ABSTRACT

Title of Thesis:	PRESENCE AND PREDICTORS OF HEALTH PROGRAMMING IN A SAMPLE OF AFRICAN AMERICAN CHURCHES
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Churches have played a central role in African American communities for decades. In addition to religious services, African American churches have increasingly offered a variety of health programs. However, there is a dearth of empirical literature on church-initiated health programming. This study examines quantity and variety of health programs and areas addressed by a convenience sample of African American churches (N = 119), as well as church characteristics that predict these health initiatives. Churches offered a mean of 6.08 (SD = 2.15) health programs targeting 4.66 (SD = 3.63) different health topics within the previous 12 months. Various church characteristics indicating greater availability of programming resources were positively associated with the quantity and variety of health initiatives. It is recommended that practitioners partner with under-resourced churches to support their existing health activities and address gaps in health programming. Future research should seek to evaluate the effectiveness of church-initiated health programs.

PRESENCE AND PREDICTORS OF HEALTH PROGRAMMING IN A SAMPLE OF AFRICAN AMERICAN CHURCHES

by

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Public Health
2019

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Acknowledgements

I would like to thank my advisor and thesis chair, Dr. Craig S. Fryer and my thesis committee members, Dr. Cheryl L. Knott and Dr. Min Qi Wang for their continued guidance and support throughout the process of developing and writing this thesis, as well as in my academic, professional, and personal development above and beyond this thesis.

I would also like to thank current and former members of the Community Health Awareness, Messages, and Prevention (CHAMP) Lab: Dr. Cheryl L. Knott, principal investigator of the CHAMP Lab, for inviting me to become a part of the team, introducing me to faith-based research, and allowing me to utilize data collected previously in projects conducted through the lab for the purposes of this thesis. Randi M. Williams, current project manager of the CHAMP Lab, for her willing contribution of an ancillary dataset used in this thesis, and for being a supportive and exemplary role model. As well as Sherie Lou Z. Santos, former project manager of the CHAMP Lab, for her guidance when I was first introduced to the lab and her continued support, even after transitioning to another position outside of the University of Maryland.

Finally, my gratitude to Rechelle Woodard and Timothy Sinclair for their love, patience, and encouragement throughout my educational experience, particularly throughout the writing phase of this thesis.

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Chapter 1: Introduction

Problem Statement

The church has played a large and stable role in African American communities for decades (Lincoln & Mamiya, 1990). Throughout this time, the information and guidance provided by the church has been perceived as trusted and valuable by its members (Matthews, Sellergren, Manfredi, & Williams, 2002). In addition to a place of religious expression, through the years, the church has become a source for non-religious services and support. As such, many of these institutions have started to incorporate aspects of health within the church culture and community (Bopp & Fallon, 2013; Parrill & Kennedy, 2011; Thomas, Quinn, Billingsley, & Caldwell, 1994; Williams, Glanz, Kegler, & Davis, 2012). This holistic support has helped to encourage an even deeper connection between many African Americans and their churches (Taylor, Chatters, & Levin, 2003). The strong connection between the African American church and its members has made these institutions a popular venue for health promotion interventions and faith-based research in recent years (Campbell et al., 2007). Much like the religious teachings provided by the African American church, the health related information more recently introduced by these institutions is also highly trusted and valued by their memberships (Harmon, Kim, Blake, & Hébert, 2014).

In alignment with emphasizing health, many churches have established some health and wellness initiatives. However, the amount of research on the health promotion already present and developing within these institutions, especially in

African American churches, is far less extensive. Instead, a great deal of health promotion research in faith-based organizations (FBOs) has focused on finding the best ways to introduce new health interventions to the church and identifying methods to help ensure that those interventions and their effects persist. But these health interventions often do not last once the research project ends and the organization is expected to continue the intervention on its own (Goodman, McLeroy, Steckler, & Hoyle, 1993). Even given previous examples of faith-based interventions that were not sustained, there is very limited available scientific literature about the sustainability, or even presence of health promotion programming that has originated within the church.

The sparse scientific literature surrounding church health program provision and the evaluative success of those activities leaves many unconfirmed assumptions. Without empirical evidence, one can presume that churches do not offer health programming, that all churches strive to promote health, that church wellness programs are or are not effective, or any other number of assumptions. Making presumptions such as these could lead to faith-based interventions targeted at select institutions that have already incorporated their own similar health activities with great success. This can lead to the unnecessary duplication of efforts, waste of time and resources, and potential undermining of the intervention and/or the programming already present within the church. Duplicating health promotion efforts already present in the church with an outside intervention divides time, attention, and other resources within the church. This can be especially difficult on churches that are already utilizing their resources at a high capacity. Further division of resources,

especially those that have already been spread thin, can result in diminished effects of programming (Coviello, Ichino, & Persico, 2010).

In churches targeted for intervention, spreading resources too thin could mean reduced effects of either the proposed intervention, the programming already present within the church, or both. This may be especially harmful and unwarranted in churches with effective programming targeting the health issue that the proposed intervention was intended to solve. That said, the lack of evaluation research surrounding these church-initiated health programs makes judging the effectiveness of these programs little more than speculation. Even still, energy may be better spent investigating the health and wellness activities already present within churches and working to build on and improve them rather than multiplying and diverting efforts by introducing new, possibly duplicative, programs (Bopp & Fallon, 2013). In order to collaborate with churches to expand and improve their established health initiatives, it is necessary to understand the wellness programming that already exists within those churches. And so, this study will focus on identifying the quantity and variety of health promotion services offered within a sample of African American churches, primarily from the state of Maryland.

Study Significance

The current study aims to describe the health and wellness activities offered within a sample of African American churches and examine potential predictors of the types and number of health programs offered and health areas addressed. With an understanding of the current programming within African American churches, we can learn more about ways to work with the church to expand or improve upon their

current programming, rather than develop entirely new projects that compete with their current programming and objectives. In order to best serve the communities we work with, and to ensure consistency with their goals and objectives, it is crucial to better understand their current efforts and interests.

Studying the current health activity within church communities can help to prevent the aforementioned duplication of efforts/services, misuse of resources, and undermining of programming in future research and intervention projects. Understanding the programs and activities offered at a church will assist practitioners in identifying health areas that have yet to be addressed. This provides one way to identify target areas of potential unmet need within the church setting. In addition, understanding predictors of health programs at these institutions can help us to understand and target the institutions that may require the most assistance to develop and improve their health promotions and services. This work may also provide insight into the most effective methods of assisting in the development or improvement of those services.

Research Questions

The main research questions in this study are as follows:

Research Question 1: How many health programs and areas are offered by African American churches?

Research Question 2: What types of health programs and areas do African American churches prioritize to support their congregation members?

Research Question 3: What church characteristics predict the number and types of health programs and areas addressed by African American churches?

Definition of Terms

Church building ownership – Whether or not a church owns its place of congregation as opposed to renting the building or space.

Church size – The number of members of a church.

Faith-based organization/institution (FBO) – An organization with values and purpose based on faith and beliefs (Carver & Reinert, 2002)

Faith-based intervention – A program or intervention designed for a particular faith group (Stewart, 2016).

Health Area – A health topic or issue (e.g. heart disease, diabetes, cancer, smoking).

Health Program – An organized act or activity with the intent of improving the health or wellness of others (e.g. exercise groups, substance abuse support, health-related screenings).

Human Resource Theory – An organizational behavior theory stating that organizations exist for the benefit of people. People can be affected negatively or benefit from an organization in the same way that an organization can be negatively or positively affected by its people depending on the 'fit' between the person and the organization (Shafritz, Ott, & Jang, 2011).

Megachurch – A church with more than 2,000 members (Bopp & Webb, 2013).

Organizational Behavior Theory – "the study of the structure, functioning, and performance of organizations, and the behavior of groups and individuals within them" (Pugh, 1971, p. 9).

Chapter 2: Background

Health Activities in the Church

Traditionally, the church has been a place of religious expression, however, many churches have begun to take a more holistic approach to improving the lives of their memberships. This has led many churches to begin incorporating health as part of their programming and activities, and some have established a number of health and wellness programs as part of their activities (Bopp & Fallon, 2013; Bopp & Webb, 2013; Thomas et al., 1994; Williams et al., 2012). There is a wide range of health and wellness activities offered within church communities including exercise clubs or programs, health classes and education sessions, health information dissemination (through pamphlets, bulletins, etc.) (Bopp & Fallon, 2013; Williams et al., 2012), screening services (Bopp & Fallon, 2013; Butler-Ajibade, Booth, & Burwell, 2012), and smoking cessation services (Williams et al., 2012), to name a few.

Food pantries are one common example of health initiatives provided by some churches (Daponte, Lewis, Sanders, & Taylor, 1998; Greenberg, Greenberg, & Mazza, 2010; Livezey, 2000; Russell, 2011). Many churches collect and distribute food to people of the church and local community members to provide assistance to those struggling with food security. Food provided through these methods is most often given free to those who need it and may include more expensive items that may be less accessible to some communities such as turkey, chicken, and other proteins (Greenberg et al., 2010). For individuals and families lacking local access or financial

resources to purchase such foods, these food pantries can provide a lifeline to necessary sustenance.

Clothing closets are another example of health initiatives in many churches (Adewale, Ritchie, & Skeels, 2016; Kinney, 2008; Livezey, 2000). Similar to food pantries, clothing closets provide free clothing to those who might struggle to buy it in stores. The presence of these free clothing locations is especially important during seasons with extreme temperatures such as frigid winter nights and blistering summer days when the clothing worn can either protect an individual from, or put them at risk for serious health complications such as frostbite and heat exhaustion. Food pantries and clothing closets are just two practical examples of health programming occurring in some churches.

In a study of 110 megachurches (churches with more than 2,000 members), the average number of health and wellness programs per church was found to be about five (Bopp & Webb, 2013). Similarly, a national sample of 844 church leaders from different churches of varying sizes, locations, and denominations, found churches to have offered, on average, just under five health and wellness activities within the previous 12 months (Bopp & Fallon, 2013). Prior to these works (Bopp & Fallon, 2013; Bopp & Webb, 2013), the number of health activities offered by churches was unknown.

In Bopp and Fallon's (2013) national sample, almost 50% of church leaders responded that in the last year their church had offered health information pamphlets, clubs or teams related to physical activity, individual health counseling, health education classes, and/or screenings for various health conditions. These findings

illustrate the interest and commitment of many church communities to both acknowledge and work to improve the health of their congregations. However, though this study provides great insight into the health promotion activities of churches previously unavailable in the scientific literature, its generalizability to other church populations is limited. Over 90% of church leaders in this sample were white, and over 60% of the sample was either Methodist or Lutheran. The nature of this sample would imply that predominantly African American churches were not well represented as they are typically led by Black or African American church leaders and are most commonly Baptist, Churches of God in Christ, or African Methodist Episcopal (AME) churches (Carver & Reinert, 2002). Based on what little data is available, an examination of African American churches is advised as there is research to suggest that different church populations may implement health programming at different levels.

In a survey of 31 Catholic, Latino-serving FBOs, only 36% had offered at least one example of health promotion programming in the last year (Allen et al., 2016) as compared to over 50% reporting multiple health programs in the sample of white church leaders (Bopp & Fallon, 2013). Though the data are limited, these findings suggest that there may be differences in health promotion programming between FBOs serving different racial/ethnic groups. The overall lack of research on church health programs warrants further investigation of them. African American churches in particular require investigation as FBOs serving different racial/ethnic groups may practice health programming at different rates and there is a particular

lack of empirical evidence regarding the health programming within these institutions.

Organizational Behavior Theory

Organizational behavior is "the study of the structure, functioning, and performance of organizations, and the behavior of groups and individuals within them" (Pugh, 1971, p. 9). Organizational behavior theory posits that people create organizations, and that people can change these organizations. Another key part of organizational behavior theory is the need for resources to establish, maintain, and change an organization (Shafritz et al., 2011). These required resources can include physical resources such as space and finances, as well as things like information, leadership, labor, motivation, and ideas. The types and quantities of resources needed will differ based on the organization and what it seeks to accomplish. A church looking to institute health programming may require most, or in many cases, all of the resources mentioned above.

Human Resource Theory

Human Resource Theory is one branch of organizational theory stating that the purpose of an organization is to serve a human need and not the other way around (Shafritz et al., 2011). People can affect organizations, but organizations can affect people as well. According to the Human Resource Theory, an organization should allow its people to grow and develop. However, the effects of the person on the organization, and the organization on the person, can either be positive or negative depending on the 'fit' of the two. In instances of poor fit, a person may take

advantage of an organization, the organization will exploit the person, or both. In instances of good fit, the relationship between the person and organization is mutually beneficial and both are able to prosper. Human Resource theory states that organizations need resources like ideas, talent, commitment, and manpower to initiate and maintain them, while people can in turn benefit from the opportunities that organizations provide. These opportunities for people can include work, social support, networking and relationship building, provision of services, etc.

The church is an organization that exemplifies the Human Resource Theory. Members bring their time, commitment, ideas, and expertise to contribute to the church environment in different ways. These member contributions play a large role in allowing a variety of programs and services, including health programs, to be offered by the church. In order to offer health programming, there is a need for individual contributions to conceptualize, lead, facilitate, and execute that programming. Once the health programs have been established, members of the church are able to benefit from that new knowledge or opportunity introduced to the church community. Those facilitating the programming benefit from gaining health program experience through their contributions and may be able to take advantage of the health services themselves. Individuals who contribute to the church in other dimensions would often have opportunities to access these services as well. But to realize these proposed health activity changes within the church organization the contributions of leadership, volunteers, and/or paid staff are critical.

Following the logic of the Human Resource Theory, the relationship between the church and its members is mutually beneficial. As the church receives resources,

services can be developed to better serve the members of the church community. As the church community receives these services and opportunities, their ability to provide resources back to the organization may be improved. An example of this might be improved health programming competency through previous experience administering health programs through the church. But for the church to serve its people the input resources are initially required. In addition to the resources that make up most organizational theories like finances and space, the Human Resource Theory emphasizes the need for ideas, labor, and leadership as contributed by the members of the organization.

Predictors of Church Health Activity

Understanding the predictors of health activity within the church could provide insight as to what churches may require the most assistance in building health programs, but it could also shed light on ways to improve a church's ability to institute a health program. Just as with the presence of health programming, the predictors of health programs within churches are understudied. However, as described in organizational theory and the Human Resource Theory, various resources contribute to organizational development. Following these theories, one might expect resources like finances, space, knowledge, leadership, and member contributions to predict church health activity. These resources are likely to be linked to church characteristic variables, such as a link between the resource of space and building ownership, knowledge and education of the church leaders, and the number of people able to contribute likely depending, in part, on church size. Though it is

limited, there is research to suggest that these variables might contribute to church health programming.

When church leaders were asked about what barriers might prevent health programming within their church, lack of program leadership, volunteers, financial resources, time, and lack of space were among the responses most reported (Bopp & Fallon, 2013). On the other hand, the presence of financial resources and interest in the health topic among members were expressed as the greatest facilitators to health and wellness activities within the church. Taking a look at a variety of church characteristics, it may be possible to gather a general understanding about the availability of resources to churches and how they may affect church wellness programming.

An example church characteristic that might provide insight about the resources available to the church is the number of church members. Though not a substitute for any other variable, church size could serve as a proxy for a number of resources present at one church as compared to another. Indicating a greater number of members in the church, size might suggest a larger pool of church staff or volunteers, a larger collection and greater variety of ideas, information, or skills, more people willing and/or able to lead health programming, and perhaps even greater financial resources due to a larger number of people giving to the church in offerings each week. In accordance with this thinking, churches with more than 1,000 members reported lack of leadership/volunteers and lack of financial resources at lower rates than churches will fewer than 100 members, though larger charges did report time or space conflicts with other church activities as a barrier at higher rates (Bopp &

Fallon, 2013). Considering these findings, it makes sense that greater church size has been linked to successful implementation of new activities in the church (Austin & Claiborne, 2011).

Within megachurches specifically (those with more than 2,000 members), size has been shown to predict the number of health and wellness activities within the church. While churches with 1,000 – 5,000 members have been shown to offer and average of just over four health and wellness activities, churches with 5,000 – 10,000 members have been shown to offer almost six different health activities (Bopp & Webb, 2013). However, the types of activities offered are unclear, as is the role of church size in predicting any variety in the types of health activities offered.

In northern U.S. Black churches, smaller membership size has been associated with a lack of community health outreach programming (Thomas et al., 1994). However, data for health outreach programs in this study were categorized binarily. Beyond the presence or lack of health outreach programs in these churches, no further details about that programming are presented in the study. As such, the link between church size and the number as well as types of programs offered by these churches are unclear.

Though there is literature to suggest that the size of a church may predict the number of health and wellness programs within that church, the literature is by no means extensive, especially in the case of African American churches. While church size as a predictor of the number of health services being offered within a church has been superficially explored, church size as a predictor of the types of health services

offered within churches is not clear in any scientific literature that we were able to find.

Building ownership is another characteristic that may reflect the church's resources for programming. Logically, building ownership may link to the availability of space for health programming. Access to facilities are critical in the success of a church's health promotion programs (Peterson, Atwood, & Yates, 2002) and building ownership provides one way to access facilities and overcome the barrier of space for programming. Without a place to put on a health promotion activity, that activity cannot exist, but owning a space permits access to and use of that space when and how an individual or group sees fit. For a church that owns its building, that church can use part of their space for health promotion programming, if they so choose. Churches that rent space may not have the same liberties to utilize parts of that space at different times for supplemental programming. Of course the condition of that space, owned or rented, is of importance to the usability of it for health programming as well.

Research on homes suggests that ownership affects the opportunities available to people by increasing stability and community involvement (Rohe, Zandt, & McCarthy, 2002). Home ownership impacts opportunity perception by increasing financial resources available to an individual. Applying the same logic to faith-based organizations, those owning (as opposed to renting) their place of congregation should have more financial resources available, increased opportunity perception, and greater stability. The importance of financial resources has already been discussed, but opportunity perception could include opportunities for new health activities, and

stability could lead to more sustainable programming. Collectively, these qualities are likely to result in more frequent and longer lasting health programs within the church. This is demonstrated in a sample of Black churches in the northern U.S., where building ownership was associated with the presence of community health outreach programming at the church (Thomas et al., 1994). In this sample, churches with building ownership were about twice as likely to have some form of health outreach than churches that rented their building.

The education of church leadership is another characteristic of the church that might contribute some valuable resources for health programming. Previously, leadership and staffing have been associated with successful implementation of new activities in an organization (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004; Leake et al., 2007; Trinitapoli, Ellison, & Boardman, 2009). Higher education levels of church ministers have been associated with the likelihood that a church will have some form of community health outreach programs (Thomas et al., 1994). In churches with ministers holding a Master's degree or higher, over 83% reported some kind of community health outreach programming, as compared to 40% of churches with ministers who did not complete high school. Education has the potential to contribute to effective leadership, as well as information and knowledge. As described based on the theories above, the presence of these resources is required for the growth of an organization, and in the case of a church, for the development of its health programming.

Chapter 3: Methods

Study Design and Dataset

This study was approved by the University of Maryland Institutional Review Board (#1368246-1). This work presents a secondary analysis of data collected as part of four public health research projects taking place from 2010-2019 at the University of Maryland's Community Health Awareness, Messages, & Prevention (CHAMP) Lab. The current project at the CHAMP Lab, as well as two previous projects (Holt et al., 2014; Saunders et al., 2013), were early detection interventions for cancer. Within each of these projects, pastors of African American churches were asked to select at least two individuals from their congregation to be trained on breast, prostate, and/or colorectal cancer and screenings for these cancers. The trained individuals then led educational programs within their church for the select cancer(s). The fourth project (Holt et al., 2017) focused on engaging African American churches that had not previously worked with a university or been part of a research trial. Recruitment of churches for these projects was led by CITI trained community partners with established relationships in the African American faith communities of two counties and one urban city in Maryland. The community partners were given recruitment materials and approached the pastors of potential churches to introduce the project and gauge interest in participating. Interested churches were then introduced to the research team, their informed consent was obtained, and those churches were then enrolled into the corresponding project. As part of an ancillary study for the current project in the CHAMP Lab, an additional 76 church leaders both

from within and outside the state of Maryland were recruited. This ancillary recruitment was conducted with the help of community partners, through snowball sampling, and from records of churches that had worked with the lab previously, with the goal of validating a set of items assessing health promotion integration within the church. For the purposes of the research presented here, duplicate and responses with more than 50% missing data were excluded. A summary of the number of participating churches by project is presented below in Table 1.

Table 1: Church Representation by Project

Project	Project Dates	Frequency	Percent
MPACT	2010-2015	12	10.1
HEAL	2011-2018	15	12.6
CTSI	2013-2014	5	4.2
HEAL 2.0	2016-2019	20	16.8
HEAL 2.0 Ancillary	2018-2019	67	56.3
Total	2010-2019	119	100.0

Upon enrollment in these projects, leaders of participating churches were asked to complete either a Faith-Based Organization Capacity Inventory (FBO-CI) (Tagai et al., 2018) or a church leadership questionnaire based on the FBO-CI. Questionnaires were comprised of 57 to 61 items regarding congregational characteristics, church activities, and previous partnerships and collaborations with other organizations (Appendix B). The intended purpose of these questionnaires was to assess the capacity of each participating church to institute health promotion activities. Most questionnaires were administered as a pen and paper survey prior to the HEAL 2.0 ancillary study. In this ancillary study, however, an online method of administration with Qualtrics Survey Software® was used. In all cases, church leader responses to items of analytic interest and identifying information were stored

separately to protect pastor and church confidentiality. An in-depth explanation of the development and validation of the FBO-CI is described elsewhere (Tagai et al., 2018).

Among the items present in the FBO-CI and church leadership surveys were a series of questions about the health activities and programming within the church. The current study utilizes the health promotion responses from the 'health area,' 'services provided by your church,' 'health activities,' and demographic item responses collected from 119 unique churches between the years of 2010 and 2019. As the questionnaires were administered prior to the intervention stage of each respective project, we presume that the health activities reported at the time of questionnaire completion were self-initiated by members and leaders of the church without outside intervention.

Study Sample

For each of the four initial projects, eligibility criteria included: 1) be the pastor of predominantly African American church, 2) the church must be located in the project target regions of Maryland, 3) the church must have approximately 100-1000 members, 4) be able and willing to complete a questionnaire about their church in English, and 5) not have participated in one of the previous projects through the CHAMP Lab. Eligibility criteria for the HEAL 2.0 ancillary study were less strict, as respondents needed to be leaders of a predominantly African American church (no necessarily a pastor), the church did not need to be in Maryland, and there was no church size requirement. For the current study, no supplemental eligibility criteria were added.

Measurement

Health programs offered within the last 12 months were measured with a checklist of possible options as well as an option to write in any activity/area the church might offer that was not included in the list presented as seen in the 'health activities' and 'services provided by your church' items highlighted in Appendix B. Programs offered were coded with a binary 'yes,' or 'no' based on whether or not the response item was left blank (coded as no) or marked (coded as yes). These responses were then collapsed to fit into a 10-item list of church health programs adapted from the work of Bopp and Webb (2013). Health areas addressed were also measured with a binary 'yes,' 'no,' as described above for the health activities item. In this case, the breast, prostate, and colorectal cancer options were all collapsed into the overarching 'cancer' response option and walking was consumed in the 'physical activity' response option, leaving a final list of 14 health areas. A full description of the 10-item health programs and 14-item health areas lists has been included in Table 4. In the online version of the questionnaire, a 'prefer not to answer' response option was added to the 'health activities' and 'health areas' items. Simple imputation was used for the few online respondents who selected 'prefer not to answer' to any of the health activity or health area items. This was done to preserve consistency in the maximum number of possible activities and areas across churches.

Predictor variables were measured in a variety of ways. Some variables, such as church building ownership were measured with 'yes' and 'no' response options. The example item for church ownership is 'Does the church own its building?' Other variables, such as church size will be measured using open-ended numeric response

to the items like 'Number of adult members.' For frequency analyses, pastor education responses were collapsed into four levels of educational attainment, 'high school,' 'some college/technical school,' 'bachelor's degree,' 'master's degree,' and 'doctorate.' For the chi-squared and ANOVA analyses, the 'high school,' and 'some college/technical school' counts were collapsed into one category due to the small frequencies of each option. Similarly, for the chi-squared and ANOVA analyses the 'rural' and 'small town' responses to the church setting question were collapsed into one category due to the low frequency in response to either option. We also collapsed continuous variables such as number of church members and number of volunteers into categories for chi-squared and logistic regression analyses (e.g. 1-100 members and 0-10 volunteers).

Analyses

Descriptive statistics were calculated for each health program and area in the 10- and 14-item lists, the total number of health programs and areas offered, as well as for church demographic characteristics and potential predictors of church health programs and areas. Additional analyses include Pearson's 2-tailed bivariate correlational tests, independent sample t-tests, one-way analyses of variance (ANOVAs), chi-squared tests, logistic regressions, and factor analysis. Bivariate correlations assessed the relationships between continuous variables such as number of church members, and number of health programs and areas offered by the church. T-tests were used to compare the mean number of health programs and areas offered by churches in the case of binary independent variables. One example of this is church building ownership. In this case, a t-test compared the mean number of areas

and programs addressed between churches that own their building and those that do not. One-way analyses of variance (ANOVAs) were used to compare the mean number of health areas and programs targeted by churches when the predictor variable split the churches into multiple groups or categories. For example, as churches can have pastors with multiple levels of educational attainment, an ANOVA was used to compare the number of programs offered between churches with pastors of varying levels of educational attainment. Chi-squared tests were used to compare the actual and expected distributions of the different types of programs for different categories of churches, such as the distribution of offering exercise groups by churches that own their building and those that do not. Bivariate logistic regressions also assessed relationships between specific types of health programs (e.g. exercise groups) or areas (e.g. diabetes) and the variables that could predict them (e.g. church building ownership). Importantly, multivariate logistic regression also allowed us to control for statistically significant covariates, as identified in our bivariate regressions. Using this multivariate adjustment, we were able to parse out the relationships between specific programs or health areas and a single church characteristic variable. Finally, a factor analysis was used to assess whether or not broader categories of health programs and areas addressed by participating churches could be identified.

Chapter 4: Results

Descriptive Statistics

Questionnaires were most frequently completed by Pastors (73.9%). Most of the churches were located in the state of Maryland (78.1%) with another 10 states (18.4%) and Washington D.C. (3.5%) represented (see Table 2). The most common church denomination reported was Baptist (40.4%), followed by nondenominational (21.1%), and African Methodist Episcopal (10.5%). Reported church size varied considerably ranging from 10 to 10,000 members with a median of 175 members. Generally, pastors did not have employment outside of the church (68.7%) and had a Master's degree or higher (73.1%). Most churches owned their building (77.4%) as opposed to renting (21.8%) and were reported to be in suburban (40.7%), inner city (33.6%), or metropolitan (15%) locations.

Of the 10 possible types of health programming, churches reported offering between 0 and 10 strategies with a mean of 6.08 (SD = 2.15). Only one church reported offering none of the types of health programming. The most common health activities were: including health in pastor sermons (88.2%), paper or electronic dissemination of health information (including health content in newsletters, brochures, bulletins, social media, etc.) (85.7%), providing food assistance (80.7%), shelter or clothing assistance (73.1%), health fairs (63%), and health related counseling (56.3%).

Of the 14 possible health areas, the range was from 0 to 13 with a mean of 4.66 (SD = 3.63). The health areas most commonly reported included cancer (58%),

heart disease (57.1%), diet (56.3%), physical activity (53.8%), and diabetes (44.5%). The complete list of health programs, areas, and church demographic variables are summarized in Tables 2, 3, and 4.

Table 2: Church Demographics

	N (%)		N (%)
Church role of respondent		**Church building ownership**	
Pastor	82 (73.9)	No	26 (22.6)
Priest	5 (4.5)	Yes	89 (77.4)
Deacon	6 (5.4)		
Lay minister	5 (4.5)	**State**	
Administrative	4 (3.6)	California	5 (4.4)
Other	9 (8.1)	Connecticut	1 (0.9)
		Washington D.C.	4 (3.5)
Pastor education		Georgia	1 (0.9)
High school	3 (2.9)	Maryland	89 (78.1)
Some college/Technical school	7 (6.7)	Michigan	1 (0.9)
Bachelors	18 (17.3)	Missouri	3 (2.6)
Master's	34 (32.7)	North Carolina	1 (0.9)
Doctorate	42 (40.4)	New York	3 (2.6)
		South Carolina	2 (1.8)
Pastor employment outside of the church		Tennessee	1 (0.9)
No	79 (68.7)	Virginia	3 (2.6)
Yes	36 (31.3)		
		Church setting	
Number of adult members		Rural	6 (5.3)
1 – 100	43 (36.8)	Small town	6 (5.3)
101 – 200	26 (22.2)	Metropolitan	17 (15.0)
201 – 500	28 (23.9)	Suburban	46 (40.7)
500+	20 (17.1)	Inner City	38 (33.6)
Number of weekly attendees		**Denomination**	
1 – 100	57 (48.7)	Baptist	46 (40.4)
101 – 200	29 (24.8)	AMEZ	1 (0.9)
201 – 500	17 (14.5)	AME	12 (10.5)
500+	14 (12.0)	Episcopal	3 (2.6)
		Pentecostal	9 (7.9)
Number of full-time staff		Church of God in Christ	3 (2.6)
0	20 (25.0)	United Church of Christ	2 (1.8)
1	20 (25.0)	Non-denominational	24 (21.1)
2 – 4	21 (26.2)	Seventh-day Adventist	2 (1.8)
5+	19 (23.8)	United Methodist	6 (5.3)
		Apostolic	2 (1.8)
Number of part-time staff		Catholic	2 (1.7)
0	18 (23.1)	Disciples of Christ	1 (0.9)
1	10 (12.8)	Unsure	1 (0.9)
2 – 4	31 (39.7)		
5+	19 (24.4)	**Health Ministry**	
		No	53 (47.3)
Number of volunteers		Yes	59 (52.7)
0 – 10	27 (24.1)		
11 – 30	35 (31.3)		
31 – 70	22 (19.6)		
71+	28 (25.0)		

Table 2: Demographic counts may not add up to 119 due to missing data. Valid percentages excluding missing data are presented.

Table 3: Church Membership Descriptives

	# adult members (N = 117)	# weekly attendees (N = 117)	# full-time staff (N = 80)	# part-time staff (N = 78)	# volunteers (N = 112)
Mean (Std. deviation)	452.36 (1047.97)	311.66 (746.70)	5.83 (17.89)	3.94 (9.24)	63.21 (130.61)
Median	175	110	1.5	2	30
Min. – Max.	10 – 10,000	7 – 7,000	0 - 125	0 - 80	2 – 1,200

Table 3: Demographic counts may not add up to 119 due to missing data. Valid percentages excluding missing data are presented.

Table 4: Health Program and Health Area Frequencies

Health Programs:	N (%)	*Health Areas:*	N (%)
Food assistance		**Heart disease**	
No	23 (19.3)	No	51 (42.9)
Yes	96 (80.7)	Yes	68 (57.1)
Clothing/Shelter assistance		**Stroke**	
No	32 (26.9)	No	90 (75.6)
Yes	87 (73.1)	Yes	29 (24.4)
Health-related counseling/support groups		**Cancer**	
No	52 (43.7)	No	50 (42.0)
Yes	67 (56.3)	Yes	69 (58.0)
Substance abuse support/recovery		**Diabetes**	
No	83 (69.7)	No	66 (55.5)
Yes	36 (30.3)	Yes	53 (44.5)
Health classes/workshops		**Physical activity**	
No	61 (51.3)	No	55 (46.2)
Yes	58 (48.7)	Yes	64 (53.8)
Health-related screening		**Diet**	
No	78 (65.5)	No	52 (43.7)
Yes	41 (34.5)	Yes	67 (56.3)
Health fair/Church health event		**Asthma**	
No	44 (37.0)	No	112 (94.1)
Yes	75 (63.0)	Yes	7 (5.9)
Exercise groups/Fitness classes		**Aging**	
No	62 (52.1)	No	90 (75.6)
Yes	57 (47.9)	Yes	29 (24.4)
Health in pastor sermons		**Obesity**	
No	14 (11.8)	No	86 (72.3)
Yes	105 (88.2)	Yes	33 (27.7)
Print/Electronic health information		**HIV**	
No	17 (14.3)	No	93 (78.2)
Yes	102 (85.7)	Yes	26 (21.8)
		Children's health	
		No	111 (93.3)
		Yes	8 (6.7)
		Weight	
		No	81 (68.1)
		Yes	38 (31.9)
		Stress	
		No	74 (62.2)
		Yes	45 (37.8)
		Smoking	
		No	101 (84.9)
		Yes	18 (15.1)

Table 4: The left side of the table represents the 10-item list of health programs and the right represents the 14-item list of health areas addressed. Frequencies of each item are represented.

Bivariate Correlations

Pearson's 2-tailed bivariate correlations demonstrated several significant associations between church characteristics and the total number of health programs offered. The number of health programs offered was significantly and positively associated with: the number of church members ($r = .223$, $p = .016$); number of part-time paid staff ($r = .280$, $p = .013$); and the number of health areas addressed ($r = .622$, $p < .001$). The number of full-time paid church staff and number of church volunteers approached statistical significance ($p < .10$), yet had weak correlation coefficients with the number of health programs offered. The number of full-time paid staff was the only church characteristic that approached significance ($p < .10$) in the bivariate correlation analyses to the number of health areas addressed with a correlation coefficient of .208 and a p-value of .067. The bivariate correlational analyses are summarized below in Table 5.

Table 5: Bivariate Correlations of Church Characteristics and Health Programs/Areas

		# adult members	# weekly attendees	# full-time staff	# part-time staff	# volunteers	# health programs
# of adult members	Pearson Correlation						
	Sig. (2-tailed)						
	N						
# of members who attend weekly	Pearson Correlation	.988**					
	Sig. (2-tailed)	< .001					
	N	116					
# of full-time staff	Pearson Correlation	.302**	.288**				
	Sig. (2-tailed)	0.007	0.01				
	N	79	80				
# of part-time staff	Pearson Correlation	0.171	0.181	0.159			
	Sig. (2-tailed)	0.138	0.112	0.168			
	N	77	78	77			
# of volunteers	Pearson Correlation	.561**	.595**	0.129	0.075		
	Sig. (2-tailed)	< .001	< .001	0.26	0.521		
	N	111	111	78	76		
# of health programs	Pearson Correlation	.223*	.208*	0.207	.280*	0.183	
	Sig. (2-tailed)	0.016	0.024	0.066	0.013	0.053	
	N	117	117	80	78	112	
# of health areas	Pearson Correlation	0.071	0.062	0.096	0.208	-0.043	.622**
	Sig. (2-tailed)	0.449	0.507	0.397	0.067	0.656	< .001
	N	117	117	80	78	112	119

*Table 5: **Correlation coefficient is significant at the .01 level.*
** Correlation coefficient is significant at the .05 level*

T-Tests

Using independent sample t-tests, significant differences were found for the number of health programs and the number of health areas addressed between: churches that had a health ministry and those that did not; churches in which the pastor had employment outside the church and those that did not; as well as between churches that owned their building and those that did not. Churches with a health ministry offered, on average, 1.66 more health programs ($p < 0.001$) and addressed

3.46 more health areas than those without one ($p < 0.001$). Those that owned their building offered an average of 1.43 more programs ($p = .003$) and targeted 1.63 more health areas ($p = .043$) than that did not. Finally, churches with pastors employed solely by the church offered 1.44 more health programs ($p = .001$) and addressed 1.51 more health areas ($p = .038$) than their counterparts. The results of these analyses are summarized in Tables 6 and 7.

Table 6: Mean Differences in Health Programming by Pastor Employment, Church Ownership, and Health Ministry

		Mean number of health programs (Std. deviation)	t-value	df	Mean difference	p-value
Does the pastor have employment outside of the church?	**No** (n = 79)	6.52 (1.97)	3.44	113	1.44**	0.001
	Yes (n = 36)	5.08 (2.30)				
Does the church own its building?	**No** (n = 26)	4.96 (2.03)	-3.07	113	-1.43**	0.003
	Yes (n = 89)	6.39 (2.11)				
Does the church have a health ministry?	**No** (n = 53)	5.17 (2.02)	-4.29	110	-1.66**	< 0.001
	Yes (n = 59)	6.83 (2.07)				

*Table 6: **Mean difference is significant at the .01 level.*

Table 7: Mean Differences in Health Areas Addressed by Pastor Employment, Church Ownership, and Health Ministry

		Mean number of health areas (Std. deviation)	t-value	df	Mean difference	p-value
Does the pastor have employment outside of the church?	**No** (n = 79)	5.09 (3.70)	2.10	113	1.51*	0.038
	Yes (n = 36)	3.58 (3.26)				
Does the church own its building?	**No** (n = 26)	3.35 (3.67)	-2.05	113	-1.63*	.043
	Yes (n = 89)	4.98 (3.55)				
‡Does the church have a health ministry?	**No** (n = 53)	2.79 (2.59)	-5.80	104.19	-3.46**	< 0.001
	Yes (n = 59)	6.25 (3.68)				

*Table 7: **Mean difference is significant at the .01 level.*
**Mean difference is significant at the .05 level*
‡Equal variances not assumed.

Analyses of Variance

One-way analyses of variance (ANOVA) detected no significant relationships between church setting (i.e. suburban, metropolitan, inner city, rural/small town) and the mean number of health programs or areas addressed. These results are presented in Table 8 below. However, the one-way ANOVA for pastor education demonstrated a statistically significant relationship with the number of health programs, though not with health areas. The results of the ANOVAs for pastor education are presented in Table 9.

Table 8: ANOVAs for Church Setting and Number of Health Programs/Areas

		Sum of Squares	df	Mean Square	F-value	Sig.
Health programs	**Between Groups**	16.25	3	5.416	1.21	0.309
	Within Groups	487.72	109	4.474		
	Total	503.97	112	-		
Health areas	**Between Groups**	7.51	3	2.504	0.20	0.900
	Within Groups	1398.63	109	12.831		
	Total	1406.14	112	-		

Table 8: Church setting categories included: suburban, metropolitan, inner city, and rural/small town.

Table 9: ANOVAs for Pastor Education and Number of Health Programs/Areas

		Sum of Squares	df	Mean Square	F-value	Sig.
Health programs	**Between Groups**	57.00	3	19.00	4.37**	0.006
	Within Groups	435.22	100	4.35		
	Total	492.22	103	-		
Health areas	**Between Groups**	65.17	3	21.72	1.68	0.176
	Within Groups	1292.05	100	12.92		
	Total	1357.22	103	-		

Table 9: Pastor education categories included: high school/some college/technical school, bachelor's, master's, and doctorate.
***Value is significant at the .01 level.*

As our ANOVAs indicated a relationship between pastor education and number of health programs, we conducted post-hoc tests for the pastor education ANOVAs. The post-hoc results indicated significantly fewer health programs among churches led by pastors with a bachelor's degree than those led by leaders of all other education levels. Thus, bachelor's degree was used as the reference for odds ratios calculated for and each other education level. Churches of pastors with bachelor's degrees offered an average of 2.20 fewer programs ($p = .009$) than those with high

school or some college/technical schooling, 1.74 fewer (p = .005) than those with a master's degree, and 2 fewer (p = .001) than those with a doctoral degree. These differences are reflected in Table 10.

Post-hoc tests for the ANOVA of pastor education and number of health areas indicated some marginally significant results (p < .10). Results trended toward more health areas being addressed within churches led by pastors with a doctoral degree over churches led by pastors at the master or bachelor levels. Thus, doctoral level was used as the reference for odds ratios at the other educational levels. The results of these analyses are depicted in Tables 11.

Table 10: Mean Differences in Health Programming by Pastor Education

Pastor Education	N (%)	Mean number of health programs	Std. deviation	Mean difference♦	p-value
High school/Some college/Technical school	10 (9.6)	6.70	1.494	2.20**	0.009
Bachelor	18 (17.3)	4.50	2.065	-	-
Master	34 (32.7)	6.24	2.216	1.74**	0.005
Doctorate	42 (40.4)	6.50	2.098	2.00**	0.001

Table 10: ♦ The mean difference depicted represents the mean number of health programs among churches with pastors at the corresponding education level minus the mean number of health programs among churches with bachelor degree level pastors (4.50).
***Mean difference is significant at the .01 level.*

Table 11: Mean Differences in Health Areas Addressed by Pastor Education

Pastor Education	N (%)	Mean number of health areas	Std. deviation	Mean difference♠	p-value
High school/Some college/Technical school	10 (9.6)	5.40	4.142	0.05	0.967
Bachelor	18 (17.3)	3.61	3.202	-1.84	0.072
Master	34 (32.7)	4.03	3.08	-1.42	0.089
Doctorate	42 (40.4)	5.45	3.983	-	-

Table 11: ♠ The mean difference depicted represents the mean number of health areas among churches with pastors at the corresponding education level minus the mean number of health areas among churches with doctorate degree level pastors (5.45).

Chi-Squared Tests

Chi-squared analyses were performed to test for relationships between church characteristics (e.g. presence of a health ministry) and the specific types of health programs (e.g. exercise groups) offered and areas (e.g. diabetes) addressed. There were a number of significant results found and reported in Tables 12 and 13. In addition to the statistically significant results reported below, there were a number of relationships that approached significance. In terms of church characteristics with marginally significant relationships to the health programs conducted, churches with pastors of higher education levels offered print/electronic health information more often than less educated ones. Churches with pastors not employed outside of the church also tended to offer substance abuse support and clothing/shelter assistance more often than churches with pastors holding multiple jobs. Those with more full-time staff were marginally more likely to offer food assistance and health-related counseling. More part-time staff had a marginal positive relationship with shelter/clothing assistance. More weekly attendees show signs of a positive

relationship with substance abuse support and print/electronic dissemination of health information. Finally, more volunteers was marginally significant with a positive relationship to health fair/church health events.

For health areas addressed, there was marginal significance indicating: churches with pastors of higher education levels addressed aging more often; churches with pastors not employed outside of the church addressed aging, stroke, diet, obesity, and weight more often; churches with building ownership addressed aging, cancer, and diet more often; and churches with a health ministry addressed children's health more often than their counterparts. Physical activity also had a marginally significant positive relationship with number of members and number of weekly attendees. Number of full-time staff had a marginally significant positive relationship with diet, while number of part-time staff shared a similar relationship with targeting the HIV health area. Number of members also trended toward a significant relationship with targeting children's health. It worth noting that there were no significant or marginally significant associations between church setting type or number of volunteers and the health areas addressed.

Table 12: Significant results of chi-squared analyses for health programs conducted

		Pastor education				
	Program conducted?	**High school or Some college/ Technical school**	**Bachelor's**	**Master's**	**Doctorate**	**Pearson Chi-square**
Health-related counseling/ support groups	**no**	1 (10%)	13 (72.2%)	14 (41.2%)	20 (47.6%)	10.56*
	yes	9 (90%)	5 (27.8%)	20 (58.8%)	22 (52.4%)	
Health classes/ workshops	**no**	2 (20%)	15 (83.3%)	18 (52.9%)	17 (40.5%)	13.24**
	yes	8 (80%)	3 (16.7%)	16 (47.1%)	25 (59.5%)	
Health-related screening	**no**	9 (90%)	15 (83.3%)	20 (58.8%)	23 (54.8%)	7.84*
	yes	1 (10%)	3 (16.7%)	14 (42.2%)	19 (45.2%)	
		Does the Pastor have employment outside serving as Pastor of this church?				
	Program conducted?	**No**		**Yes**		**Pearson Chi-square**
Health-related screening	**no**	46 (58.2%)		30 (83.3%)		6.96**
	yes	33 (41.8%)		6 (16.7%)		
Exercise groups/Fitness classes	**no**	30 (38%)		28 (77.8%)		15.67**
	yes	49 (62%)		8 (22.2%)		
Print/electronic health information	**no**	6 (7.6%)		11 (30.6%)		10.35**
	yes	73 (92.4%)		25 (69.4%)		
		Does the church own its building?				
	Program conducted?	**No**		**Yes**		**Pearson Chi-square**
Health-related screening	**no**	17 (65.4%)		27 (30.3%)		10.46**
	yes	9 (34.6%)		62 (69.7%)		
Exercise groups/Fitness classes	**no**	18 (69.2%)		41 (46.1%)		4.32*
	yes	8 (30.8%)		48 (53.9%)		
		Church setting				
	Program conducted?	**Rural/ Small town**	**Metropolitan**	**Suburban**	**Inner City**	**Pearson Chi-square**
Exercise groups/ Fitness classes	**no**	10 (83.3%)	7 (41.2%)	20 (43.5%)	23 (60.5%)	7.93*
	yes	2 (16.7%)	10 (58.8%)	26 (56.5%)	15 (39.5%)	

Table 12: Significant results of chi-squared analyses for health programs conducted (cont.)

		Does the church have a health ministry?				
	Program conducted?	No		Yes		Pearson Chi-square
Food assistance	no	15 (28.3%)		7 (11.9%)		4.78*
	yes	38 (71.7%)		52 (88.1%)		
Substance abuse support/ recovery	no	44 (83%)		33 (55.9%)		9.54**
	yes	9 (17%)		26 (44.1%)		
Health classes/ workshops	no	34 (64.2%)		25 (42.4%)		5.31*
	yes	19 (35.8%)		34 (57.6%)		
Health fair/ Church health event	no	27 (50.9%)		15 (25.4%)		7.76**
	yes	26 (49.1%)		44 (74.6%)		
Exercise groups/ Fitness classes	no	36 (67.9%)		22 (37.3%)		10.50**
	yes	17 (32.1%)		37 (62.7%)		
Print/electronic health information	no	13 (24.5%)		4 (6.8%)		6.83**
	yes	40 (75.5%)		55 (93.2%)		
		Number of members				
	Program conducted?	1-100	101-200	201-500	501+	Pearson Chi-square
Health-related screening	no	37 (86%)	15 (57.7%)	15 (53.6%)	9 (45%)	14.10**
	yes	6 (14%)	11 (42.3%)	13 (46.4%)	11 (55%)	
Health fair/ Church health event	no	25 (58.1%)	7 (26.9%)	8 (28.6%)	3 (15%)	14.42**
	yes	18 (41.9%)	19 (73.1%)	20 (71.4%)	17 (85%)	
Exercise groups/ Fitness classes	no	28 (65.1%)	14 (53.8%)	15 (53.6%)	4 (20%)	11.23*
	yes	15 (34.9%)	12 (46.2%)	13 (46.4%)	16 (80%)	
		Number of weekly attendees				
	Program conducted?	1-100	101-200	201-500	501+	Pearson Chi-square
Health-related screening	no	44 (77.2%)	18 (62.1%)	6 (35.3%)	8 (57.1%)	10.80*
	yes	13 (22.8%)	11 (37.9%)	11 (64.7%)	6 (42.9%)	
Health fair/ Church health event	no	28 (49.1%)	8 (27.6%)	3 (17.6%)	3 (21.4%)	8.94*
	yes	29 (50.9%)	21 (72.4%)	14 (82.4%)	11 (78.6%)	
Exercise groups/ Fitness classes	no	37 (64.9%)	15 (51.7%)	5 (29.4%)	4 (28.6%)	10.36*
	yes	20 (35.1%)	14 (48.3%)	12 (70.6%)	10 (71.4%)	

Table 12: Significant results of chi-squared analyses for health programs conducted (cont.)

		Number of full-time staff				
	Program conducted?	0	1	2-4	5+	**Pearson Chi-square**
Health fair/ Church health event	**no**	13 (65%)	11 (55%)	5 (23.8%)	4 (21.1%)	12.05**
	yes	7 (35%)	9 (45%)	16 (76.2%)	15 (78.9%)	
Exercise groups/ Fitness classes	**no**	19 (95%)	10 (50%)	12 (57.2%)	6 (31.6%)	17.29**
	yes	1 (5%)	10 (50%)	9 (42.9%)	13 (68.4%)	
Print/electronic health information	**no**	8 (40%)	1 (5%)	3 (14.3%)	1 (5.3%)	11.89*
	yes	12 (60%)	19 (95%)	18 (85.7%)	18 (94.7%)	
		Number of part-time staff				
	Program conducted?	0	1	2-4	5+	**Pearson Chi-square**
Food assistance	**no**	10 (55.6%)	1 (10%)	4 (12.9%)	4 (21.1%)	12.95**
	yes	8 (44.4%)	9 (90%)	27 (87.1%)	15 (78.9%)	
Print/electronic health information	**no**	7 (38.9%)	3 (30%)	2 (6.5%)	2 (10.5%)	9.84*
	yes	11 (61.1%)	7 (70%)	29 (93.5%)	17 (89.5%)	
		Number of volunteers				
	Program conducted?	0-10	11-30	31-70	71+	**Pearson Chi-square**
Food assistance	**no**	11 (40.7%)	7 (20%)	2 (9.1%)	2 (7.1%)	11.94**
	yes	16 (59.3%)	28 (80%)	20 (90.9%)	26 (92.9%)	
Clothing/ Shelter assistance	**no**	15 (55.6%)	8 (22.9%)	2 (9.1%)	4 (14.3%)	17.75**
	yes	12 (44.4%)	27 (77.1%)	20 (90.9%)	24 (85.7%)	
Health-related screening	**no**	21 (77.8%)	27 (77.1%)	15 (68.2%)	12 (42.9%)	10.44*
	yes	6 (22.2%)	8 (22.9%)	7 (31.8%)	16 (57.1%)	

*Table 12: **Chi-square value is significant at the .01 level*
**Chi-square value is significant at the .05 level*

Table 13: Significant results of chi-squared analyses for health areas addressed

		Pastor education				
	Area addressed?	**High school or Some college/ Technical school**	**Bachelor's**	**Master's**	**Doctorate**	**Pearson Chi-square**
Physical Activity	**no**	5 (50%)	9 (50%)	23 (67.6%)	12 (28.6%)	11.64**
	yes	5 (50%)	9 (50%)	11 (32.4%)	30 (71.4%)	
		Does the Pastor have employment outside serving as Pastor of this church?				
	Area addressed?	**No**		**Yes**		**Pearson Chi-square**
Heart disease	**no**	30 (38%)		21 (58.3%)		**4.15***
	yes	49 (62%)		15 (41.7%)		
Physical activity	**no**	30 (38%)		22 (61.1%)		**5.34***
	yes	49 (62%)		14 (38.9%)		
		Does the church own its building?				
	Area addressed?	**No**		**Yes**		**Pearson Chi-square**
Heart disease	**no**	17 (65.4%)		33 (37.1%)		6.56**
	yes	9 (34.6%)		56 (62.9%)		
Stroke	**no**	24 (92.3%)		63 (70.8%)		5.06*
	yes	2 (7.7%)		26 (29.2%)		
Cancer	**no**	20 (76.9%)		45 (40.6%)		5.69*
	yes	6 (23.1%)		44 (49.4%)		
Physical activity	**no**	18 (69.2%)		35 (39.3%)		7.24**
	yes	8 (30.8%)		54 (60.7%)		
Asthma	**no**	22 (84.6%)		86 (96.6%)		5.08*
	yes	4 (15.4%)		3 (3.4%)		

Table 13: Significant results of chi-squared analyses for health areas addressed (cont.)

		Does the church have a health ministry?				
	Area addressed?	**No**		**Yes**		**Pearson Chi-square**
Heart disease	**no**	34 (64.2%)		16 (27.1%)		15.49**
	yes	19 (35.8%)		43 (72.9%)		
Stroke	**no**	46 (86.8%)		39 (66.1%)		6.53*
	yes	7 (13.2%)		20 (33.9%)		
Cancer	**no**	33 (62.3%)		16 (27.1%)		14.01**
	yes	20 (37.7%)		43 (72.9%)		
Diabetes	**no**	43 (81.1%)		20 (33.9%)		25.31**
	yes	10 (18.9%)		39 (66.1%)		
Physical activity	**no**	36 (67.9%)		16 (27.1%)		18.69**
	yes	17 (32.1%)		43 (72.9%)		
Diet	**no**	29 (54.7%)		20 (33.9%)		4.92*
	yes	24 (45.3%)		39 (66.1%)		
Asthma	**no**	53 (100%)		53 (89.8%)		5.70*
	yes	0 (0%)		6 (10.2%)		
Aging	**no**	48 (90.6%)		36 (61%)		13.00**
	yes	5 (9.4%)		23 (39%)		
Obesity	**no**	46 (86.8%)		37 (62.7%)		8.44**
	yes	7 (13.2%)		22 (37.3%)		
HIV	**no**	47 (88.7%)		39 (66.1%)		7.98**
	yes	6 (11.3%)		20 (33.9%)		
Weight	**no**	42 (79.2%)		34 (57.6%)		5.98*
	yes	11 (20.8%)		25 (42.4%)		
Smoking	**no**	51 (96.2%)		44 (74.6%)		10.17**
	yes	2 (3.8%)		15 (25.4%)		
		Number of members				
	Area addressed?	1-100	101-200	201-500	501+	**Pearson Chi-square**
Heart disease	**no**	24 (55.8%)	11 (42.3%)	12 (42.9%)	3 (15%)	9.29*
	yes	19 (44.2%)	15 (57.7%)	16 (57.1%)	17 (85%)	

Table 13: Significant results of chi-squared analyses for health areas addressed (cont.)

		Number of weekly attendees				
	Area addressed?	1-100	101-200	201-500	501+	**Pearson Chi-square**
Heart disease	**no**	30 (52.6%)	14 (48.3%)	3 (17.6%)	3 (21.4%)	9.61*
	yes	27 (47.4%)	15 (57.7%)	14 (82.4%)	11 (78.6%)	
Stroke	**no**	50 (87.7%)	22 (75.9%)	6 (35.3%)	10 (71.4%)	19.43**
	yes	7 (12.3%)	7 (24.1%)	11 (64.7%)	4 (28.6%)	
Aging	**no**	48 (84.2%)	18 (62.1%)	10 (58.8%)	12 (85.7%)	8.44*
	yes	9 (15.8%)	11 (37.9%)	7 (41.2%)	2 (14.3%)	
HIV	**no**	49 (86%)	17 (58.6%)	14 (82.4%)	11 (78.6%)	8.58*
	yes	8 (14%)	12 (41.4%)	3 (17.6%)	3 (21.4%)	
		Number of full-time staff				
	Area addressed?	0	1	2-4	5+	**Pearson Chi-square**
Heart disease	**no**	14 (70%)	7 (35%)	11 (52.4%)	5 (26.3%)	8.91*
	yes	6 (30%)	13 (65%)	10 (47.6%)	14 (73.7%)	

*Table 13: **Chi-square value is significant at the .01 level*
**Chi-square value is significant at the .05 level*

Logistic Regressions

Binary logistic regressions were used to detect relationships between specific health programs/areas (e.g. food assistance/stroke) and church characteristic variables. These binary regressions demonstrated a number of significant results between various church characteristics and health programs/areas. Number of members, staff, and volunteers, church building ownership, presence of a health ministry, among other characteristics were significantly related to various programs and health areas such as food assistance, shelter/clothing assistance, health-related counseling, heart disease, stroke, cancer, etc. The results of these binary regression are displayed in the 'OR' columns of Tables 14 and 15.

After the binary regression identified church characteristics significantly related to a specific health program/area, we then developed a multivariate adjustment model for each program/area. This was done to assess the relationship of significant church characteristics to the outcome variables without being obscured by the interaction of the other significant variables. These multivariate models included solely the significant church characteristics from the binary regression as covariates for the corresponding program/area. The identified covariates were each put into the corresponding model in a single step.

Though we had a plethora of significant findings in the bivariate regression analyses, our multivariate adjustment left us with far fewer statistically significant relationships. After the covariate adjustment, number of church members, number of full- and part-time staff, number of volunteers, and presence of a health ministry, among a few others, still demonstrated some statistically significant, positive relationships to the presence of specific types of health programming, such as food assistance, shelter/clothing assistance, health classes, etc. Tables 14 and 15 below present the results of the multivariate regression in the 'Adj. OR' columns.

Table 14: Significant results of logistic regressions for health programs offered

		Food assistance	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of full-time staff	**0**	Reference	Reference
	1	3.78 (0.83, 17.25)	0.07 (0.00, 1.83)
	2 - 4	1.33 (0.37,4.77)	0.05 (.00, 0.97)*
	5+	5.67 (1.02, 31.54)*	0.88 (0.03, 23.54)
Number of part-time staff	**0**	Reference	Reference
	1	11.25 (1.17, 108.41)*	136.22 (3.30, 5620.09)**
	2 - 4	8.44 (2.08, 34.30)**	37.32 (2.15, 648.14)*
	5+	4.69 (1.11, 19.834)*	49.83 (1.94, 1283.20)*
Number of volunteers	**0 - 10**	Reference	Reference
	11 - 30	2.75 (0.89, 8.51)	3.60 (0.66, 19.70)
	31 - 70	6.88 (1.33, 35.58)*	15.42 (0.91, 261.10)
	71+	8.94 (1.75, 45.63)**	8.20 (0.71, 94.40)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	2.93 (1.09, 7.89)*	2.40 (0.42, 13.72)
		Shelter/Clothing assistance	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of part-time staff	**0**	Reference	Reference
	1	5 (0.82, 30.46)	6.36 (0.84, 48.26)
	2 - 4	4.29 (1.22, 15.02)*	4.77 (1.12, 20.42)*
	5+	3.5 (0.88, 13.93)	3.82 (0.76, 19.27)
Number of volunteers	**0 - 10**	Reference	Reference
	11 - 30	4.22 (1.41, 12.61)**	3.18 (0.91, 11.15)
	31 - 70	12.5 (2.43, 64.43)**	18.52 (1.64, 209.01)*
	71+	7.5 (2.04, 27.59)**	10.28 (1.76, 59.91)**
		Health-related counseling/support groups	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	1.82 (0.73, 4.53)	1.57 (0.37, 6.71)
	201 - 500	3.61 (1.05, 12.42)*	2.36 (0.31, 18.11)
	500+	1.11 (0.35, 3.58)	1.14 (0.14, 9.14)
Number of full-time staff	**0**	Reference	Reference
	1	1.24 (0.34, 4.46)	1.23 (0.26, 5.85)
	2 - 4	3.02 (0.85, 10.78)	2.48 (0.42, 14.66)
	5+	4.02 (1.06, 15.29)*	4.59 (0.62, 34.00)
Pastor education	**High school/ Some college/ Technical**	23.40 (2.33, 235.54)**	-
	Bachelor	Reference	Reference
	Master	3.71 (1.08, 12.80)*	3.61 (0.75, 17.46)
	Doctorate	2.86 (0.87, 9.46)	1.92 (0.42, 8.83)

Table 14: Significant results of logistic regressions for health programs offered (cont.)

		Substance abuse support/recovery	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	2.56 (0.94, 6.93)	7.08 (0.98, 51.09)
	201 - 500	3.71 (1.17, 11.83)*	2.43 (0.13, 46.48)
	500+	2.32 (0.65, 8.32)	66.52 (2.01, 2198.63)*
Number of full-time staff	**0**	Reference	Reference
	1	10.23 (1.12, 93.34)*	4.95 (0.38, 64.05)
	2 - 4	4.47 (0.45, 44.01)	0.65 (0.04, 11.15)
	5+	3.56 (0.34, 37.69)	0.09 (0.00, 5.64)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	3.85 (1.59, 9.31)**	9.52 (1.51, 60.14)*
		Health classes/workshops	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of full-time staff	**0**	Reference	Reference
	1	4.50 (1.17, 17.37)*	6.78 (1.21, 38.10)*
	2 - 4	1.85 (0.48, 7.06)	2.79 (0.46, 16.96)
	5+	3.33 (0.86, 12.92)	3.26 (0.54, 19.75)
Pastor education	**High school/ Some college/ Technical**	20.00 (2.75, 145.48)**	30.89 (1.82, 524.20)*
	Bachelor	Reference	Reference
	Master	4.44 (1.08, 18.22)*	2.83 (0.45, 18.02)
	Doctorate	7.35 (1.84, 29.35)**	5.29 (0.91, 30.57
Does the church have a health ministry?	**no**	Reference	Reference
	yes	2.43 (1.14, 5.22)*	1.11 (0.30, 4.05)
		Health-related screening	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	4.52 (1.42, 14.45)*	3.76 (0.76, 18.67)
	201 - 500	5.34 (1.71, 16.68)**	2.12 (0.24, 18.47)
	500+	7.54 (2.20, 25.86)**	1.98 (0.10, 41.06)
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	2.07 (0.78, 5.47)	1.15 (0.25, 5.21)
	201 - 500	6.21 (1.92, 20.02)**	1.64 (0.17, 15.59)
	500+	2.54 (0.75, 8.65)	1.02 (0.05, 23.38)
Number of volunteers	**0**	Reference	Reference
	1	1.04 (0.31, 3.45)	0.73 (0.18, 2.96)
	2 - 4	1.63 (0.46, 5.85)	0.51 (0.08, 3.42)
	5+	4.47 (1.44, 15.13)**	1.58 (0.26, 9.55)
Does the pastor have employment outside of the church?	**no**	Reference	Reference
	yes	0.28 (0.10, 0.75)*	0.623 (0.17, 2.37)
Pastor education	**High school/ Some college/ Technical**	0.56 (0.05, 6.18)	0.86 (0.06, 12.18)
	Bachelor	Reference	Reference
	Master	3.50 (0.85, 4.41)	3.28 (0.59, 18.38)
	Doctorate	4.13 (1.04, 16.43)*	2.69 (0.57, 12.70)

Table 14: Significant results of logistic regressions for health programs offered (cont.)

		Health fair/Church health event	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	3.77 (1.31, 10.85)*	6.64 (0.44, 99.76)
	201 - 500	3.47 (1.25, 9.62)*	1.49 (0.02, 146.66)
	500+	7.87 (2.00, 30.94)**	1.43 (0.00, 1055.41)
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	2.53 (0.97, 6.66)	2.55 (0.08, 83.02)
	201 - 500	4.51 (1.17, 17.39)*	3.31 (0.02, 451.90)
	500+	3.54 (0.89, 14.05)	2.34 (0.01, 793.55)
Number of full-time staff	**0**	Reference	Reference
	1	1.52 (0.43, 5.43)	0.29 (0.03, 3.29)
	2 - 4	5.94 (1.52, 23.18)**	2.62 (0.23, 30.48)
	5+	6.96 (1.66, 29.36)**	5.76 (0.34, 97.62)
Number of part-time staff	**0**	Reference	Reference
	1	6.29 (1.02, 38.65)*	8.80 (0.56, 138.17)
	2 - 4	2.18 (0.66, 7.13)	1.19 (0.14, 9.95)
	5+	3.41 (0.88, 13.19)	1.51 (0.16, 14.13)
Number of volunteers	**0 - 10**	Reference	Reference
	11 - 30	1.88 (0.68, 5.18)	2.86 (0.55, 14.94)
	31 - 70	4.25 (1.21, 14.88)*	0.69 (0.03, 15.08)
	71+	3.13 (1.02, 9.55)*	0.42 (0.03, 5.82
Does the church own its building?	**no**	Reference	Reference
	yes	4.34 (1.72, 10.95)**	3.05 (0.53, 17.57)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	3.05 (1.37, 6.75)**	0.94 (0.22, 3.99)
		Exercise groups/Fitness Classes	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	1.60 (0.59, 4.32)	-
	201 - 500	1.62 (0.61, 4.28)	-
	500+	7.47 (2.11, 26.34)**	-
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	1.73 (0.70, 4.29)	-
	201 - 500	4.44 (1.37, 14.40)*	-
	500+	4.63 (1.29, 16.65)*	-
Number of full-time staff	**0**	Reference	Reference
	1	19.00 (2.12, 170.38)**	-
	2 - 4	14.25 (1.60, 127.17)*	-
	5+	41.17 (4.42, 383.40)**	-
Number of part-time staff	**0**	Reference	Reference
	1	5.00 (0.87, 28.86)	-
	2 - 4	3.61 (0.86, 15.09)	-
	5+	5.56 (1.20, 25.71)*	-
Number of volunteers	**0 - 10**	Reference	Reference
	11 - 30	1.28 (0.46, 3.57)	-
	31 - 70	1.42 (0.45, 4.46)	-
	71+	3.59 (1.12, 10.92)*	-

Table 14: Significant results of logistic regressions for health programs offered (cont.)

Does the pastor have employment outside of the church?	**no**	Reference	Reference
	yes	0.18 (0.07, 0.43)**	-
Pastor education	**High school/ Some college/ Technical**	0.86 (0.16, 4.55)	-
	Bachelor	Reference	Reference
	Master	2.00 (0.61, 6.56)	-
	Doctorate	3.25 (1.02, 10.38)*	-
Does the church own its building?	**no**	Reference	Reference
	yes	2.63 (1.04, 6.69)*	-
Church setting	**Rural/Small town**	Reference	Reference
	Metropolitan	7.14 (1.18, 43.19)*	-
	Suburban	6.50 (1.28, 33.05)*	-
	Inner city	3.26 (0.63, 17.01)	-
Does the church have a health ministry?	**no**	Reference	Reference
	yes	3.56 (1.63, 7.78)**	-
		Print/electronic health information	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of full-time staff	**0**	Reference	Reference
	1	12.67 (1.40, 114.42)*	8.33 (0.22, 317.96)
	2 - 4	4.00 (0.88, 18.19)	1.15 (0.10, 13.07
	5+	12.00 (1.33, 108.67)*	2.36 (0.12, 44.87)
Number of part-time staff	**0**	Reference	Reference
	1	1.49 (0.29, 7.74)	0.49 (0.03, 8.92)
	2 - 4	9.23 (1.66, 51.42)*	6.19 (0.39, 98.17)
	5+	5.41 (0.95, 30.97)	3.20 (0.22, 46.51)
Does the pastor have employment outside of the church?	**no**	Reference	Reference
	yes	0.19 (0.06, 0.56)	0.17 (0.03, 1.18)
Pastor education	**High school/ Some college/ Technical**	4.50 (0.46, 44.29)	2.20 (0.09, 53.30)
	Bachelor	Reference	Reference
	Master	2.33 (0.62, 8.72)	1.12 (0.15, 8.56)
	Doctorate	6.50 (1.41, 30.00)*	13.65 (1.02, 182.42)*
Does the church have a health ministry?	**no**	Reference	Reference
	yes	4.47 (1.36, 14.72)*	1.72 (0.16, 18.30)

Table 14: The "adjusted" column reflects the resulting odds ratio and confidence interval after controlling for the significant independent variables in the corresponding sections. Cells marked with – are those that yielded odds rations approaching 0 or infinity with significance values approaching 1.
***OR is significant at the .01 level*
**OR value is significant at the .05 level*

Table 15: Significant results of logistic regressions for health areas addressed

		Heart disease	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	1.72 (0.64, 4.61)	0.14 (0.01, 1.80)
	201 - 500	1.684 (0.65, 4.40)	0.26 (0.01, 7.96)
	500+	7.16 (1.82, 28.09)**	0.15 (0.00, 40.45)
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	1.19 (0.49, 2.91)	5.83 (0.39, 86.91)
	201 - 500	5.19 (1.34, 20.02)*	24.81 (0.46, 1335.35)
	500+	4.07 (1.03, 16.17)*	28.23 (0.17, 4742.75)
Number of full-time staff	**0**	Reference	Reference
	1	4.33 (1.15, 16.32)*	2.75 (0.49, 15.45)
	2 - 4	2.12 (0.59, 7.69)	0.48 (0.08, 3.03)
	5+	6.53 (1.61, 26.47)**	1.00 (0.09, 10.93)
Number of volunteers	**0 - 10**	Reference	Reference
	11 - 30	1.67 (0.61, 4.59)	0.96 (0.21, 4.37)
	31 - 70	1.50 (0.48, 4.65)	2.02 (0.15, 26.45)
	71+	3.13 (1.02, 9.55)*	1.68 (0.20, 14.25)
Does the pastor have employment outside of the church?	**no**	Reference	Reference
	yes	0.44 (0.20, 0.98)*	2.04 (0.47, 8.90)
Does the church own its building?	**no**	Reference	Reference
	yes	3.21 (1.28, 8.01)*	2.89 (0.64, 13.14)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	4.81 (2.16, 10.73)**	1.81 (0.50, 6.55)
		Stroke	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	1.85 (0.53, 6.49)	-
	201 - 500	3.43 (1.08, 10.91)*	-
	500+	3.32 (0.94, 11.71)	-
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	2.27 (0.71, 7.26)	-
	201 - 500	13.10 (3.67, 46.67)**	-
	500+	2.86 (0.70, 11.63)	-
Number of full-time staff	**0**	Reference	Reference
	1	6.33 (0.67, 60.16)	2.433 (0.20, 29.1)
	2 - 4	9.50 (1.05, 86.26)*	2.16 (0.17, 27.84)
	5+	6.79 (0.71, 64.72)	1.17 (0.05, 29.31)
Does the church own its building?	**no**	Reference	Reference
	yes	4.95 (1.09, 22.49)*	-
Does the church have a health ministry?	**no**	Reference	Reference
	yes	3.37 (1.29, 8.81)*	2.95 (0.58, 14.95)

Table 15: Significant results of logistic regressions for health areas addressed (cont.)

		Cancer	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	1.15 (0.43, 3.05)	0.28 (0.06, 1.34)
	201 - 500	2.88 (1.04, 7.94)*	0.64 (0.08, 4.95)
	500+	2.68 (0.87, 8.30)	0.60 (0.03, 12.97)
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	1.82 (0.73, 4.53)	0.86 (0.18, 4.07)
	201 - 500	3.61 (1.05, 12.42)*	1.46 (0.12, 17.39)
	500+	2.00 (0.60, 6.71)	1.26 (0.05, 33.68)
Number of volunteers	**0 - 10**	Reference	Reference
	11 - 30	1.54 (0.56, 4.25)	1.45 (0.41, 5.13)
	31 - 70	3.88 (1.15, 13.04)*	3.43 (0.51, 23.01)
	71+	2.62 (0.88, 7.78)	4.53 (0.66, 31.13)
Pastor education	**High school/ Some college/ Technical**	3.7 (0.70, 19.12)	3.74 (0.48, 29.17)
	Bachelor	Reference	Reference
	Master	1.57 (0.49, 5.02)	1.68 (0.36, 7.93)
	Doctorate	3.14 (1.00, 9.87)*	2.89 (0.64, 13.09)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	4.43 (2.00, 9.86)**	4.44 (1.47, 13.35)
		Diabetes	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	2.28 (0.92, 5.67)	0.60 (0.14, 2.61)
	201 - 500	3.39 (1.09, 10.54)*	0.88 (0.15, 5.01)
	500+	1.39 (0.42, 4.56)	0.62 (0.08, 4.81)
Number of full-time staff	**0**	Reference	Reference
	1	4.64 (1.02, 21.04)*	1.97 (0.35, 11.00)
	2 - 4	5.15 (1.15, 23.01)*	2.75 (0.46, 16.38)
	5+	4.12 (0.89, 19.00	1.64 (0.21, 12.70)
Does the church own its building?	**no**	Reference	Reference
	yes	3.26 (1.20, 8.88)*	1.75 (0.34, 9.05)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	8.39 (3.50, 20.10)**	5.71 (1.68, 19.42)**

Table 15: Significant results of logistic regressions for health areas addressed (cont.)

		Physical activity	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	3.19 (1.15, 8.82)*	5.19 (0.73, 37.03)
	201 - 500	2.61 (0.98, 6.94)	7.55 (0.47, 121.02)
	500+	3.13 (1.04, 9.49)*	11.62 (0.10, 1337.65)
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	3.06 (1.19, 7.87)*	0.22 (0.02, 2.20)
	201 - 500	1.96 (0.65, 5.90)	0.15 (0.01, 3.32)
	500+	2.48 (0.74, 8.33)	0.19 (0.00, 13.74)
Number of full-time staff	**0**	Reference	Reference
	1	2.33 (0.64, 8.54)	1.25 (0.25, 6.31)
	2 - 4	3.11 (0.86, 11.29)	1.35 (0.26, 7.04)
	5+	4.00 (1.05, 15.21)*	1.10 (0.13, 9.06)
Does the pastor have employment outside of the church?	**no**	Reference	Reference
	yes	0.39 (0.17, 0.88)*	1.29 (0.34, 4.95)
Does the church own its building?	**no**	Reference	Reference
	yes	3.47 (1.36, 8.84)*	4.48 (0.87, 23.14)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	5.69 (2.52, 12.84)**	2.64 (0.83, 8.38)
		Diet	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	1.57 (0.59, 4.19)	1.21 (0.23, 6.21)
	201 - 500	1.53 (0.59, 4.00)	0.67 (0.14, 3.17)
	500+	3.45 (1.06, 11.19)*	7.05 (0.33, 152.52)
Number of full-time staff	**0**	Reference	Reference
	1	2.85 (0.78, 10.47)	3.24 (0.74, 14.23)
	2 - 4	3.11 (0.86, 11.29)	3.36 (0.73, 15.40)
	5+	6.53 (1.61, 26.47)**	1.29 (0.14, 11.74)
Number of volunteers	**0 - 10**	Reference	Reference
	11 - 30	2.18 (0.78, 6.07)	1.63 (0.43, 6.20)
	31 - 70	1.75 (0.56, 5.44)	0.74 (0.10, 5.26)
	71+	3.64 (1.18, 11.18)*	2.41 (0.35, 16.74)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	2.36 (1.01, 5.06)*	1.12 (0.35, 3.56)
		Asthma	
		OR (95% CI)	**Adj. OR (95% CI)**
Does the church own its building?	**no**	Reference	N/A
	yes	0.19 (0.04, 0.92)*	N/A

Table 15: Significant results of logistic regressions for health areas addressed (cont.)

		Aging	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of members	**1 - 100**	Reference	Reference
	101 - 200	3.27 (1.00, 10.65)*	0.58 (0.12, 2.92)
	201 - 500	2.06 (0.61, 6.93)	1.07 (0.18, 6.27)
	500+	2.64 (0.73, 9.58)	0.64 (0.05, 8.48)
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	3.26 (1.16, 9.17)*	3.37 (0.75, 15.15)
	201 - 500	3.73 (1.13, 12.39)*	0.84 (0.10, 7.33)
	500+	0.89 (0.17, 4.66)	1.70 (0.11, 25.30)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	6.13 (2.13, 17.69)**	4.02 (1.36,11.87)*
		Obesity	
		OR (95% CI)	**Adj. OR (95% CI)**
Does the church have a health ministry?	**no**	Reference	N/A
	yes	3.91 (1.50, 10.15)**	N/A
		HIV	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	4.32 (1.51, 12.37)**	3.22 (1.06, 9.75)*
	201 - 500	1.31 (0.31, 5.62)	0.89 (0.20, 4.00)
	500+	1.67 (0.38, 7.33)	1.38 (0.29, 6.57)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	4.02 (1.47, 10.99)**	3.54 (1.24, 10.15)
		Weight	
		OR (95% CI)	**Adj. OR (95% CI)**
Number of weekly attendees	**1 - 100**	Reference	Reference
	101 - 200	2.16 (1.02, 6.67)*	1.70 (0.63, 4.64)
	201 - 500	0.86 (0.24, 3.06)	0.59 (0.16, 2.23)
	500+	1.56 (0.45, 5.39)	0.97 (0.24, 3.90)
Does the church have a health ministry?	**no**	Reference	Reference
	yes	2.81 (1.21, 6.51)*	2.81 (1.16, 6.81)
		Smoking	
		OR (95% CI)	**Adj. OR (95% CI)**
Does the church have a health ministry?	**no**	Reference	N/A
	yes	8.69 (1.88, 40.13)**	N/A

Table 15: The "adjusted" column reflects the resulting odds ratio and confidence interval after controlling for the significant independent variables in the corresponding sections. Cells marked with – are those that yielded odds rations approaching 0 or infinity with significance values approaching 1.

***OR is significant at the .01 level*

*OR value is significant at the .05 level

Factor Analysis

Exploratory factor analyses using a correlation matrix based on Eigenvalues greater than 1 and rotated using the Varimax method were conducted to identify categories of health programming offered and health areas addressed. For our factor analysis of health programs, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was 0.68. Due to the low KMO value and lack of distinct patterns in the resulting "components," we do not report factors derived from the various health programs here. However, for health areas, our KMO value reached 0.85 and the areas grouped into more clear components. Our factor analysis of health areas yielded three resulting components. We have labeled component 1 as obesity and obesity risk factors, consisting of health areas including weight, obesity, diet, physical activity, as well as stress and children's health due to their links with obesity (National Institutes of Health, 2014; van der Valk, Savas, & van Rossum, 2018). Component 2 consisting of heart disease, diabetes, stroke and cancer has been identified as chronic diseases, as described by the Centers for Disease Control (Centers for Disease Control, 2019). Finally, component 3, consisting of asthma, smoking, aging, and HIV may represent risk factors of other health issues not necessarily related to cancer. Each component was responsible for explaining 15-20% of the variance in health areas covered for a cumulative amount of 54%. Results from the factor analysis are summarized below in Table 16.

Table 16: Factor Analysis of Health Areas Covered

Health area	Component (% of variance)		
	1 (19.69%)	2 (19.39%)	3 (15.36%)
Weight	0.74		
Children's health	0.69		-0.33
Stress	0.67		0.31
Obesity	0.61	0.32	
Diet	0.50	0.34	
Physical activity	0.45	0.34	
Heart disease		0.79	
Diabetes	0.31	0.76	
Stroke		0.73	
Cancer		0.60	
Asthma			0.78
Smoking	0.33		0.74
Aging	0.40		0.55
HIV		0.41	0.52

Table 16: Loads are expressed in the corresponding cell of each health area. Negligible loads (-0.30 < load < 0.30) are not displayed. Component 1: obesity and obesity risk factors, component 2: chronic diseases, and component 3: other risk factors.

Chapter 5: Discussion

Summary of Central Findings

These analyses have provided empirical evidence that many African American churches are in fact offering varying types of health programs and services to their members targeting a variety of health issues. Only one of our 119 churches offered no types of health programming. Additionally, participating churches offered, on average, just over six types of health programs, which is approximately one more than the rough average of five types of programs reported by Bopp and Webb's (2013), as well as Bopp and Fallon's (2013) samples. Over 99% of our sample offered at least one type of health programming which is considerably more than the 36% of Catholic, Latino-serving FBOs that had offered at least one health program in the last year, as reported by Allen and colleagues (2016). Neither of Bopp's works (Bopp & Fallon, 2013; Bopp & Webb, 2013), not Allen and colleagues' (2016) had a focus on African American churches. As such, one explanation for this difference in programming could be something related to the culture or capacity of African American churches. It may be that African American churches are generally more interested in health programming, see a need to address more health concerns in their communities, or perhaps have more resources to initiate and sustain health programming. However, the data to confirm or refute any of these explanations do not currently exist. Our churches also averaged nearly five health areas addressed per church, but there is no empirical literature available to compare this to.

The findings presented demonstrated the ability to predict the quantity of health programs and areas addressed within an African American church based on

characteristics specific to that institution. In line with organizational and human resource theory, churches with more resources, as expressed in terms of larger memberships, more staff and volunteers, ownership of their buildings, existing health ministries, pastors of higher education levels, and pastors with no employment outside of the church, generally provided more health promotion, more health area coverage, or both. This is in line with work done previously that has demonstrated links between various proxies for church resources such as pastor education, church building ownership, church size, and staffing to the presence of health programming (Austin & Claiborne, 2011; Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004; Leake et al., 2007; Peterson, Atwood, & Yates, 2002; Thomas et al., 1994; Trinitapoli, Ellison, & Boardman, 2009).

It was unexpected and contradictory to the available literature to find that, in our sample, pastors in the high school/some college/technical school group had more or similar levels of programming to those of higher education levels. This may be explained by our small sample size and unsubstantial representation of pastors in the high school/some college/technical school group. As only 10 of our respondents belonged to this education group, it is very likely that these responses are not representative of all churches with pastors at these education levels. Another surprising finding was the lack of a relationship between church setting (inner city, metropolitan, suburban, small town, rural) and the quantity of health programs or areas addressed. One might expect churches in more rural settings to have fewer resources to conduct health programming, though this did not seem to be the case. This too may also be attributed to lack of representation in our small sample size. In

the rural and small town categories together, we only had representation from 12 churches. It is reasonable to presume that these 12 churches recruited via convenience sampling methods are not representative of other churches from these settings. It is possible that the churches led by pastors without a bachelor's degree and those within rural and small town community settings that we happened to recruit were on the more active side of health programming as compared to churches in similar situations. Alternatively, there may in fact be no relationship between church setting and health programming, and the relationship between pastor education and health activities could be much more complex than initially expected.

Our findings also support the potential to predict particular types of health programming or areas addressed depending on church characteristics, which has not been explored in previous research. However, the ability to predict a type of program or area varied greatly. Based on our findings, predicting specific types of programming or health area targeting seems possible, though it may be not as consistent and reliable as predicting health program and area quantities. This could be due to the different health demands among different churches. Churches with more resources may generally offer more health opportunities, but one might expect the health foci of each church to differ depending on the interest and concerns of the membership, independent of resource availability.

We also saw a decline in the significance of relationships between our independent church characteristic and dependent health activity and area variables after our logistic regression covariate adjustment. This indicates that the independent variables identified, such as number of members, number of staff, building

ownership, etc., may be closely linked. Thus, controlling for one covariate could appear to eliminate the effect of another, which is largely what we saw. Finally, while there are a number of different health areas that these churches are working to address, we were able to categorize these health topics into three broader health categories of obesity and obesity risk factors, chronic diseases, and other risk factors.

Implications of Findings

Being aware of the church climate with regard to health promotion in African American churches can provide practitioners another way to effectively design and target interventions and opportunities for many African American individuals. Having an understanding of the quantity and variety of health programming offered by a church can provide insight as to how interested that church is in health promotion, what areas of health they think are most important to their community, what areas they are working to address and what areas may still require some attention, and their capacity to establish and offer additional health programs. The lack of consistent relationships between church characteristics and specific types of health programs and areas demonstrates to immense variability in church health foci. This variability is the reason why it is critical to understand a particular churches health interests and concerns before introducing a new program to them. Knowing what health programs exist in a setting allows health promotion professionals to evaluate and improve upon those programs if necessary, rather than developing and implementing brand new programs, which could be much more costly and less likely to be sustained by comparison. And for areas that have not yet been addressed by the church, practitioners can still develop interventions to then address those unmet needs.

As we have identified some likely predictors of the quantity of health programming within African American churches, we may be able to use this information to target the institutions with fewer resources that may require the most assistance to develop and improve their health promotion efforts. This work perhaps provides some insight into effective areas to target when seeking to improve church capacity to institute health programs. For example, as churches with a health ministry offered an average of almost two more types of health programming targeting almost four more different health areas, perhaps interventions to assist churches without a health ministry to create one would be effective for increasing their health promotion programming. We also note the substantial difference between the percentage of organizations in our sample offering any health programming and the percentage of Catholic, Latino-serving FBOs offering health programs, as reported by Allen and colleagues (2016). As Hispanic and Latino populations are another group that is disproportionately affected by various health issues (The Office of Minority Health, 2015), and Catholic, Latino-serving institutions seem to be less engaged in the health of their memberships, this may highlight an unaddressed gap of working with Latino- and perhaps Hispanic-serving faith groups to improve the health of their communities.

Limitations

One limitation to this study is the relatively small sample size. Due to our sample size and the distribution of the sample, the power of each statistical test was restricted. This was particularly apparent in the counts for a number of our chi-squared analyses. In some cases, the expected counts were below the suitable

threshold, even after collapsing the variables into broader categories. This may have contributed to a lack of statistically significant results, particularly in relationships of pastor education and church setting, as these two variables showed especially small counts in some cells. The small number of respondents likely limited many of our other analyses as well. The slim sample size likely contributed to our difficulties in identifying relationships between specific health programs or areas and our independent variables as well.

This study is also limited in the generalizability of its findings. As our sample was of African American churches, primarily from Maryland, and located in inner city of suburban settings, these findings may not hold for other community organizations or even other churches serving non-African American audiences or in different environmental settings. These data were also collected over multiple projects between 2010 and 2019. This variability in the time and project in which the data were collected could potentially reduce the validity of this study. The items and responses on the questionnaires from these projects also had to be interpreted by our team in order to create a checklist of health programs more consistent with the sparse literature available on health programming in churches. This interpretation of course invites researcher bias into the mix, in addition to the biases innately present with self-report data, such as social desirability bias.

Additionally, we were most interested in health programming initiated by churches without prompting from outside sources. The data analyzed in this study were collected prior to any intervention by our research teams, and so, we presumed that the programs reported were solely church initiated. However, this may not

necessarily be the case, as participating churches could have partnered with other groups or research teams prior to enrolling in our projects. Making the presumption that these programs were initiated by the church without outside intervention thus presents another limitation of this study.

Finally, this work does not take into account how many times or how frequently in the past year that a particular type of program is conducted by a church, nor does it evaluate the effectiveness of the programs identified. It is possible that one church that has included health in their sermon only did so once in the past 12 months and another church may do it every Sunday, and this study does not report on this. Similarly, it is possible that one church holds exercise groups, but only a few people show up to walk for 10 minutes and the impact on their overall health is negligible. The effect of this could be considerably less on the grand scale of health in the church community as compared to a church that gets 50% of their members to increase their heart rate considerably with a 30-minute jog after service.

Directions for Future Research and Intervention

Future research should seek to replicate the work presented here. As stated above, a replication with a larger sample and more representative sample of churches would be ideal to follow-up on this work. In recognition of the comparatively low rates of Latino-serving institutions implementing health as part of their activities, future research to reach these groups in particular are advised. Given the evidence that churches are tackling health issues in their communities, we would also recommend empirical evaluations of the programs instituted by churches. The effectiveness of these church-initiated health programs have gone largely unreported

in the scientific literature in favor of intervention studies, however, without evaluation of the church-initiated activities, it becomes difficult to adequately identify what kinds of health interventions may be most needed in these communities. Further investigation of the ways to best support churches in developing, expanding, and improving their health promotion programming is advised as well.

Conclusion

African American churches hold a special place in their communities. Through their longstanding relationships they have the power to, and often do, impact their members other community members greatly. In terms of health, this means they have a lot of opportunity to reach individuals who health and medical professionals may find hard to reach. Many African American churches have been filling health accessibility gaps that exist in their communities, but the health roles these churches take have been understudied thus far. This work provides insight into the points of health that churches target most to give practitioners a better understanding of what is being done and where gaps may still need to be addressed. Working with churches to bolster their current programming and intervening where holes in accessibility still persist can not only be fiscally sound and potentially more effective than creating a new intervention from scratch, but programs initiated through the church with support of health promoters may be more well sustained than researcher generated interventions. This approach has implications for other community organizations that may not necessarily be health oriented as well. By partnering with groups and institutions that serve traditionally under resourced populations, we as health

professionals can increase our reach and create more sustainable health programs for those in greatest need.

Chapter 6: Appendices

Appendix A – IRB Approval

UNIVERSITY OF MARYLAND

INSTITUTIONAL REVIEW BOARD

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DATE:	December 20, 2018
TO:	Nathaniel Woodard
FROM:	University of Maryland College Park (UMCP) IRB
PROJECT TITLE:	[1368246-1] Presence and Predictors of Health Services in a Sample of African American Churches
REFERENCE #:	
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	December 20, 2018
REVIEW CATEGORY:	Exemption category # *4*

Thank you for your submission of New Project materials for this project. The University of Maryland College Park (UMCP) IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact the IRB Office at 301-405-4212 or irb@umd.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

Appendix B – Project HEAL Church Leadership Questionnaire

Project HEAL
Health through Early Awareness and Learning

Church Leadership Survey

Name: _____

What is your role within the church?

____ Pastor ____ Priest ____ Deacon ____ Lay Minister

____ Non-pastoral role (e.g., administrative assistant, business manager)

____Other:_____

Email address: _____

Phone: _____(Home) _____(Cell) _____(Office)

Name of Church: _____

Address: _____

City: _____ State: ____ Zip Code: _____

Name of Pastor: _____

Pastor email address: _____

Pastor Phone: _____(Home) _____(Cell) _____(Office)

To which denomination or convention does your church belong?

____Baptist
____AMEZ
____ AME
____Episcopal
____Other (please specify)_____
____Don't Know/Not sure
____Pentecostal
____Church of God in Christ
____United Church of Christ
____Non-denominational

Member of National Church Organization? ____ Yes ____ No

If yes, name of organization: _____

Day/Time(s) of Weekly Worship Service: _____

Section A: Profile of Congregation Members

1. Estimated number of adult members: _____
2. On average, estimated number of members who attend weekly: _____
3. Estimated number of men age 45-75 (who attend weekly): _____
4. Estimated number of women age 45-75 (who attend weekly): _____

Section B: Congregational Characteristics

1. Does the Pastor have employment outside serving as Pastor of this church?
   ____ Yes ____ No
2. Pastor education (type of degree): _____
3. Does the church own its building? _____ Yes _____ No
4. Is the building adequate for the church's present program activities?

   _____ Yes _____ No
5. Community setting:

___ Rural ___ Small town ___ Metropolitan ___ Suburban ___ Inner city

6. Do most of the members live in the surrounding neighborhood or do they come in from other areas to attend services here (check only one)?

____ most live in this neighborhood
____ most come in from other areas
____ it is a mixture some from here some from other areas

7. How many paid staff does the church have?

____ # full-time staff (35 hours or more) ____ # part-time staff (less than 35 hours)

8. About how many people volunteer for various roles and activities at the church? _____

9. Please identify the services provided by your church (check all that apply).

____ food-related assistance
____ shelter
____ emergency grants/loans for rent/utilities
____ providing members with transportation
____ clothing closet
____ financial training, money management/education
____ assistance with food stamps, welfare, etc.
____ college enrollment/preparation
____ computer classes
____ ESL or GED classes/preparation
____ job readiness or resume writing
____ HIV counseling
____ mental health counseling
____ parental skills
____ peer support groups (such as grief counseling)
____ substance abuse recovery and support
____ recreation (arts, crafts, outdoor activities)
____ other:

_____

_____

Section C: Collaboration/Partnerships

1. Has your church worked with other churches or organizations on any of the below activities in the past 12 months? ____ Yes _____ No

If yes, please indicate the *number of partners* in each category - support received OR provided.

	Estimated number of organizations received support from	Estimated number of organizations provided support to
Financial assistance		
Technical assistance		
Expanded services of the church		
Health activities		
Participate in research		
Other		

Section D: Past and Current Church Health Activities

1. Health areas addressed currently or within the past 12 months (check all that apply)

- ❑ Heart disease (including high blood pressure)
- ❑ Stroke
- ❑ Cancer
  - ❑ Breast
  - ❑ Prostate
  - ❑ Colorectal
- ❑ Diabetes
- ❑ Physical Activity
- ❑ Healthy Diet
- ❑ Other:
- ❑ Asthma
- ❑ Aging
- ❑ Obesity/Overweight
- ❑ HIV/AIDS
- ❑ Children's Health
- ❑ Weight Loss
- ❑ Stress Reduction
- ❑ Walking
- ❑ Smoking

_____

_____

2. Health activities currently conducted or within the past 12 months (check all that apply)

❑ Classes/workshops	❑ Counseling
❑ Brochures (e.g., pamphlets, booklets)	❑ Internet health activities
❑ Testing/Screening	❑ Walking groups
If yes, what kind: _____	❑ Exercise groups
❑ Health Fairs	❑ Activities for children
❑ Other:	

_____

_____

Section E: Current Church Health Activities

Church Health Activities	Your Answers
1. We define a church health ministry as an organized and holistic approach led by a designated person(s), to promote health and well-being to church members through a wide range of activities. According to this definition, does your church have a health ministry?	❑ Yes ❑ No
1a. ***If not,*** does your church conduct health activities?	❑ Yes ❑ No ❑ Not sure
1b. ***If not,*** are you interested in establishing a health ministry?	❑ Yes ❑ No ❑ Not sure
1c. What future plans do you suggest for your health ministry? _____ _____	
2. Does your church have a <u>health team</u>, meaning more than one person who works together on health activities for the church?	❑ Yes ❑ No
2a. ***If yes,*** how many people make up your church's health team? _____	

3. Are the health activities your church provides done as part of the expectations of a regional or national religious organization?	❑ Yes ❑ No ❑ Some are, some are not
3a. ***If yes***, which organization is that: _____	
4. How many volunteers work on health activities as part of their volunteer activities at the church?	_____
5. How many dedicated staff work on health activities as part of their role at the church?	_____
6. Is there one particular person at your church who is in charge of health activities?	❑ Yes ❑ No ❑ Committee ❑ Other _____
7. Does the church provide training for the people conducting your health activities?	❑ Yes-Internal ❑ Yes-External ❑ No ❑ Not sure
8. How often does your church hold organizational meetings <u>specifically</u> about health-related issues?	❑ Once a week ❑ Once a month ❑ A few times a year ❑ Once a year ❑ Never
9. Does your church have a health policy (for example, about tobacco use on site or healthy meals served at church functions)?	❑ Yes –written (ask for copy) ❑ Yes–unwritten ❑ No ❑ Not sure
10. Does your church mission statement mention health?	❑ Yes ❑ No ❑ Not sure

11. Do your church keep any records of your health activities?	❑ Yes _____ ❑ No ❑ Not sure
12. Do you do any evaluation of the quality of your health activities?	❑ Yes _____ ❑ No ❑ Not sure
13. When you do health activities at church, are they adapted to fit the specific needs of your members?	❑ Yes _____ ❑ No ❑ Not sure
14. How often, if ever, do you talk about health in your sermons?	❑ Once a week ❑ Once a month ❑ A few times a year ❑ Once a year ❑ Never
15. How often, if ever, do you include health content in church newsletters or bulletins?	❑ Once a week ❑ Once a month ❑ A few times a year ❑ Once a year ❑ Never
16. How often, if ever, do you include health content in church social media activity (e.g., web site; Facebook, etc.)	❑ Once a week ❑ Once a month ❑ A few times a year ❑ Once a year ❑ Never
17. How often, if ever, does your church hold a health retreat, where a group of members set aside a longer period of time to talk about health?	# times in the past 2 years – health-specific _____ # times in the past 2 years – talked about health as part of another retreat _____
18. Does your church have its own health clinic? (that provides medical care to members)	❑ Yes ❑ No

19. Is space provided for health activities at your church?	❑ Space specifically for health activities ❑ Space shared with other activities ❑ No space for health activities ❑ Not sure
20. Do you do fundraising to support health activities at your church?	❑ Yes-Internal ❑ Yes-External ❑ No ❑ Not sure
21. Does your church provide a portion of the budget to support health activities?	❑ Yes ❑ No ❑ Not sure

22. Is there anything I did not ask you about, that you would like to say about your church's *health activities*?

_____

_____

THANK YOU FOR YOUR PARTICIPATION IN PROJECT HEAL!

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