HEALTH PROGRAMMING AND COMMUNITY-BASED RADIO STATIONS IN SUB-SAHARAN AFRICA: AN EXAMPLE FROM ZAMBIA

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A community- based radio station has potential for significant positive impact on the health of a community by providing important information about health to its listenership. This influence is particularly important in rural areas of low and middle-income countries where such stations serve as the only practical form of communication. This study looks at the impact of the health messaging from Namwianga Radio, a community-based radio station in rural Zambia, on its listenership. The researcher sought to determine (1) if the radio station could serve as an effective means of communication in the region, (2) the extent to which the station has influence over the listenership, (3) specific health topics that listeners could recall from the broadcasts, and (4) what ways could the station better serve the health communication needs of the community. To answer these questions, a mixed methods survey was utilized. Participants (n=103) were interviewed orally about basic radio listening habits and health behaviors as well as channels through which they received health information. Participants were also given an opportunity to give qualitative feedback on the health messaging of the radio station.

The findings suggest that Namwianga Radio is an important communication tool in the Southern Province of Zambia. Most of the respondents (68%) reported listening to the radio for "more than three hours every day." Furthermore, over half of the participants reported getting

their health information from Namwianga Radio. The station also has serves as an important influence in the community. All participants said that they trusted the radio station, and 85.2% reported specific health behavior change. Participants also had high recall of health topics.

This project has significant public health implications as it shows that community-based radio stations have potential to improve the overall health of a community. It also suggests that such community-based radio stations might be effective tools for communicating health messages in rural areas with hard-to-reach populations in other parts of Sub-Saharan Africa.

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PREFACE

To Austin Siabeenzu, Raymond Moonga, Sheryl Ramsey, Eleanor Hamby, Kel Hamby and many others at Namwianga Mission and with Zambia Medical Mission. Thank you so much for your love and support over these past five years.

To my thesis committee: Drs. Sharma, Felter, and Talbot. Thank you for your guidance and flexibility throughout this process.

And most importantly, to my family.

GLOSSARY OF ABBREVIATIONS

CRS: Community Radio Stations

DALYs: Disability Adjusted Life Years

EE: Entertainment Education

GNI: Gross National Income

IRB: Institutional Review Board

MSM: Men who have Sex with Men

NR: Namwianga Radio

NM: Namwianga Mission

PI: Principal Investigator

ZMM: Zambia Medical Mission

1.0 INTRODUCTION

In June and July of 2011, an evaluation was conducted of the health messaging of the community-based radio station, Namwianga Radio. Working with Namwianga Mission and Zambia Medical Mission, a medical outreach, 103 oral interviews were conducted with people in the Namwianga Radio catchment area to assess the impact of Namwianga Radio on the health behaviors of its listenership.

In resource-poor areas of low and middle-income countries, such as Zambia's Southern Province, lack of health information poses a serious risk to public health. There is little overall health literacy, and most areas lack an established communication infrastructure. Furthermore, many of the most important public health risks in the area, such as HIV/AIDS, malaria, and hygiene, have important behavioral risk factors.[1,2] Health communication can help improve health outcomes for behaviors which have significant behavioral components.[3]

Starting in 2009, Namwianga Radio began broadcasting a combination of health information, faith-based programming, and general entertainment. Since then, the listenership has grown to about 80,000 regular listeners spanning a broadcast area with a radius of about 100 kilometers. As the only radio station that covers much of the area, most of the members of the community rely on its broadcast to provide them with information about health, religion, and important community events.

This thesis will evaluate the effectiveness of Namwianga Radio's health programming, suggest ways in which new programming could be developed to maximize public health impact, and discuss the implications that this evaluation might have for other radio stations and health messaging campaigns.

1.1 ZAMBIA HEALTH PROFILE

Zambia is a landlocked country in the heart of south central Africa. It is bordered by eight countries, making it particularly dependent on its neighbors for trade.[4] The July 2011 estimate for the population of the country was 12.9 million.[5] English is the official trade language of Zambia, but there are over 70 different ethnolinguistic groups, seven of which have an officially recognized language: Bemba, Tonga, Nyanga, Lozi, Kaonde, Luvale, and Chewa.[6]

Figure 1. Map of Zambia. Zambia is highlighted in red on inset map. Study area is approximated in red [7]

Zambia gained its independence from the United Kingdom in October of 1964, after nearly a century of colonial rule.[8] After release of colonial power, the country enjoyed a short-lived period of economic prosperity but quickly fell into economic turmoil after the price collapse of several of its major exports.[4] The GNI in 2009 was $979 US,[5] ranking 187th out of 217 countries ranked by the World Bank.[9] Zambia is a democracy; however, the political system has been viewed as fairly corrupt, ranking 99th out of 180 countries in the Heritage Foundation's Freedom from Corruption index in 2011.[10] The Gini coefficient of Zambia over the time span of 2000-2010 was 50.7,[11] showing a large gap in income equality.

The overall public health situation in Zambia is grim. The life expectancy at birth declined from 51 to 46 from 1990 to 2009, although some estimates show that it has risen again to around 51 i n 2011.[6] The HIV/AIDS pandemic has hit Zambia particularly hard, with prevalence rates at 13.5% of the total population[12] and as high as 33% in MSM populations and 69% in female sex worker populations.[13] HIV alone accounts for 30% of the burden of disease by DALYs lost in the entire population.[12] In 1991, Zambia underwent a total healthcare system restructuring. The majority of healthcare facilities are operated by the central government, and nominal fees are charged for services.[8]

The most significant burden of disease in Zambia can be attributed to communicable, maternal, perinatal and nutritional causes, which account for 78% of total DALYs lost. The top three contributors in this category are HIV/AIDS, respiratory infections, and malaria. Neuropsychiatric conditions, cardiovascular disease and sense organ diseases are the top three causes of loss of DALYs among non-communicable diseases, although such diseases only account for about a small percent of total disease burden (15%).[12]

1.2 PARTNER ORGANIZATIONS

1.2.1 Namwianga Mission.

Namwianga Mission is a faith-based mission located 7 kilometers east of Kalomo, Zambia and funded by the Churches of Christ. Western missionary influence in the area began around 1920 when John Sherriff crossed the Zambezi River from Southern Rhodesia (Zimbabwe) to Northern

Rhodesia (Zambia).[14] In the early days of the mission, primary and secondary school education were the primary focus of western influence in the area; however the mission now supports a college, several orphanages, a rural health center which is in the process of becoming a full hospital, a radio station, and agricultural extension services, among other activities.[14] Due to the longevity of the mission in the region, Namwianga has a very positive reputation throughout the country.[15]

1.2.2 Namwianga Radio.

The primary partner in this research and evaluation project was Namwianga Radio (NR), a community radio station whose mission is to "Lead and draw listener to God and Jesus Christ through excellence in programming that emphasizes culturally relevant information, news, education, health, agriculture, and valuable entertainment which is related to the communities."[16]

Initial test broadcasts for the station began in late 2008 with fulltime broadcasting starting in 2009. With the second tallest radio tower in the country, the station reaches an area with a radius of approximately 100 kilometers. Estimates of listenership suggest that there may be as many as 80,000 people tuning in during peak hours. The station begins broadcast at 6:00 a.m. and closes nightly at 11:00 p.m.[16]

There are three primary "presenters" (individuals who host programming), two male and one female. Programs are broadcast both in English, the official language of Zambia, and chiTonga, the language of the Tonga people who comprise the largest ethnolingiustic group in the area.[17]

As suggested in the mission statement, the station broadcasts a variety of programs ranging from spiritual teachings and music, secular music, to educational programs including health and agriculture.

1.2.3 Zambia Medical Mission.

Zambia Medical Mission (ZMM) is an extension of Namwianga Mission, consisting primarily of medical outreach to remote communities in the region surrounding the mission. Since its inception in 1994, ZMM has grown into one of the largest short-term medical outreaches in the world.[15] Every July more than 120 American team members, consisting of approximately 10 physicians, 20 nurses, and a myriad of support personnel, join around 150 Zambian team members, who are primarily nurses. The team travels to four separate sites, usually schools, in remote areas and establishes temporary primary care clinics, including medical and wound care, a dental clinic, and an optometry/ophthalmology clinic as well as an extensive pharmacy. In 2011, over 16,000 patients were seen as a part of the mission, and, in some years, as many as 20,000 patients receive medical care.[18] The care received at ZMM constitutes the only medical attention that the majority of patients will receive in the year. Patients who cannot have basic needs met in the mobile clinic are assisted with transportation to the appropriate permanent medical facility.

2.0 LITERATURE REVIEW

Given the importance of HIV/AIDS in Zambia, much focus has been placed on HIV prevention. Although there is some debate amongst scholars as to the most effective means of HIV prevention, many researchers believe that behavioral prevention remains the most practical tactic.[19,20] Health communication is "a means to disease prevention though behavior modification,"[21] and mass media campaigns are widely used in behavior change campaigns. In Zambia, health communication as a strategy for HIV prevention has widely been adopted.[22] Historically, communication campaigns in the region have used various communication mediums such as print media, song, dance and live drama productions.[23] Recently however, television and radio programs have become a popular method of public education for HIV and other health messages.[23]

2.1 COMMUNITY RADIO STATIONS

Community Radio Stations (CRS) have been recognized as an important tool in public health and economic development.[24,25] They promote such activities by providing programming that is relevant and community-focused, which address community specific issues and concerns.[25,26]

Local voices promoting local issues foster the development of a community dialogue around important topics that can have a significant impact on health and development.[25]

In 2007, the Center for International Media Assistance (CIMA) at the National Endowment for Democracy hosted a forum on the social impact of community radio models. Participants described community radio as having a "horizontal exchange of information,"[26] where the station and the public interact. This model differentiates CRS from the traditional model of mass communication where there is much less interaction between the media outlet and its audience.[26] This facet of community radio can be particularly powerful in health communication, as the station has a greater ability to listen to community members and tailor important messages to meet specific community needs and audience segments.

The group from CIMA also said "the impact of community radio is most evident in areas having practically no other access to information."[26] Because Namwianga Radio is the only media outlet available to most of its listenership, it has enormous potential for community influence.

2.2 TRADITIONAL HEALTH COMMUNICATION AND THE RADIO

There is strong evidence that radio campaigns can be an effective agent of behavior change. Bertrand and Anhang conducted a systematic review of mass media campaigns that "had the main objective of providing information about HIV/AIDS or sexual health"[27] in developing countries, including in the analysis eleven studies from Africa, two from Latin America, one from Asia and another from multiple low-income countries.[27] Of these studies, seven used radio

as a major channel for communication about HIV behaviors. The campaigns in this analysis were effective in increasing knowledge of participants' understanding of HIV transmission, improving self-efficacy in condom usage, and changing social norms surrounding HIV behaviors.[27]

There is other evidence that exposure to radio communication has an impact on health behavior. One study showed that, among men in Burkina Faso and Uganda, those who were exposed to the radio were 1.4 and 1.5 times more likely, respectively, to know how to use condoms correctly than those who were not exposed to the radio.[28] In the same study, correct condom usage was also directly proportional to the number of media sources to which an individual was exposed such as radio, television and print media.[28]

Finally, radio communication campaigns seem to be cost-effective as an agent of behavior change in HIV prevention. Hsu et al. looked at the cost-effectiveness of various behavior change tactics in Benin in 2009, finding only three with statistically significant evidence to support positive behavior change: magazine adds, radio communication and public outreach events. Such outreach events were found to be less cost-effective than magazine and radio campaigns,[29] and, due to the low literacy rate of the population in this study, radio campaigns seem to be the most viable option for cost-effective health communication campaigns.

2.3 ENTERTAINMENT EDUCATION IN SUB-SAHARAN AFRICA

Entertainment-education (EE) is a mass media strategy which involves the intentional incorporation of educational materials into popular media in order to bring about social change.[30]

The theoretical basis for entertainment-education is often grounded in Bandura's Social Cognitive Theory, making the assumption that an individual's perceptions of his or her ability to initiate behavior change can be influenced by listening to the program.[22]

Entertainment-education programs have been proven successful in influencing behavior change in a variety of settings and cultural contexts in sub-Saharan Africa. Soul City, an EE program in South Africa, is an example of success in this form of health communication. The program, which began broadcasting in 1994, employed a combination of media channels including radio and television dramas, print media, and social marketing techniques. It was one of the most popular television programs in South Africa, consistently scoring in the top three television programs both in children and adult age categories.[31] Numerous evaluation studies have proven Soul City to be effective in combating stigma and misinformation about HIV/AIDS.[23] Additionally, evidence of behavior change and HIV risk factors can be attributed to Soul City.[32] The program has also been broadcast in 8 other countries in sub-Saharan Africa,[33] including Zambia.[23]

In Tanzania, the radio soap opera *Twende na Wakati* ("Lets Go With the Times) was shown to have a positive effect on HIV prevention behaviors. Vaughan et al found that 73% of *Twende na Wakati* listeners reported learning about AIDS from the program. Additionally, those living in the intervention area reported 16% higher change in behavioral risk factors for HIV than those in the control area where the program was not broadcast. Several years after the intervention, 58% of individuals in the rural study area had exposure to *Twende na Wakati.*[19] This study shows the remarkable power of radio programming to reach remote populations. It has particular significance for Namwianga Radio because it demonstrates a successful radio campaign in an area with similar cultural and demographic characteristics.

As with all communication strategies, however, varying degrees of success have been shown in radio-centered entertainment education campaigns. In the early 1990s, a radio drama about HIV/AIDS was prevented in Zambia's Northern Province. Yoder et al discovered that "[t]hose with high exposure to the program were no different in knowledge, attitude, or behavior from those who had no or low exposure".[22] To account for these results, which contradicted many other published evaluations of EE, the researchers proposed the following three explanations:

> (1) This particular radio drama was ineffective, but does not represent all other such dramas that might be produced; (2) the particular context into which the program was introduced limited its effectiveness, but a similar program might be effective in a different context; (3) the evaluation methodology was insensitive to the changes that were produced.[22]

Whatever the actual explanation for the disappointing results of this EE campaign, the study highlights the importance of careful implementation and evaluation of health communication initiatives.

3.0 METHODOLOGY

This project was conducted using a mixed methods approach. Quantitative data was collected about participants' recall of Namwianga Radio and quantitative data was collected which examined, among other things, perceptions of the radio station. The setting for the project was in the Southern Province of Zambia in the area surrounding Namwianga Mission. The Principal Investigator (PI) traveled to Zambia four times before the start of this project, working with Zambia Medical Mission. Strong relationships had already been established with the leadership of ZMM and Namwianga Mission. These relationships facilitated easy entrée into the community. Before traveling to Zambia from the United States, extensive preparation work was done. Numerous meetings were conducted between the PI and leaders from Namwianga Mission and Zambia Medical Mission via telephone and Skype. Additionally, email communication was established with various Zambian stakeholders who could not be reached via Skype. The project was approved by the Institutional Review Board of the University of Pittsburgh.

The primary instrument used to assess the work of Namwianga Radio was a survey that was completed orally (Appendix A). The instrument was based on a survey that was used as an evaluation of the radio program "Your Shout" in Nairobi, Kenya.[34] This survey was chosen as the basis for the instrument in this project because it had previously been validated[34] and was the only survey that was found in the literature that was relevant to Namwianga Radio. Specific

questions were also developed to address issues relevant to Namwianga Radio. The survey consisted of three main parts: basic demographic questions, radio listening habits, and specific information about Namwianga Radio. The majority of information collected was quantitative; however, several open-ended and qualitative questions were asked.

Upon arrival to Namwianga, meetings were held with the staff of Namwianga Radio to establish a plan of action for the project. It was suggested by the radio director that the project should receive approval from the Regional Chief. A meeting was scheduled with His Royal Highness Chief Sipatunyana. After speaking for approximately an hour and administering the survey to the Chief himself, the project received his blessing. As the primary link between the national government and the individual participants in the study, Chief Sipatunyana served as an important gatekeeper into the community. It was necessary to gain his approval before conducting any work in the area.

The survey was conducted orally due to the low levels of literacy in rural areas of Zambia, 54.4% of the total population (66.7% male, 43.7% female).[35] For the majority of participants (n= 87), the researcher asked questions orally via a translator. Effective English communication was established with some of the participants (n=16), making translation unnecessary. Due to the language barrier between participants and the PI, the interviews were not audio recorded; however, thorough notes were taken during the interview process.

Participants were selected from five different sites: Kalomo/Namwianga, Njambalombe, Chawila, Kasukwe, and Nantale. These sites were the locations of the 2011 ZMM medical outreach, allowing for travel and logistical support in these remote locations. Furthermore, the reputation of ZMM in the area fostered a sense of trust between the participants and the researcher. Due to time and financial constraints of the project, it was impractical to conduct a

true random sample. Participants were approached in their respective villages and asked if they might be interested in participating. A plastic bag containing a bar of soap and a washcloth was given as incentive for participation, as that was determined to be both culturally appropriate and non-coercive by the PI and the leadership of Zambia Medical Mission. Based on recommendations from the University of Pittsburgh's IRB, all participants were over the age of eighteen.

The survey was divided into three basic sections. First, basic demographic information was collected including age, occupation, marital status, number of children, and languages spoken. The second section covered information about basic radio listening habits. Participants were also asked about where they got their health information and whether or not they trusted information that they heard from Namwianga Radio.

The final section consisted of two parts. The first was a quantitative section which tested participants' recall of information discussed on the radio. Seven health topics that had recently been broadcast were presented to participants, and they were asked to identify which of these topics they remembered hearing about on Namwianga Radio. Finally, qualitative information was asked about the participants' health behaviors and their perceptions of the radio station in general.

4.0 RESULTS

There was a fairly even gender distribution in the sample, with 53 males (51.5%) and 50 females (48.5%). The sample had an age range of 18-76, with a mean age of 33.92. Farmers constituted the largest occupational category within the population (48% of all participants). The next highest employment categories were students (7.8%) and domestic workers (5.8%). Almost 13% of the population described themselves as “unemployed”. The mean number of children per participant was 3.57. Most of the participants listened to a radio that was owned either by himself or herself or a family member (84%).

Table 1: Demographic information by data collection site

Site	n=	Male: Female	Mean Age	Mean # Languages Spoken	% married (current)	Mean # children
Namwianga/ Kalomo	45	18:27	36.16	2.44	71.10	3.58
Njambalombe	9	6:10	33.33	2.00	89.90	3.89
Chawila	8	4:4	38.12	1.50	100	5.88
Kasukwe	28	18:10	27.54	2.14	57.10	2.04
Nantale	13	7:6	37.92	2.31	69.20	5.23
Total	**103**	**53:50**	**33.20**	**2.23**	**70.90**	**3.57**

The majority of participants reported listening to Namwianga Radio "more than three hours every day" (60.8%) and an additional 24.3% reported listening "between one and three hours every day." Just over one half (50.5%) of respondents reported that they most often got their health information from Namwianga Radio. Importantly, all participants that were interviewed responded yes to the question, "Do you trust information that you hear from Namwianga?"

When asked about where participants most often get information about their health, responses varied significantly by site. The majority (71.1%) of those at Namwianga reported that they usually obtained health information from health workers. Only 13% reported that they most often got their health information from the radio. In contrast, a much higher percentage of participants in the more remote data collection sites reported obtaining their health information primarily from the radio. In Kasukwe, 78.57 of those asked and in Chawila 100% of those asked

reported that the radio was their primary means for obtaining health information. There was no noticeable change in responses when participants were asked the question "Where do you usually get the information that you trust the most about your health?"

Table 2: Radio listening habits by data collection site. Percentages of participants reporting for each category

Site	More than 3 hrs/day	1-3 hrs/day	Several hrs/week	Several hrs/month	Less than several hrs/week
Namwianga/ Kalomo	35.6	37.8	11.1	4.1	11.1
Njambalombe	88.9	11.1	0.0	0.0	0.0
Chawila	75.0	25.0	0.0	0.0	0.0
Kasukwe	78.6	14.3	7.1	0.0	0.0
Nantale	83.3	8.3	8.3	0.0	0.0
Total	**60.8**	**24.5**	**7.8**	**2.0**	**4.9**

Overall data collection sites, 94% of participants responded "yes" to the question, "Do you think that Namwianga Radio is effective in encouraging you and your family members to be more healthy?" Additionally, over 93% reported that they had changed a behavior because of what they had heard on the radio, and 85.2% of all participants reported that that behavior change was specifically health-related. Participants were then asked to describe the behavior that they had changed without prompts from the researcher. Of those who reported that they had changed behaviors, many reported specifically that those changes were of sexual behaviors (58.3%), giving responses such as "I have decided to not have so many girlfriends", "I don't sleep around as much", and general responses such as "I now can protect myself from HIV."

Many participants reported a change in their perception of HIV/AIDS. One man said, "I used to be afraid to get tested [for HIV], now I am not afraid. I just came from getting tested." Another said, "You should not fear people with AIDS and you should make positive people feel not bad." One woman, who disclosed her HIV positive status, unprompted, at the beginning of the interview said that she and her husband have "learned to live positively."

Additionally, many reported that they had improved their hygiene practices, and some said that they now know to use healthcare facilities when they fell sick. Other non-health related responses for behavior change were primarily of religious nature such as, "I read my Bible more" and "Now I go to church."

Additionally, most listeners reported that they had passed along information that they had learned on the radio to family and friends (89.8%). Several listeners even reported that they had created informal discussion groups to talk about the health messages they heard on the radio. This fact has important implications for the overall impact of the radio station as will be discussed further in the discussion section.

Two participants reported inaccurate information about HIV. One said that he has learned to have fewer girlfriends, "because if your have five, four are probably positive, so you should stick to just one". Another said that he was taught that, "out of three, two might be positive." These quotations suggest HIV prevalence rates that are much higher than the prevalence in the communities, and to the best of this researcher's knowledge, this incorrect information has not been broadcast at Namwianga Radio.

Table 3: Health behaviors and perceptions by site. Percentages of individuals who responded "yes" to the listed questions

Site	"Do you find these programs useful?"	"Do you think Namwianga Radio is effective in encouraging you and your family members to be more healthy?"	"Have you changed any behaviors because of what you have heard on Namwianga Radio?"	"Have you passed any information that you learned to any friends or family members?"
Namwianga/ Kalomo	100.0	97.5	85.0	76.19
Njambalombe	100.0	100.0	100.0	100.0
Chawila	100.0	100.0	100.0	87.5
Kasukwe	100.0	100.0	100.0	100.0
Nantale	100.0	100.0	100.0	84.62
Total	**100.0**	**98.97**	**95.83**	**89.78**

Of the seven topics that were presented to test for recall, the mean number of topics that participants were able to remember was 5.67. The topic with the highest level of recall was vertical transmission of HIV/AIDS (93.9% of participants). The program "Hello Patients" and the topics of postnatal care, stigma and discrimination against HIV/AIDS, and nutritional factors and HIV/AIDS all had around 80% recall (83.7%, 81.6%, 82.7%, and 79.6%, respectively). The topic with the lowest recall was "other sexually transmitted infections" (70.1%), although in the

open-ended question, many patients were able to recall hearing information about syphilis and gonorrhea.

Table 4: Mean number of topics recalled by each participant (out of 7 total)

Site	Mean number of topics recalled by each participants /7 total topics
Namwianga/Kalomo	5.49
Njambalombe	5.67
Chawila	6.38
Kasukwe	5.75
Nantale	5.62
Total	**5.68**

Table 5: Recall of health topics by site. Percent of participants who responded "yes" to recalling each topic

Site	"Hello Patients Program"	Prevention of Vertical Trasnmisison of HIV	Postnatal Care	Stigma assoc. w/ HIV	Nutrition and HIV	TB and HIV	Other STIs
Namwianga/ Kalomo	77.5	95.0	75.0	75.0	85.0	77.5	65.0
Njambalombe	66.7	100.0	77.78	100	88.89	66.67	66.67
Chawila	100.0	87.5	100.0	87.5	87.5	87.5	87.5
Kasukwe	89.29	92.86	85.71	85.71	71.42	75.0	75.0
Nantale	92.31	92.31	84.61	84.62	69.23	76.92	69.23
Total	**83.67**	**93.88**	**81.63**	**82.65**	**79.59**	**76.53**	**70.41**

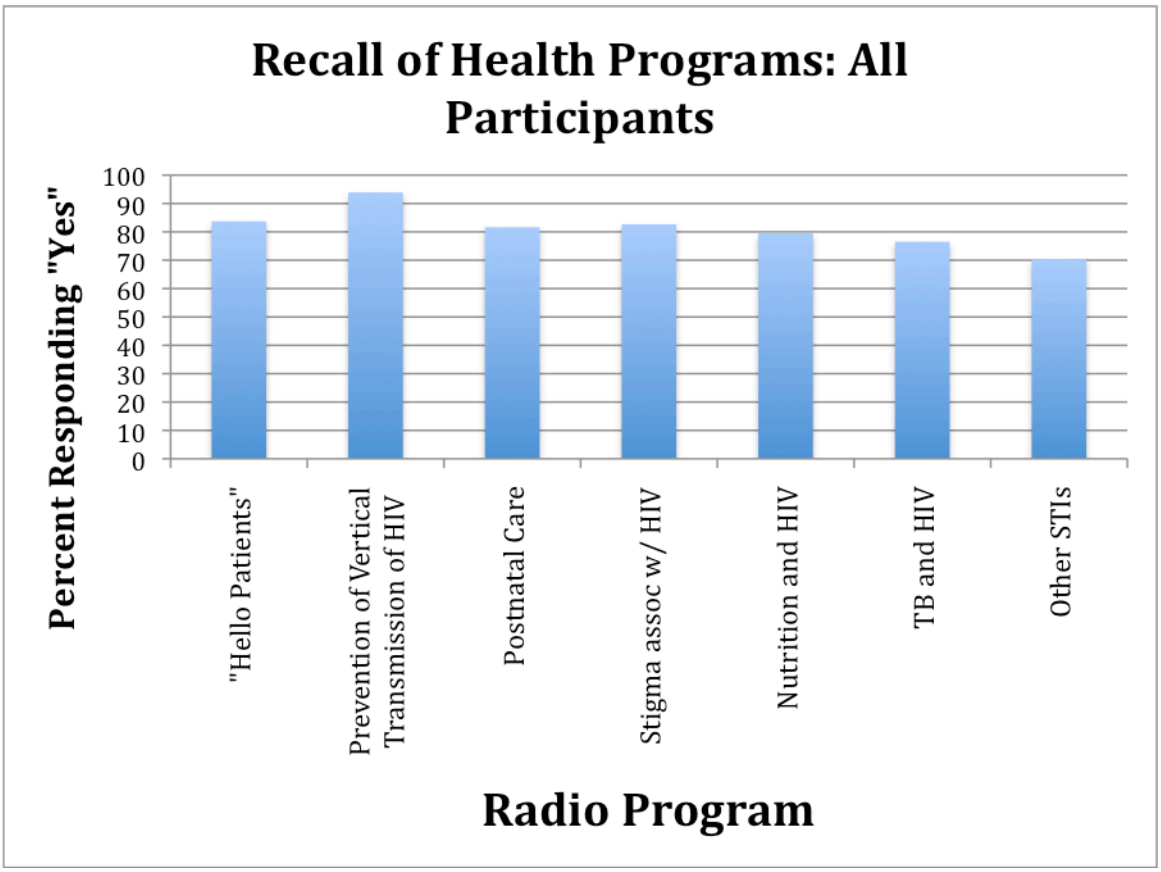

Figure 2: Recall of health programs, all participants

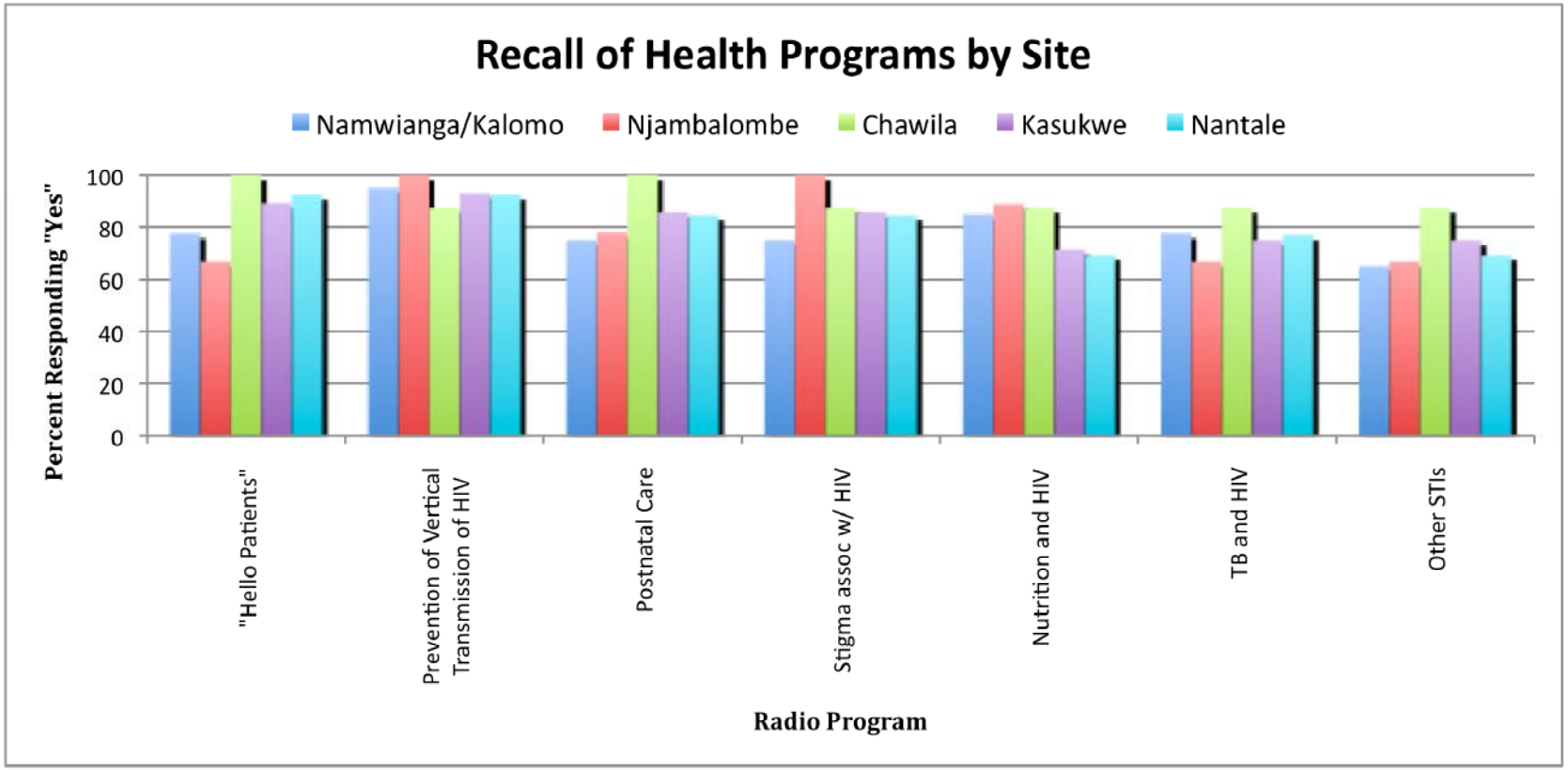

Figure 3: Recall of health programs by site

5.0 DISCUSSION

The following research questions were asked at the onset of data analysis of the evaluation project:

- Is the radio an effective medium for communicating health information in the Southern Province of Zambia?
- To what extent does Namwianga Radio have influence over its listeners?
- What are the health topics that listeners have learned about from Namwianga Radio?
- What are some ways that Namwianga Radio can improve its health communication initiatives to better serve the public health needs of their listenership?

While this project mainly looked at Namwianga Radio and its health messaging efforts, implications about radio communication in other rural areas of sub-Saharan Africa may be drawn.

The data shows that, overall, individuals listened to the radio very frequently and had high recall of health topics; however, the more rural the data collection area, the more frequently individuals listened to the radio and the more positive responses in qualitative analysis. The area directly surrounding the radio station (Namwianga/Kalomo in this study), is much more developed than the other collection sites. There are more developed roads, electricity, and running potable water. The other collection sites, which are more rural, seemed to be greater consumers of Namwianga Radio. This could be due to the isolation of these areas. With fewer sources of information, rural areas may depend more on NR for information. Semi-urban areas such as Kalomo have other options for communication channels.

Furthermore, it is logical that those who live directly around Namwianga Mission would report that the majority of their health information came from the healthcare workers due to the central location of Namwianga Zonal Health Centre and Kalomo District Hospital. In more remote areas, more participants reported getting their health information from the radio perhaps because, in such locations, there are fewer communication channels through which an individual might receive health information.

As previously mentioned, many participants reported that they passed information along to family and friends. One said that she would conduct "group meetings" to discuss information that she and her friends learned on the radio, several reported discussing health information that they had learned on the radio at church meetings, and another said that she would "call her friends and tell them to tune in when a good topic or program was on." This frequent dissemination of information significantly expands the impact of the radio station in the community. Even if an individual does not hear the health messages directly, there is opportunity to obtain important information from a peer. Namwianga Radio could further support this dissemination by directly asking individuals to share information with their peers.

It is also important to note that all participants responded that they trusted information that they heard from Namwianga Mission. Since the radio station is inextricably attached to the mission, it is necessary for the community to have a high level of trust in the information that bears the Namwianga name. If Namwianga was not a trusted source of information within the community, the radio station would be unable to affect positive change in the health status of the listenership, regardless of the overall quality or accuracy of the message itself.

5.1 RADIO AS A MEANS OF COMMUNICATION

The first question, "Is the radio an effective medium for communicating health information in the Southern Province of Zambia?" was answered in a number of ways. First, the number of participants who reported listening to the radio more than three hours every day is substantial (60.8%). Fewer than five percent responded that they listened to the radio "less than several hours per month." The high proportion of regular listeners suggests that information broadcast over the radio will reach a large segment of the population and that the radio is likely an effective means of communication.

Next, most participants reported having access to a radio because it is the most prevalent form of mass communication in the area. In most parts of Namwianga Radio's coverage area, there is little to no access to the internet, newspaper, television, or even basic mail service. Four of the five sites in this study (excepting Namwianga/Kalomo) do not have access to electricity. There are no land-based telephone lines, and cellular telephone communication can be expensive and is not accessible by all individuals. The radio provides an important channel through which to receive information and entertainment.

Furthermore, anecdotal evidence also helps to support the theory of the radio as an effective form of communication in this area. There are numerous occasions where individuals who had to get an important message to another person in a remote area of the NR broadcast area were able to broadcast these personal messages over the airwaves of Namwianga Radio. In one situation, three days before the start of the school term, funding became available for a child to be sponsored at one of the schools on Namwianga's campus. The child lived in an area that was inaccessible by road and was several days walk from the school. A message went out on the

radio instructing the child that he needed to report the following Monday to school, and the boy showed up on s chedule to begin the term.[36] Stories such as these illustrate the vital role that community radio stations such as Namwianga Radio play in their communities.

5.2 INFLUENCE OF NAMWIANGA RADIO OVER ITS LISTENERSHIP

The data in this study support the notion that Namwianga Radio does have significant influence over its listenership. Of the 103 participants, all indicated that they trust information that they hear from Namwianga. There are several factors that influence this sustained trust. Namwianga Mission has been an integral part of the community for almost a century. Trust in the mission has been built through humanitarian outreach and educational campaigns. This trust places a huge responsibility on t he Namwianga Radio to continue to provide accurate and thorough information in its broadcasts.

Additionally, the behavioral change reported by participants illustrates the influence of the station on its listeners. Many of the participants reported a change in sexual behavior. This question in the survey was open-ended. Responses were not asked in a leaning manner, which acted to reduce response bias. This has enormous implications for HIV prevention efforts in the region since, as illustrated by Coates and Collins and Vaughn et al., behavioral prevention, seems to be the most effective means for HIV prevention.[19,20] If people consistently practice safer sexual behaviors, HIV incidence rates could reduce significantly. Reports from participants in this study suggest that the radio is influencing their sexual behaviors, and therefore, the radio is impacting the health of the community.

Finally, the high number of topics that participants were able to recall further supports the notion that the station has influence over its listenership. On average, participants could recall over 80% of the topics that were presented to them. There is, of course, a difference between recall of information and behavioral change, and further research should be conducted to determine the full extent of impact of Namwianga Radio on health practices.

5.3 HEALTH TOPICS ABOUT WHICH INDIVIDUALS HAVE LEARNED FROM NAMWIANGA RADIO

As previously mentioned, there was a high level of recall of health topics. It is not surprising that there is a high level of recall of information about HIV topics specifically, as that is a major focus of the health communication efforts made by Namwianga Radio. Additionally, participants were able to recall information about hygiene and sanitation, malaria, syphilis and gonorrhea. Some recalled information about chronic diseases such as diabetes and cancer. These topics have had less airtime than more prominent health issues in the community, particularly HIV/AIDS.

5.4 AREAS FOR IMPROVEMENT IN HEALTH MESSAGING

To assess this evaluation question, participants were asked two qualitative questions:

- "Do you have any suggestions that you think might make the health programming or programming in general on Namwianga Radio more valuable to you?"
- Do you have any suggestions for topics that you or people you know might be interested in hearing on Namwianga Radio?

The majority of patients did not have a specific answer to the first question, commonly saying positive statements such as “The way things are is ok” and “Just to continue on.”

Several noted that, due to technical issues, the radio station will often go off-air at unexpected times, and suggested that infrastructural improvements be made within the station to prevent this from happening. Additionally, it is thought that, when the electricity goes off at Namwianga, particularly in the evenings, listenership in the Namwianga/Kalomo area increases because there are fewer entertainment options. By creating a more stable electricity backup, Namwianga would be able to take advantage of this opportunity to reach more individuals.

A general consensus among many of the participants was that there should be more time devoted to health topics in general. One said that there should be “more on all the diseases.” Namwianga Radio could improve its health communication initiatives by expanding the quantity and variety of health information that it discusses.

Additionally, the development of an entertainment education program that focuses on HIV/AIDS and other health concerns would greatly strengthen the health programming of the Namwianga Radio. A “radio drama” about HIV has been broadcast on the station in the past, and one participant recalled hearing this program, but the implementation of a more strategically developed serial drama that is rooted in an evidence-based program, such as that of Soul City, has potential for great influence on health behaviors.

5.5 LIMITATIONS

There are a number of limitations of this project that can be attributed, primarily, to limited time and financial resources. First, the sample size is relatively small. To further understand the impact of the Namwianga Radio, it would be necessary to complete a similar but expanded survey with a larger sample size. Additionally, conducting a study with a random sample, rather than the convenience sample that was utilized in this project would increase the validity of the study.

As previously mentioned, due to the restrictions placed on the project by the Institutional Review Board of the University of Pittsburgh, only participants above the age of 18 were interviewed. This places a serious limitation on the data, as it excludes a significant portion of the population. Furthermore, individuals between the ages of 15-19 have a high rate of HIV prevalence,[37] making them an important target group for HIV messaging from Namwianga Radio.

The surveying method relies only on reported behavior change. There might be some bias in recall of information and actual behavior change. Although the surveys were kept anonymous, participants might have been more inclined to report more positive behavior changes since they were conducted in person than if the surveys were written in an electronic format.

Several alterations could have been made to the survey used in this project to strengthen its internal and external validity. The section on health message recall would have been stronger if it had included several health topics that had not been discussed on the radio. If participants had to differentiate between topics that had been discussed and those that had not, a more accurate representation of true recall of messages could have been obtained.

Differences in translations could lead to differences among the data. Only two different translators were used throughout the interview process, and the importance of complete and accurate translations was conveyed to each. However, the PI was unable to validate that their translations were completely accurate.

Finally, there was some concern about how cultural norms could influence the responses that individuals gave to specific questions. Tonga culture is very gracious and accommodating, and it is possible that some of the positive responses were made that were not completely accurate. To prevent this as much as possible, it was made very clear during the interview process that the researcher was interested in honest opinions, rather than courteous validation. Participants were told that there were no "right or wrong" answers, and that their responses would, in no way, affect their ability to listen to the radio. Finally, the PI tried to distance himself as much as possible from the radio station in an attempt to hear valid opinions.

6.0 CONCLUSION

There are several clear conclusions that can be drawn from this study. First, the radio is an effective and powerful means of communication in the Southern Province of Zambia. For many people, it is the primary or only source of information and education.

Next, Namwianga Radio does have significant influence over their listenership. The high number of regular listeners and the number of people who reported behavioral change as a direct result of radio messages shows that Namwianga Radio has enormous potential to have a positive effect on the pubic health status of its community.

Despite the limitations of this study, the researcher believes that there are implications for other communities and radio stations. Radio is a powerful and often times underutilized medium for health communication. Community-based radio stations, such as Namwianga Radio, have the opportunity to provide health education and other information to a population which might not otherwise be exposed to this valuable knowledge.

APPENDIX

NAMWIANGA RADIO HEALTH MESSAGING SURVEY

Namwianga Radio Health Messaging Evaluation

The purpose of this research study is to determine the effectiveness of the health messages that are being aired on Namwianga Radio, and to determine how health radio programming can be improved. For that reason, I will be asking you several questions about how you use the radio and about any health messages you might have heard. No personal information will be collected in the process, and there are no foreseeable risks associated with your participation. By answering these questions, you will be helping Namwianga Radio to better develop health messages to hopefully improve health in the community, but you will not be receiving any direct payments for your participation. Your participation is voluntary, and you may withdraw from this project at any time. Also you can choose to not answer any specific question. This study is being conducted by Joseph Lawrence who can be reached at (097) 154-1746 or by email at jjl55@pitt.edu. Joseph will also be staying at Namwianga Mission through the end of July, and you are more than welcome to ask questions in person at any time.

I want to stress to you the importance of getting your honest opinion. I want to hear both the positive and negative things that you have to say about the radio.

First, I will need to ask some basic information about you and your family.

1. What is your age? (Participant *must* be over 18 years of age)

2. Are you male or female?

3. What is your occupation?

4. What is the highest education level that you obtained?

5. Are you married? Yes Divorced Never Married

6. How many children do you have?

7. What language(s) do you speak?

8. Where do you most often get information about your health?
    a. Family members
    b. Friends
    c. Health workers (Dr, nurse, clinical officer, etc)
    d. Traditional Healer
    e. The radio
    f. Other _____

9. Where do you usually get the information that you trust the most about your health?
    a. Family members
    b. Friends
    c. Health workers (Dr, nurse, clinical officer, etc)
    d. Traditional Healer
    e. The radio
    f. Other _____

10. Do you trust information that you hear from Namwianga?
    a. Yes
    b. No

Now, I am going to ask you a few questions about your knowledge of the health programming that is played on Namwianga Radio.

1. How often do you listen to Namwianga Radio?
    a. More than 3 hours every day
    b. 1-3 hours every day
    c. Several hours per week
    d. Several hours per month
    e. Less than several hours per month

2. How often do you listen to other radio stations?
    a. More than 3 hours every day
    b. 1-3 hours every day
    c. Several hours per week
    d. Several hours per month
    e. Less than several hours per month

3. Who owns the radio set that you most often listen to?
    a. You/Your family
        i. If family, which relative? _____
    b. Friend
    c. Community used radio
    d. Other? _____

4. Which, if any, of the following programs and topics on Namwianga Radio do you remember hearing? (Circle those which the participant HAS heard)

    "Hello Patients" program (Where patients at hospitals are interviewed)

    Prevention of Mother to Child Transmission of HIV/AIDS

    Postnatal Care (This is information about what a mother should do after she gives birth for her health and the health of the baby)

    Stigma and Discrimination associated with HIV/AIDS

Nutrition and HIV/AIDS

TB and AIDS

Other sexually transmitted infections

Others? _____

Thank you so much for your participation so far. I just have a few more questions, and, again, I want to remind you to be completely honest with your answers.

5. Do you find these programs useful? Yes or No

6. Do you think that it is effective in encouraging you and your family members to be more healthy? Yes or No.

7. Have you changed any behaviors because of what you have heard on Namwianga Radio? If so, which behaviors?

8. Have you passed any information that you learned along to any friends or family members? How?

9. Do you have any suggestions that you think might make the health programming or programming in general on Namwianga Radio more valuable to you?

10. Do you have any suggestions for topics that you or people you know might be interested in hearing on Namwianga Radio?

11. Do you feel like you are at risk for getting HIV?

Thank you so much for your participation in this survey!

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