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Ideation and practices related to common communicable and non-communicable

causes of morbidity and mortality among

Couples' HIV Counseling and Testing Clients in Copperbelt, Zambia

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An abstract of
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Abstract

Ideation and practices related to common communicable and non-communicable causes of morbidity and mortality among Couples' HIV Counseling and Testing Clients in Copperbelt, Zambia

By Lauren Witt

BACKGROUND: The growing threat of cardiovascular disease and other common causes of morbidity and mortality in developing countries may be ameliorated with preventive action. Hypertension and other contributing illnesses to cardiovascular disease are not being managed by current health systems and little is known about the prevalence and trends of these diseases in Zambia.

OBJECTIVES: Knowledge and attitudes of and self-reported diagnosis of nine common causes of morbidity and mortality was assessed in adults who had completed Couples' Voluntary Counseling and Testing in the urban Copperbelt Province.

METHODS: Four formative focus groups were conducted in Ndola to inform development of a regional cross-sectional survey. From June to August 2012, 126 participants in four cities were surveyed. Biomedical and social knowledge, experience with diseases, misinformation, importance of addressing disease prevention at the community level were assessed.

RESULTS: Of survey respondents, 34.5% (N=116) did not use Insecticide Treated Nets in their homes and 26.7% (N=116) reported not having soap in their homes. No person in the respondent's household received regular deworming treatments in 62.1% (N=116) of the sample. Knowing someone with the target disease was associated with reporting that the disease is a large problem in the community with hypertension (CMH $\chi2= 11.9576$, p= 0.0075) and diabetes (CMH $\chi2 = 12.9826$, p=0.0047), but not with schistosomiasis (CMH $\chi2=4.4884$, p= 0.2133) or syphilis CMH $\chi2= 5.5131$, p= 0.1379).

CONCLUSIONS: Results from the knowledge assessment indicate that many diseases are thought to be caused by environmental and social factors; however, there is still some misinformation regarding etiology, risk factors, and treatment or prevention. Within this population, the willingness to learn about health was affirmed. Providing appropriate, empowering education will allow communities to manage risk at multiple levels and redefine social norms regarding healthy behavior. Prevention, screening, and treatment for common diseases with HIV testing as the point of entry can be a beneficial and cost-efficient strategy. Introducing awareness of other common causes of morbidity and mortality at HIV diagnosis may assist providers in care plan formation.

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Introduction

Sub-Saharan Africans face significant disease burden of both infectious and non-infectious chronic illnesses in addition to bearing the globe's disproportionate incidence of HIV; this epidemiologic burden translates into clinical comorbidities that include syphilis, malaria, diarrhea, parasites, hypertension, and diabetes, which complicate treatment regimens and diminish positive health outcomes. Health systems are currently ill-equipped to absorb the morbidity associated with chronic diseases and should be incorporated into the existing infrastructure to address the growing need (1). Complications from aforementioned illnesses can cause other debilitating conditions, which are in turn likely to increase the risk of several important infections in the region, including tuberculosis, pneumonia and sepsis (2). Regular monitoring and screening of all people in a community and training of their health care staff is imperative to identify and treat underfunded common causes of morbidity and mortality. These morbidities increase consumption of valuable social and medical resources, which slow the achievement of the millennium development goal 6a and 6c, reducing transmission of HIV and reducing morbidity from malaria and other major diseases in Zambia.

In Sub-Saharan Africa, the greatest risk of contracting HIV is being a married woman (3). As a United States Agency for International Development HIV priority country, Zambia has received significant support in its battle against the spread of the virus. Currently 14.3% of the Zambian people are infected with HIV; with higher prevalence rates in urban areas of 23.1%, Lusaka and the Copperbelt regions, in which approximately 40% of the population reside, have been highlighted as areas in which prevention efforts may have the largest population level return on investment (4, 5). The HIV-related health system infrastructure is well-developed in the Copperbelt with many international donors contributing to national response efforts (5). Due to the funding structures, HIV research infrastructure has been implemented vertically in

Zambia, focusing on the disease independent of sociopolitical, infrastructural, and biomedical integrated frameworks. The fracturing of health care programs imposes additional barriers to communities in resource-poor settings. Established national and international prevention programs may present as the most proactive sector in Zambia's health system for outreach, education, and prevention of this chronic illness in adults. Integrating cardiovascular disease prevention into this framework can allow the strengths of the HIV-related health infrastructure to facilitate outreach. Utilizing the coordination between donors and the public health sector may present the most sustainable method of scale-up in preventing cardiovascular disease, particularly in urban areas.

Though this study examined many causes of morbidity and mortality throughout the Copperbelt Province, special attention is paid in this report to hypertension, a disease that has the capacity to complicate many treatment regimens; in addition, the prevalence is increasing globally and the response to prevent and manage this disease include substantial changes to health systems to accommodate adequate treatment plans. Hypertension serves as a demonstrative illness that can be prevented and detected through HIV services. The largest contributory disease in cardiovascular disease in Africa is hypertension (6). A systematic review of hypertension in sub-Saharan Africa indicates that as the life expectancy increases in many countries, the prevalence of hypertension, which manifests most often in the older population, is growing (7). Hypertension is defined as chronic high blood pressure, which persists at or above 140 mm Hg systolic or 90 mm Hg diastolic pressure and is most often recognized during pregnancy (8). However, outside of this condition, hypertension is largely under-recognized. The WHO estimated that in 2008, nearly 600,000 male and 700,000 female deaths in Africa were attributed to cardiovascular disease; the 1.26 million deaths is expected to rise to over two million each year by 2030 (9).

The capacity of African health systems to diagnose and treat hypertension, cardiovascular disease, and other non-communicable illnesses is variable, but regardless of response capacity, the first and most appropriate method of treatment and prevention is lifestyle modification for many causes of morbidity (10). Individual and community level awareness and management of hypertension has been noted as "far from optimal" in both providers and consumers of health care (11). In cases that had been diagnosed, 62% of patients contacted a year after diagnosis had uncontrolled hypertension and an alarming 26% of the sample denied knowledge of their condition despite referral (7).

Many studies have been conducted within the past ten years to examine the link between cardiovascular disease and HIV infection. There is significant support for increased risk of hypertension for people living with HIV, yet the physiological cause is debated. Despite the academic debate, it is recognized that "cardiovascular disease is the leading cause of non-HIV-related death in HIV-infected persons" in the United States, warranting investigation in low income countries that will bear the burden of HIV infection, ART management, and associated comorbidities in the near future (12). People living with HIV infection are at 1.4 times increased risk of myocardial infarction than the general population (13, 14). The management of people living with HIV/AIDS must include the metabolic adverse effects of drug therapy that lead to or exacerbate hypertension and cardiovascular disease (15). Moreover, HIV-infected persons may be under-diagnosed or undertreated when cardiovascular disease risk is present (16).

Targeting cardiovascular risk reduction is central for promotion of health within this group. "The management of high blood pressure (BP) is particularly inadequate in low-income countries" and requires significant attention since these health systems must bear the brunt of HIV infections, ART regimens, and rely on low income solutions to management of comorbidities (12).Throughout the literature, treatment through behavioral modification of

lifestyle has become the most agreed-upon component of this research field. Modification of lifestyle and control of hypertension reduces the risk of a variety of conditions associated with HIV-related mortality (17).

Opportunities for hypertension and other morbidity screening are missed in some traditional points of entry in Zambia. Though most women are screened for hypertension and diabetes during pregnancy, other primary health care services are not diagnosing or linking hypertensive or diabetic patients to appropriate services. The 2007 DHS reported that 80% of pregnant women had their blood pressure taken during at least one antenatal care visit; however, there is no follow up data on linkage to care or a diagnosis of hypertension (18). Men and non-pregnant women are not targets of hypertension screening, unless they are enrolled in clinical HIV care, where taking blood pressure measurements is a standard of care vital sign procedure.

One route in Zambia in which couples are already seeking preventive health care is Couples Voluntary HIV Counseling and Testing (CVCT). One provider of CVCT is the Zambia-Emory HIV Research Project, which has successfully integrated family planning services into couples testing at initial point of entry (19, 20). Adding-on services takes little additional resource burden and can have a large impact in outreach through this modest, cost-effective service integration (21). This service ensures that men are targeted, alongside women, in hypertension and HIV prevention and screenings, a traditionally underrepresented group in preventive care for both diseases due to the health system's favor towards pregnant women and children (4, 22).

As the perception of hypertension and all other illnesses depend on community, family, and individual level risk perception, attempting health education interventions outside of the individual level may be clinically and socially useful for advancing health-seeking behavior and

social norms. In a couple or household level, meals are prepared, activity patterns overlap,

financial resources available for health spending, and social networks are shared. Targeting this

level for intervention is necessary since there is a 15% increase in odds of hypertension of a

spouse married to someone with hypertension (OR=1.15, CI 1.06, 1.25) (23). Additionally,

treatment and control of hypertension was positively associated between spouses (23). In

educational and screening campaigns, medical providers may target couples and families as

opposed to individually to ensure maximum impact. Adding hypertension prevention education

and screening to Couples' Voluntary HIV Counseling and Testing (CVCT) may offer a population

that may be most likely to engage in behavior change, preventing both hypertension and HIV in

a family setting, which in turn may allow for the establishment of social norms that favor the

prevention of cardiovascular disease (24).

The Rwanda Zambia HIV Research Group (RZHRG), based at Emory University in Atlanta,

Georgia, USA, pioneered CVCT in Rwanda and Zambia 25 years ago and has rigorously continued

to test and implement HIV prevention methods. Their research is unique in that CVCT is utilized

and couples are followed over time to prevent transmission; education, counseling, and repeat

testing accomplish this objective. The Rwanda Zambia HIV Research Group (RZHRG) is currently

exploring the integration of services that address high morbidity and mortality rates into an

organized and expanding HIV testing program. A preventive health package service was

introduced in Copperbelt clinics in 2011. This package consists of a group of preventive services

that include intestinal worm treatment, insecticide treated net distribution, soap dispersal, and

cost-free chlorine supply, alongside schistosomiasis, syphilis, hypertension and diabetes

screenings and referrals to care, to serve as an incentive to return to the clinic.

Hypertension is a grossly understudied phenomenon in sub-Saharan Africa, and Zambia

in particular. The global burden of hypertension and cardiovascular disease is rising at an

alarming rate and resource-poor health care systems are not able to accommodate that burden. As the health infrastructure surrounding HIV prevention and care is robust in Zambia relative to other African countries, it is logical to integrate hypertension not only into primary care settings but also into HIV testing services. Working within the current infrastructure to establish hypertension education outreach can be accomplished through adding on this service. CVCT may serve as an effective vehicle for integration due to the behavioral benefits of targeting couples, who have already overcome many barriers in seeking HIV preventive care and control many household level nutritional, substance use, and activity level risk factors. Targeting couples for hypertension interventions may lead to increased care-seeking behavior as well as increased adherence through social support. Further, the risk of hypertension in HIV+ persons, particularly those with a low CD4 or who have or will be longitudinally exposed to antiretroviral drug therapy is high. As CVCT identifies HIV+ persons, it can also serve as a point of prevention for hypertension in this at-risk population.

Currently, there is very little data available about hypertension knowledge or prevalence in Zambia. One study took clinical measurements of general population residents in the capital city, Lusaka and one other examined prior testing, knowledge of personal blood pressure levels, and screening in women of child-bearing age in some rural and urban districts in Zambia; however, there are currently no peer-reviewed published studies exploring the Copperbelt Province. In order to ensure the appropriateness of any hypertension service integration in the Copperbelt, Zambia, community level knowledge, attitudes, and practices regarding hypertension must be examined.

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Literature Review: Hypertension and Service Integration in Zambia

Burden of Hypertension

The growth of non-communicable diseases (NCDs) as causes of morbidity and mortality

has become a global discussion in which leaders such as the World Health Organization (WHO)

have mounted a response to understand, prevent, and treat on all continents (1). Cardiovascular

disease is documented as the largest of NCD threats to existing health systems, particularly in

resource-poor countries that cannot accommodate the incumbent burden. The burden of

hypertension was estimated to cause 4.5% of total global burden of disease in 2003 (2). In low

and middle income countries, NCDs were responsible for half of total disease burden in 2005,

with higher documented mortality from NCDs than in high income countries (3). In twenty-three

low and middle income countries, the cost from non-intervention between 2006 and 2015 is

estimated at $84 billion in economic production losses from heart disease, stroke, and diabetes

(3). The global response to cardiovascular disease and other NCDs must include both policy level

interventions and effective prevention and treatment; identification and targeting of modifiable

risk factors, effective screening implementation, and early diagnosis and case management all

must be addressed in order to mitigate the global burden of hypertension (4).

Because many sub-Saharan nations' health systems rely on episodic management of

acute illness, cardiovascular disease presents challenges in management and prevention of

chronic illness. The WHO 2009 Health Systems and Services Annual Report states that, "health

systems in the African Region remain generally weak, hampering the achievement of better

health outcomes. Major weaknesses include: health sector performance gaps and

ineffectiveness in addressing the main health challenges, inequities in access to health services,

lack of quality in health care, low efficiency in the use of scarce human and financial resources

and low institutional capacity to effectively coordinate donors' support" (5). Current responses

to population health threats have been inadequate in many countries, but particularly ineffective in Africa. As women, particularly of child-bearing age, are the most targeted population in current donor-led efforts across the continent, they were the most likely to be aware of and engaged in a treatment regimen for hypertension (6). However, the narrow focus of health interventions on this population leaves many with undetected pre-hypertension and hypertension diagnoses.

The largest contributory disease in cardiovascular disease in Africa is hypertension (7). A systematic review of hypertension in sub-Saharan Africa indicates that as the life expectancy increases in many countries, the prevalence of hypertension, which manifests most often in the older population, is growing (6). Hypertension is defined as chronic high blood pressure, which persists at or above 140 mm Hg systolic or 90 mm Hg diastolic pressure and is most often recognized during pregnancy (8). However, outside of this condition, hypertension is largely under-recognized. The WHO estimated that in 2008, nearly 600,000 male and 700,000 female deaths in Africa were attributed to cardiovascular disease; the 1.26 million deaths is expected to rise to over two million each year by 2030 (9). The capacity of African health systems to diagnose and treat hypertension is variable, but regardless of response capacity, the first and most appropriate method of treatment and prevention is lifestyle modification (2). Individual and community level awareness and management of hypertension has been noted as "far from optimal" in both providers and consumers of health care (10). In cases that had been diagnosed, 62% of patients contacted a year after diagnosis had uncontrolled hypertension and an alarming 26% of the sample denied knowledge of their condition despite referral (6).

Though Zambia does not have a national surveillance system to provide accurate prevalence or trend data, several studies have attempted to measure hypertension in Lusaka, the capital city. A 2011 study in Lusaka attempted to quantify the urban burden of hypertension.

In Goma, et.al's sample of nearly 2000 capital residents, the prevalence for hypertension was 34.8%, with a higher prevalence in males than in females despite a higher rate of obesity in females in Lusaka (11). Their multivariate analysis demonstrated known risk factors, such as age, sex, body mass index, alcohol consumption, physical inactivity, and blood sugar level (11). The 2007 DHS reported that 80% of pregnant women had their blood pressure taken during at least one antenatal care visit; however, there is no follow up data on linkage to care or a diagnosis of hypertension (12). A 2011 survey of knowledge regarding hypertension during screenings of women of child-bearing age in both rural and urban communities in Zambia, indicated that most women were unaware of their blood pressure and did not pursue screening independent of this study, "resulting in missed opportunities for treatment to maintain their health whether pregnant or not" (8). Self-report of hypertension is likely to underestimate the prevalence rate, but is more economically feasible to explore than clinically-based methods, an important consideration facing the Zambian public infrastructure (13). Many of the identified risk factors can be modified through lifestyle change; all efforts to address hypertension in Zambia must ensure strategies that are both timely and cost-effective given the restraints of system resources (8).

HIV Infrastructure

As a United States Agency for International Development HIV priority country, Zambia has received significant support in its battle against the spread of the virus. Currently 14.3% of the Zambian people are infected with HIV; with higher prevalence rates in urban areas of 23.1%, Lusaka and the Copperbelt regions, in which approximately 40% of the population reside, have been highlighted as areas in which prevention efforts may have the largest population level return on investment (11, 14). The HIV-related health system infrastructure is well-developed in the Copperbelt with many international donors contributing to national response efforts.

Established national and international prevention programs may present as the most proactive sector in Zambia's health system for outreach, education, and prevention of this chronic illness in adults. USAID is currently conducting research to strengthen the health system in Zambia through integration of services through Abt Associates in a project entitled "Zambia Integrated Systems Strengthening Program (ZISSP)" (15). Reaching further than integrating communicable diseases and family planning, efforts to prevent and control hypertension need to be addressed. Integrating hypertension prevention into this framework can allow the strengths of HIV infrastructure to facilitate outreach to the health-conscious sector of society. Utilizing the coordination between donors and the public health sector may present the most sustainable method of scale-up in preventing hypertension, particularly in urban areas. A strategic point of entry in HIV prevention is Couples Voluntary HIV Counseling and Testing (CVCT); adding hypertension prevention education and screening may offer a population that may be most likely to engage in behavior change, preventing both hypertension and HIV in a family setting, which in turn may allow for the establishment of social norms that favor the prevention of cardiovascular disease (16). Vigilant pursuit of prevention is required to minimize the ill effects on the strained system and economy.

In rural Uganda, a short community level campaign attempted to integrate rapid HIV testing with screening for NCDs; utilizing the existing HIV outreach system of mobile rapid testing, diabetes and hypertension screenings were added on to the normative service of HIV diagnosis (17). Chamie et. al discovered significant undiagnosed cases of HIV, hypertension and diabetes—28% of those tested were identified as hypertensive, with a 43% follow-up rate for treatment, and 7.8% of the sample was HIV positive, of which 46% were previously undiagnosed (17). This integrated campaign demonstrates the feasibility of service integration using existing infrastructure for service delivery, personnel, and procedures.   This study identified NCD service

'add-ons' is possible and effective even when conducting disease-specific campaigns. Within this study, NCDs and HIV were treated as separate silos, despite evidence to link HIV with hypertension.

Hypertension and HIV

Many studies have been conducted within the past ten years to examine the link between cardiovascular disease and HIV infection. There is significant support for increased risk of hypertension for people living with HIV, yet the biomedical cause is debated. Despite the academic debate, it is recognized that "cardiovascular disease is the leading cause of non-HIV-related death in HIV-infected persons" in the United States, warranting investigation in low income countries that will bear the burden of HIV infection, ART management, and associated comorbidities in the near future (18). The management of people living with HIV/AIDS infection must include the metabolic adverse effects that lead to or exacerbate hypertension and cardiovascular disease (19). Moreover, HIV-infected persons may be underdiagnosed or undertreated when cardiovascular disease risk is present (20).

People living with HIV infection (PLWHA) are at 1.4 times increased risk of myocardial infarction than the general population (21, 22). Targeting cardiovascular risk reduction is central for promotion of health within this group. "The management of high blood pressure (BP) is particularly inadequate in low-income countries" and requires significant attention since these health systems must bear the brunt of HIV infections, ART regimens, and rely on low income solutions to management of comorbidities (18). Throughout the literature, treatment through behavioral modification of lifestyle has become the most agreed-upon component of this research field. Modification of lifestyle and control of hypertension reduces the risk of a variety of conditions associated with HIV-related mortality (23). In a cohort of Nigerian hypertensive patients, half of the patients were misinformed about the direct causes of hypertension;

however once the intervention group was educated on controllable contributors, more than half of these patients adopted behavior changes that were recommended by health personnel (7). Lifestyle interventions, including increase in physical activity and diet modification, for patients living with HIV in Brazil were effective in reducing cardiovascular disease risk, as measured by body mass index and blood pressure (24). Further lifestyle modification interventions in PLWHA have included a yoga regimen in the United States, in which blood pressure levels decreased through a low-cost and socially popular physical activity (21).

Of less agreement is the epidemiologic link between factors that place PLWHA at a higher risk of hypertension; though all examined studies agreed that there is a "constellation of comorbidities" including hypertension, with treating HIV, some studies have linked hypertension to antiretroviral (ARV) use, particularly over time, while other studies are exploring the diminished immunologic response through CD4 counts (25, 26). Over the period of six years, patients on ARVs were at higher risk of coronary heart disease than HIV+ patients that were not currently prescribed an antiretroviral therapy (ART) regimen (27). ART regimens were a significant predictor of elevated blood pressure; however different regimens were found to pose significantly different risk to PLWHA, particularly in those that caused weight gain (28-30).

However, Factor et. al, found that ARVs were not significantly associated with hypertension incidence in women (HR 0.72; CI 0.26, 1.99) and was negatively associated men (HR 0.15; CI 0.03-0.78) (31). This study found CD4 T-cell count to be positively associated with hypertension (HR 1.15; 1.03, 1.28) however, suggesting immunologic capacity is the culprit behind PLWHA's higher risk of cardiovascular disease (31). Manner, et al.'s findings also concluded that CD4 count was a greater predictor of hypertension within this population; additionally, this study suggested that delaying ART may be linked to an even higher risk of cardiovascular disease (32). However, the effect of causal agents manifest in "the pericardium,

myocardium, coronary arteries and pulmonary arteries [, which] are the main targets for cardiac disease in people who are infected with HIV" (33).

Regardless of the cause, sub-optimal rates of HIV care with sub-optimal detection and care of hypertension present a great challenge for developing economies, including Zambia (34). Cardiovacular risk is a clear danger to persons living with HIV/AIDS, and lifestyle changes are recommended to mitigate modifiable risk. However, in the current political climate of universal coverage for ART, the economic burden of ARVs plus the hypertension-related burden seem out of feasible reach for a country like Zambia. In South Africa, a much more affluent neighboring country to Zambia, the amount of money required to provide universal coverage exceeds the national health budget; incorporating the excess burden of hypertension related to HIV+ persons on treatment seems out of reach (35). Still, the link between hypertension and HIV needs to be explored; the front lines of screening may offer substantial informed input into techniques to manage the burden on an economically appropriate scale. Working to diagnose those at risk of cardiovascular disease, including those with hypertension, before ART is initiated may allow for providers to decrease cardiovascular disease risks. Additionally, it may inform of the best available and appropriate regimen of ART options for the at-risk or hypertensive patient. Any adherence and entry into care relies, however, on the patient's willingness to engage the health sector.

Risk Perception of Hypertension

The social world shapes the attitudes, beliefs and practices surrounding disease, including hypertension. The network of friends and family can be both helpful and harmful in shaping the personal and community risk of hypertension. Seeking health care includes knowledge about the health risk, awareness of the disease in the community, and other personal factors that directly relate to decision-making behavior (36). The health belief model

suggests individual's perceived risk of a health threat is weighed with the factors that could

mitigate the effects of that threat and may prompt action through social cues after analyzing the

costs and benefits to taking an action. At an individual level, social ecological determinants lead

to risk perception and decision-making regarding health care. Working within social groups is

beneficial in addressing an individual's actions to seek care.

Demographic information is useful for breaking down the contributors to the perception

of risk. Marital status, distance from health center, and socioeconomic class all are strong

indicators of health-seeking behavior (37, 38). Environmental factors or contextual influences

further contribute to where, when, and how individuals seek medical care, particularly for

preventive measures such as hypertension screening. In a West African setting, studies have

shown that the prevalence of nutrition-related chronic disease, including hypertension, is higher

in lower socioeconomic groups than in higher-ranked groups, which may have implications in

social justice and adds another layer of urgency in addressing the growing hypertension rates in

Zambia and other low income countries (39).

The out-of-pocket costs for hypertension care in the clinical setting in some resource-

poor settings can be prohibitive (40). Further, some research indicates that women are at

greater risk of hypertension, particularly in the United States; in a sample of urban black

women, objective risk assessment was poorly correlated with perceived risk, since "among

those with 3 or more risk factors ('high risk') [of cardiovascular disease], 63% did not perceive

themselves to be at risk for heart disease" (41). Further, many patients who have sought care

for hypertension have underestimated their risk of cardiovascular disease, indicating a need for

appropriate and accessible health information at time of entry into the health care system (42).

Social support is an important indicator in the status of one's health. Having a strong network of friends and family has been linked to a greater overall health status, particularly for older individuals (43). Networks are crucial in helping patients make decisions and manage the consequences of those decisions and many public health interventions seek to expand collective efficacy in risk perception through utilization of existing social networks (44-46).

Though the direct impact on health-seeking behavior may be modest, ensuring emotional support is imperative in adherence to medical instructions concerning hypertension (47, 48). In patients who are hypertensive, emotional support from social networks is associated with hypertension diagnosis and control (49). Directly, having concerned family members who assist in drug therapy management is positively associated with compliance (50). Network influence, though usually beneficial, can also inhibit the decision to seek care. In some instances, family members hold the power to make the decision about seeking health care (36). In the case where a male relative, who usually earns a steady income, decides if and when a member of the family is allowed to attend clinic, the barriers to seeking care can be immense.

Belief in ability to change one's health status and perceived availability of target service are tantamount to seeking medical care. Although some studies have determined self-efficacy to be a confounder between attitude towards health status and perceived ailment status, many behavioral scientists have linked this predictor to the outcome of taking action(37). In the UK, "belief in personal ability to control illness" was protective in compliance measures (OR 0.59 (0.40-0.89), P=0.01) (51). Perceptions of availability of the service the individual is contemplating seeking can serve as a barrier to uptake of that service, particularly in the public sector (52). Perceived ease of access to target health services and prior success in changing behavior contribute to self-efficacy, and may have a direct association with compliance with medical instruction (53). In Jamaica, access to a mobile hypertension screening service was

associated with a greater likelihood of screening, supporting access and availability as determinants of self-efficacy and health seeking behavior (54).

However, diminished self-efficacy has been linked to prior failures to change behaviors linked to hypertension prevention and control (55). Further, failure to control risk factors is linked to acceptance of the risk of hypertension through coping mechanisms, such as denial (56). Self-denial behavior, such as denying stress, may be associated with higher rates of observed hypertension (56). Though acute stress is not a direct factor in absolute risk of hypertension, it is associated with perceived risk of the disease and it may contribute to the self-efficacy of an individual (57).

The USAID's Communication Support for Health project in Zambia aims to strengthen national health-seeking messages in order to pressure social norms to adopt more healthy behaviors; this project seeks to address risky behaviors within the context of social barriers, such as gender inequality (15). This project, alongside others, seeks to address the double burden of malnutrition, both under and over nutrition, facing low income countries in Africa (39). Health messaging in Zambia requires cultural competency and understanding of lack of material wealth, where utilizing socially accepted programs to advance community education of hypertension can be helpful.

CVCT as Point of Entry in Hypertension Education and Screening

As the perception of hypertension depends on community, family, and individual level risk perception, attempting health education interventions outside of the individual level may be clinically and socially useful for advancing health-seeking behavior and social norms. In a couple or household level, meals are prepared, activity patterns overlap, financial resources available for health spending, and social networks are shared. Targeting this level for intervention is necessary since there is a 15% increase in odds of hypertension of a spouse married to someone

with hypertension (OR=1.15, CI 1.06, 1.25) (57). Additionally, treatment and control of hypertension was positively associated between spouses (57). In educational and screening campaigns, medical providers may target couples and families as opposed to individually to ensure maximum impact. One route in Zambia that couples are already seeking preventive health care is Couples Voluntary HIV Counseling and Testing (CVCT). One provider of CVCT is the Zambia-Emory HIV Research Project, which has successfully integrated family planning services into couples testing at initial point of entry (58-60). Adding-on services takes little additional resource burden and can have a large impact in outreach through this modest, cost-effective service integration (61). This service ensures that men are targeted, alongside women, in hypertension and HIV prevention and screenings, a traditionally underrepresented group in preventive care for both diseases due to the health system's favor towards pregnant women and children (11, 62).

Known barriers to CVCT uptake are stigma, fear of partner reaction, and logistics in accessing a clinic (63). Additionally, adding on hypertension services can augment these barriers. A significant barrier to integration of hypertension screenings and education is lack of provider knowledge and confidence in their knowledge; health professionals do not disclose options that they are unfamiliar or uncomfortable with to patients, indicating a need to ensure providers are knowledgeable about the risks, etiology, and possible treatments of hypertension (64). Though there is little knowledge about Zambian providers' perceptions and knowledge of hypertension, South African physicians were found to be lacking in knowledge of the national guidelines regarding hypertension management (65). Of health care workers in Burkina Faso, 18% had never heard of hypertension and surveyed case reports indicated that in cases where a blood pressure result was present, many hypertensive patients were not diagnosed nor educated about the risks of hypertension or cardiovascular disease (66).

Conclusion

Hypertension is a grossly understudied phenomenon in sub-Saharan Africa, and Zambia

in particular. The global burden of hypertension and cardiovascular disease is rising at an

alarming rate and resource-poor health care systems are not able to accommodate that burden.

As the health infrastructure surrounding HIV prevention and care is the most robust in Zambia,

it is logical to integrate hypertension not only into primary care settings but also into HIV testing

services. Working within the current infrastructure to establish hypertension education

outreach can be accomplished through adding on this service. CVCT may serve as an effective

vehicle for integration due to the behavioral benefits of targeting couples, who have already

overcome many barriers in seeking HIV preventive care and control many household level

nutritional, substance use, and activity level risk factors. Targeting couples for hypertension

interventions may lead to increased care-seeking behavior as well as increased adherence

through social support. Further, the risk of hypertension in HIV+ persons, particularly those with

a low CD4 or who have or will be longitudinally exposed to antiretroviral drug therapy is high. As

CVCT identifies HIV+ persons, it can also serve as a point of prevention for hypertension in this

at-risk population.

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Manuscript

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Cover Page

i.) Ideation and practices related to common communicable and non-communicable causes of morbidity and mortality among Couples' HIV Counseling and Testing Clients in Copperbelt, Zambia

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Contribution of authors and Conflict of Interest Disclosure

i.) Contribution of authors

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Susan Allen: Approval of conception, design, data collection methods and tools, analysis of the project and critical revision of the manuscript.

ii.) Conflict Of Interest Disclosure

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Abstract (Word count 180/180 maximum)

We measured knowledge, attitudes, and practices regarding common causes of morbidity and mortality in the Copperbelt, Zambia through focus groups and surveys in a convenience sample of participants who had completed Couples HIV Counseling and Testing. Of respondents, 34.5% (N=116) did not use Insecticide Treated Nets for malaria prevention and 26.7% (N=116) reported not having soap in their homes. 62.1% (N=116) of respondents reported that no one in their household received regular deworming treatments. Knowing someone with hypertension (CMH $\chi 2$= 11.9576, p= 0.0075) or diabetes (CMH $\chi 2$ = 12.9826, p=0.0047), was associated with the belief that these diseases were problems in the community, but this association was not seen with schistosomiasis (CMH $\chi 2$=4.4884, p= 0.2133) or syphilis CMH $\chi 2$= 5.5131, p= 0.1379)l. Though self-report is likely to underestimate the true prevalence, it illuminates the growing need for prevention education, screening, and treatment for communicable and non-communicable diseases in Zambia. Further research should aim to clinically measure disease rates in the Copperbelt and identify best practices; policy makers may focus on service integration utilizing existing infrastructure.

**Ideation and practices related to common communicable and
non-communicable causes of morbidity and mortality
among Couples' HIV Counseling and Testing Clients in Copperbelt, Zambia
(Word count 5180/3500 maximum)**

Introduction

In a global push to strengthen health systems, many stakeholders within the health sector are examining methods to promote sustainability, increase efficiency, and reduce waste through service integration (1-3). The duplication of services or structures waste resources and pose a significant barrier to universal coverage of the health sector. (2) Further, integration of services between sectors and the non-governmental organizations with state efforts may reduce brain drain and allow a need-based distribution system dissuades ownership and alignment between stakeholders. (1) In Zambia, this is complicated due to the high frequency of vertical programs implemented by a multitude of donors that focus a single communicable disease. Currently 14.3% of the Zambian adults are infected with HIV; with higher prevalence rates in urban areas of 23.1%. The capital city of Lusaka and the Copperbelt region are home to 40% of Zambians and prevention efforts may have high the largest population level return on investment. (4)

Couples Voluntary HIV Counseling and Testing (CVCT) presents an opportunity to provide prevention education, screening, and the foster social norms that favor prevention and detection of infectious and non-infectious acute and chronic diseases. (5) Family planning is currently being integrated into CVCT, and efforts to address multiple causes of morbidity and mortality can be added to this effort. (6, 7) Nine common causes of morbidity and mortality were targeted through a preventive health package to incentivize follow-up testing and counseling among couples. Soap, chlorine, insecticide-treated bed nets (ITNs), and mebendazole tablets were offered and screenings were offered for hypertension via blood pressure

measurement, diabetes via urine glucose dipstick, schistosomiasis via hematuria dipstick, and

syphilis via RPR plasma test. These conditions were chosen after consideration of national and

regional burden, financial cost, local procurement, diagnostic needs, and ease of training for

diagnosis in government clinics. Unsafe water, malaria, diarrhea, pulmonary infection,

hypertension, diabetes, sexually transmitted infections, intestinal worms, and schistosomiasis

were examined from the communities' perspective in order to determine health concerns.

The primary causes of mortality in Zambia for children under five include pneumonia,

malaria, HIV, and diarrhea, indicating a need for household level education and intervention.(8)

In 2008, 104/100,000 deaths were attributed to malaria with 221 of every 1000 people infected

in Zambia. (9) Both children and adults often suffer parasitic infections. Schistosomiasis affects

are understudied in this population; however 15% of the sample a Lusaka CVCT has been

infected with at least one strain.(10, 11) Intestinal worms have been commonplace within the

population, with 18% up to 21% of samples being infected, with relatively uniform distribution

nationally.(12, 13) Intestinal worms and unsafe drinking water have the capacity to disrupt the

quality of life through interference with efficacy of many medical treatments and contribution

to poor nutritional status. Schistosomiasis and severe intestinal worm infection is found in those

who are exposed to contaminated water or foods; exploration of usage patterns and barriers to

intestinal worm treatments and chlorine use should be incorporated into effective health

messaging campaigns.(12, 14-16)

Adult-specific causes of illness can also be addressed at a household level with decision-

makers. Approximately 7% of women and 8% of men nationally were infected with syphilis in

2007; however, the Copperbelt region expressed 10.6% infection in men and 9.7% in

women.(17) Concentration on the prevention and treatment of sexually transmitted infections,

malaria, and other top causes of morbidity and mortality in this region is an actionable

imperative for all capable health providers and programs. It is estimated that 7.2% of men and

7.5% of women have elevated blood glucose levels.(8) Similarly in hypertension, it is estimated

that 41% of men and 37.9% of women have elevated blood pressures; these diseases present

challenges to the management of both chronic and episodic disease management, including

increased risk of neuropathy, microalbuminuria, and retinopathy. (9, 18, 19) These contributory

conditions are likely to increase in the future and should be prevented wherever possible to

decrease health system burden. (19) Further, people living with HIV are at increased risk of

cardiovascular disease, indicating HIV screening services as a strategic point of entry for

hypertension and other cardiovascular risk factors. (20-24)

This study aimed to observe knowledge, attitudes, and practices regarding common

causes of morbidity and mortality to enhance a program's efforts to prevent loss to follow up

through appropriate patient education in a preventive health package. Aims included

exploration of colloquial knowledge, etiologic understandings, and practices surrounding

examined diseases, as well as measurements of regional adherence or discordance to those

formative understandings. Focus groups were conducted to inform the content examined in a

regional survey of four cities in the Copperbelt Province of Zambia in conveniently selected

participants who had completed Couples Voluntary HIV Counseling and Testing. Further

research should aim to clinically measure capacity to integrate programs within government

services in the Copperbelt; policy makers may prioritize integrating services and optimizing

linkage to care throughout the health infrastructure.

Materials and Methods

Sampling and Ethics

Participants had successfully completed Couples Voluntary HIV Counseling and Testing

(CVCT) in Zambia-Emory HIV Research Project (ZEHRP) clinics, were over the age of 18, and

consented to participate in this study. Participants were recruited through invitations during

CVCT clinic operations in Ndola government clinics to attend a focus group discussion on

ZEHRP's preventive health package, the results of which informed the development of a

quantitative survey. Surveys were conducted in Chingola, Kitwe, Luanshya, and Ndola.

Considered clinics were randomly selected through simple random draw by a researcher not

connected to this project. The participants chosen to be surveyed were invited to participate by

the trained clinical coordinator or research staff member conducting the surveys. The

researcher was added as an investigator on relevant approved protocols and only utilized

materials approved by Emory University IRB and University of Lusaka Research Ethics

Committee. Informed consent was obtained and reimbursement was provided for study

participation.

Study Procedures

Focus group discussions were held in Ndola and conducted in Bemba after all

participants verbally consented to being recorded. Written notes from the discussion and

recorded debriefings with both the note taker and moderator were conducted in English

immediately following the discussions. Prompt transcription allowed for iterative analysis. Each

discussion chronicled the items in the Good Health Package with the intention of gaining the

emic perspective on how communities discussed the items and diseases, the baseline

knowledge and practices of community members, and attitudes towards both the ailments and

the preventive health goods. Following this analysis, a survey was designed to extrapolate the

commonalities and the outlier information to the regional level. After the survey was piloted

and edited, ten surveys were distributed to each clinic and collected over the course of two

days. The survey consisted of approximately one hundred questions concerning demographics,

attitudes about targeted diseases, practices with preventive health items, and knowledge about the diseases and items.

Measurements and Analysis

Qualitative data was analyzed using thematic and content analysis techniques. Reliability and validity measures included reflexive field note analysis, triangulation with existing literature, and engaging non-related researchers and local staff in result interpretation after each focus group. Survey data measures of age, the number of people living in a home, the number of children (0-4 years old and 5-17 years old), the number of income earners, and the number of times a person in the household was dewormed per year were measured as discrete numerals. Dichotomous variables included 'male/female', 'yes/no', and 'true/false' responses. Ordinal variables included all questions relating to how large a disease was in the respondent's community and degree of social network questions relating to whom in the household engages in preventive health behaviors. In order to assess the relationship between the attitude that a disease is a large problem in the community and degree of impact within a social network, only those who agreed that the disease was a large problem were used through generation of a new dichotomous variable. All questions were equipped with a 'did not answer' and 'don't know' option, allowing participants to skip questions at any time.

Prospectively, the quantitative analysis was stratified by city and conducted with SAS 9.3 program. Survey responses were entered into two separate Microsoft Excel files and quality assured using the SAS PROC COMPARE function. All alphas were set at 0.05 for statistical significance and normal distribution was achieved in regional level analysis. Only observations with no missing information necessary to each analysis were utilized. Predictors were tested using Mantel-Haenszel Chi-square tests of association or Fisher's Exact where the expected cell count was less than five and CMH trend tests for ordinal variables to assess relationships.

Additional a priori strata 'of childbearing age', defined as between 18 and 45 years old, and having 'at least one child under the age of five in the home' were tested with Student's T-tests and Chi-square.

Results

Themes emerging from focus group discussions with 28 residents from Ndola (14 men and 14 women) are shown in Table 1. This qualitative information is integrated below with the quantitative survey results to facilitate triangulation.

The average survey participant was 38 years old with 5.8 people living in the household (Table 2); of those, 1.4 were children under the age of 5 and 2.3 between the ages 5 and 17. The regional proportion of homes with no one regularly earning an income was 43.4% (N=106) with only 14.2% (N=106) having more than one consistent income earner, though this varied by city. Thirty-two respondents or partners, 30.1%, were pregnant at the time of the survey and 54.9% reported wanting more children. In the survey of 126 CVCT participants in four Copperbelt Province cities, the respondents' demographics were not statistically different by city in age, sex ratio, number of people living in the home, number of income earners in the home, number of children under or above the age of five, or pregnancy status of the respondent or partner. There is a significant association between the number of people who usually live in a household and if the respondent was of child-bearing age or not (Satterthwaite t=3.12 p=0.0035; n=116). In a general linear regression model, 11.7% of the difference in household size can be attributed to whether the respondent was of child-bearing age or not (r=0.1173 p <0.001). Please see Table 1 for more information.

Of respondents, 34.5% (N=116) did not use ITNs in their homes. As in Table 5, in homes where ITNs were used, 41.3% (N=75) did not have a bed net over all of the sleeping areas in the home. There is a marginally insignificant association between those of child-bearing age and

using an ITN in the household (χ2=3.7569 p=0.0526 n=116). Most nets in Copperbelt are

between >1 year and 3 years old, with 53.1% N=64) of the oldest net in the home under a year

old and only 15.6% (F=64) being over three years old. In pregnant respondents or respondents

with a pregnant partner, 12.5% (N=32) reported that the woman was not sleeping under a net.

Many children do not sleep under ITNs, even in homes that report using them to prevent

malaria. Throughout Copperbelt, 22.5% (N=54) of children under 5 and 44.0% (N=50) of children

between 5 and 17 were not sleeping under ITNs in households that reported using ITNs;

compared with the 2008 WHO report of 41% of children under five sleeping under an ITN, more

children may be using an ITN in this survey, more children overall may have used bed nets in

2012 than in 2008, or social desirability bias may be higher in this sample. (8)

   Two common sanitation-related household goods, soap and chlorine, were discussed. In

focus group discussions as presented in Table 1, clients did not talk about prevention of

diarrheal disease or pneumonia, but did discuss hygiene, through washing with soap. In the

region, about 26.7% (N=116) of respondents reported not having soap in their homes. Soap is to

be used in hand washing, which helps to prevent diarrheal diseases, according to 96.5% (N=114)

of the survey respondents, as in Table 6. However, only 35.1% (N=112) in the region knew that

washing hands with soap can help prevent pneumonia and other respiratory infections. Focus

group results indicate clients were generally unsure of or sought clarification on the process of

treating drinking water. Some clients were not using any type of container to chlorinate from.

Others had containers, but were unaware of how many liters each container would hold.

Shaking the container was mentioned once throughout the discussion series. The wait time

before drinking ranged from 1 hour to 24 hours or longer if the participant felt they may have

over-poured the chlorine. Few were concerned with safety or potential poisoning.

Additionally, only 58.6% (N=116) reported using chlorine in their homes to purify their

water; of those, less than half reported having chlorine in their homes at the time of the survey.

Measuring appropriate amounts of chlorine still poses a barrier in some communities, in Ndola

and Chingola in particular. Measuring the correct quantity of chlorine was also difficult or

confusing in 9.9% (N=111) of the survey participants. However, over 99% (N=116) knew that

treated water must be shaken and left to wait for at least 30 minutes. Another challenge is

effectively communicating the uses of chlorine and soap. Over 99% (N=115) of respondents

knew chlorinating water helps prevent cholera, with all participants in 3 cities agreeing with the

statement. One piece of information that was of interest was the misuse of chlorine that was

identified in focus group discussions. In order to determine the spread of acceptance of

concentrated chlorine as a topical antiseptic or oral analgesic, the statement 'You can apply

chlorine to a toothache, a cut, or a sore to treat it' was asked in the true/false section.

Throughout the region, 13.9% (F=108) agreed with the statement. One in five respondents in

Ndola believed chlorine could be used in the stated manner. A significant association was found

between a respondent being of child-bearing age and agreeing that a person can apply chlorine

directly to the skin to treat a wound or mouth to treat pain (fisher's p=0.0201 n=108).

Regular intestinal worm treatment has also been promoted by the government, yet

62.1% (N=116) of respondents reported that no one in their household (any person) received

regular worm infection treatments. 'Regular' was defined as having a determined number of

worm treatment events over a period of one year. Within those households that deworm

someone on a regular basis, 16.2% (N=37) of children under 5 did not receive treatments.

However, children between 5 and 17 fared worse in this survey, with 61.3% (N=31) receiving

treatments. Within those users, children under the age of five were dewormed on average 2

times a year regionally (µ=1.966, SD=0.50). Of those children above five who did receive worm

treatment treatments, the frequency was 2.2 times per year on average (μ=2.154, SD=0.55). In formative focus groups, prevention of major worm infection was acknowledged by all participants for children and pregnant women; however, only half of the groups contained adults who used the drug to prevent worm infections in themselves. Regionally, 77.4% (N=106) of respondents agreed that every six months, adults can take a regular dose of dewormer to kill worms. Using mebendazole as a worm treatment was normative in adults in both focus groups and survey participants, who reported being able to take a regimen every 3 months; any symptomatic adult can get treatment through a chemist for a fee. Participants self-prescribed this drug to treat any stomach condition before seeking care at a clinic. Only one couple talked about the adults in a home taking intestinal parasite medication on the same schedule as the children in the focus groups; there was no other mention of the household level taking a course. Couples discussed this disease as a common inconvenience.

In discussions of schistosomiasis, or bilharzia, nearly all couples said it was a waterborne disease from lakes and ponds, but there is some suspicion it can be found in some piped water. There was no mention of finding this disease away from water. They described the disease as having blood in the urine. No other symptom was mentioned and no discussion of blood in the stool was noted. The couples said their education predominantly came from elementary school campaigns and is becoming increasingly rare, where few cases are detected only during the rainy season each year. Clients suggested the only way to know there was an infection was blood in urine and that only a clinic could diagnose and treat through a course of pills. Only 33.9% (N=112) of respondents agreed that bilharzia could be found away from ponds and streams. ZEHRP data from previous GFE student Paul Livingston revealed a prevalence of 21% in HIV+ individuals (N=68) and 13% unselected HIV+ or HIV- (N=99) in the Lusaka CVCT population in 2011. (25) Every participant (N=114) knew to seek medical attention if blood appeared in

excreta and 90.7% (N=107) of respondents agreed that untreated bilharzia can result in organ

failure. Most respondents felt that it was unimportant, as referenced in Table 3, as in all cities

save Ndola proportionally ranked this disease the least severe threat in the communities.

Eighteen percent of participants (N=111) knew someone that had schistosomiasis and 10%

(N=20) of those reported that they had been diagnosed with the disease. Please see Tables 2-4

for detailed information.

Syphilis and schistosomiasis have been targeted by government health campaigns and

seems to be well understood by community members; however, there seems to be a strong

community level responsibility to eliminate syphilis and other STIs. Most participants were well-

informed about the consequences of sexually transmitted infections. Most participants, 96.5%

(N=113), knew that antibiotics were available to treat syphilis and 98.1% (N=110) knew it was

fatal if untreated; additionally, 97.4% (F=113) of participants knew that having an STI increased

the risk of transmission for HIV.

Symptoms of syphilis infection were identified as abdominal pain, which can cause walking

difficulties when severe, and genital manifestations. Some focus group participants felt this

disease is very common, while others said its prevalence is decreasing over time. The majority of

clients felt this disease was well publicized alongside other sexually transmitted infection

prevention and treatment efforts through the government. Some focus group participants felt

that most people still sought out traditional treatments for syphilis due to the public nature of

the clinics and the privacy and confidentiality that herbalists offered. These couples tended to

agree that only the medical clinic could cure the disease. There are some pills that are given at

the clinics that will treat and cure this disease. A point of concern is that 34.7% (N=98) of survey

respondents believed that herbal solutions cure syphilis. Clients knew that this disease can be

prevented by avoiding unprotected sex, multiple sexual partners, and using condoms.

Explicitly, few couples talked about the relationship of having syphilis to contracting HIV, which may be colloquially discussed in a linear and causal relationship, in that syphilis causes HIV. A total of 35 survey participants, 31.3% (N=111), of survey participants reported knowing someone and 2 participants, 5.7%, of those 35 reported that they had been diagnosed with syphilis. There is a significant association between a respondent being of child-bearing age and responding that STDs are a large problem in their community (CMH $\chi2$=10.8326 p=0.0127 n=107). Further, there is a significant association between a respondent being of child-bearing age and reporting knowing someone who has had syphilis ($\chi2$=5.0009 p=0.0253 n=112). There was a significant trend between a respondent being of child-bearing age and the degree of relationship of the known person with syphilis, despite having a small sample for this test (CMH $\chi2$ =11.8536 p=0.0185 n=35). This population may be the target of health education messages due to reproductive repercussions of syphilis in that group.

In formative results, clients called hypertension "BP", addressing high blood pressure. All listed causes as poor diet consisting of fatty foods and genetically modified foods, and stress, resulting from social tensions. Additional contributors listed include tobacco use, alcohol use, and inactivity. Symptoms discussed were headache, dizziness, fatigue, heart palpitations, and sweats. Each focus group contributed a different set of symptoms. Seventy-five percent of the groups believed the prevalence was high, but all groups agreed that it was rising. Traditional treatments were described in more detail than conventional management through a clinic. Eating a controlled diet was the most common management technique listed, though the couples were not aware of what to modify within their diets. There was one explicit link made between this disease and diabetes in focus groups. In the survey, 15.7% (N=108) of respondents in the region, with 28.0% (N=25) of respondents in Ndola, believed that hypertension was infectious. Poor diet is recognized by many respondents as a cause of hypertension at 81.6%

(N=114) and 89.3% (N=112) know that a balanced diet and physical activity contribute to the prevention of diabetes.

Additionally, vulnerable populations to the diseases need education as 21.1% (N=112) of respondents also believed that only fat and rich people developed hypertension and 6.2% (N=113) of respondents agreed that only pregnant women could develop hypertension or diabetes. There was a self-report hypertension rate of 11.0% (N=82), while 75.9% (F=108) reported knowing someone in their social network with hypertension. There are many myths in communities surrounding both diabetes and hypertension, owing their existence to the lack of information available. The couples have learned about these diseases from friends who have been diagnosed. Only 58.9% (N=107) agreed that there was a relationship between diabetes and hypertension. "BP and sugar disease trend in families" was agreed to by 45.4% (N=108) of respondents.

Focus group participants believe sugar disease is caused by poor diet and eating too much sugar and fat; some felt it was hereditary or that you were born with it. Most felt it is incurable and that prevalence was rising, even though it is currently low in some communities. Symptoms were discussed by half of the groups and were fatigue, frequent urination, and sweating. Some mentioned it is generally a disease you get when you grow old. Modifying the diet and regular exercise were a listed treatment and prevention strategy. Diagnosis and management included both conventional options through a clinic and the consulting of herbalists. A self-reported diabetic participant discussed insulin injections as part of her treatment regimen. Out of 55 respondents who reported knowing someone with diabetes, 48.3% of the sample (N=114), one observation, 1.8% reported a diagnosis of diabetes as demonstrated in Table4 These high rates of personal, if indirect, experience with the target diseases may have implications for the magnitude of the threat participants felt these diseases were to their person. In the cases of

bilharzia and syphilis, not only were they much less commonly reported within social networks, they were also viewed as low priority health threats.

Of respondents who reported knowing someone with the disease, a personal diagnosis of diabetes was reported the least of the four examined illnesses, as in figure 5. Knowing someone in your social network with the target disease is associated with reporting the disease is a large problem within a respondent's community with hypertension (CMH χ2= 11.9576, p= 0.0075) and diabetes (CMH χ2 = 12.9826, p=0.0047), but not with schistosomiasis (CMH χ2=4.4884, p= 0.2133) or syphilis (CMH χ2= 5.5131, p= 0.1379) at the 0.05 level. Respondents were more likely to think hypertension and diabetes were a problem in their communities if they knew someone in their social network with the disease. The proximal degree of a person affected by the disease's status in the social network of the participant was not associated with the attitude that the disease was a large problem in their community.

Tested relationships that did not yield significant results correct knowledge of each disease's prevention, symptoms, etiology, and treatment was not associated with the usage of preventive health items in home or pregnancy status. Having an income earner in the home was not associated with having the preventive health items in the home at the time of the survey. Additionally, the degree of a person in a given social network was not significant in the relationship of knowing someone with the disease and believing the disease is a big problem in the community. Analysis was conducted by childbearing age, in which the results regarding sexually transmitted infections were reported; in participants who reported at least one child under the age of five in the home, no significant differences were detected in the sample throughout analysis. No differences were detected between responses by male and female respondents, or between respondents or partners who were currently pregnant or not.

Discussion

These results help to contextualize community health priorities, an emic perspective that must be incorporated to provide a foundation for successful intervention efforts. The programmatic implications include the establishment of baseline knowledge surrounding the target diseases; further, the exploration of knowledge gaps and common misconceptions about the goods or target diseases allow for targeted education to dispel those myths. The baselines and common misconceptions were incorporated into the training materials for the program; a standardized flip chart contains pages that convey appropriate health messages to the level of knowledge established in this study. In addressing hypertension, for example, the flip chart page reads "It is not transmitted from person to person, but it does run in families. It is a risk factor for heart disease." The misconception of hypertension as an infectious disease and the murky understanding of the health effects were clarified in the education materials. Further, the flip chart was created within the social reality of task-shifting; due to the government's efforts to shift education tasks to lay counselors and health providers, this tool allows both education providers and clients to gain a macroscopic understanding of the material presented. (26) The implementation of this tool will continue to be monitored and customized as the program evolves.

The demographic considerations according to the participant population in each city suggest that programs operating in multiple cities should tailor each campaign to each unique market. Beyond city-specific marketing, regional and city messages during client-educator sessions should ensure there is an explicit attempt to connect with the clients about concerns in their community. Though a significant proportion of children under 5 years old tend to receive deworming regularly, more focus on deworming for others in the household is needed; widening the audience for prevention of intestinal parasite infections may be helpful for project marketing and may improve health status of households. Additionally, hypertension is a large

and growing concern in the Copperbelt; the vast majority of participants knew someone with

the disease, allowing an emotional appeal strategy to help stress the importance of prevention

and lifestyle changes. However, this approach will likely be unsuccessful with schistosomiasis

and syphilis due to perceptions of both diseases as low-threat conditions. Diseases that are

disregarded should be brought to the attention of health system actors. In order to be most

cost-effective, focusing only on diseases that a community believes is important may be in the

best interest of stakeholders.

These results may also allow for more accurate measures to be utilized. Measuring ITN

usage at the household level through explicit questions may prove a more accurate determinant

of which members of a family are sleeping under an ITN than simply measuring ITN ownership.

The number of nets needed to sufficiently cover all sleeping areas compared to the number of

nets used in the home can also offer a more complete picture of malaria prevention efforts in

the region and may contribute to the knowledge of which populations are left vulnerable within

society.

These broad data may also identify further points of intervention for stakeholders.

Health campaign messaging can be proximally measured through knowledge and knowledge

gap evaluation. Some state employed messages concerning sexually transmitted infections have

been effective in behaviors and beliefs reported in this study. Since the vast majority of

participants knew that syphilis is fatal if left untreated and were adamant about reducing the

prevalence within their communities, a strong community buy-in of this campaign is expected.

However, many still report that their fellow community members prefer to consult herbalists

over presenting to the clinic due to privacy concerns. This gap is an opportunity to improve

confidentiality and discretion efforts within government clinics, which may impact of frequency

of antibiotic regimens prescribed for syphilis. Additionally, stakeholders may coordinate efforts

to attain maximum outreach for screening and education efforts. The ZEHRP program may reach a large population for diabetes prevention; for example, gestational diabetes would only be screened for in pregnant women and those who feel healthy would likely not attend clinic for screening. Those couples who attend CVCT, however, would be offered this screening regardless of pregnancy status or sex; these screenings may allow for early diagnosis and referral to clinical management, as well as allow a greater inclusion of men who may use the health messages to activate their agency regarding health status.

Limitations

The results are not generalizable due to sample size and recruitment population. There are many potential influences that may have contributed to biases as well. There is selection bias in the population; the surveys and focus groups were conducted from participants who were already seeking HIV preventive health care, meaning they were already engaging in behavior that may have predisposed them to being more active than the general population concerning preventive health. Additional bias by design may include an inflated proportion of correct knowledge about HIV, STIs, and sexual health; since the participant had undergone CVCT before the survey was conducted, the counseling received could have influenced attitudes and knowledge. Additionally, there was respondent bias in favor of what is most pleasing for the research team to hear or what was most socially acceptable through self-report bias. By design, the enumerator was a representative from the community clinic, so there may have been overrepresentation of knowledge or use. Generally, training of enumerators was inadequate and was reflected in the quality of some surveys.

Conclusion

Gaining a formative focus on the target community's needs, attitudes, and practices will allow insight to cut waste within each program. Ensuring efficient and effective strategies allows

for the most sustainable and most community-appropriate project communications. Utilizing

the coordination between donors, the public health sector, and primary care infrastructure may

present the most sustainable method of scale-up in prevention programs. This formative study

has offered several points of intervention in strengthening the health system of Zambia in sexual

health, cardiovascular disease, and intestinal parasite prevention, among other causes of illness.

Further research should include efficiency studies of current efforts and the identification of

integration points in existing services. Vigilant pursuit of prevention, early detection, and timely

treatment is required to minimize the ill effects of common causes of morbidity on the strained

system and economy.

Tables (6/7 maximum)

Table 1: Demographic Characteristics of Survey Participants by City

Demographic Characteristics of Survey Participants by City					
	Copperbelt Total (N=126)	Ndola (N=26)	Luanshya (N=20)	Kitwe (N=40)	Chingola (n=30)
Mean Age of Participant	38.0	33.9	40.8	40.2	36.8
Female	47 (41.6)	9 (37.5)	8 (40.0)	18 (45.0)	12 (41.4)
People Living in Home	5.8	5.2	6.4	6.3	5.2
Children < 5 in Home	1.4	1.2	1.1	1.8	1.1
Children 5-17 in Home	2.3	1.9	3.1	2.4	2.0
No Income Earner in Home	46 (43.4)	11 (42.3)	9 (75.0*)	12 (30.0)	14 (50.0)
More than 1 Income Earner in Home	15 (14.2)	3 (11.5)	1 (8.3*)	5 (12.5)	6 (21.4)
Respondent or Partner is Pregnant	32 (30.1)	6 (23.1)	6 (50.0*)	6 (16.7*)	14 (46.7)
Respondent Plans on More Children	62 (54.9)	17 (65.4)	6 (31.6)	19 (48.7)	20 (69.0)
* denotes 10% or more of data is missing					

Table 2: Qualitative Summary of Formative Focus Group Discussion Results

Qualitative Summary of Formative Focus Group Discussion Results		
Goods		
Baseline Knowledge	Usage Patterns	Reported Misuses or Knowledge Gaps in Community
Soap		
All-Purpose Soap is not available for purchase in some communities	Brand names identified: Protex and Dettol for All-Purpose Soaps and Champion, Lifebuoy, and Ibu for Carbolic Soaps	Groups did not identify all points in household routine to use soap
Carbolic Soap is more gentle on skin than All-Purpose Soap	Carbolic Soaps can be used to bathe infants and the deceased, wash wounds, heal rashes, and is appropriate for post-coital use	No hand-washing method was identified
Carbolic Soap has a distinct scent that can be identified by clients regardless of brand	Carbolic Soap is most commonly used	Carbolic Soap can be combined with water and left on skin to dry in lieu of lotion

Soap is used for washing hands after using the toilet, bathing, laundry, and household cleaning	If a bar of soap is used to clean an infant, no other person may use that soap	Carbolic Soap can be used in lieu of toothpaste
Soap is used in a hygiene regimen		All-Purpose Soap was mis-identified as medicated soap
Carbolic Soap is also called "Health Soap"		
Chlorine		
Chlorine is used to purify drinking water by killing germs	Chlorine is used by some households in addition to boiling, though some added before and some after boiling	In cases where homes had piped water, suspicion about treatment quality evoked some participants to chlorinate
Chlorine should be added to standard liter containers		Dilution of chlorine was unclear or misunderstood
After chlorine is added to container, it should be mixed and left to process before use		Clients often did not use 5L or 20L containers
Some communities receive demonstrations for cholera prevention		Clients reported variances in wait times after mixing due to perceived under or over chlorination or not knowing the appropriate wait time
		One group identified the danger of chlorine bottles to young children
		Chlorine is used in lieu of bleach for disinfecting surfaces or in laundry
		Chlorine is used as an antiseptic for wounds
		Chlorine is used as an analgesic for tooth aches
Intestinal Parasite Treatment		
Symptoms of a worm infection include hair loss, extended abdomen, gastrointestinal discomfort, rumbling stomach, rashes, coughs, and changes in appetite	The most commonly available is Vermox	No group discussed household level prevention or treatment

Children can take it twice a year as a preventive strategy and also as a treatment when parasite infection is apparent	Adults often take a course of Vermox at onset of gastrointestinal illness, when a worm is passed, or during antenatal care	Clients reported that children over the age of five do not need preventive courses but do need treatment courses
Children 3 months to 5 years can receive a free course during wellness clinic	Adults often purchase Vermox from a pharmacy or chemist as opposed to seeking free treatment at a clinic	Vermox pills should be kept out of the hands of children, who may view the tablets as candies
Adults can take it as a preventive strategy		
Illnesses		
Etiology and Treatment	**Misconceptions**	**Prevalence**
Hypertension		
Called "BP", but also known as "heartbeat" or "the sweat"	Hypertension is an infectious disease	It is much more common than in the past
Symptoms can be recognized by how a person feels; they may experience severe headaches, heart palpitations, and sometimes dizziness and fatigue	Sweet or genetically modified foods contribute to hypertension	
Foods with high fat content eaten over time contributes to hypertension along with tobacco use, high alcohol intake, and inactivity	Feeling angry, worrying about someone, or thinking too much about a situation causes hypertension	
Management of this disease at the clinic is available	Only fat, rich, or pregnant people are susceptible	
Hypertension that presents during pregnancy may remain post-delivery	Sodium was not mentioned in any dietary discussion	
	Honey or cucumbers cure hypertension	
Diabetes		
Called "sugar disease"	Sugar in beverages does not contribute to the risk of diabetes	Not common in some communities
There are no public health campaigns sensitizing communities to this disease	Only rich people are susceptible	Prevalence is growing
This disease may have a genetic component making a descendent more susceptible than the general population	There is no link between hypertension and diabetes	

Diet is the best means of prevention and treatment	A Diabetic may appear fatigued and wasted, which may evoke suspicion and stigma of HIV	
	No dietary specific changes could be named to help prevent diabetes	
Schistosomiasis		
Bathing in contaminated water exposes a person to this parasite	Only children get this disease	This disease is rare and under control
If blood is seen in urine or stool, the patient should present to the clinic as soon as possible for treatment	Only people living near ponds or rivers are susceptible to this disease	
Basic prevention knowledge is provided in primary schools		
Syphilis		
Syphilis is an STI that presents through genital symptoms, abdominal pain, and difficulty walking in later stages	Some prefer to attend traditional healers for a cure out of confidentiality concerns	It is prevalent, but incidence is decreasing due to increased condom usage
Pregnant women get tested at antenatal clinics	aloe vera, ground lemon tree root, or ground paw-paw root are cures for the disease	Local campaigns have improved prevention behaviors
Treatment is available at clinics		
Syphilis is a killer disease		
Syphilis and other STIs increase susceptibility to HIV		

Table 3: Proportional Rank of Examined Illnesses by Reported Proportional Largest Problem in the Community by City

	Proportional Rank of Diseases by Large Problem in the Respondent's Community				
	Copperbelt	Ndola	Luanshya	Kitwe	Chingola
Largest Proportion Agreed Disease is a Large Problem	Malaria	Malaria	Malaria/HIV	HIV	Unsafe water
	HIV	Unsafe water		Malaria	Malaria
	Unsafe water	HIV	Hypertension	Diarrhea	HIV
	Diarrhea	Diarrhea	Diarrhea	Unsafe water	Hypertension
	Hypertension	Hypertension	Unsafe water	Hypertension	Diabetes

	Diabetes	Pneumonia	Syphilis	Worms	STD
	Syphilis	STDs	Diabetes	Diabetes	Diarrhea
	STDs	Bilharzia	STD	Syphilis	Syphilis
	Worms	Syphilis	Pneumonia	STDs	Worms
	Pneumonia	Diabetes	Bilharzia/Worms	Pneumonia	Pneumonia
Smallest Proportion Agreed Disease is a Large Problem	Bilharzia	Worms		Bilharzia	Bilharzia

Table 4: Respondents by City who Reported Knowing Someone with Target Disease

Respondents by City who Reported Knowing Someone with Target Disease				
	Diabetes (N=114)	Hypertension (N=108)	Bilharzia (N=111)	Syphilis (N=111)
Copperbelt Total	55 (48.3)	82 (75.9)	20 (18.0)	35 (31.3)
Ndola	13 (50.0)	21 (84.0)	4 (16.7)	(8 (33.3)
Luanshya	11 (55.0)	15 (88.2)	5 (25.0)	7 (35.0)
Kitwe	21 (55.3)	28 (77.8)	10 (27.0)	17 (44.7)
Chingola	10 (33.3)	18 (60.0)	1 (3.3)	3 (10.0)

Table 5: Use and Practice of Preventive Health Goods by City

Use and Practice of Preventive Health Goods by City					
	Copperbelt Total (N=126)	Ndola (N=26)	Luanshya (N=20)	Kitwe (N=40)	Chingola (N=30)
Insecticide Treated Bed Nets (ITN)					
Respondents who reported ITN non-use	40 (34.5)	8 (30.8)	6 (30.0)	14 (35.0)	12 (40.0)
ITN characteristics in users					
ITN not over all beds	31 (41.3)	11 (61.1)	2 (14.3)	9 (36.0)	9 (50.0)
Oldest ITN < 1 year old	34 (53.1)	7 (87.5*)	3 (25.0*)	16 (61.5)	8 (44.4)
Oldest ITN > 3 years old	10 (15.6)	0.0*	3 (25.0*)	4 (15.4)	3 (16.7)
ITN user demographics					
Pregnant females not sleeping under ITN	4 (12.5*)	2 (33.0*)	0.0*	1 (16.7*)	1 (7.1*)
Children < 5 not sleeping	12 (22.2)	3 (27.3)	3 (37.5)	3 (14.3)	3 (21.4)

under ITN					
Children 5-17 not sleeping under ITN	22 (44.0)	5 (71.4)	5 (50.0)	5 (23.8)	7 (58.3)
Hygiene and Sanitation Goods					
Respondent did not have soap in home	31 (26.7)	10 (38.5)	5 (25.0)	12 (30.0)	4 (13.3)
Respondent did not use chlorine in home	68 (58.6)	15 (57.7)	11 (55.0)	18 (45.0)	24 (80.0)
Among users, respondent did not have chlorine in home	24 (53.3)	6 (60.0)	6 (66.7)	8 (40.0)	4 (66.7)
Mebendazole Usage					
Homes did not regularly deworm someone	72 (62.1)	15 (57.7)	13 (65.0)	20 (50.0)	24 (80.0)
Homes where children < 5 did not treat regularly	6 (16.2)	1 (11.1)	2 (28.6)	2 (12.5)	1 (20.0)
Homes where children 5-17 did not treat regularly	19 (61.3)	5 (71.4)	4 (80.0)	10 (62.5)	0.0
* denotes 10% or more of data is missing					

Table 6: Knowledge of Target Diseases by City by Agreement with Statement

Knowledge of Target Diseases by City by Agreement with Statement					
	Copperbelt Total	Ndola	Luanshya	Kitwe	Chingola
Hygiene					
If everyone in the house washes their hands often, it will help prevent diarrheal diseases (N=114)	110 (96.5)	24 (92.3)	20 (100)	39 (100)	27 (93.1)
Washing your hands with soap helps prevent pneumonia (N=111)	39 (35.1)	15 (57.7)	2 (10.0)	10 (27.0)	12 (42.9)
Chlorine					
If your container holds 5 liters of water, you should pour 5 capfuls of chlorine in it (N=111)	11 (9.9)	3 (11.5)	2 (10.0)	2 (5.7)	4 (13.3)
No matter what size container you have, you should put one capful of chlorine in it (N=113)	7 (6.2)	2 (7.7)	1 (5.0)	3 (8.1)	1 (3.3)
Chlorinating water helps prevent cholera (N=115)	114 (99.1)	26 (100)	19 (95.0)	40 (100)	29 (100)
After you add chlorine and shake the container, you should wait at least 30 minutes before drinking treated water (N=116)	115 (99.1)	26 (100)	20 (100)	40 (100)	29 (96.7)
You can apply chlorine to a toothache, a cut, or a sore to treat it	15 (13.9)	5 (20.0)	0.0	5 (13.9)	5 (18.5)

(N=108)				
Mebendazole				
Adults can take Vermox every six months to regularly kill worms (N=106)	82 (77.4)	18 (72.0)	16 (84.2)	28 (77.8)	20 (76.9)
If someone in your house had worms, everyone living there should take a course of Vermox (N=110)	57 (51.8)	9 (36.0)	7 (36.8)	27 (69.2)	14 (51.9)
Hypertension (BP)				
BP can lead to heart attack or stroke if untreated (N=105)	102 (97.1)	22 (95.7)	19 (100)	36 (97.3)	25 (96.2)
You can get BP, or hypertension, from someone who has the disease (N=108)	17 (15.7)	7 (28.0)	0.0	7 (20.0)	3 (10.7)
Only fat and rich people get BP and sugar disease (N=112)	24 (21.1)	7 (26.9)	3 (15.0)	10 (26.3)	4 (13.3)
Only pregnant women can get BP and sugar disease (N=113)	7 (6.2)	1 (3.9)	0.0	5 (13.2)	1 (3.5)
If someone has heart palpitations, they should get checked for BP (N=109)	105 (96.3)	26 (100)	19 (95.0)	32 (91.4)	28 (100)
You can get BP from eating fatty and salty foods over time (N=114)	93 (81.6)	22 (84.6)	17 (85.0)	31 (79.5)	23 (79.3)
If someone has headaches, dizziness, and feel tired, they should get checked for BP (N=112)	106 (94.6)	25 (96.2)	18 (94.7)	36 (94.7)	27 (93.1)
You can prevent BP by eating a balanced diet, exercising, and not smoking (N=112)	100 (89.3)	23 (92.0)	17 (85.0)	31 (81.6)	29 (100)
Hypertension and Diabetes				
BP and sugar disease trend in families (N=108)	49 (45.4)	10 (38.5)	2 (10.0)	21 (60.0)	16 (59.3)
If someone has BP, it is likely they will develop sugar disease (N=107)	63 (58.9)	20 (80.0)	16 (80.0)	17 (47.2)	10 (38.5)
Diabetes (Sugar Disease)				
People who have sugar disease can get treated with nutrition advice, tablets or injections (N= 110)	101 (91.8)	23 (92.0)	20 (100)	32 (86.5)	26 (92.9)
If someone is urinating frequently, feels very thirsty, and has blurry vision, they should get checked for sugar disease (N=108)	104 (96.3)	26 (100)	18 (94.7)	34 (91.9)	26 (100)
Schistosomiasis (Bilharzia)				

Bilharzia is found in communities without a pond or stream (N=112)	38 (33.9)	8 (32.0)	5 (25.0)	13 (34.2)	12 (41.4)
If you see blood in your urine or stool, you should get checked for bilharzia (N=114)	114 (100)	25 (100)	20 (100)	39 (100)	30 (100)
Bilharzia can lead to organ failure if left untreated (N=107)	97 (90.7)	19 (86.4)	19 (95.0)	36 (92.3)	23 (88.5)
Sexually Transmitted Infections					
Syphilis is an STD that can be treated with antibiotics from the clinic (N=113)	109 (96.5)	23 (88.5)	20 (100)	39 (97.5)	27 (100)
Herbal solutions, such as paw-paw root and lemon tree root, cure syphilis (N=98)	35 (34.7)	6 (30.0)	7 (36.8)	15 (41.7)	6 (26.1)
If you don't get treated for syphilis, you will die from it (N=110)	108 (98.2)	22 (95.7)	19 (100)	40 (100)	27 (96.4)
If you have an STI, it is easier to get HIV/AIDS (N=113)	110 (97.4)	26 (100)	20 (100)	37 (94.9)	27 (96.4)

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Conclusion and Recommendations

Though hypertension is not a major focus of health-related social or political efforts at the moment in Zambia, it has gained significant international donor support as a legitimate point of intervention in the developing world, as declared by the United Nations' High-Level Meeting on Non-Communicable Diseases (1). Much of the world is moving through the infectious disease stage as the major cause of morbidity and mortality to the third epidemiologic transition- the explosion of non-communicable diseases and the reemergence of infectious illnesses (2). Cardiovascular disease burden is growing in nearly every country at different rates (3). Though Zambia is battling many infectious diseases as the primary drivers of morbidity and mortality, there is a growing concern that this nation will follow in the footsteps of wealthier nations; the global pendulum has swung back into the ideological framework of primary health care, indicating the need to address multiple causes of morbidity and mortality in each individual patient, as opposed to concentrating on disease silos. There is some evidence that the burden of hypertension is currently above 30% in urban populations in Zambia(4). However, survey data samples are not adequate to extrapolate to the national level. Though evidence suggests that Zambia will face a much larger burden of cardiovascular disease in the near future, current policy must be based on the inadequate existing scientific literature and the precautionary principle to protect the population from suffering the ill effects and complications associated with hypertension and other contributors to cardiovascular disease.

The prevention, early detection, treatment of at-risk Zambians is imperative to minimizing the negative effects of hypertension on the burdened health system. Current efforts within the Ministry of Health have been moderately successful at diagnosing hypertension in primary health care settings. Three quarters of the sample in this study were aware that someone in their social network had been diagnosed with hypertension. Further, 80% of

pregnant women had their blood pressure taken at least once during their antenatal care regimen (5). Efforts to prevent and treat this disease may be improved alongside expansion of screening to capture the prevalence within the general population. Further, gaining reliable data and managing it within a system that is accessible to experts and policy makers is imperative to measuring the state of the problem to allow for proportionate financial and human resource efforts. Many stakeholders in multiple levels are affected by the current and incumbent hypertension burden, including the state, the clinical sector, and non-governmental organizations. All of these sectors have a responsibility to strengthen current efforts and build opportunities for new supportive policy in hypertension mitigation.

The state holds much of the responsibility to provide policy changes that should improve the health outcomes of the population throughout the political infrastructures. There are many improvements that can be made in the national and district levels of the Ministry of Health policy.   The state would benefit from acting proactively on cardiovascular disease prevention due to the resource constraints and reliance on foreign aid to manage health threats. Depending on donors, such as USAID or WHO, to act against hypertension and other contributing morbidities to cardiovascular disease places Zambia in a position of relatively low negotiating power, since these donors require scientific evidence to implement any type of intervention or assistance in strengthening the health system against the threat. This conditional and unstable source of funding has greatly improved recent actions against HIV; however, they should be managed skeptically at a country Ministry of Health level.

First, research should be encouraged through research grants to the domestic budding public health sector in higher education. Ensuring a strong domestic presence in public health infrastructure and program advances is critical to a robust health information and response sector. Additionally, more health system research is necessary to inform policy on integrating

the fractured service provision system; this study may serve as a pilot for integration of services within the sound medical and social infrastructure in HIV prevention, detection, and treatment.

Compiling a data collection and information management system is key to the progression of chronic disease management, including that of hypertension. Additional efforts can be made to formulate an appropriate monitoring system of chronic disease built upon the existing infectious disease reporting strategies. Advancing that system to include active data collection in real time can be accomplished with the incumbent Zambian public health workforce and strategic allocation of funds for the initial compilation of a universal health information management system. Stakeholders should be required by the state to contribute to and use this national surveillance system, contributing to a coordinated and centralized effort to improve the health status of the people of Zambia. In hypertension management, all cases of chronic high blood pressure can be entered into the system and could be made available to all relevant clinical care personnel in real time; the state could also utilize this information to geographically map clusters of incidence. These clusters could inform non-governmental organizations where to pilot control efforts and health messaging education projects. Overall, a national surveillance system would be the ideal mechanism for initial measurement and monitoring of the growing health threat of cardiovascular disease.

Non-governmental organizations and global donors for both research and implementation would benefit from more clinical and behavioral studies of hypertension in Zambia. These studies should be based in the principles of supply and demand, in that they enhance and improve the service's accessibility, availability, appropriateness, or quality. Working within the realm of hypertension, organizations will find that the materials are inexpensive and that training is straightforward and can be accomplished quickly with minimum effort. Many programs could introduce blood pressure screening into their current algorithms

with slight disruption to their activities in the health service sector. As task-shifting has become a primary strategy to accomplish the Millennium Development Goals, training community health workers to educate and screen could further lessen the burden on the medical staff and bring this topic to a large audience. Programs should also incorporate the formal clinic staff and medically trained professionals to incorporate blood pressure measurements into all routine points of care for adults which are not critical at time of entry. Forming a new management system at the clinic level can include recording blood pressure results on patients' health cards so that care providers may assess for blood pressure trends and can lead to an early diagnosis of hypertension.

Community health workers and medical staff can assist in advocacy of hypertension awareness to the community. In order to activate the willing population, effective health messaging campaigns designed to address community and society level norms regarding hypertension should be explored and piloted. Clinical awareness may be a small part of a food education program, aimed at all forms of malnutrition within the social reality of the region or municipality. Non-governmental organizations should, however, explicitly handover successful programs to the District Health Management Team in which the program was piloted. The organization may provide technical assistance and work together with the state to make the most efficient and effective program for the district or region. Non-governmental organizations may also engage at-risk populations at the community level to build capacity for change. Schools, women's groups, and other points of social cohesion may serve as an important platform to disseminate hypertension-related awareness into the community; utilizing these existing networks may allow for communities to feel a sense of control over their destiny and reduce fatalism. At the family and individual level, learning more about cardiovascular disease

within a comfortable environment may provide the resources necessary for behavior change through enhanced self-efficacy.

The medical provider community's responsibility to respond to the impending chronic disease health burden regardless of sector is necessary to complete any response to hypertension. One policy and strategy may be to incorporate primary health screenings into existing presence at fairs and festivals; in many popular fairs, the Ministry of Health or District Health Management Team already has a presence through tents and representatives. Adding on hypertension screenings with local outreach may be a cost-effective strategy for early detection and prevention messaging. Providers must be provided with adequate health information to declare to the public, however. Improving the level of knowledge of all care providers regarding hypertension and other contributors to cardiovascular disease is imperative to the success of any outreach. Identifying points of entry that are appropriate for an add-on hypertension screening service may also be warranted. Adding on hypertension screenings to the robust HIV testing infrastructure is likely cost-efficient and will introduce an active, health conscious population to educational and detection efforts. This may include enhancing male participation in the health sector, traditionally underrepresented in Zambia.

Hypertension awareness and diagnosis may have particular application to the HIV+ sector of society. Ensuring hypertensive HIV+ patients receive comorbidity-sensitive clinical care can improve the quality of life of people living with HIV. Hypertensive HIV+ patients require special care and HIV+ patients are at higher risk of cardiovascular disease than the general population. Screening for both diseases simultaneously may decrease the complications associated with hypertension in clinical management of HIV and ensure cardiovascular disease becomes an integral part of HIV management (6, 7). Though blood pressure may be checked on a regular basis as part of vital statistics of general health status in HIV clinical care, ensuring

policies that examine the possibility of hypertension should be employed; further, this clinical

care setting may be another point of entry for awareness and education that may be utilized

during ARV clinic waiting times or as a method to normalize HIV into routine clinical care.

  The medical, non-governmental, and state sectors of Zambian society all face challenges

and opportunities to address the growing burden of hypertension and cardiovascular disease.

Measuring and allocating resources based on evidence will take cooperation and targeted

communication between stakeholders. If policy changes are not made to account for this threat,

the morbidity and mortality associated with it will continue to rise without an effective means of

restriction, increasing the health expenditures on this preventable disease. The initial costs of

integrating hypertension screening services into the existing health infrastructure will be

disbursed over time as expenditures yield a return on investment in the outcome of a health

system whose capacity can meet the demand of hypertension and cardiovascular disease.

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Appendix of Forms Used

Focus Group Discussion Invitation Template
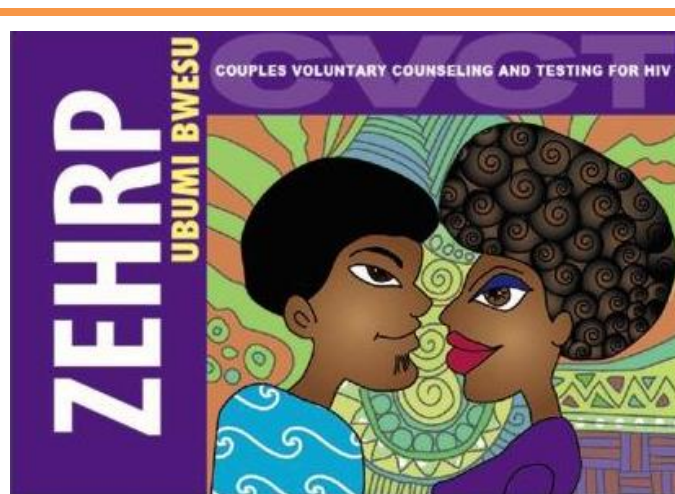
We want to hear from you!

You both are invited to a Focus Group Discussion on ZEHRP's Good Health Package!

11:00 hours
Wednesday 18th of July

22a Lupili Rd. Northrise, Ndola

Come share your thoughts and knowledge with us!   Refreshments Provided.

Focus Group Discussion Guide

Please read aloud to participant. Instructions for the moderator are in bold and in brackets.

Thanks for participating in this study. My name is _____ and I am a talking with you all for the Zambia-Emory HIV Research Project. We are researching what people think about our Good Health Package. We feel it is important to hear about your opinions and experiences, so we are conducting focus groups like this one in Ndola. Our conversation will help us to make education materials on the Good Health Package. Once we learn from these discussions, we will give surveys to people in Ndola, Chingola and Kitwe.

Your participation today is entirely voluntary. You can choose to not answer questions at any time. Our discussion will last an hour. I would like to record our conversation so that I don't miss any of the points you all bring up. The information collected today will only be listened to by the research team. This recording will only be used for this research project and then it will be destroyed. Is it ok to record this conversation?

[Ensure all consent verbally. Explain the purpose of the informed consent form. Read informed consent and ensure all participants sign it before moving forward.]

I'm not sure if any of you have been in groups like this before, but before we get started, I would like us to agree on some rules for our discussion. Most importantly, this conversation is confidential. It is really important that you do not tell anyone who was here or what they said today. We will not be using our names in this conversation to make sure we all have privacy. In order to respect each other, only one person should talk at a time; we should not have side conversations with our neighbors, either. It is okay to disagree with one another; please remember you are all here because you each have important thoughts to share. I have a list of topics that I would like your opinions of, but please feel free to bring up any relevant issues. There are no right or wrong answers and it is alright if you don't know about something. I also want to remind you that the researchers are not experts in what happens in your community, so it would be really helpful to me if you could explain things more than you would to each other. Are there any rules we should add?

Before we begin, do you have any questions?

It would be great if we could go around the circle and say one interesting thing about yourself and whether you have been to 1 CVCT visit or you have come back for a follow up visit before.

I would like to explain our Good Health Package. It is a group of goods and services that we think are important for people living in the Copperbelt. We came up with this as a way to get more people to come back for another visit after their first counseling and testing session. We think people will like these things and that it will bring more people back to the clinic. The things we want to give people are chlorine bottles, all-purpose soap, carbolic soap and worm infection tablets for a client's family. Clients will get one of those items per couple. We also want to be able to offer services like testing for high blood pressure, high sugar and Bilharzia. We also want to test and diagnose people who have syphilis. If someone tests positive for a disease, we will refer them to treatment. Each time a couple comes back for another visit, they would pick either one good or two services from the Good Health Package.

1. Let's talk about the things we have on the table. **[Present all-purpose soap.]**
   a. What do people call this item?
   b. How do you use it?
   c. When do people use it?
   d. Do people use this incorrectly?

2. **[Present carbolic soap.]**
   a. What do people call this item?
   b. How do you use it?
   c. When does this get used?
   d. Do people use this incorrectly?
   e. What is the difference between this soap and the first soap?

3. **[Present chlorine.]**
   a. What do people call this item?
   b. How do you use it?
   c. When does this get used?
   d. Do people use this incorrectly?

4. **[Present dewormer.] This medicine is called Mebendazole and is for deworming. One brand of this medicine is Vermox.**
   a. How do you use it?
   b. When does this get used?
   c. Do people use this incorrectly?

5. **I would like to ask you all about hypertension. It is also called high blood pressure.**
   a. What do you know about it?
      1. Probe on: who informs people, when people learn about it, the size of problem, how it is acquired, available treatments
   b. Who in your community is talking about it? What are they saying?

6. **I would like to ask you all about diabetes. People often call it high blood sugar, or high sugar.**
   a. What do you know about it?
      1. Probe on: who informs people, when people learn about it, the size of problem, how it is acquired, available treatments
   a. Do people in your community talk about it? (How?)

7. **Moving on, I want to ask you about Bilharzia. Sometimes people call it Schistosomiasis.**
   a. What do you know about it?
      1. Probe on: who informs people, when people learn about it, the size of problem, how it is acquired, available treatments
   b. Do people in your community talk about it? (How?)

8. **Now I'd like to ask you about syphilis.**
   a. What do you know about it?
      a. Probe on: who informs people, when people learn about it, the size of problem, how it is acquired, available treatments
   b. Do people in your community talk about it? (How?)

[Check Time. Target: 20 minutes or more remaining]

9. **[Point to goods.]** If a couple received one of the goods and it ran out, how could they get it again?

10. **[Point to services.]** If a couple wanted to get tested or treated for these diseases, where could they go to get it?

11. What obstacles could this couple face in attempting to get these goods and treatments?
    [Probe until exhausted.]

12. Does having this Good Health Package available during follow-up HIV counseling and testing encourage people to come back to the clinic for their appointment?

13. What would you like to change about the Good Health Package?

14. What advice to do you all have for our team?

15. Is there anything else you think is important that I didn't ask you about?

16. Does anyone have anything that they would like to add?

We are almost done with our meeting. We would like to offer each of you a good to take home from our Good Health Package. I will be going over each item and service right now and then you will be free to decide.

The services we will be providing at the clinics, not today, are a blood pressure screening, syphilis testing, and a urinalysis.

The blood pressure screening is done to check for hypertension. The nurse will put a cuff around your arm that will squeeze your arm when she pumps it. She will then write down your blood pressure and compare it to a chart. Hypertension is a symptom of cardiovascular disease, which can lead to artery problems, a heart attack and even a stroke. It is also related to heart failure and renal (kidney) failure. Things that contribute to hypertension include poor diet, lack of exercise, and smoking. This disease is growing in countries like Zambia, especially in cities. Hypertension can be corrected through quitting smoking, exercising more, and eating a healthy diet. There are also some medications that can help.

Testing for syphilis involves taking a little bit of blood and using a laboratory test to diagnose the disease. Syphilis is a diseased caused by bacteria and is transmitted through sexual contact. It can move throughout the body, damaging many organs over time. People with syphilis can have sores, rashes, fever, fatigue, and swollen lymph glands. There are 4 stages of the disease. The first two stages are contagious. In the early stages, it can be easily treated with antibiotics. In its late stages, untreated syphilis can cause serious heart abnormalities, mental disorders, blindness, neurological problems and death.

The urinalysis is a simple test where a client urinates in a cup. The staff then uses a dipstick with different boxes that test for multiple diseases. For the GHP, we will be looking for 2 things: blood in the urine and too much sugar in the urine.
        If there is any blood, even a tiny amount you can't see, it may be a sign of Bilharzia. Bilharzia is caused by a worm that enters a person through their skin and it lives in two different kinds of snails. This disease is found mostly near puddles and ponds, but has been also found in people that do not live near water. It can affect your kidneys and bladder, causing progressive damage over time. It can also affect your intestines, which causes swelling of the liver and spleen, and intestinal damage. Control

of Bilharzia is based on drug treatment for those who are infected, snail control, and improved sanitation.

We will also be checking the sugar level in the urine. A high amount of sugar may indicate diabetes. Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. There are two types, but most cases are Type II and develop during adulthood. High blood sugar is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. Diabetes is related to obesity, lack of physical activity, and unhealthy diets. More than 80% of the 350 million in the world with Type II Diabetes live in low and middle income countries. Treatments include changes in diet and exercise, weight loss, or oral medications or even insulin injections.

The goods we will offer in the Good Health Package and to you all today are carbolic soap, all-purpose soap, chlorine, and deworming medication.

Carbolic soap is a mild soap that can be used for hand washing and bathing. It can also be used for washing clothes and cleaning household surfaces. All-purpose soap is used for everyday washing and cleaning. When washing hands, scrub for at least 20 seconds before rinsing with clean water. Hand washing should take place before cooking and eating, after using the washroom, before and after caring for someone who is sick or has wounds, after handling garbage, after touching animals, and after changing diapers. It is wise to keep the suds away from mouths, eyes, and other orifices.

Chlorine is used to kill bacteria in water. To use Chlorin, the brand we offer, fill a sealable container of water. For 5 liters of water, measure Chlorin using the top of the cap. For 20 liters of water, measure Chlorin using the inside of the cap. Add the measured amount to the water and shake the container well. Wait for at least 30 minutes before using the water. All of the water used in every home should be clean. Cholera, E. Coli, and other bacteria will be killed if the water is properly chlorinated. If by accident, more Chlorin than used for the water is swallowed, keep the person warm and resting. Do not make the person vomit. Call your doctor. If the Chlorin splashes on the skin or in the eyes, flush with cold water for 15 minutes and remove any cloth near the spill. Try to keep the Chlorin cool and out of the sun.

Deworming medication is often presented as Mebendazole, Vermox, Ovex, Antiox, or Prispen. This medicine is used to kill worms that are living in a person's digestive system. Worm infections can cause blood disorders, discomfort, diarrhea, and fatigue. The medicine can be chewed, swallowed, or crushed. In order to keep healthy, it should be administered twice a year to the whole family. A doctor should discuss taking this drug during pregnancy and breastfeeding. Rash and diarrhea are common

reactions to taking the drug. If anyone takes more than one dose at a time, induce vomiting. Washing hands, washing fruits and vegetables, cleaning the floors, and keeping children covered with pants and shoes when they are near the soil can help prevent worm infections.

Thank you all for coming. We talked about a lot of important things today. I want to thank you for sharing your points of view. In exchange for participating, you will be reimbursed with a good from the Good Health package as well as travel reimbursement. **[Please distribute vouchers.]**

ZEHRP Client GHP Survey   ID: City_____ Clinic _____ Number _____
Survey Identification
Date of survey(dd/mm/yyyy)|____|____||__0__|__7__||_**2**_|_**0**_|_**1**_|_**2**_|Surveyor _____

➡ *IMPORTANT NOTE: Please survey all partners separately. The person must have completed CVCT. You must talk to a person over age 18.*

Do not begin this survey until a participant has signed informed consent form.

Surveyor instructions:
       1. Fill in the response to every question by ticking or writing the answer given.
       2. Check one answer per question unless the directions under a question
allow for multiple answers.
       3. Do not read answer choices aloud to participant.
       4. Follow instructions located next to answers to follow skip patterns.

This weekend I am working for ZERHP. We are doing a survey to learn more about you community, your health priorities, and knowledge of some diseases to improve the Good Health Package. The survey is anonymous; we will not ask for your name or your HIV status. This survey is optional and you can skip a question or stop it at any time. It will take 30 minutes. Are you willing to take this survey today?

If YES, mark 01 here to acknowledge that consent for respondent was given.
      |___|___|

If NO, *thank respondent and stop survey.*

A. RESPONDENT AND FAMILY "I would like to first learn about you."		
A.01	*OBSERVE:* Gender of respondent [SEX]	☐Male .....1 ☐Female.....2
A.02	How old are you? [AGE] *(If age is unknown, approximate)*	|___|___| years ☐ Did not answer............98
A.03	How many people usually live in your home? [INHOME]	Total number of people: |__|__| ☐ Did not answer............98
A.04	How many children 5 years old and under usually live in your home? [U5INHOME]	Children 5 and under: |___|___| ☐ Did not answer............98

A.05	How many children ages 5 through 17 years old usually live in your home? [A5INHOME]	Children 5-17: |___|___| ☐ Did not answer............98
A.06	How many people who live in your home usually earn an income or have a job? [EARNERS]	Income Earners: |___|___| ☐ Did not answer............98
A.07	**If *female***: Are you currently pregnant? OR **If *male***: Is your partner currently pregnant? [PREGNOW]	☐ Yes.......................................1 ☐ No.......................................2 ☐Don't know......................................99 ☐ Did not answer............98
A.08	Do you plan on having a child in the future? [WANTPREG]	☐ Yes.......................................1 ☐ No.......................................2 ☐Don't know......................................99 ☐ Did not answer............98

B. COMMUNITY HEALTH PRIORITIES "Now I would like to ask you questions about your health priorities."							
	Question	**Did not answer**	**Small Problem**	**Medium Problem**	**Large Problem**	**Not a Problem at all**	**Don't Know**
B.1	Do you think that each of the following is a small problem, a medium problem, a large problem, or not a problem at all in your community:						
B.1a	Malaria [PROBM]	98	1	2	3	0	99
B.1b	Intestinal worms [PROBW]	98	1	2	3	0	99
B.1c	Bilharzia [PROBBZ]	98	1	2	3	0	99
B.1d	BP / hypertension [PROBBP]	98	1	2	3	0	99
B.1e	Sugar disease / diabetes [PROBDIA]	98	1	2	3	0	99

B.1f	Syphilis [PROBSY]	98	1	2	3	0	99
B.1g	STDs [PROBSTD]	98	1	2	3	0	99
B.1h	Unsafe water [PROBH20]	98	1	2	3	0	99
B.1i	Pneumonia [PROBP]	98	1	2	3	0	99
B.1j	Diarrhea [PROBDD]	98	1	2	3	0	99
b.1k	HIV/AIDS [PROBHIV]	98	1	2	3	0	99

C. GOOD HEALTH PACKAGE "I am now going to ask you some questions about your preventive health."		
C.01	Do you use malaria nets in your home? [ITNINHOME]	☐ Yes..1 ☐No...➔**Skip to Question C.05**………........2 ☐Don't know…➔**Skip to Question C.05**...99 ☐ Did not answer............98
C.02	Who sleeps under a malaria net in your home? [ITNUSE, ITNUSE1, ITNUSE2, ITNUSE3, ITNUSE4, ITNUSE5] [***More than one answer is allowed! PROBE to get all by asking, "Is there anyone else?" until exhausted***.]	☐Myself...1 ☐My spouse.......................................2 ☐Elderly..3 ☐ Children 5 and under.......................4 ☐ Children over 5...............................5 ☐ Did not answer............99
C.03	Do you have a malaria net over <u>every</u> sleeping area? [ITNALL]	☐Yes..1 ☐No………………….…………......2 ☐Don't know …………………………99 ☐ Did not answer............98
C.04	How many years old is your oldest malaria net? [ITNAGE]	☐Under 1 year old………………………1 ☐Under 2 years old……………………..2

		☐Under 3 years old……………………..3
		☐Older than 3 years……………………4
		☐ Did not answer…………98
C.05	Do you have soap in your home right now? [SPINHOME]	☐ Yes... 1
		☐ No.………………………….....................2
		☐Don't know..99
		☐ Did not answer…………98
C.06	When should you wash your hands with soap? [SPUSE, SPUSE1-SPUSE9] [**More than one answer is allowed! PROBE to get all sources by asking, "Is there any other time?" until you get them all**]	☐After I use the bathroom..................1
		☐Before cooking................................2
		☐Before eating..................................3
		☐Before feeding the baby..................4
		☐After changing the baby..................5
		☐After taking care of a sick person ...6
		☐After touching trash.........................7
		☐After touching animals ……………...8
		☐ Other..9
		☐ Did not answer…………98
C.07	Do you use chlorine to purify the drinking water in your home? [CHUSE]	☐ Yes..1
		☐No...→ **Skip to Question C.9..**..................2
		☐Don't know...→ **Skip to Question C.9..**…99

		☐ Did not answer............98
C.08	Do you have chlorine in your home right now? [CHINHOME]	☐ Yes.. 1 ☐ No...2 ☐Don't know……………………………….99 ☐ Did not answer............98
C.09	Does anyone living in your home get regular deworming treatments? [MBINHOME]	☐ Yes...1 ☐No...→ **Skip to Question C.11**.................2 ☐Don't know...→ **Skip to Question C.11**...99 ☐ Did not answer............98
C.10	Who receives regular deworming treatments? [MBWHO, MBWHO1, MBWHO1X – MBWHO5, MBWHO5X] [**For each tick, ask "How often does this person receive deworming treatments?"**]	☐Myself...............................1 How often? |___|___| Times each year ☐My spouse.........................2 How often? |___|___| Times each year ☐Elderly ....3 How often? |___|___| Times each year ☐Children 5 and under ....4 How often? |___|___| Times each year ☐Children over 5.................5 How often? |___|___| Times each year ☐ Did not answer............98
C.11	Have you or someone you know ever had bilharzia? [BZKNOW]	☐ Yes...1 ☐No...→ **Skip to Question C.13**.................2 ☐Don't know...→ **Skip to Question**

		C.13...99
		☐ Did not answer............98
C.12	Who has had bilharzia? [BZWHO] [**More than one answer is allowed! PROBE to get all sources by asking, "Is there any other place?" until you get them all**]	☐ Myself.........................……..1 ☐ My partner or child........................2 ☐ My family member.........................3 ☐ My friend.....................................4 ☐ Someone in my community...........5 ☐ Did not answer............98
C.13	Do you or someone you know have sugar disease? [DIAKNOW]	☐ Yes...1 ☐No...→ **Skip to Question C.15**.................2 ☐Don't know...→ **Skip to Question C.15**...99 ☐ Did not answer............98
C.14	Who has had sugar disease? [DIAWHO, DIAWHO1] [**More than one answer is allowed! PROBE to get all sources by asking, "Is there any other place?" until you get them all**]	☐ Myself.........................……..1 ☐ My partner or child........................2 ☐ My family member.........................3 ☐ My friend.....................................4 ☐ Someone in my community...........5 ☐ Did not answer............98
C.15	Do you or someone you know have BP? [BPKNOW]	☐ Yes...1 ☐No...→ **Skip to Question C.17**.................2 ☐Don't know...→ **Skip to Question C.17**...99 ☐ Did not answer............98
C.16	Who has had BP? [BPWHO, BPWHO1] [**More than one answer is allowed! PROBE to get all sources by asking, "Is there any other place?" until you**]	☐ Myself.........................……..1 ☐ My partner or child........................2 ☐ My family member.........................3

	get them all]	
		☐ My friend.........................4
		☐ Someone in my community..........5
		☐ Did not answer............98
C.17	Have you or someone you know had syphilis? [SYKNOW]	☐ Yes..1 ☐No...→ **Skip to Section D**........................2 ☐Don't know...→ **Skip to Section D**……...99 ☐ Did not answer............98
C.18	Who has had syphilis? [SYWHO, SYWHO1] [**More than one answer is allowed! PROBE to get all sources by asking, "Is there any other place?" until you get them all**]	☐ Myself........................……..1 ☐ My partner or child.........................2 ☐ My family member.........................3 ☐ My friend........................4 ☐ Someone in my community..........5 ☐ Did not answer............98

D. DISEASE KNOWLEDGE "I am now going to ask you some true or false questions about diseases. Please say if the sentence I say is true or if it is not true."		
D.01	When you wash your hands, you should rub the soap for one minute in your hands before you rinse them. [WASHTIME]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98
D.02	Washing your hands with soap helps prevent pneumonia. [WASHP]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98
D.03	If everyone in the house washes their hands often, it will help prevent diarrheal diseases. [WASHDD]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98
D.04	In order to treat your drinking water, it has to be in a container that you can measure in litres. [CONTL]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98
D.05	If your container holds 5 litres of water,	☐True…01 ☐False…02

	you should pour 5 capfuls of chlorine in it. [CHMIS]	☐Don't know…99 answer…………98	☐ Did not
D.06	No matter what size container you have, you should put one capful of chlorine in it. [1LANYSZ]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.07	Chlorinating water helps prevent cholera.[CHLPCH]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.08	After you add chlorine and shake the container, you should wait at least 30 minutes before drinking treated water. [WAIT30MIN]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.09	You can apply chlorine to a toothache, a cut, or a sore to treat it. [CHTOSKIN]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.10	Adults can take Vermox every six months to regularly kill worms.[PREV6MOS]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.11	Vermox treats all kinds of worms. [ALLWORMS]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.12	If someone in your house had worms, everyone living there should take a course of Vermox. [MBHOUSE]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.13	BP can lead to heart attack or stroke if untreated. [BPSTROKE]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.14	You can get BP, or hypertension, from someone who has the disease. [BPINFECT]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.15	Only fat and rich people get BP and sugar disease. [BPFAT]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not

D.16	If someone has headaches, dizziness, and feel tired, they should get checked for BP. [BPSYMP]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.17	You can get BP from eating fatty and salty foods over time. [BPDIET]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.18	You can prevent BP by eating a balanced diet, exercising, and not smoking. [BPPREV]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.19	You can get sugar disease by eating a diet full of sugar and starch over time. [DIADIET]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.20	Only pregnant women can get BP and sugar disease. [BPPREG]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.21	BP and sugar disease trend in families.[BPTREND]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.22	If someone has heart palpitations, they should get checked for BP. [BPPALP]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.23	If someone has BP, it is likely they will develop sugar disease. [BPDIA]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.24	People who have sugar disease can get treated with nutrition advice, tablets or injections. [DIATRT]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.25	If someone is urinating frequently, feels very thirsty, and has blurry vision, they should get checked for sugar disease [DIASYMP]	☐True…01 ☐Don't know…99 answer…………98	☐False…02 ☐ Did not
D.26	Bilharzia is found in communities without a pond or stream. [BZNOPOND]	☐True…01 ☐Don't know…99	☐False…02 ☐ Did not

		answer............98	
D.27	If you see blood in your urine or stool, you should get checked for bilharzia.[BZBLD]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98	
D.28	Bilharzia can lead to organ failure if left untreated.[BZFAIL]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98	
D.29	Syphilis is an STD that can be treated with antibiotics from the clinic. [SYCLNC]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98	
D.30	Herbal solutions, such as paw paw root and lemon tree root, cure syphilis. [SYHERBS]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98	
D.31	If you don't get treated for syphilis, you will die from it. [SYDIE] .	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98	
D.32	If you have an STI, it is easier to get HIV/AIDS. [STIHIV]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98	
D.33	By coming to the clinic today, you have made an important step towards living a more healthy life. [HEALTHY]	☐True…01 ☐False…02 ☐Don't know…99 ☐ Did not answer............98	

999. Do you have any questions or comments for me?
_____

Thank you for your time and your answers. Your participation is very important to us.

For Data Entry Purposes Only:

Recorded in Excel Database 1:

Entered by:_____Date _____

Recorded in Excel Database 2:

Entered by:_____Date _____

Recorded In field Journal: Entered by:_____Date _____