with rates expected to rise sharply.

Prevalence and mortality rates captured in this review showed a general increasing trend over time. It is reported that more than 14 million people living in sub-Saharan Africa are diabetic, with approximately 67% unaware of their status (Sundufu et al 2017). Historically, at the regional level, the WHO estimated the prevalence of diabetes in sub-Saharan Africa to be in the range of 1 – 2% in 1985. Other studies suggested a prevalence of 0.0 – 1.0% in the African population, with reported rates of 0.0% in a rural community in Togo in the late 1980s to 5.7% in a rural population in Ivory Coast in the late 1970s. Diabetes prevalence among adults across sub-Saharan Africa has increased to 4% by 2010, and is expected to double to 6% in 2035 (Sundufu, Bockarie and
Jacobsen, 2017). A study by Ceesay et al. (1997), conducted 20 years ago reported prevalence rates for diabetes at 2.4% in urban areas and 0% in rural areas. This can be attributed to the risk factors which are more pronounced in the urban setting. WHO predicted rates for 2014 was reported as 5% prevalence, slightly lower than the rate of overall prevalence of 6.2% reported by Sundufu et al. (2017), and an increase from the rates reported over 20 years ago, with the standardized prevalence of diabetes also increasing from the reported 7.0%, showing an increase from the 2.4% rate reported in 1997. This was also captured for other NCDs and their associated risk factors. This can be attributable to the aforementioned dearth in interventions to address the growing problem. Additionally, fragility and instability related to the civil war (1991-2002) and the Ebola outbreak (2014) are likely to have acted as a psychological stressor that led to the increase in NCDS especially that of hypertension prevalence (Awad et al., 2014). The overall NCDs age-standardized death rates for all ages in low- and middle-income countries were 756 per 100,000 for males and 565 per 100,000 for females. The age-standardised death rate estimated due to NCDs was reported in Sierra Leone as 808 per 100,000 deaths for males and 769.9 per 100,000 for females. This is in line with regional age-standardized death rates attributable to NCDs reported in the Global Health Observatory data (WHO, 2017).

3.4 Official policies and regulatory frameworks

3.4.1 The National NCD Policy & Strategic Plan

The Ministry of Health and Sanitation in Sierra Leone has developed a National NCD Policy (MoHS 2013a) and a National NCD Strategic Plan (2013-2017) (MoHS 2013b) to address the growing concerns related to NCD burden. However, there is intent to review and update the current strategic plan as its lifespan has been outdated. The STEPS survey informed the development of the Policy, described by the then Minister of Health and Sanitation as marking “a new beginning for interventions in NCDs in Sierra Leone” (MoHS 2013a, p. 2). The rationale for its development includes the absence of a comprehensive policy, even though there was a reported growing burden of disease, weak national coordination and implementation framework to align all NCD prevention and control programmes, financial constraints to support a sector wide approach and poor integrated and inter-sectoral collaborative efforts. The aim of the policy was to reduce the burden of all NCDs (including CVDs, chronic pulmonary diseases, diabetes mellitus, obesity, cancers, sickle cell disease, mental disorders and epilepsy) in Sierra Leone, by reducing morbidity, mortality and risk factor prevalence, using cost effective and evidence based interventions at all levels of care.

The National NCD Policy is built around eight key principles:

i. Ownership and accountability;
ii. People-centred health care;
iii. Cultural relevance;
iv. Focused on reducing inequities;
v. Encompassing the entire care continuum;
vi. Involving the whole of society;
vii. Integral to health systems strengthening; and
viii. Flexibility through a phased approach.

The objectives and strategies involved are:

1. Reinforce leadership and strengthen capacity of health system for prevention and control of NCDs (advocacy; recruitment; HR development; policy formulation and review; care, treatment and rehabilitation services; improving built environment; supportive supervision);

2. Advocate for and influence other relevant national policies and plans that may impact on prevention and control of NCDs (advocacy; negotiation and mediation; social mobilization);

3. Establish and strengthen integrated NCDs surveillance system and provide evidence for public health decision making (NCD incorporation into HMIS; develop NCD registries; NCD data utilization; institutional capacity strengthening; monitoring);

4. Promote healthy lifestyles and reduce risk factors using health promotion strategies (advocacy; policy; negotiation and mediation; legislation and regulations; health education and awareness raising; social mobilizations);

5. Promote research for prevention and control of NCDs (advocacy; policy);

6. Strengthen partnerships and establish a network of relevant stakeholders for surveillance, prevention and management of NCDs (partnership meetings; strengthen partnerships; community participation; networking); and

7. Establish a system for NCD monitoring and evaluating the effectiveness of promotion, prevention and control measures

The priority areas for intervention included:

i. Health promotion and education

ii. Capacity building (infrastructure, staffing, training and equipment)

iii. Surveillance of NCDs and its associated risk factors

iv. NCD management at the primary level of care

v. Monitoring and evaluation

vi. Evidence based research

vii. Collaboration and partnerships
viii. Financing

A budget of 1,104,000 USD\(^3\) was estimated to be needed to support the implementation of the National NCD Plan. MoHS was expected to be the main funder of this programme, with additional support from other partners.

3.4.2 Evaluation and assessment of implementation of the policy

According to the NCD Policy (MOHS, 2013a), the evaluation of NCD prevention and control will be under the guidance of the National Steering Committee. The document describes how evaluation would involve assessing the progress in implementation of the program through a detailed analysis of inputs, outputs and outcomes. However, little progress has been made in implementing this policy, and accordingly evaluating and assessing the implementation of the policy.

3.4.3 Key actors and stakeholders involved in NCDs

National stakeholders include policy-makers, as well as international development partners, service providers and researchers who have a key role in ensuring that NCD and mental health prevention and control become a major part of the health system strengthening process. Our study identified a number of stakeholders, at individual and organisational level, who are currently engaged in working on NCDs in Sierra Leone. Table 6 provides the list.

Table 6: Key stakeholders involved in NCDs in Sierra Leone

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoH/national level</td>
<td>NCD Directorate Director</td>
</tr>
<tr>
<td></td>
<td>Programme Officer - NCD Directorate</td>
</tr>
<tr>
<td>MoH/service providers</td>
<td>Caregiver at Tertiary, Secondary and Primary Health Care level</td>
</tr>
<tr>
<td>International organisations</td>
<td>WHO</td>
</tr>
<tr>
<td>NGOs</td>
<td>GOAL</td>
</tr>
<tr>
<td>Service users / patients’ groups and associations</td>
<td>Planned research on incidence of NCDs in Bo and survey of providers</td>
</tr>
<tr>
<td>King’s Sierra Leone Partnership</td>
<td>Planned research on incidence of NCDs in Bo and survey of providers</td>
</tr>
<tr>
<td>Researchers (PhD research project)</td>
<td>Research on the prevalence of hypertension and diabetes in Sierra Leone, by building on the 2009 WHO STEPS survey by gathering data for Step 1 &amp; 2 using a cross-</td>
</tr>
</tbody>
</table>

\(^3\) The scoping assessment review was unable to capture and report on the actual amount expended
In particular, two main key players are involved in NCD decision-making, planning and delivery – the MoHS and specifically, the NCD directorate which is tasked with providing administrative and technical support to the NCD agenda, and the WHO. The roles and responsibilities of the MoHS and WHO/partners are listed below, as stated in the National NCD Policy. Given the existing challenges, however, some of the roles and responsibilities of the main key stakeholders listed are yet to be fully realized.

**MoHS/NCD directorate**

i. Foster leadership for NCDs within the health care sector by building on existing structure, ensuring effective coordination and facilitation of the relevant key stakeholders at ministerial and government bodies level.

ii. Strengthen human resource capacity, including improvement of training of health care workers, relevant on the job training by establishing a continued medical education programme at all levels (i.e. primary, secondary and tertiary), with particular emphasis on the primary care level.

iii. Build institutional capacity, i.e. the NCD directorate, with adequate human resource and funding, using existing structures and processes as a platform.

iv. Support national policies, strategies and action plans, providing effective legislations and regulations with regards to NCDs and its associated risk factors.

v. Effectively monitor and evaluate progress made against the implementation of the Policy and Strategic Plan.

vi. To promote health education and promotion on NCDs by providing accurate and timely information to the population, to allow them to make informed healthy choices.

vii. Promote and encourage multi-sectoral involvement, including NGOs, FBOs, civil society, communities, media, development partners and the private sector in activities related to NCD prevention and control.

viii. Promote and invest in surveillance, research and evaluation of NCDs and their determinants.

ix. Invest financially in the national NCDs action plan implementation, and identify alternative sources of funding.
WHO and other partners

i. Provide technical and financial assistance in the development, implementation and evaluation of advocacy campaigns for the prevention and control of NCDs.

ii. Support the MOHS in the implementation of inter-sectoral initiatives in Sierra Leone.

iii. Support the efforts of the MOHS in strengthening opportunities for training and capacity building, with regards to public health aspects and appropriate cost effective clinical interventions for NCDs.

iv. Support the development and dissemination of supporting materials, i.e. protocols and guidelines, for rational use of medicines and technology for NCD prevention and control.

v. Support the development of networks of community based programmes for NCD prevention and control at national and district level.

vi. Provide support to the MOHS in implementing the Framework Convention on Tobacco Control and support national led programmes designed to reduce NCD modifiable risk factors.

vii. Support the development of a relevant research agenda to support NCD prevention and control, including capacity building for epidemiological and health systems research.

viii. Promote collaborative relationships with international stakeholders, national and regional funders of health programmes to support the work in NCD prevention and control.

ix. Support the development of relevant indicators and milestones relevant to the context in Sierra Leone.

3.5 Current challenges in the implementation of policy

Effective implementation of the activities included in the NCD Policy and in the NCD Strategic Plan has been faced with challenges as documented in the National NCD Policy itself (MOHS, 2011). Indeed, it appears that no specific policy, programme or action plan of the MoHS is currently operational for the prevention and control of CVD, cancer, chronic respiratory diseases, diabetes, sickle-cell disease and other genetic disorders, alcohol or tobacco. This impedes efforts to deliver and monitor quality services for the prevention and treatment of NCDs and to address the growing burden of NCDs in a concerted and cumulative manner.

Challenges that have hindered the implementation of the National NCD Policy and Strategic Plan (MOHS, 2013) include:
i. Financial constraints which impede effective implementation of preventive and control activities
ii. Difficulties in mainstreaming NCDs in the presence of other competing priorities
iii. Weak surveillance structures for NCDs and their associated risk factors
iv. Weak integration of NCDs at the primary health care level
v. Unplanned urbanization and its associated impact on risk factors for NCDs
vi. Unregulated tobacco, food (unhealthy) and alcohol industries
vii. Institutional, community and public policy changes for incorporation of NCD prevention and control.

3.6 Existing legal and regulatory framework

In 2008, the WHO led the introduction of a policy called MPOWER (which stands for M: monitor tobacco use; P: protect people from tobacco smoke; O: offer help to quit tobacco use; W: warn about the dangers of tobacco; E: enforce bans on tobacco advertising and promotion; R: raise taxes on tobacco products). The policy aimed at serving as a tool in assisting implementation of effective interventions at the country level to reduce the demand for tobacco as indicated in the WHO’s Framework Convention on Tobacco Control (FCTC). The FCTC was designed to reduce the use of tobacco, as a means of preventing the range of chronic diseases associated with tobacco use. As of June 2015, implementation of the WHO’s FCTC rate for Sierra Leone, calculated as the status of implementation of elected WHO FCTC Articles on tobacco control was 9% (Husain, English and Ramanandraibe, 2016). However, efforts are being put in place with support from WHO, with possible additional support from the World Bank, to improve on this, with plans to develop a strategic plan for tobacco control in early 2018.

3.7 Service delivery organization

In this section, we synthetize the information found in the documents reviewed about the delivery of NCD related services, looking at prevention strategies, management of NCDs and also palliative care. It must be noted that, overall, the information available on NCD service delivery and its organisation is extremely limited.

3.7.1 Prevention of NCDs

We attempted to extract and report information on all levels of prevention, including primary, secondary and tertiary prevention (Figure 10).
One of the few examples of primary prevention intervention is that carried out by the NGO Goal, focusing on substance use among children and youth living in the streets (Galway, 2013). In 2011 GOAL Sierra Leone in partnership with the MoHS and funded by the European Union (EU) and Irish Aid, engage in a research project and programme design process followed by implementation to address some of the identified issues around substance abuse and “reduce non-communicable diseases and other negative impacts of substance abuse (tobacco, alcohol, drugs) among children and youth in slum and disadvantaged communities of Freetown, Sierra Leone.” The overall findings of the research project, confirmed the anticipated high exposure to risk factors for NCDs among the target group, highlighted the high levels of tobacco, alcohol and marijuana use, the association between substance use and risk behaviours and the role of the peer group as a driver for substance use. This highlighted the need for evidence-based policy relating to substance misuse in Sierra Leone and the need to put effective measures in place to address the easy access to harmful substances and lack of controls (such as advertising bans, purchasing laws, or taxation), that will ultimately protect the young and vulnerable. The intervention was designed around creativity in the form of visuals, music and dance, and allowed for the development of culturally grounded highly colourful schemes, funky graphics and engaging health promotion brands, which was reported as easy to interpret and recall. Evaluation of the intervention found a high level of brand recognition. Using ex substance users and community members, youth focused materials and music allowed the communication of health information and knowledge dissemination amongst the hideouts and communities. No examples of interventions or service delivery focused on secondary and tertiary prevention were found in the documents retrieved.
Management of NCDs

As in most LMICs, patients with NCDs are usually managed in tertiary or secondary-level hospitals, although there is growing evidence from other settings about the management and care of NCDs in the primary health care setting (Manjomo, Mwagomba and Ade, 2016). It is documented that the shared workload has also trickled down to the Peripheral Health Units (PHUs), with established referral mechanisms to ensure that patients with selected NCDs (e.g. diabetes, epilepsy) or severe complications from hypertension or peptic ulcer disease are referred from primary health care level to secondary or tertiary care facilities (Samba et al., 2017).

In Sierra Leone, guidelines from the NCD directorate of the MoHS recommend which NCDs can be treated and managed at the primary/peripheral health care (PHU) level, and the criteria for referral to the secondary and tertiary care levels. The health workforce should be trained to detect, diagnose, manage and refer patients with NCDs at all levels of the health care system, with a range of essential drugs available for each condition, varying from simple or first-line drugs, available at the PHU and secondary hospital level, to more advanced therapies at the tertiary level. This will allow for a range of NCDs to be diagnosed at the PHU level, including hypertension, cardiovascular disease, diabetes mellitus, peptic ulcer disease, cancer/tumour and mental health disease. Services for hypertension and peptic ulcer disease should be treated at the PHU level, while referral, treatment and follow up for the other conditions should be available at the secondary and tertiary levels. It should also be possible for patients to directly access secondary and tertiary level care and to be diagnosed, treated and managed for NCDs. At the PHU level, monthly reports on the numbers of patients with selected NCDs, stratified by sex and age group (0–14 and over 15 years) are sent to the District Health Management Team, where they are collated into monthly summaries for the out-patient morbidity forms by the monitoring and evaluation (M&E) officers and sent to the Directorate of Planning, Policy and Information (DPPI), where data can be obtained by the directorate for NCDs. Monthly reports are also compiled at the secondary and tertiary levels by the M&E officers and sent directly to DPPI (Samba et al 2017). However, it was confirmed at the DHMT that these monthly reports are being sent but limited information on NCDs was available at the directorate, with no current disaggregation captured in the health management information system.

With regards to cancer treatment, a tool kit, the ‘Africa Cancer Advocacy Toolkit’ has been described in the literature (Odedina et al 2013). It comprises key elements, including the development of an advocacy plan as a concerted effort with governments, whilst being actively engaged in health promotion and awareness raising campaigns and ensures that resources and sustainable funding is available. This approach is very relevant in the context of Sierra Leone to explore the potential development of a comprehensive synopsis of innovative cancer advocacy programmes.
There is also a diabetes clinic being run at the main tertiary hospital in Freetown, Connaught hospital. There is scope to assess the barriers to access care at this level, and also all other levels of care, both from a service user’s perspective and from a service provider’s perspective. With regards to hypertension treatment and management, they currently have one cardiologist, who is also accessible at Connaught hospital.

3.7.3  **Palliative care**

The study by Lacoux et al. (2003), followed up on patients with traumatic amputations in Freetown, Sierra Leone. This is relevant in the context of NCDs as amputations are usually likely in poorly controlled diabetic patients. This study reported that in 2001, 223 patients had their pain treated with amitriptyline and carbamazepine. It further assessed the relief of pain and the improvement in mood during the treatment and their employability post operation. It reported an improvement in pain management and mood in those patients who adhered to the medication over a longer period. Those patients were also more likely to get employed, improving their economic standing (Lacoux et al., 2003; Schneider, Pautex and Chappuis, 2017).

3.8  **Unmet needs for NCDs and barriers in access to services**

The studies included in this review point to a number of elements that constrain access to NCD treatment and prevention services for the population. One element is the shortage of health care professionals (Agaku and Filippidis, 2014; Ntirenganya et al., 2014). This is reported to limit the availability of interventions and implementation programmes by trained professionals. Awad et al. (2014) found that the health care provider-to-population ratio is extremely low at 19/100,000 in Sierra Leone (lower for example than in the Gambia, where it is estimated at 61/100,000), reflecting the inadequate establishment and funding of public health care facilities in these countries. Samba et al. (2017) in their study noted that the downward trends observed for most NCDs during the Ebola disease outbreak were likely to be due to the closure and repurposing of some health facilities for the Ebola response, a decrease in clinic attendance, as well as the redeployment and the tragic death of health care professionals.

Financial constraint was noted as another key barrier in accessing care (Ntirenganya et al., 2014). Stewart et al. 2015 reported that 77% of their study population did not seek medical care for NCDs due to lack of financial resources. The lack of policies to support early detection of NCDs (for example, in the case of breast cancer) can also be a key barrier to accessing care (Ntirenganya et al., 2014). Access to palliative care remains a problem in low-income countries like Sierra Leone where the number of deaths from cancer and other NCDs are on the increase (Lamas and Rosenbaum, 2012; WHO, 2017). This shortfall was noted to be the result of prohibitive regulations
to the use and cost of opioids, barriers related to health professionals’ training as well as perceptions and restrictions in the health system (Schneider, Pautex and Chappuis, 2017).

In addition, the literature reports that the lack of knowledge and awareness amongst women in Sierra Leone about conditions such as breast cancer and on how to perform simple life-saving diagnostic breast checks such as breast self-examination can be a barrier to health care seeking. Also, women do not have access to modern technologies for the detection and treatment of cancers except that of surgery (Jhee Sheperd, 2007). A country like Sierra Leone has no breast cancer policy in place to address this threat. There is no institute undertaking research in cancer in the country and no screening facilities, e.g. a mammogram, available in the whole country. Sierra Leone as a country, is faced with the problem of accessing reliable data. This situation has been worsened by the 10-year rebel war in the country when a number of health facilities were destroyed and rendered non-functional (UNICEF, 1999), possibly destroying any screening facilities and equipment available. This is speculative as the literature does not capture the situation in this phase. Women do not have access to vital information regarding their health. Instead, women rely on radio discussions or health talks during visits to the antenatal clinic for information on reproductive health (Shepherd and McInerney, 2006).

Summary of review

As the first phase of the RUHF’s research project, this scoping review aimed to explore available evidence and possibly identify research gaps with respect to NCDs in Sierra Leone. Overall, 28 documents met our predefined inclusion criteria and formed the basis of this scoping study. Notably, the reviewed evidence suggests that NCD burden (prevalence and mortality, as well as corresponding risk factors) is increasing in Sierra Leone across gender and settings (urban and rural). Overall, whilst the general evidence suggests the need for more studies with robust methodological approaches, there appears to be scant evidence on CVD, diabetes, hypertension, cancer, chronic respiratory diseases and palliative care. Importantly, the findings will be useful for informing potential future research studies on NCDs in Sierra Leone.

In its first global report on NCDs, the WHO (World Health Organization, 2010) reported an increase in the number of deaths caused by NCDs in 2008: 36 million (63%) of the 57 million deaths worldwide and alarmingly, 80% of those deaths occurred in developing countries which creates an enormous impact on socio-economic development, given that many of those affected are at the peak of their productive and economic activity (Wurie and Cappuccio, 2012). This resonates with the situation in Sierra Leone. It is hoped that these findings will form the basis for further elucidation of the current NCDs landscape in Sierra Leone; whilst also highlighting the current issues regarding NCDs care and management from a health system and service user perspectives. The vast majority of the literature retrieved and reviewed focused on the ‘situation
analysis’, providing a reflection of the growing concern of the NCD burden in an already overstretched health system in Sierra Leone. Very little had been done by way of intervention and assessments/evaluation of any proposed intervention, which reflects the fact that there is very limited number of interventions and NCD services offered to the population in Sierra Leone, despite the increasing rates of prevalence and mortality attributable to NCDs.

Implementation of the national policy has not been undertaken due to a number of challenges identified in the accompanying strategic plan, ranging from socio-cultural factors to resource constraints. This poses a major barrier in accessing and delivering effective NCD services. It is evident that the national system in place to address the growing concern of NCDs is faced with challenges that cut across different sectors. However, this provides a window of opportunity to support the efforts of the NCD directorate in the current health system reconstruction phase, and provides evidence that can serve as an advocacy tool to harness more financial and ongoing technical support to the directorate.
References


MOHS (2011) ‘National NCD Policy - Sierra Leone’.


Sierra Leone STEPS Survey 2009 (no date) *The Prevalence of the Common Risk Factors of Non-Communicable Diseases in Sierra Leone.*


Find out more about the RUHF here: www.qmu.ac.uk/ruhf

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