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Predictors of Reported Influenza Vaccination during the 2012-2013 Influenza Season in an Older African American Population Based on Data Collected in a Faith-Based Setting

By

Sahithi Boggavarapu

Master of Public Health

Epidemiology

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Predictors of Reported Influenza Vaccination during the 2012-2013 Influenza

Season in an Older African American Population Based on Data Collected in a

Faith-Based Setting

By

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B.S.

Virginia Commonwealth University

2012

Faculty Thesis Advisor: Dr. Kevin Sullivan, PhD, MPH, MHA

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An abstract of

A thesis submitted to the Faculty of the

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Abstract

Predictors of Reported Influenza Vaccination during the 2012-2013 Influenza Season in an Older African American Population Based on Data Collected in a Faith-Based Setting

By Sahithi Boggavarapu

Objectives

Faith-based settings are institutions of social and health support for elderly African Americans. This thesis looks at predictors of reported 2012-2013 influenza vaccination in an older African American population in the context of a faith-based setting.

Methods

A cross-sectional study was conducted collecting data on older congregation members from six churches located in or around the Atlanta area participating in the Dose of Hope study.

Results

Out of 208 study participants, 95 (45.67%) reported receiving the influenza vaccine. Logistic regression showed that relationship with healthcare provider (OR: 14.83 [3.68, 59.83], PR: 4.25 [1.48, 12.22]) and fear of "getting the flu from the flu shot" (OR: 0.1 [0.05, 0.23], PR: 0.29 [0.17, 0.49]) were significant predictors of the vaccination outcome. Not experiencing discrimination in a faith-based setting was associated with a strong healthcare provider relationship. Age, type of medical insurance, and easy access to the influenza vaccine were identified as confounders.

Conclusion

A strong relationship with a healthcare provider and fear of getting influenza from the vaccine were significant predictors of the vaccination outcome. Eliminating negative attitudes towards preventive health behaviors due to mistrust of conventional medicine within the church may strengthen the patient-healthcare provider relationship. This could be done by using medical speakers to disseminate health information in a way that is socioculturally sensitive.

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Literature Review

Influenza is an infectious illness caused by a RNA virus in the orthomyxovirus family. There are three antigen strains: A, B, and C. Influenza A causes illness across all 1age groups, whereas Influenza B primarily affects children. Influenza C is rarely reported and has not been associated with epidemic disease. Humans are the only reservoir for influenza B and C, but influenza A can cause illness in humans and animals (23).The incidence of influenza cases peaks from December to March, but can occur before and after that time period (23).

Influenza is an air borne illness, transmitted person to person via virus-containing droplets generated when an infected person sneezes or coughs. It can also be transmitted through contact with respiratory secretions and then touching the eyes, mouth, or nose. The incubation period is 1-4 days and common symptoms include fever (101°-102°F), myalgia, sore throat, nonproductive cough, and headache (23). Ocular symptoms such as eye pain and sensitivity to light may occur. These symptoms rarely last more than 5 days. However, complications such as secondary bacterial pneumonia, primary influenza viral pneumonia, myocarditis, Reye Syndrome (particularly in children and in association with Influenza B), and other chronic pulmonary conditions can occur (23). Around 200,000 hospitalizations and 30,000 deaths annually can be attributed to influenza (26).

Generally, the mortality rate for influenza is 0.5-1 death per 1,000 cases, but the number of influenza-related deaths varies depending on the age group. The risk for influenza-related complications and hospitalizations is higher for young children (0-4 years of age), people with underlying medical conditions, and people older than 65 years of age. Older populations over the age of 65 have the highest mortality percentage,

accounting for approximately 90% of annual influenza-related deaths (6, 23, 26).

For the 2012-2013 influenza season, there were two vaccines available for influenza – trivalent inactivated influenza vaccine (TIV or IIV3) (9) and live attenuated influenza vaccine (LAIV) (23). Both vaccines contain three viruses: influenza A (H1N1), influenza A (H3N2), and influenza B. LAIV is an intranasal vaccine and was approved for use in 2003 only for healthy, nonpregnant persons from 2-49 years of age (23). IIV3 is the primarily the vaccine administered to the elderly population. It comes in two types: intramuscular and intradermal. In 2009, a high dose version of the intramuscular vaccine was approved by the FDA for people age 65and older. In 2011, the intradermal IIV3 vaccine was approved by the FDA for people ages 18-64 (23).

The efficacy of the vaccine is dependent on the age of the recipient, the recipient's health status, and the similarity between the vaccine strain and the currently circulating strain (23). Although the vaccine is effective in preventing 90% of people under the age of 65, it only protects 30%-40% of people that are 65 or older. However, the vaccine is 50%-60% effective in preventing hospitalizations and 80% effective in preventing death among the elderly (23).

A new quadrivalent influenza vaccine has been introduced for the 2013-2014 influenza season that protects against two influenza A viruses and two influenza B viruses, potentially providing broader protection to vaccine recipients. This vaccine can be administered to recipients between the ages of six months to 49 years (10). However, the quadrivalent vaccine is not recommended over the trivalent one and will comprise a minority of the vaccines that are administered this season (10).

Given the relatively high influenza-related mortality in the elderly population, the protection the influenza vaccine provides is significant. Currently, the CDC's Advisory Committee on Immunization Practices (ACIP) recommends an annual influenza vaccine for all age groups, but particularly for those at high risk (very young children, those above the age of 50, those with underlying medical conditions) (1,6). Influenza immunity wanes after less than 1 year following vaccination due to the waning potency of the vaccine-induced antibody (23). Furthermore, antigenic drift causes new strains of influenza to circulate each year (23). Therefore, it is important that people get vaccinated every year.

Despite the importance of receiving the vaccination annually, there remain disparities in the level of vaccination across age groups and race. The Healthy People 2020 objective for the influenza vaccine targets 90% immunization among people over the age of 65 (22) and for adults 18-64 who have medical conditions that increase their susceptibility to influenza. However, in 2008 only 66% of people over the age of 65 got vaccinated (7, 22). The percent of African Americans over the age of 65 that get vaccinated is even less: 56% of the population was vaccinated at the end of the 2010-2011 influenza vaccine cycle (8).

Literature covering the seasonal influenza vaccine and the H1N1 vaccine suggests several possible predictors for vaccine acceptance and refusal in elderly and minority populations. Studies looking at mediators for seasonal influenza and H1N1 vaccine acceptance concluded that a general positive attitude towards vaccines, prior vaccination, communication with physicians about vaccine benefits and perceptions (39), perception of vaccines as a preventive health measure (19), access to regular medical care, and a

perception of influenza as a serious illness (20) were significant predictors of getting the vaccine in minority populations. A cross-sectional study concluded that disadvantaged, minority populations are more likely to refuse the vaccine if they do not have access to government-based health and social services (6). Concern about the ingredients in the influenza vaccine has been associated with a decrease in vaccination (2). Influenza vaccination has also been associated with pneumococcal vaccination (additionally, predictors for pneumococcal vaccination among the elderly are similar to those for influenza vaccination: belief in the efficacy of the vaccine and physician recommendation (40)). Another randomized controlled study in Rochester looked at the effect patient and provider outreach had on influenza vaccination in an inner city senior population served by urban primary care centers, concluding that patient outreach on the part of healthcare providers is strongly associated with vaccination (21). However, the authors note that even with a strong, multifaceted interventional approach to increasing immunization rates, only 60%-70% vaccination coverage may be achieved (21).

Another predictor of negative health outcomes in minority populations is perceived discrimination. Williams and Mohammed describe in their literature review the effect discrimination has on racial disparities in health outcomes. They emphasize that even when controlling for socioeconomic factors (income, education, gender, age), there are still pathogenic factors (heart disease mortality, hypertension, obesity, and self-reported health assessment) that are associated with race (38). Perceived racial discrimination is becoming a factor of interest, relating to the role of stress of determining health outcomes and socioeconomic disparity. Perceived/experienced discrimination has been associated with poorer mental health, hypertension, and other

chronic conditions.   Discrimination has also been associated with a decrease in health-seeking behaviors, such as a failure to seek preventive services like cholesterol testing and influenza vaccination and using alternative medicine as opposed to conventional medicine for their health needs (38). These conclusions are supported by other meta-analytic reviews (29).The authors stress that discriminatory experiences tend to have long-term negative impacts on health and health behavior; it is unlikely that discrimination directly leads to illness.

In another study, Trivedi and Aynian conducted a cross-sectional analysis using the 2001 California Health Survey to determine the effect discrimination in healthcare settings may have on preventive health outcomes. They conclude that people who have experienced discrimination may be less likely to take advantage of preventive health resources, but that association disappears once this factor is adjusted for, indicating that perceived discrimination is unlikely to explain a large portion of health disparities regarding access and utilization of preventive care (35). The authors also note that perceived discrimination can be overstated due to recall bias, which would lead to overstating an association between discrimination and health outcomes (38).

Patient participation in preventive health behaviors depends on the trust they place on their healthcare provider. In the case of African Americans, there is a history of racial discrimination in health-based settings. A primary example of this is the 1932 U.S. Public Health Service Tuskegee Syphilis Study on Untreated Syphilis in the Negro Male, where the study investigators did not inform African American males if they had syphilis and did not offer them treatment or counseling (5, 34). This fostered a distrust of physicians and public health officials in the African American population (5).

Boulware and colleagues conducted a study comparing African American and Caucasian perceptions of physicians, health insurance plans, and healthcare delivery. They found that African Americans were more likely to distrust their physicians, but more likely to trust their healthcare plans compared to Caucasians. They were also more likely to express their concerns regarding privacy and confidentiality (5). Another study conducted by O'Malley and colleagues affirmed the importance of healthcare provider trust, especially when it comes to preventive measures. They asserted that a high level of trust in a patient-provider relationship can lead to better health outcomes due to adherence with preventive health measures (27). On the side of healthcare delivery, physicians are encouraged to tailor health information based on the cultural background of their patient. For African Americans, this cultural context includes an emphasis on holistic medicine, religiosity, and spiritualism (16).

In the literature, study participants frequently noted their churches as a good, alternative venue for spreading health messages and providing health services (for example, an influenza vaccine clinic). There has always been an association between religious affiliation/religious participation and health outcomes, with people with higher levels of religious participation displaying better health outcomes (24). DeHaven and colleagues conducted a literature review on the effectiveness of health interventions in faith-based settings. They found that around 50% of the health interventions focus on community and preventive health, leading to an increase in preventive health behaviors from the intervention participants (13).

The results of these literature reviews indicate that health interventions based in faith-based settings could improve health outcomes and preventive health behaviors in

the African American population. This is supported by literature showing the effect of health interventions taking place in a faith-based setting have on reducing outcomes of chronic conditions such as hypertension (32), diabetes and obesity (25), and smoking-related complications (31). Denominational differences could have an effect on preventive health behavior compliance – while a high level of religiosity and spirituality is associated with better health outcomes, it could also interfere with compliance of important health behaviors (16).

What may also be important is how the health information is delivered. Edwin Sanders, a reverend at an interdenominational church, asserts that the religious community will be more willing to accept health messages if they are delivered in a holistic approach, emphasizing healthy living over a fear of dying and the relationship between the physiological, psychological, and spiritual self (30). The literature suggests that using a faith-based setting to distribute health information frames the message in a way that is socially, culturally, and behaviorally relevant to the organization's members (25, 30).

If faith-based settings can be used to influence attitudes towards preventive care and health outcomes in African American populations, then it is important to look at African American attitudes towards the influenza vaccine in this context. Although there is literature on influenza vaccine acceptance and refusal, influenza vaccination disparities among race and age groups, and the use of faith-based organization to distribute health information, to my knowledge there is no analysis that ties all of these factors together. This thesis will look at predictors of reported 2012-2013 influenza vaccination in an older African-American population that are surveyed through a faith-based setting. A faith

venue could serve as a non-conventional health setting that could be an alternative for spreading health information about reducing health disparities and preventive health behaviors in the older African American population.

Introduction

Influenza is a significant cause of preventable morbidity and mortality in the United States, causing more than 200,000 hospitalizations and 30,000 deaths annually (26). Older populations are particularly vulnerable to influenza, as 90% of influenza-caused deaths occur in people over the age of 65 (6, 26). The CDC's ACIP recommends an annual influenza vaccine for those at high risk, which includes those who are aged 50 or older (6). However, the percent of individuals vaccinated for people over the age of 65 is only 66%, which is well below the 90% target set by the Healthy People 2020 Objective (7, 22). This percentage of people who get vaccinated for influenza is even lower in the African American population: 56% at the end of the 2010-2011 vaccine cycle (8). This is a health disparity that needs to be addressed; it has been estimated that the number of influenza-caused deaths among the elderly minority population could decrease by 1880 deaths if racial parity for influenza vaccinations was achieved (18).

Several factors have been shown to be predictors of vaccination in minority or elderly populations, such a general positive attitude towards vaccines, prior vaccination, communication with physicians about vaccine benefits and perceptions (39), perception of vaccines as a preventive health measure (19), access to regular medical care, perception of influenza as a serious illness (20), access to government-based health and social services (4), and pneumococcal vaccination (40). A strong patient-healthcare provider relationship based on trust has also been shown to be an important predictor of vaccination, which is especially important in this population since there is a history of racial discrimination in health-based settings, such as the 1932 U.S. Public Health Service Tuskegee Syphilis Study (5, 34).

Considering the need to reduce these health disparities in African American populations, it may be time to look at alternative methods for doing so. DeHaven and colleagues discuss the effectiveness of health programs in faith-based organizations. In their literature review they find that 50% of the health programs focus on primary prevention and that the programs , with one of the main outcomes from these programs being an increase in mammography and other forms of preventive care. The authors concluded that faith-based organizations can be very effective in influencing health outcomes (13). This conclusion is supported by prior literature that advocates using faith-based settings to distribute health information along with asserting that the health information be shared using a holistic approach (30). Distributing health information in a faith-based setting is believed to help frame information in a way that is more socioculturally relevant to the organization's members (30, 25).

If faith-based settings can be used to influence attitudes towards preventive care and health outcomes in African Americans, then it is important to look at African American attitudes towards the influenza vaccine in this context. Although there is literature on influenza vaccine acceptance and refusal, influenza vaccination disparities among race and age groups, and the use of faith-based organization to distribute health information, there is no analysis that ties all of these factors together. This thesis will look at predictors of reported 2012-2013 influenza vaccination in an older African-American population that are surveyed through a faith-based setting. A faith venue could serve as an alternative health setting for spreading health information about health outcomes and preventive health behaviors in the older African American population.

Thesis Objectives

The objective of this thesis is to determine predictors of reported 2012-2013 influenza vaccination in an older African American population. This thesis ventures to answer all of the following questions –

1) Do study participants' relationships with their healthcare provider (if they have one) predict whether or not they got the 2012-2013 influenza vaccination? [PRIMARY EXPOSURE]

2) Does a study participant's attitude towards vaccination and perception of influenza as an illness affect their vaccination outcome?

3) Does a study participant's religious affiliation (church denomination) predict whether or not they received the 2012-2013 influenza vaccination?

4) Did study participants' experience with discrimination and safety affect their odds of receiving the 2012-2013 influenza vaccination?

5) Does study participants' access to government resources affect their vaccination outcome?

Methods

Study Design

This study is a cross-sectional analysis using data taken from the Dose of Hope's baseline (Appendix B) and 3-month follow-up (Appendix C) surveys. The study looks at African American participation in clinical trials and the effect faith-based settings and health interventions (in the form of presentations and handouts about various health outcomes and preventive measures) have on participants' attitudes towards clinical trials at baseline, 3-month, and 6-month time points.

A list of churches that had prior relationships with Emory University was compiled with the assistance of the Emory Center with Community Partnerships. Churches that had less than a 60% majority of an African American population were eliminated from the list, leaving American Methodist Episcopalian (AME), Baptist, and Seventh Day Adventist (SDA) churches on the list. A randomization algorithm was utilized to match the churches on denomination and, in effect, size (the SDA congregations had less than 1000 participants, the Baptist congregations had between 1000-5000 participants, and the AME congregations had more than 5000 participants). A church was placed in the control or intervention group based on the denomination's preference and convenience. A breakdown of the churches chosen for the study and their cohort is listed below.

Control	Intervention
Decatur SDA	Maranatha SDA
Turner Chapel AME	St Philip AME
Greater Piney Grove Baptist Church	Greater Travelers' Rest Baptist Church

A total of 221 participants were recruited at baseline for the study. The Baptist churches provided a randomized list of 100 people from their congregation. These congregation members were subsequently screened for eligibility in this study. The health ministers at the SDA and AME churches provided a list of participants they knew were interested in the study and were potentially eligible. Participants were considered eligible for the study if (14):

-- They identified as black or African American

-- They were aged 50 or older

-- They lived in one of the 22 counties comprising metropolitan Atlanta

-- They did not plan to leave Atlanta for 12 months following recruitment

-- They did not previously participate faith-based health interventions

-- They did not participate in a clinical trial at Emory or anywhere else prior to this study

-- They were able to attend or obtain services from one of the selected faith venues

-- They were able to read and write English

Survey Development and Data Collection

The data for this thesis was primarily collected from Dose of Hope's 3-month follow-up survey (Appendix B). Questions regarding the 2012-2013 influenza vaccination and attitudes towards vaccination in general were inserted into the 3-month follow-up survey. They surveys were developed at a 6th-8th grade reading level (14). The surveys were administered to study participants in person and occasionally via phone (for the control cohort) if the person was unable to come to the meeting.

IRB Approval/Informed Consent

IRB approval (IRB00045737) was obtained prior to developing the survey

questions. Participants were asked to complete and sign consent forms (Appendix A) prior to completing the survey at the baseline time point.

Database Creation

A codebook for the 3-month time point survey was created and the parameters were entered into SPSS. Data from the 3-month surveys were then entered into the database. Along with the questions from the 3-month survey, other questions from the baseline survey (Appendix C) regarding participants' relationships with their healthcare providers and demographic and socioeconomic information were incorporated into the compiled dataset. The additional questions taken from the baseline surveys are listed below:

A1) What is your gender?

A3) How old are you?

A4) What is the highest level of school you have completed?

A5) How would you describe your race?

A8) What is your marital status?

A9) What is your employment status?

A10) What is your annual salary?

A11) What is your source of healthcare?

B3) Do you have access to transportation to get to a healthcare provider, clinic, or hospital?

B4) Has access to transportation ever limited you from getting to a healthcare facility?

B6) Do you have a regular doctor?

B7) Do you trust your doctor?

B17) In the past 12 months, was there a time when you didn't meet basic expenses such as food, clothing, or shelter?

B18) In the past 12 months, was there a time when you didn't pay for full gas, electricity, or oil?

B19) In the past 12 months, was there a time when you had your home and cellular phone suspended?

B20) In the past 12 months, was there a time when you couldn't afford leisure activities such as seeing movies or going out to dinner?

K1) Do your personal beliefs give meaning to your life?

K2) To what extent do your perceive your life to be meaningful?

K3) To what extent do your personal beliefs give you the strength to face your difficulties?

K4) To what extent do your personal beliefs help you to understand difficulties in your life?

After the dataset was completely compiled, it was exported into SAS.

Data Cleaning

Data cleaning and analysis for this thesis was done using SAS 9.3. The outcome variable was whether or not the participant got the 2012-2013 influenza vaccine. Any values for the outcome variable that were not 1 or 0 were dropped from the dataset. Any values of 99, 98, or a "not applicable" code were recoded as missing. A variable called "churchtype" was created, categorizing the church variable by denomination. The age variable was dichotomized (variable name = "diage") into 50-64 and 65+ categories. A

variable called "healthexposure" was created, indicating if study participants were exposed to health education materials (intervention cohort) or no (control cohort).

For variables that had a write in option, the written answer was compared to the rest of the variables' coding to make sure the write-in couldn't be coded as an existing option. If they were, the write-in options were recoded. The employment variable was dichotomized into two categories: employed (full-time or part-time) or unemployed (unemployed or retired). The education variable was recategorized into four levels: up to high school/GED, Technical/Vocational/Associates degree, Bachelor degree, and Master/Doctoral degree. The income variable was categorized into four levels as well: less than $20,000, $20,001-40,000, $40,001 – 80,000, and $80,000+. The medical insurance variable B11 was categorized into three levels: no insurance, private insurance, and managed care/combination of managed care and private insurance. Multiple imputation using the EM method was done with the discrimination variables (variables "dbdisc1"-"dbdisc11") to account for missing values. Several variables were dichotomized:

Access to transportation variable ("btransport")

Imputed discrimination perception variables (F1-F11)

Variables concerning participants' perceptions of their safety ("bsafety1"-"bsafety5")

Variables concerning participants' level of spirituality ("bspirit1"-"bspirit4")

Participants' assessment of their relationship with their healthcare provider on a scale from 1-10 (B1)

Other relationship with healthcare provider variables (B2-B10)

How serious do you think it would be if you got the flu? (C20)

Immunization attitudes variables (C30-C41)

Sources of health information variables (E1-E19)

Variable C5 (in the past five years, how often have you received the influenza vaccine) was recoded so the lower values indicated a smaller frequency of vaccinations. After the imputed discrimination variables were dichotomized, they were compared with the original discrimination variables (dbdisc1-dbdisc11) to see if there were any discrepancies in missing value counts. All coding options for these variables are provided in Appendix D. The SAS code used to clean the data is provided in Appendix E.

Data Analysis

Potential predictors were divided into categories: descriptive variables, relationship with healthcare provider, attitudes towards immunizations, sources of health information, discrimination and safety, transportation, spirituality, and immunization history. Predictors placed in each category are listed below, coding for each the variables is provided in Appendix D.

<u>Descriptive Variables</u>

Church denomination	Exposure to Health	Education Materials
Gender	Age Bracket	Relationship status
Employment status	Education	Income
Insurance Policy		

<u>Relationship with Healthcare Provider Variables</u>

Dichotomized relationship with healthcare provider

Do you trust your doctor?

I feel comfortable talking to my healthcare provider about immunizations

I feel comfortable talking to my healthcare provider about preventive procedures

I feel a strong commitment with my healthcare provider

I would expend effort to keep seeing my healthcare provider

I feel loyal to my healthcare provider

I intend to make an appointment with my healthcare provider again

I would work with my healthcare provider even if my fees increase

I trust my healthcare provider's judgment

My healthcare provider has experience and knows the best

I trust my provider to make decisions about which vaccines would be the best for me to receive

Attitudes towards Immunizations Variables

I want to be told about a vaccine's side effects and how they occur

I feel like I have enough access to immunization information

I want more information about immunizations before making decisions

Immunizations are important for a healthy lifestyle

My body can protect itself against vaccine diseases

I worry that getting the flu shot would give me the flu

I would be less likely to get the flu shot if it gave me symptoms such as tiredness or fever

Immunizations can actually lead to illness

I would like to know more about what is in shots

I doubt whether vaccines really work

I can easily get the flu shot

Sources of Health Information Variables

Where have you received your health information:

Family or Friends   Doctor/Nurse/Pharmacist   Newspaper/Magazine/TV

Health Help Line   Health Department   Church

School   Internet   Public Library

Healer   Other

How often in the last month have you looked for health information in:

Books/Brochures   Magazines/Newspapers   Internet   TV/Radio

Talks/Presentations Doctor/Healthcare Provider   Family   Friends

Faith Leader or Pastor

I would trust health information from:

Books/brochure   Magazines/Newspapers   Internet

TV/Radio   Talk/Presentation   Doctor/Healthcare Provider

Family   Friends   Faith Leader/Pastor

Church

Discrimination and Safety Variables

Have you faced discrimination at school?

Have you faced discrimination applying for a job?

Have you faced discrimination at work?

Have you faced discrimination in a store, at a restaurant, or another public place?

Have you faced discrimination getting medical care?

Have you faced discrimination getting medical care?

Have you faced discrimination from the police or in the courts?

Have you faced discrimination from the police or in the courts?

Have you faced discrimination volunteering for a medical research study?

Have you faced discrimination at a college or university?

Have you faced discrimination at a church or faith-based organization?

Have you faced discrimination at a community-based organization?

How safe do you feel in your daily life?

Do you feel you are living in a safe and secure environment?

How much do you worry about your safety and security?

How comfortable is the place you live?

How easily can you get medical care?

Transportation Variables

How often do you have access to transportation to healthcare?

Have you ever lacked transportation to get to a healthcare provider?

Spirituality Variables

Do your personal beliefs give meaning to your life?

To what extent do you find your life to be meaningful?

To what extent do your personal beliefs give you strength to face difficulties?

To what extent do your personal beliefs let you understand difficulties in your life?

Immunization History Variables

How often have you got the flu shot in the last 5 years?

Has a family member gotten the flu shot in the last year?

Has anyone in the family refused the flu shot in the last year?

How serious do you think it would be if you got the seasonal flu?

Have you received the vaccine for:

Chicken Pox   Hepatitis B   Measles, Mumps, Rubella (MMR)

Meningococcal   Pertussis   Shingles

Pneumonia   Tetanus-Diphtheria (Td)

Bivariate analyses between the outcome and potential exposures were conducted using the chi-square test to determine which potential predictors had strong associations with the outcome. Fisher's exact test was used when any cell had less than five observations. Other than the significant descriptive variables, a significant predictor in each category was chosen to be considered in the model, with the healthcare provider relationship variable being the primary exposure. Predictors to be placed in the model were chosen based on high ORs in their respective category and the distribution of numbers within the variable.

Potential interaction terms were also placed in the model prior to logistic regression analysis. A new working dataset was created with interaction terms and dummy variables for the medical insurance and church denomination variables. Collinearity assessment was conducted to ensure there were no correlations between independent variables. Variables were dropped if the condition indices were greater than 30 and the variance inflation factors (VIFs) were 10 or greater. The significance of the potential interactions terms were assessed using backwards elimination. A gold standard model was left, which was compared with all possible subsets of the model to assess for confounding. From these potential models, a final one was chosen. The final model was run again using the proc genmod command to determine prevalence ratios. These analyses were used to answer the questions stated in the thesis objectives.

Results

Descriptive Analysis

From the 221 people recruited from baseline in the study, 211 participants followed up at the 3-month time point, indicating a 95% retention rate. Of those 211 participants in the dataset, three were dropped because their influenza vaccination status was unknown, leaving the final dataset for analysis with 208 participants. Ninety-five (45.67%) of these participants reported receiving the 2012-2013 influenza vaccine. Forty-four of the participants were male (21.15%) and 164 were female (78.85%). For the age variable, 116 of the participants were within the age range of 50-64 (55.77%) and 92 were aged 65 and older (44.23%). When looking at the breakdown for church denomination, 58 of the participants belonged to an AME church (27.88%), 72 belonged to a Baptist church (34.62%) and 78 belonged to an SDA church (37.50%). As per the study design, 104 of the participants were in the control cohort and so were not exposed to health education materials and the other 104 were exposed to the health education materials in the intervention cohort. Twenty-two of the participants have no insurance (10.78%), 75 have a private insurance plan (36.76%), and 107 get their insurance through managed care or a combination of managed care and private insurance (52.45%) (Table 1).

Bivariate Associations

In the descriptive variables category, statistically significant bivariate associations ($p < 0.05$) were observed between the outcome variable (whether or not study participants received the 2012-2013 influenza vaccine): the dichotomized age variable (OR: 2.39 [1.37, 4.20]), medical insurance policy (ORs: 5.96 [1.27, 55.62],

14.32 [3.16, 130.26]), and church denomination (ORs: 1.22 [0.61, 2.45], 0.34 [0.17, 0.70]) (Table 2).

In the relationship with health care provider category, significant bivariate associations were observed between the outcome variable and the following variables: dichotomized relationship with healthcare provider (OR: 3.79 [1.47, 9.75]) and the statements "My healthcare provider knows best" (OR: 3.21 [1.31, 7.87]) and "I trust my provider to make decisions about which vaccines would be the best for me to receive" (OR: 5.44 [2.49, 11.95]) (Table 3).

In the immunization attitudes category, significant bivariate associations were observed between the outcome variable and the following statements: "Immunizations are important for a healthy lifestyle" (OR: 6.94 [2.77, 17.34]), "I worry that getting the flu shot would give me the flu" (OR: 0.10 [0.05, 0.20]), "I would be less likely to get the flu shot if it gave me symptoms such as tiredness or fever" (OR: 0.32 [0.18, 0.56]), "Immunizations can actually lead to illness" (OR: 0.26 [0.13, 0.52]), "I doubt whether vaccines really work" (OR: 0.46 [0.22, 0.97]) and "I can easily get the flu shot" (OR: 2.44 [1.07, 5.57]) (Table 4).

In the health source category, significant bivariate associations were observed between the outcome variable and the variable "How often in the last month have you searched for health information from a healthcare provider?" (OR: 1.82 [1.00, 3.31]) (Table 5). In the discrimination and safety category, significant bivariate associations were observed between the outcome variable and the discrimination experienced in a church or faith-based setting variable (OR: 0.47 [0.24, 0.92]) (Table 6).

In the transportation category, significant bivariate associations were observed between the outcome variable and the question "how often do you have access to transportation to healthcare?" (OR: 0.10 [0.00, 0.75]) (Table 7).

No variables were found to be significantly associated with the outcome in the spirituality category (Table 8).

In the immunization history category, significant bivariate associations were observed between the outcome variable and the variables "how often did you get a flu shot in the last five years?" (ORs: 23.5 [7.63, 74.71], 188 [48.98, 833.24]), "has a family member received a flu shot in the last year?" (OR: 3.79 [1.91, 7.52]), "has anyone in the family refused to get a flu shot in the last year?" (OR: 0.33 [0.15, 0.72]), "how serious do you think it would be if you got the seasonal flu?" (OR: 2.01 [1.05, 3.83]), "in the past year, have you received the shingles vaccine?" (OR: 5.87 [2.09, 16.47]), "in the past year, have you received the pneumonia vaccine?" (OR: 9.20 [3.37, 25.12]), "in the past year, have you received the tetanus-diphtheria vaccine?" (OR: 1.99 [1.02, 3.88]) (Table 9).

Choosing Potential Predictors for the Logistic Model

"I trust my provider to make decisions about which vaccines would be the best for me to receive" was chosen as the primary exposure from the relationship with healthcare provider category because of its strong OR (5.44) it displayed with the outcome. All the significant descriptive variables – church denomination, medical insurance policy, age bracket – were included in the model. The significant variable from the discrimination and safety category – have you faced discrimination in a church or faith-based setting – was included in the model. From the immunization attitudes

category, the variable "I worry that getting the flu shot would give me the flu" was included in the model because of its strong OR (0.10).

The variable "I can easily get the flu shot" was moved from the immunizations attitudes category to the transportation category since it too was asking a question regarding study participants' access to transportation resources. It was also included in the model because of its strong OR (2.44).

All the bivariately significant variables from the immunization history category were not included not in the model either because of the number of missing values that could cause quasi separation of data points when analyzing the data or the inability to attribute the variable to the whole age range of the study population. Interaction between the primary exposure and dichotomized age, church denomination, medical insurance policy, experienced discrimination in a church or faith-based setting, "I can easily get the flu shot", and "I worry that betting the flu shout will give me the flu" was chosen to be assessed in the model. These interaction terms were chosen due to indicators in the literature review.

Chosen Model Outcome

Did you or did you not get the 2012-2013 influenza vaccine? (C1)

Chosen Model Primary Exposure

Relationship with healthcare provider: I trust my provider to make decisions about which vaccines would be the best for me to receive (dc35)

Chosen Model Predictors

Dichotomized age (diage)

Discrimination variable: Have you faced discrimination in a church or faith-based setting? (redf10)

Church denomination variables (churchtype1, churchtype2)

Medical insurance policy variables (t1B11, t2B11)

Vaccine access variable: I can easily get the flu shot (dc41)

I worry that getting the flu shot would give me the flu (dc36)

<u>Chosen Model Interaction Terms</u>

Primary exposure and dichotomized age (dc35 x diage)

Primary exposure and discrimination in a church or faith-based setting (dc35 x redf10)

Primary exposure and church denomination (dc35 x churchtype1, dc35 x churchtype2)

Primary exposure and medical insurance policy (dc35 x t1B11, dc35 x t2B11)

Primary exposure and "I can easily get the flu shot" (dc35 x dc41)

Primary exposure and "I worry that getting the flu shot would give me the flu" (dc35 x dc36)

Collinearity Assessment

The full model with predictors and interaction terms was compared to the model with no interaction terms. The full model had multiple VIFs greater than 10 and the highest condition index was 40.13197. The reduced model had all VIFs less than 10, which indicated that the interaction terms were causing collinearity issues. The interaction terms with the greatest VIF values were the ones with the medical insurance variables (dc35xt2B11: 22.02008, dc35xt1B11: 14.36516), and one church denomination variable (dc35xchurchtype1: 12.57). These terms along with dc35xchurchtype2 were taken out of the model. When the model was run without those interaction terms, all the

VIFs were less than 10. The remaining interaction terms in the model were then assessed for significance.

Interaction Assessment

A likelihood ratio test was conducted comparing the full model with four interaction terms (-2LogL = 171.056) with the reduced model with no interaction terms (-2LogL = 164.89). The result (6.1666) was found to be less than the critical value of 9.488 (df = 4, alpha = 0.05), indicating that none of the interaction terms were significant. However, when backwards elimination was done and the interaction terms with dichotomized age (p = 0.8808), "I worry that getting the flu shot would give me the flu" (p = 0.6467), and the vaccine access variable (p = 0.3076) were eliminated, the interaction term with discrimination in a church or faith-based setting was found to be to be significant in the model (p = 0.0268). This interaction term was kept in the model while the other interaction terms were dropped.

Model Selection

After the interaction assessment, the following variables were left in the model that were statistically significant: relationship with healthcare provider (14.57 [3.44, 61.74], p = 0.0003), "I worry that getting the flu shot will give me the flu" (0.10 [0.04, 0.22], p < 0.0001), and the interaction term between healthcare provider relationship and experiencing discrimination in church or faith-based setting (0.09 [0.01, 0.76], p = 0.0268). The following statistically non-significant variables were also left in the model: the discrimination variable (p = 0.1451), dichotomized age (p = 0.4217), the influenza vaccine access variable (p = 0.1479), church denomination (churchtype1: p = 0.2346,

churchtype2: p = 0.9347), and medical insurance (t1B11: p = 0.2828, t2B11: p = 0.1684) (Table 10). This was set as the gold standard model.

An all possible subsets analysis was conducted to assess for confounding, comparing the resultant ORs for the primary exposure and the interaction term. The statistically significant variables – primary exposure, interaction term, and "I worry that getting the flu shot will give me the flu" – were kept in all the models. Although it was not statistically significant, the discrimination variable was also kept in all the models to keep them hierarchically well formulated.

Sixteen total models were compared. Only models 6, 8, 13, 14, and 15 yielded ORs for both dc35 and dc35xredf10 that fell within the OR ±10% range (Table 11). Furthermore, the medical insurance variables and the dichotomized age variable were kept in the model due to information provided in literature. When only the vaccine access variable was dropped from a model (model 12), the OR for the primary exposure went outside the OR ±10% range. Therefore, the vaccine access variable was left in the model. When only the church denomination variables were dropped from the model (model 15), both the primary exposure and interaction term ORs stayed within the OR ±10% range. However, when the church denomination variables and vaccine access variables were dropped from the model (model 7), both ORs went outside the OR ±10% range (Table 11).

When comparing the gold standard model and model 15, model 15 had a narrower confidence interval and was therefore more precise (Table 11). Therefore, model 15, where only the church denomination variables were dropped from the model,

was chosen as the final model representing the association between participants' relationship with their healthcare provider and their influenza vaccination outcome.

Model Statistics

The final model had the primary exposure "I trust my healthcare provider to make decisions about which vaccines are the best for me to receive" (dc35), the medical insurance policy variables (t1B11 and t2B11), the dichotomized age variable (diage), "I worry that getting the flu shot would give me the flu" (dc36), "I can easily get the flu shot" (dc41), discrimination experience in a church or faith-based setting, (redf10), and the interaction term between discrimination and the primary predictor (dc35xredf10) (Table 12) . The church denomination variables (churchtype1, churchtype2) from the gold standard model were dropped after confounding assessment.

Statistically significant variables in this model were: the primary predictor (OR= 14.83 [3.68, 59.83], p = 0.0002), "I worry that getting the flu shot would give me the flu" (OR = 0.1[0.05, 0.23], p < 0.0001), and the interaction term when redf10 = 0 (OR = 14.83[3.68, 59.83], p = 0.0002) (Table 12). The statistically insignificant variables − medical insurance (t1B11: p = 0.2549, t2B11: p = 0.1335), vaccine access (p = 0.1225), dichotomized age (p = 0.4584), and redf10 (p = 0.1847) - were left in the model either as confounders for the association between the primary exposure and the vaccination outcome or to keep the model hierarchically well formulated. When the interaction term was assessed by strata, the association between the primary exposure and outcome was significant only when redf10 = 0 (OR = 14.83[3.68, 59.83], p = 0.0002), but not when redf10 = 1 (p = 0.6074). (Table 12)

Assessing Prevalence Ratios

Because odds ratios tend to overstate associations between the exposure and the outcome, prevalence ratios were also assessed as a measure of association. The prevalence ratio of the primary exposure is 4.25 [1.48, 12.22] (p = 0.0072). A significant prevalence ratio were also observed with the "I worry that getting the flu shot will give me the flu" variable (prevalence ratio = 0.29 [0.17, 0.49], p <0.0001) (Table 13). Insignificant prevalence ratios were observed with the dichotomized age variable (p = 0.3967), the medical insurance policy variables (t1B11: p = 0.3151, t2B11: p = 0.3483), the discrimination variable (p = 0.1817), and the vaccine access (p = 0.0808). When assessing the interaction term, the prevalence ratio was only significant when redf10 = 0 (4.25[1.48, 12.22], p = 0.0072), but not when redf10 = 1 (p = 0.4484) (Table 13).

Discussion

Answering thesis objectives

1) **Do study participants' relationships with their healthcare provider (if they have one) predict whether or not they got the 2012-2013 influenza vaccination? [PRIMARY EXPOSURE]**

    The final model shows that participants' relationships with their healthcare provider and the trust they place in them in deciding which vaccines are the best for them to receive is associated with their vaccination outcome. The odds of being vaccinated if the participant trusts their healthcare provider is 14.83 times more than the odds of being vaccinated if the participant does not trust their healthcare provider. A positive vaccination outcome is 4.25 times more prevalent in the group that trusts their healthcare provider compared to the group that does not.

2) **Does a study participant's attitude towards vaccination and perception of influenza as an illness affect their vaccination outcome?**

    The variable concerning participants' perceptions of the influenza variable was found to be associated with the vaccination outcome during bivariate analyses. However, this variable was not included as a potential predictor in the model because of a large number of missing values that caused quasi-separation of data points. Although multiple variables were found to be significantly associated with the vaccination outcome during bivariate analysis, the variable "I worry that getting the flu shot would give me the flu" was chosen to represent this category in the initial model. In the final model, the variable was found to be significantly

associated with the vaccination outcome. The odds of being vaccinated if the participant believes that getting the influenza vaccine will give them the disease is 0.1 times the odds of being vaccinated if the participant does not believe that getting the influenza vaccine would give them influenza. A positive vaccination outcome is 0.29 times as prevalent in the group that believes getting the influenza vaccine would give them the illness compared to the group that does not.

3) **Does a study participant's religious affiliation (church denomination) predict whether or not they received the 2012-2013 influenza vaccination?**

The relationship between vaccination outcome and belonging to an SDA church denomination (versus the referent AME denomination) was found to be significant during bivariate analysis. However, the church denomination variables were dropped from the final model and were found to be insignificant predictors of the vaccination outcome and non-confounders of the association between the primary exposure and vaccination outcome.

4) **Did study participants' experience with discrimination and safety affect their odds of receiving the 2012-2013 influenza vaccination?**

Experiencing discrimination in a church or faith-based setting was found to be bivariately associated with the vaccination outcome. In the final model, the discrimination variable by itself was not found to be significant, but its interaction with the primary exposure was found to be significant. Analysis of the interaction term showed an insignificant association between the primary exposure and vaccination outcome if the participant had experienced discrimination in a church or faith-based setting, but a significant association between the primary exposure

and vaccination outcome if the participant had not experienced discrimination in a church or faith-based setting. Among those who did not experience discrimination, the prevalence of a positive vaccination outcome was 4.25 times higher in the group that trusts their healthcare provider compared to the group that did not. Among those who did not experience discrimination, the odds of being vaccinated if the participant trusted their healthcare provider was 14.83 times more than the odds of being vaccinated if the participant did not trust their healthcare provider.

5) **Does study participants' access to government resources affect their vaccination outcome?**

Participants' access to government resources was represented by the medical insurance variable and whether or not they had Medicare as at least part of their medical insurance policy. These variables were found to be significant with the vaccination outcome during the bivariate analysis. They were not found to be significant in the final model, but were kept as confounders of the association between the primary exposure and vaccination outcome.

Results Interpretation

Although there have been studies describing the association between healthcare provider relationship and subsequent health outcomes, studies describing the relationship between faith-based settings and health outcomes, and studies about attitudes towards influenza vaccines in an African American population, there is a dearth of literature on studies that examine the combined effect faith-based settings and healthcare provider

relationship have on influenza outcomes in this population. This seems like an integral factor to discuss, given the age group of this population.

The model displays a strong relationship between participants' trust in their healthcare provider's ability to make vaccine-related decisions for them and their vaccination outcome (OR: 14.83 [3.68, 59.83], PR: 4.25 [1.48, 12.22]). This is a relationship that makes sense and is supported by the research provided in the literature review. The primary exposure serves as a proxy for the participants' general relationship with their healthcare provider, and the better that relationship, the more likely the participant is to participate in healthy and preventive behaviors suggested by his or her healthcare provider.

However, it is the other variables in the model – the confounders and the interaction term - that provide a sociocultural context to the exposure-outcome relationship in terms of the age of the participants and the cultural background that they come from. The Advisory Committee on Immunization Practices suggests that everybody above the age of 6 months get the influenza vaccine, but particularly populations that are at high risk, including those above the age of 50 (1,6). People over the age of 65 account for 90% of all influenza-related deaths (6, 23, 26), so it can be presumed that healthcare providers would alter their health messages to more strongly favor influenza vaccinations for that age group. A stronger health message may foster a stronger relationship between healthcare providers and their patients. This explains the bivariate association that was found between the dichotomized age variable and the vaccination outcome, as well as the confounding role it plays in the model.

The medical insurance policy variables were also confounders in the model and were found to be bivariately associated with the vaccination outcome. This is supported by literature that states that managed care is an important predictor of vaccination in elderly and minority populations (6). Literature suggests that managed care is detrimental to the healthcare provider-patient relationship and quality of care because of the healthcare provider's inability to put the patients' needs first (17).

This influence was not seen in the model; however, this could be because of two reasons: (1) because the influenza vaccination is an optional vaccine, there is no conflict at hand for healthcare providers to decide between their patients' needs and what their insurance policy dictates, and (2) because this population is more likely to have managed care for their insurance policy due to their age, the medical insurance policy variables remain in the model most likely because they facilitate study participants' ability to pay for preventive health services, such as influenza vaccinations.

The variable "I can easily get the flu shot", which was a proxy for study participants' access and ability to access vaccine resources, also was a confounder in the model. The relationship between this access variable and the vaccination outcome is represented in the bivariate analysis, where those who report that they can easily access the influenza vaccine are more likely to be vaccinated. The model suggests that there is also a relationship between the access variable and study participants' relationship with their healthcare providers. This could be because if a study participant is more able to access the influenza vaccine, this probably means they have better access to other health resources – this includes their healthcare provider, and the close access facilitates a better doctor-patient relationship.

The interaction between the primary exposure and the discrimination variable (if the participant has experienced discrimination in a church or faith-based setting) is significant in the model. After determining the primary exposure-outcome odds and prevalence ratios stratifying by discrimination experience (or lack thereof), it appears that experiencing discrimination in a church or faith-based setting did not alter study participants' relationships with their healthcare providers, but not experiencing discrimination made study participants more likely to place trust in their healthcare providers. This suggests that a lack of experiencing discrimination in a church or faith-based setting leads to a greater likelihood of study participants listening to their healthcare providers and trusting them to make health-related decisions for them. Because these churches have greater than a 60% African American population, it appears unlikely that the discrimination study participants' note in the survey is racial discrimination that they experience from their pastors or congregation members. It is more likely that this discrimination is a normative negative attitude among congregation members towards particular health behaviors that may include vaccinations.

Literature suggests that complementary alternative medicine such as prayer, herbs, meditation, vitamins, and exercise is prevalent in elderly populations (11), and that a majority do not consult their healthcare provider when partaking in these alternative therapies (12). Complementary alternative medicine has also been shown to be favored by elderly African American women, choosing to use religion and spirituality for health reasons (15). Factors associated with the use of complementary alternative medicine in the African American population include: age, cultural traditions, and lack of access to and mistrust of conventional medicine (5). This could account for the significant variable

in the model "I believe the getting the flu shot would give me the flu", perhaps confirming the association between mistrust in Western medicine and the use of complementary alternative medicine.

Along with the alternative medicine lifestyle, this mistrust of Western medicine may be caused by medical discrimination this population has faced in the past, such as wit the 1932 U.S. Public Health Service Tuskegee Syphilis Study (5, 34). Furthermore, the family and the church are two of the main sources of social support in the African American community, with the church often promoting unity within the community (36). It was noted during the data collection process that the larger AME churches provided resources to their parishioners such as a credit union and medical counseling, perhaps facilitating a community atmosphere within the church. This is supported by the literature; black churches have historically provided social services such as food, clothing, and educational and employment opportunities to its members when they were unavailable elsewhere (36). The church has been an alternative source of care for the elderly, essentially acting as a surrogate family and providing emotional support (33, 36). There is also literature suggesting that the most prevalent form of emotional support from the church comes during times of illness (33).

When the church is a strong component of social support and alternative medicine is widely viewed as a valid health choice, a negative normative attitude towards Western medicine and healthcare providers could potentially dissuade church members from seeking out information regarding conventional health services and trusting their healthcare providers. This negative attitude has already been established regarding mental (4) and HIV-related health services (37) in the literature. Although this specific

occurrence has not been demonstrated in the model, the model does suggest that if the attitude within the church congregation towards healthcare providers and Western medicine changes, and parishioners no longer feel a general sense of distrust towards Western medicine among their community, they would be more likely to trust their healthcare provider with decisions about health and preventive care decisions.

The results of this study indicate that altering the perceptions of Western medicine, preventive health behaviors that utilize Western medicine, and perceptions of healthcare providers amongst church communities is integral in encouraging this population to receive the influenza vaccine, pursue other health behaviors, and engage in conversation with their healthcare providers. This is already an important component of the Dose of Hope study, with African American speakers that work in various areas of healthcare speaking about preventive behaviors in obesity, hypertension, stroke, and HIV. Presentations on influenza and its vaccine were also given at the 3-month time point. These speakers were able to connect with the study participants not only through the health information they had, but also through personal stories involved relatives that were in the participants' age group. It was apparent that the personal connection made it easier for the health speakers to connect with their audience and that the study participants felt more at ease with someone that understood their cultural background and mentality.

Over a period of time, sustained exposure to preventive health information (that includes vaccine information) coming from presenters that have a strong background in healthcare, are experienced enough in the field to easily disseminate health information, and understand or have experienced the cultural background in this age group could lead to a change in mindset in this population. An integrative approach involving church

collaborations with healthcare providers has already been suggested as a way of improving access and attitudes towards mental health resources (4). A study looking at the effect a health intervention that paired faith-based settings with members in the academic and medical community had on health attitudes in the elderly yielded a positive response in the intervention evaluations, suggesting that this multidimensional approach has the potential to successfully promote conventional medicine as an avenue for healthy behaviors (28). An open mindset within the congregation could lead members to feel less uncomfortable seeking out health information, develop strong relationship with their healthcare providers, and look more favorably towards getting vaccinated for illnesses, the influenza vaccine being one of them.

Study Limitations

This study utilizes a cross-sectional design, so causality cannot be ascertained using cross-sectional measures of associations. Although the Baptist churches utilized a randomization procedure to select a list of congregation members for screening, the SDA and AME churches often provided a list of members that had expressed interest in the study and would potentially be eligible, potentially causing some self-selection bias. The vaccination outcome was also self-reported without any medical records verification, also potentially leading to bias. The primary measure of association in this study was the odds ratio, which tends to overstate the association between predictors and the outcome. This could be due to the vaccination outcome not being a rare event (less than 10% in the overall population). When the prevalence ratios were determined using the final model, they were closer to the null compared to the odds ratios, but the significance of the predictors remained the same using both measures. So although the associations were

initially overstated by the odds ratio, the significant predictors in the model can still be considered as explanatory variables for the vaccination outcome.

Future Directions

Future studies in this area should look at amassing a larger sample size that includes a larger variety of church denominations. Some sort of medical records verification regarding the vaccination outcome should also be considered to eliminate the potential self-report bias. Future studies should also look at utilizing a randomization procedure to select study participants in all the selected churches to eliminate any self-selection bias.

Conclusion

This study looked at predictors of seasonal 2012-2013 influenza vaccination decision making in an elderly African American population using data collected in a faith-based setting. This was of interest because there is no study that looks at the combined effect faith-based settings and healthcare provider relationship have on influenza outcomes in this population. Given that there is literature displaying the relationship between healthcare provider trust and health outcomes, between faith-based settings and health outcomes, and elderly minority attitudes towards influenza vaccines, this is significant.

The primary exposure was identified as trusting the healthcare provider to make vaccine decisions for you, although other questions were posed. The final model showed that the odds and prevalence of getting vaccinated were stronger if study participants had a strong relationship and trust with their healthcare provider compared to if they did not. The model also showed that the odds and prevalence of getting vaccinated was less likely if study participants believed that getting influenza vaccine would give them the illness. Medical insurance, easy access to getting the influenza vaccine, and age bracket were identified as confounders in the model.

There was a significant interaction term in the model between the primary exposure and discrimination in a church or faith-based setting that indicated a lack of experiencing discrimination in a church or faith-based setting made study participants more receptive to their healthcare providers. The discrimination is not necessarily racial discrimination, given the homogeneity of the study population, but a normative negative attitude within the church towards Western medicine and health behaviors. This negative

attitude and distrust may be fostered by the alternative medicine lifestyle that is prevalent in the elderly African American populations, coupled with medical discrimination this population has faced in the past.

When these attitudes are brought into a faith-based setting, an important social structure for this population, it can create an atmosphere where individuals feel uncomfortable going against the norm – or at least, according to the model, they would be more likely to seek out Western medicine and health behaviors if they did not experience this normative attitude. Altering this mindset appears integral to developing stronger healthcare provider relationships and accessing Western preventive health behaviors in this population. This can be done through sustained exposure to health speakers that are African American, have strong backgrounds in healthcare, and understand the cultural background in this age group and can provide anecdotes as a way to connect with them. Although it may be easier to develop this exposure in a faith-based setting, the exposure can happen anywhere so long as the net outcome is that the congregation members communicate that altered mindset to their peers, developing open-mindedness to traditional medicine, including vaccinations, in the faith-based setting.

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Table 1

Table 1. Description of Dose of Hope's study population at the 3-month time point		
Total n = 208		
Variable	**N**	**% of population**
Received vaccine	95	45.67
Gender		
Male (ref)	44	21.15
Female	164	78.85
Age		
50-64 (ref)	116	55.77
65+	92	44.23
Marital Status		
Single/Never Married (ref)	20	9.62
Married/Domestic Partner	98	47.12
Divorced/Separated	56	26.92
Widowed	34	16.35
Education		
Up to High School/GED (ref)	75	36.06
Technical/Vocational/ Associates	60	28.85
Bachelor Degree	35	16.83
Masters/Doctorate	38	18.27
Employment (missing: 7)		
Unemployed/retired (ref)	138	66.67
Employed (full time, part time)	63	30.43
Exposure to Health Education Materials		
No (ref)	104	50.00
Yes	104	50.00

Table 1. Description of Dose of Hope's study population at the 3-month time point		
Total n = 208		
Variable	**N**	**% of population**
Medical Insurance Policy (missing = 4)		
No insurance/other (ref)	22	10.78
Private insurance plan*	75	36.76
Managed Care/Combination of private insurance and managed care*	107	52.45
Church		
Greater Piney Grove Baptist Church	38	18.27
Turner Chapel AME	28	13.46
Decatur SDA	38	18.27
Greater Travelers' Rest Baptist Church	34	16.35
St Philip AME	30	14.42
Maranatha SDA	40	19.23
Church Denomination		
American Methodist Episcopalian (ref)	58	27.88
Baptist	72	34.62
Seventh Day Adventist	78	37.50
Income Bracket (missing: 22)		
Less than $20,000 (ref)	55	29.57
$20,001 - $40,000	46	24.73
$40,001 - $80,000	55	29.57
$80,001+	30	16.13

Table 2

Table 2. Distribution and bivariate analysis of descriptive variables by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Descriptive Variables					**OR (95% CI)**	**p-value**
Gender						
Male (ref)	19	25	44	43.18	--	--
Female	76	88	164	46.34	1.14 (0.58, 2.22)	0.7087
Age						
50-64 (ref)	42	74	116	36.21	--	--
65+	53	39	92	57.61	2.39 (1.37, 4.20)	0.0021
Marital Status						
Single/Never Married (ref)	10	10	20	50.00	--	0.0029 (overall)
Married/Domestic Partner	44	54	98	44.90	0.81 (0.31, 2.13)	0.6764
Divorced/Separated	17	39	56	30.36	0.44 (0.15, 1.24)	0.1151
Widowed	24	10	34	70.59	2.4 (0.76, 7.55)	0.1303
Education						
Up to High School/GED (ref)	32	42	75	42.67	--	0.0946 (overall)
Technical/Vocational/ Associates	35	25	60	58.33	1.78 (0.90, 3.54)	0.0979
Bachelor Degree	12	23	35	34.29	0.66 (0.29, 1.53)	0.3345
Masters/Doctorate	15	23	38	39.47	0.83 (0.38, 1.84)	0.6456
Employment (missing: 7)						
Unemployed/retired (ref)	69	69	138	50.00	--	--
Employed (full time, part time)	24	39	63	38.10	0.62 (0.34, 1.13)	0.1164
Exposure to Health Education Materials						
No (ref)	48	56	104	46.15	--	--
Yes	47	57	104	45.19	0.96 (0.56, 1.66)	0.8893

	Did you get the flu vaccine?			% vaccinated		
Table 2. Distribution and bivariate analysis of descriptive variables by vaccination outcome						
	Yes	No	Total			
	95	113	208	45.67		
Descriptive Variables					OR (95% CI)	p-value
Income Bracket (missing: 22)						
Less than $20,000 (ref)	25	30	55	45.45	--	0.7067 (overall)
$20,001 - $40,000	21	25	46	45.65	1.01 (0.46, 2.21)	0.9842
$40,001 - $80,000	29	26	55	52.73	1.34 (0.63, 2.83)	0.4455
$80,001+	12	18	30	40.00	0.80 (0.32, 1.97)	0.6279
Medical Insurance Policy (missing = 4)						
No insurance/other (ref)	2	20	22	9.09	--	<0.0001 (overall) *
Private insurance plan*	28	47	75	37.33	5.96 (1.27, 55.62) **	0.0165 *
Managed Care/Combination of private insurance and managed care*	63	44	107	58.88	14.32 (3.16, 130.26) **	<0.0001 *
Church Denomination						
American Methodist Episcopalian (ref)	31	27	58	53.45	--	0.0004 (overall)
Baptist	42	30	72	58.33	1.22 (0.61, 2.45)	0.5769
Seventh Day Adventist	22	56	78	28.21	0.34 (0.17, 0.70)	0.0028
*used Fisher's exact test		****calculated Fisher exact confidence limits around OR**				

Table 3

Table 3. Distribution and bivariate analysis of variables pertaining to participants' relationship with their healthcare provider by vaccination outcome					
	Did you get the flu vaccine?			**% vaccinated**	
	Yes	No	Total		
	95	113	208	45.67	
Variable				**OR (95% CI)**	**p-value**
Dichotomized relationship with healthcare provider					
1-5 (ref)	6	23	29	20.69	-- --
6-10	89	90	179	49.72	3.79 (1.47, 9.75) 0.0036
Do you trust your healthcare provider? (missing: 24)					
No (ref)	0	1	1	0	-- --
Yes	91	92	183	49.73	-- 1 *
I feel comfortable talking to my healthcare provider about immunizations					
Disagree/Neutral (ref)	2	9	11	18.18	-- --
Agree	93	104	197	47.21	4.02 (0.80, 38.99) ** 0.0692*
I feel comfortable talking to my healthcare provider about preventive procedures					
Disagree/Neutral (ref)	3	9	12	25.00	-- --
Agree	92	104	196	46.94	2.65 (0.63, 15.62) ** 0.2316*
* used Fisher's exact test **calculated Fisher exact confidence limits around OR					

Table 3. Distribution and bivariate analysis of variables pertaining to participants' relationship with their healthcare provider by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Variable					**OR (95% CI)**	**p-value**
I feel a strong commitment with my healthcare provider						
Disagree/Neutral (ref)	7	15	22	31.82	--	--
Agree	88	98	186	47.31	1.92 (0.75, 4.94)	0.1677
I would expend effort to keep seeing my healthcare provider						
Disagree/Neutral (ref)	8	18	26	30.77	--	--
Agree	87	95	182	47.80	2.06 (0.85, 4.98)	0.1029
I feel loyal to my healthcare provider						
Disagree/Neutral (ref)	18	28	46	39.13	--	--
Agree	77	85	162	47.53	1.41 (0.72, 2.75)	0.3128
I intend to make an appointment with my healthcare provider again						
Disagree/Neutral (ref)	5	10	15	33.33	--	--
Agree	90	103	193	46.63	1.75 (0.58, 5.30)	0.3192

Table 3. Distribution and bivariate analysis of variables pertaining to participants' relationship with their healthcare provider by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Variable					**OR (95% CI)**	**p-value**
I would work with my healthcare provider even if my fees increase						
Disagree/Neutral (ref)	20	34	54	37.04	--	--
Agree	75	79	154	48.70	1.61 (0.85, 3.05)	0.1387
I trust my healthcare providers judgment						
Disagree/Neutral (ref)	8	17	25	32.00	--	--
Agree	87	96	183	47.54	1.93 (0.79, 4.68)	0.1434
My healthcare provider has experience and knows the best						
Disagree/Neutral (ref)	7	23	30	23.33	--	--
Agree	88	90	178	49.44	3.21 (1.31, 7.87)	0.0079
I trust my provider to make decisions about which vaccines would be the best for me to receive						
Disagree/Neutral (ref)	9	41	50	18.00	--	--
Agree	86	72	158	54.43	5.44 (2.48, 11.95)	<0.0001

Table 4

Table 4. Distribution and bivariate analysis of variables pertaining to participants' attitudes towards immunizations by vaccination outcome						
	Did you get the flu vaccine?			% vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					OR (95% CI)	p-value
I want to be told about vaccine's side effects and how they occur						
Disagree/Neutral (ref)	6	10	16	37.50	--	--
Agree	89	103	192	46.35	1.44 (0.50, 4.12)	0.4945
I feel like I have enough access to immunization information						
Disagree/Neutral (ref)	46	58	104	44.23	--	--
Agree	49	55	104	47.12	1.12 (0.65, 1.94)	0.6762
I want more info about immunizations before making decisions						
Disagree/Neutral (ref)	14	14	28	50.00	--	--
Agree	81	99	180	45.00	0.82 (0.37, 1.82)	0.6212
immunizations are important for a healthy lifestyle						
Disagree/Neutral (ref)	6	36	42	14.29	--	--
Agree	89	77	166	53.61	6.94 (2.77, 17.34)	<0.0001
my body can protect itself against vaccine diseases						
Disagree/Neutral (ref)	77	80	157	49.04	--	--
Agree	18	33	51	35.29	0.57 (0.29, 1.09)	0.0868
I worry that getting the flu shot would give me the flu						
Disagree/Neutral (ref)	80	40	120	66.67	--	--
Agree	15	73	88	17.05	0.10 (0.05, 0.20)	<0.0001

Table 4. Distribution and bivariate analysis of variables pertaining to participants' attitudes towards immunizations by vaccination outcome						
	Did you get the flu vaccine?			% vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
I would be less likely to get a flu vaccine if it gave me symptoms such as tiredness or fever						
Disagree/Neutral (ref)	60	40	100	60.00	--	--
Agree	35	73	108	32.41	0.32 (0.18, 0.56)	<0.0001
immunizations can actually lead to illness						
Disagree/Neutral (ref)	81	68	149	54.36	--	--
Agree	14	45	59	23.73	0.26 (0.13, 0.52)	<0.0001
I would like to know more about what is in shots						
Disagree/Neutral (ref)	17	14	31	54.84	--	--
Agree	78	99	177	44.07	0.65 (0.30, 1.40)	0.2667
I doubt whether vaccines really work						
Disagree/Neutral (ref)	83	86	169	49.11	--	--
Agree	12	27	39	30.77	0.46 (0.22, 0.97)	0.0382
I can easily get the flu shot						
Disagree/Neutral (ref)	9	23	32	28.13	--	--
Agree	86	90	176	48.86	2.44 (1.07, 5.57)	0.0303

Table 5

Table 5. Distribution and bivariate analysis of variables pertaining to participants' sources for health information by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
Have you received your health information from:						
Family and friends? (missing: 5)						
no (ref)	59	70	129	45.74	--	--
Yes	34	40	74	45.95	1.01 (0.57, 1.79)	0.977
Your healthcare provider? (missing: 5)						
no (ref)	12	22	34	35.29	--	--
Yes	81	88	169	47.93	1.69 (0.79, 3.63)	0.1773
books/TV/magazines? (missing: 5)						
no (ref)	70	89	159	44.03	--	--
Yes	23	21	44	52.27	1.39 (0.71, 2.72)	0.3312
a health help line? (missing: 5)						
no (ref)	82	94	176	46.59	--	--
Yes	11	16	27	40.74	0.79 (0.35, 1.79)	0.57
the health department? (missing: 5)						
no (ref)	84	99	183	45.90	--	--
Yes	9	11	20	45.00	0.96 (0.38, 2.44)	0.9388
your church? (missing: 5)						
no (ref)	76	82	158	48.10	--	--
Yes	17	28	45	37.78	0.66 (0.33, 1.29)	0.2201

Table 5. Distribution and bivariate analysis of variables pertaining to participants' sources for health information by vaccination outcome

	Did you get the flu vaccine?			% vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
Have you received your health information from:						
the Internet?						
(missing: 5)						
no (ref)	60	67	127	47.24	--	--
Yes	33	43	76	43.42	0.86 (0.48, 1.52)	0.5967
your school?						
(missing: 5)						
no (ref)	92	107	199	46.23	--	--
Yes	1	3	4	25.00	0.39 (0.01, 4.94) **	0.6266 *
a healer?						
(missing: 5)						
no (ref)	93	109	202	46.04	--	--
Yes	0	1	1	0	--	--
the public library?						
(missing: 5)						
no (ref)	88	109	197	44.67	--	--
Yes	5	1	6	83.33	6.19 (0.67, 295.55) **	0.0956 *
other sources?						
(missing: 5)						
no (ref)	88	102	190	46.32	--	--
Yes	5	8	13	38.46	0.72 (0.23, 2.30)	0.5824
How often in the last month have you looked for health information in:						
books/brochures?						
sometimes/never (ref)	49	57	106	46.23	--	--
often/all the time	46	56	102	45.10	0.96 (0.55, 1.65)	0.8703

* used Fisher's exact test   **calculated Fisher exact confidence limits around OR

Table 5. Distribution and bivariate analysis of variables pertaining to participants' sources for health information by vaccination outcome						
	Did you get the flu vaccine?			% Vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
How often in the last month have you looked for health information in:						
Talks/Presentations						
sometimes/never (ref)	56	70	126	44.44	--	--
often/all the time	39	43	82	47.56	1.13 (0.65, 1.98)	0.6592
magazines/newspapers?						
sometimes/never (ref)	51	69	120	42.50	--	--
often/all the time	44	44	88	50.00	1.35 (0.78, 2.35)	0.2834
the Internet?						
sometimes/never (ref)	41	50	91	45.05	--	--
often/all the time	54	63	117	46.15	1.05 (0.60, 1.81)	0.8746
TV/radio?						
sometimes/never (ref)	51	73	124	41.13	--	--
often/all the time	44	40	84	52.38	1.57 (0.90, 2.75)	0.1099
Healthcare provider?						
sometimes/never (ref)	24	43	67	35.82	--	--
often/all the time	71	70	141	50.35	1.82 (1.00, 3.31)	0.0493
Family						
sometimes/never (ref)	54	68	122	44.26	--	--
often/all the time	41	45	86	47.67	1.15 (0.66, 2.00)	0.6266
Friends						
sometimes/never (ref)	59	74	133	44.36	--	--
often/all the time	36	39	75	48.00	1.16 (0.66, 2.04)	0.6129
Faith Leader or Pastor						
sometimes/never (ref)	66	87	153	43.14	--	--
often/all the time	29	26	55	52.73	1.47 (0.79, 2.73)	0.2207

Table 5. Distribution and bivariate analysis of variables pertaining to participants' sources for health information by vaccination outcome						
	Did you get the flu vaccine?			% Vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
I would trust health information from: books/brochures						
Disagree/Neutral (ref)	26	35	61	42.62	--	--
Agree	69	78	147	46.94	1.19 (0.65, 2.17)	0.5694
a magazine/newspaper						
Disagree/Neutral (ref)	33	54	87	37.93	--	--
Agree	62	59	121	51.24	1.72 (0.98, 3.01)	0.0573
the Internet						
Disagree/Neutral (ref)	37	49	86	43.02	--	--
Agree	58	64	122	47.54	1.20 (0.69, 2.09)	0.5195
I would trust health information from: the TV/Radio						
Disagree/Neutral (ref)	36	57	93	38.71	--	--
Agree	59	56	115	51.30	1.67 (0.96, 2.91)	0.0698
a talk/presentation						
Disagree/Neutral (ref)	24	36	60	40.00	--	--
Agree	71	77	148	47.97	1.38 (0.75, 2.54)	0.2956

Table 5. Distribution and bivariate analysis of variables pertaining to participants' sources for health information by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
I would trust health information from:						
my doctor or healthcare provider						
Disagree/Neutral (ref)	2	4	6	33.33	--	--
Agree	93	109	202	46.04	1.71 (0.24, 19.21) **	0.6901*
my family						
Disagree/Neutral (ref)	28	36	64	43.75	--	--
Agree	67	77	144	46.53	1.12 (0.62, 2.02)	0.7105
my friends						
Disagree/Neutral (ref)	39	49	88	44.32	--	--
Agree	56	64	120	46.67	1.10 (0.63, 1.91)	0.7369
my faith leader/pastor						
Disagree/Neutral (ref)	31	44	75	41.33	--	--
Agree	64	69	133	48.12	1.32 (0.74, 2.33)	0.3454
my church						
Disagree/Neutral (ref)	31	35	66	46.97	--	--
Agree	64	78	142	45.07	0.93 (0.52, 1.66)	0.798
* used Fisher's exact test **calculated Fisher exact confidence limits around OR						

Table 6

Table 6. Distribution and bivariate analysis of variables pertaining to participants' attitudes towards discrimination and safety by vaccination outcome					
	Did you get the flu vaccine?			% vaccinated	
	Yes	No	Total		
	95	113	208	45.67	
Variables				**OR (95% CI)**	**p-value**
Have you faced discrimination:					
at school?					
(missing: 15)					
no (ref)	35	46	81	43.21	--	--
yes	54	58	112	48.21	1.22 (0.69, 2.17)	0.4913
applying for a job?					
(missing: 15)					
no (ref)	22	31	53	41.51	--	--
yes	68	72	140	48.57	1.33 (0.70, 2.52)	0.3801
at work?					
(missing: 13)					
no (ref)	21	32	53	39.62	--	--
yes	67	75	142	47.18	1.36 (0.72, 2.59)	0.3452
in a store, at a restaurant, or another public place?					
(missing: 13)					
no (ref)	12	20	32	37.50	--	--
yes	77	86	163	47.24	1.51 (0.69, 3.29)	0.3
getting medical care?					
(missing: 18)					
no (ref)	53	62	115	46.09	--	--
yes	34	41	75	45.33	0.97 (0.54, 1.73)	0.9188
from the police or in the courts? (missing: 20)					
no (ref)	40	47	87	45.98	--	--
yes	47	54	101	46.53	1.02 (0.58, 1.82)	0.9391

Table 6. Distribution and bivariate analysis of variables pertaining to participants' attitudes towards discrimination and safety by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
Have you faced discrimination:						
volunteering for a medical research study? (missing: 20)						
no (ref)	51	58	109	46.79	--	--
yes	36	43	79	45.57	0.95 (0.53, 1.70)	0.8685
interacting with medical research study staff? (missing: 20)						
no (ref)	49	58	107	45.79	--	--
yes	38	43	81	46.91	1.05 (0.57, 0.59)	0.8789
at a college or university? (missing: 19)						
no (ref)	50	56	106	47.17	--	--
yes	37	46	83	44.58	0.76 (0.51, 1.60)	0.7228
at church or faith-based organization? (missing: 19)						
no (ref)	71	67	138	51.45	--	--
yes	17	34	51	33.33	0.47 (0.24, 0.92)	0.0267
at a community-based organization (missing: 20)						
no (ref)	64	71	135	47.41	--	--
yes	23	30	53	43.40	0.85 (0.45, 1.61)	0.6197
how safe do you feel in your daily life?						
not at all/slightly moderately (ref)	22	19	41	53.66	--	--
very/extremely	73	94	167	43.71	0.67 (0.34, 1.33)	0.252

Table 6. Distribution and bivariate analysis of variables pertaining to participants' attitudes towards discrimination and safety by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
do you feel you are living in a safe and secure environment?						
not at all/slightly moderately (ref)	34	33	67	50.75	--	--
very/extremely	61	80	141	43.26	0.74 (0.41, 1.33)	0.3113
how much do you worry about your safety and security?						
not at all/slightly moderately (ref)	78	102	180	43.33	--	--
very/extremely	17	11	28	60.71	2.02 (0.90, 4.56)	0.0859
how comfortable is the place you live?						
not at all/slightly moderately (ref)	25	30	55	45.45	--	--
very/extremely	70	83	153	45.75	1.01 (0.55, 1.88)	0.9697
how easily are you able to get good medical care?						
not at all/slightly moderately (ref)	18	23	41	43.90	--	--
very/extremely	77	90	167	46.11	1.09 (0.55, 2.17)	0.7995

Table 7

Table 7. Distribution and bivariate analysis of variables pertaining to transportation issues by vaccination outcome						
	Did you get the flu vaccine?			**% vaccinated**		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
how often do you have access to transportation to healthcare? (missing : 2)						
sometimes/not often/never (ref)	8	1	9	88.89	--	--
always/most of the time	86	111	197	43.65	0.10 (0.00, 0.75) **	0.0123 *
have you ever lacked transport to get to a healthcare provider? (missing: 2)						
no (ref)	87	103	190	45.79	--	--
yes	8	8	16	50.00	1.18 (0.43, 3.29)	0.7456
* used Fisher's exact test **calculated Fisher exact confidence limits around OR						

Table 8

Table 8. Distribution and bivariate analysis of variables pertaining to spirituality by vaccination outcome						
	Did you get the flu vaccine?			% vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
do your personal beliefs give meaning to your life?						
no/moderately (ref)	9	8	17	52.94	--	--
Yes	86	105	191	45.03	0.73 (0.27, 1.97)	0.5301
to what extent do you find your life to be meaningful?						
no/moderately (ref)	9	11	20	45.00	--	--
Yes	86	102	188	45.74	1.03 (0.41, 2.60)	0.9493
to what extent do your personal beliefs give you strength to face difficulties?						
no/moderately (ref)	9	8	17	52.94	--	--
Yes	86	105	191	45.03	0.73 (0.27, 1.97)	0.5301
to what extent do your personal beliefs let you understand difficulties in your life?						
no/moderately (ref)	9	10	19	47.37	--	--
Yes	86	103	189	45.50	0.93 (0.36, 2.39)	0.8763

Table 9

Table 9. Distribution and bivariate analysis of variables pertaining to participants' and their families' vaccine history by vaccination outcome					
	Did you get the flu vaccine?			**% vaccinated**	
	Yes	No	Total		
	95	113	208	45.67	
Variables					**OR (95% CI)**	**p-value**
How often did you get the flu shot in the last 5 years? (missing: 5)						
0/1 times (ref)	8	94	102	7.84	--	<0.0001 (overall) *
2-4 times	22	11	33	66.67	23.5 (7.63, 74.71) **	<0.0001 *
5 times	64	4	68	94.12	188 (48.98, 833.24) **	<0.0001 *
Has a family member received the flu shot in the last year? (missing: 46)						
No (ref)	17	44	61	27.87	--	--
Yes	60	41	101	59.41	3.79 (1.91, 7.52)	<0.0001
Has anyone in the family refused to get a flu shot in the last year? (missing: 87)						
No (ref)	47	30	77	61.04	--	--
Yes	15	29	44	34.09	0.33 (0.15, 0.72)	0.0043
How serious do you think it would be if you got the seasonal flu? (missing: 47)						
not at all/somewhat serious (ref)	24	40	64	37.50	--	--
serious/very or extremely serious	53	44	97	54.64	2.01 (1.05, 3.83)	0.0331
* Fisher's exact test **calculated Fisher exact confidence limits around OR						

Table 9. Distribution and bivariate analysis of variables pertaining to participants' and their families' vaccine history by vaccination outcome					
	Did you get the flu vaccine?			% vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					**OR (95% CI)**	**p-value**
In the past year, have you received:						
Chicken pox (missing: 26)						
No (ref)	56	82	138	40.58	--	--
Yes	21	23	44	47.73	1.34 (0.68, 2.64)	0.4034
Hepatitis B (missing: 33)						
No (ref)	67	82	149	44.97	--	--
Yes	12	14	26	46.15	1.05 (0.45, 2.42)	0.9106
Measles, Mumps, Rubella (MMR) (missing : 24)						
No (ref)	59	79	138	42.75	--	--
Yes	20	26	46	43.48	1.03 (0.53, 2.02)	0.9315
Meningococcal (missing: 42)						
No (ref)	71	91	162	43.83	--	--
Yes	2	2	4	50.00	1.28 (0.09, 18.06) **	1 *
* Fisher's exact test **calculated Fisher exact confidence limits around OR						

Table 9. Distribution and bivariate analysis of variables pertaining to participants' and their families' vaccine history by vaccination outcome

	Did you get the flu vaccine?			% vaccinated		
	Yes	No	Total			
	95	113	208	45.67		
Variables					OR (95% CI)	p-value
In the past year, have you received:						
Pertussis (missing: 39)						
No (ref)	70	87	157	44.59	--	--
Yes	5	7	12	41.67	0.89 (0.27, 2.92)	0.8445
Shingles (missing: 30)						
No (ref)	62	91	153	40.52	--	--
Yes	20	5	25	80.00	5.87 (2.09, 16.47)	0.0002
Pneumonia (missing: 24)						
No (ref)	58	92	150	38.67	--	--
Yes	29	5	34	85.29	9.20 (3.37, 25.12)	<0.0001
Tetanus-Diptheria (missing: 27)						
No (ref)	55	78	133	41.35	--	--
Yes	28	20	48	58.33	1.99 (1.02, 3.88)	0.043

Table 10

Table 10. Statistics for the gold standard model describing the association between participants' relationship with their healthcare provider and vaccination outcome			
Variable	**OR**	**95% CI**	**p-value**
Intercept	--	--	0.0028
dc35	14.57	(3.44, 61.74)	0.0003
Diage	1.59	(0.51, 4.93)	0.4217
redf10	3.98	(0.62, 25.48)	0.1451
churchtype1	1.78	(0.69, 4.59)	0.2346
churchtype2	0.96	(0.36, 2.59)	0.9347
t1B11	2.75	(0.434, 17.5)	0.2828
t2B11	3.71	(0.58, 23.88)	0.1684
dc41	2.41	(0.73, 7.96)	0.1479
dc36	0.1	(0.04, 0.22)	<0.0001
dc35xredf10 when redf10 = 1	1.33	(0.28, 6.41)	0.7214
dc35xredf10 when redf10 = 0	14.47	(3.44, 61.74)	0.0003

Table 11

Table 11. Confounding Analysis for All Possible Subsets of Gold Standard Model (when dc35, dc36, redf10, and dc35xredf10 are kept)						
Model	Variables Kept	Variables Dropped	dc35 OR	dc35 OR 95% CI	dc35xredf10 OR	dc35xredf10 OR 95% CI
GS	diage, churchtype1, churchtype2, t1B11, t2B11, dc41	none	14.57	3.44, 61.74	0.09	0.01, 0.76
1	none	diage, churchtype1, churchtype2, t1B11, t2B11, dc41	15.41	4.05, 58.67	0.15	1
2	diage	churchtype1, churchtype2, t1B11, t2B11, dc41	17.02	4.33, 66.94	0.1	0.01, 0.79
3	churchtype1, churchtype2	diage, t1B11, t2B11, dc41	13.55	3.43, 53.53	0.14	0.02, 1.05
4	t1B11, t2B11	diage, churchtype1, churchtype2, dc41	15.34	3.9, 60.38	0.12	0.02, 0.92
5	dc41	diage, churchtype1, churchtype2, t1B11, t2B11	14.23	3.70, 54.77	0.14	0.02, 1.00
6	diage, dc41	churchtype1, churchtype2, t1B11, t2B11	15.69	3.97, 62.04	0.1	0.01, 0.77
7	diage, t1B11, t2B11	dc41, churchtype1, churchtype2	16.44	4.09, 65.97	0.11	0.01, 0.84
8	diage, churchtype1, churchtype2	dc41, t1B11, t2B11	15.31	3.75, 62.44	0.1	0.01, 0.78
9	dc41, t1B11, t2B11	diage, churchtype1, churchtype2	14.08	3.54, 56.01	0.11	0.01, 0.86

Model	Variables Kept	Variables Dropped	dc35 OR	dc35 OR 95% CI	dc35xredf10 OR	dc35xredf10 OR 95% CI
	Table 11. Confounding Analysis for All Possible Subsets of Gold Standard Model (when dc35, dc36, redf10, and dc35xredf10 are kept)					
10	dc41, churchtype1, churchtype2	diage, t1B11, t2B11	12.68	3.18, 50.57	0.13	0.02, 1.00
11	churchtype1, churchtype2, t1B11, t2B11	diage, dc41	14.97	3.62, 61.93	0.11	0.01, 0.85
12	diage, churchtype1, churchtype2, t1B11, t2B11	dc41	16.35	3.87, 69.09	0.094	0.01, 0.77
13	diage, churchtype1, churchtype2, dc41	t1B11, t2B11	14.26	3.49, 58.33	0.1	0.01, 0.77
14	churchtype1, churchtype2, t1B11, t2B11, dc41	diage	13.58	3.25, 56.71	0.1	0.01, 0.82
15	t1B11, t2B11, dc41, diage	churchtype1, churchtype2	14.83	3.68, 59.83	0.1	0.01, 0.81

Table 12

Table 12. Statistics for model 15 describing the association between participants' relationship with their healthcare provider and vaccination outcome			
Variable	**OR**	**95% CI**	**p-value**
Intercept	--	--	0.0017
dc35	14.83	(3.68, 59.83)	0.0002
diage	1.53	(0.5, 4.65)	0.4584
redf10	3.43	(0.56, 21.25)	0.1847
t1B11	2.91	(0.46, 18.25)	0.2549
t2B11	4.16	(0.65, 26.83)	0.1335
dc41	2.55	(0.78, 8.39)	0.1225
dc36	0.1	(0.05, 0.23)	<0.0001
dc35xredf10 when redf10 = 1	1.5	(0.32, 7.00)	0.6074
dc35xredf10 when redf10 = 0	14.83	(3.68, 59.83)	0.0002

Table 13

Table 13. Prevalence Ratio estimates for model 15 describing the association between participants' relationship with their healthcare provider and vaccination outcome			
Variable	**Prevalence Ratio**	**95% CI**	**p-value**
Intercept	--	--	0.0005
dc35	4.25	(1.48, 12.22)	0.0072
diage	1.15	(0.83, 1.60)	0.3967
redf10	2.42	(0.66, 8.88)	0.1817
t1B11	1.95	(0.53, 7.13)	0.3151
t2B11	1.88	(0.50, 7.05)	0.3483
dc41	1.8	(0.93, 3.48)	0.0808
dc36	0.29	(0.17, 0.49)	<0.0001
dc35xredf10 when redf10 = 1	1.39	(0.59, 3.28)	0.4484
dc35xredf10 when redf10 = 0	4.25	(1.48, 12.22)	0.0072

Appendix A – Dose of Hope Consent Forms

Emory University School of Medicine

Hope Clinic of the Emory Vaccine Center
Informed Consent to be a Research Subject

<u>**Title**</u>: Vaccine and Prevention Studies Recruitment and Retention Project

<u>**Principal Investigator:**</u> Paula Frew, Ph.D

<u>**Introduction**</u>
You are being asked to join a separate participant database, before we screen you for the
_____ study. This form is designed to tell you everything you
need to think about before you decide to consent (agree) to be in the database or not to be
in the database. The study staff will answer any questions you may have. Once you
learn about the database, if you agree to take part, and allow the use and disclosure of
information that identifies you, you will be asked to sign this consent form. **It is entirely
your choice. If you decide to take part, you can change your mind later on and
withdraw from the research study. You can skip any questions that you do not wish
to answer.**

After talking about the information in this consent form with the study team you should
know:

- Why this research database is being done.
- Any possible benefit to you.
- The possible risks to you as it relates to your data being put in a database.
  Consider these carefully.
- Who will have access to your study database information

Before making your decision:

- Please carefully read this form or have it read to you
- Please ask questions about anything that is not clear

You can take a copy of this consent form, to keep. Feel free to take your time thinking
about whether you would like to participate. By signing this form you will not give up
any legal rights.

<u>**Study Overview**</u>
The purpose of the database is to maintain information about those who are interested in
joining future research studies at the Emory clinical trials sites for the Vaccine and
Treatment Evaluation Unit (VTEU) and Clinical Trials Unit (CTU). If you do not qualify

for the _____study today, we would like to contact you in the future for other studies that you may be eligible for based on the information you provide us today. The database also lets us evaluate our recruitment efforts.

About the Database
The database is password protected with restricted access. Your name will be coded with a number. The electronic list that links your name to the coded number is also password protected with restricted access. We will not provide paper copies of this confidential list to anyone. If you agree to have your information stored in the database, we will ask you the following questions and record the information in the database. You may skip any question you do not wish to answer.

- What is your full name?
- What is your street address?
- What is your telephone number?
- What other/alternate phone numbers may we reach you at?
- What is your e-mail address?
- What kind of work do you do?
- How far did you go in school?
- What is your date of birth?
- What is your race?
- What is your ethnicity?
- What is your gender?
- What was your gender at birth?
- What gender do you identify with?
- What is your sexual orientation?
- What is your motivation to be in this study?
- How did you hear about us?
- Do you have any medical problems or conditions?
- Are you taking any prescription medicine?
- Have you had a smallpox vaccination?
- May we contact you for future research studies?
- Do you have any plans to move in the next 1-2 years?
- Do you have sex with men, women, or both?
- Females Only: Have you had unprotected vaginal sex with a man in the last 6 months?
- Have you had unprotected anal sex with a man in the past 6 months?
- Have you had anal sex (protected or unprotected) with 3 or more men in the past 6 months?
- Males only: have you been circumcised? If yes, fully or partially?
- Are you currently participating in any HIV related studies?
- Are you currently or have you previously participated in any HIV vaccine studies? Did you receive the vaccine or the placebo?

- Have you previously been tested for HIV? When were you tested? What were the results?
- Would you agree to be tested for HIV and participate in risk reduction counseling?
- How many alcoholic drinks do you have per day?
- Have you used any drugs in the last six months?
- Have you used marijuana laced with any other drugs in the last six months?
- How do you prefer we contact you in the future?
- Date and outcome of this phone call

If you decide to enroll in the _____study we are about to screen you for, the name of that study will be entered in the database. If you do not qualify for that study, the reason why you did not qualify will be entered only if you volunteer that information to us. The date and outcome of this screening will be entered in the database.

Risks and Discomforts
We will keep all facts about you confidential to the extent allowed by law. However, it is possible that your information may become unprotected. You may be uncomfortable with the personal nature of some of the questions you are asked. You can refuse to answer any questions that you don't want to answer.

Benefits
There is no direct benefit to being included in this database. However, you may feel personal satisfaction from making yourself available as a potential participant in future studies.

Compensation
You will not be offered payment for being in this database.

Confidentiality and HIPAA
The privacy of your health information is important to us. We call your health information that identifies you, your "protected health information" or "PHI."   To protect your PHI, we will follow federal and state privacy laws, including the Health Insurance Portability and Accountability Act (HIPAA). This consent explains how we will use your PHI for this study.

Certain offices and people other than the researchers may look at your medical charts and study records. Government agencies and Emory employees overseeing proper study conduct may look at your study records. These offices include the Emory Institutional Review Board and the Emory Office of Research Compliance. Emory will keep any research records we create private to the extent we are required to do so by law.

If we disclose information to people who do not have to follow the Privacy Rules, your information will no longer be protected by the Privacy Rules. People who do not have to follow the Privacy Rules can use or disclose your information with others without your permission if they are allowed to do so by the laws that cover them. For example, study records can be opened by court order. They may also be produced in response to a subpoena or a request for production of documents. Let us know if you have questions about this.

Research Information Will Not Go Into the Medical Record

If you are or have been an Emory Healthcare patient, you have an Emory Healthcare medical record. If you are not and have never been an Emory Healthcare patient, you do not have one.   If you agree to be in this database, a copy of the consent form and HIPAA patient form that you sign **will not** be placed in your Emory Healthcare medical record.

Costs
There will be no costs to you for participating in this database.

Voluntary Participation and Withdrawal from the Study
Your participation is voluntary.   You may refuse to answer any questions that you do not wish to answer. You have the right to refuse to be included in this database. If you decide to be in the database and change your mind, you have the right to drop out at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled. There are no consequences to wanting your information deleted from the database at any time. If you are an Emory employee, your employment will in no way be affected if you decide not to participate in this study. If you are an Emory student, your student, grade, or graduation status will not be affected if you decide not to participate in this study.

Not wanting your information in the database, or asking to have it taken out of the database later will not affect whether or not you may join a study now or later. If you would like your information deleted from the database at any time, please contact the Hope Clinic at 1-877-424-HOPE.

Expiration Date
Your permission to use and disclose your PHI will expire. You can take back your permission allowing us to keep your information and have your information removed from the database at any time by contacting the Hope Clinic at 1-877-424-HOPE. We will make sure your information is removed from the database at your request. Otherwise, the permission to keep your information in the database will expire 10 years after we enter your information

Contact Information

We want you to ask any questions you may have about the database or the consent form, either now, or at any time in the future. Call Dr. Paula Frew, Ph. D., Principal Investigator of this study at 404-712-8546:

- if you have any questions about this study or your part in it, or
- if you have questions, concerns or complaints about the research

Contact the Emory Institutional Review Board at 404-712-0720 or 877-503-9797 or irb@emory.edu:

- if you have questions about your rights as a research participant.
- if you have questions, concerns or complaints about the research.
- You may also let the IRB know about your experience as a research participant through our Research Participant Survey at http://www.surveymonkey.com/s/6ZDMW75.

Before you sign this consent form, make sure of the following:

- You have read this consent form.
- This study has been explained to you.
- You have had your questions answered.
- You understand you can ask more questions at any time.
- You understand you personal information will be available to the doctors, staff, and other groups working on the study.
- You agree to join this study and be put into the database.

Consent

Please, print your name and sign below if you agree to have your information saved in this database, and agree to be considered as a potential participant for future studies.

You have been informed that your participation in this study in voluntary, and that you have the right to ask questions at any time and to refuse to be part of this study without a penalty, loss of benefits, or loss of other treatments. By signing this form, you acknowledge that the above information has been read by you and all questions have been answered. You will be given a copy of this informed consent to keep.

_____

Name of Subject

_____   _____

Signature of Subject   Date

Time

_____

Name of Person Conducting Informed Consent Discussion

_____   _____

Signature of Person Conducting Informed Consent Discussion   Date
Time

Emory University School of Medicine

Consent Form to be a Research Subject & Authorization to Use or Disclose Health Information that Identifies you for a Research Study

Delivering a Dose of Hope: A Faith-Based Program to Increase Older African American's Participation in Clinical Trials

Title: Delivering a Dose of Hope: A Faith-Based Program to Increase Older African American's Participation in Clinical Trials

Principal Investigator: Paula Frew, PhD, MA, MPH

Sponsor's Name: National Institutes of Health (NIH)

Introduction/Purpose:

We would like to ask you to join a research study. This form is designed to tell you everything you need to think about before you decide to consent (agree) to be in the study or not to be in the study. **It is entirely your choice. If you decide to take part, you can change your mind later on and withdraw from the research study. You can skip any questions that you do not wish to answer.**

Before making your decision:

- Please carefully read this form or have it read to you
- Please ask questions about anything that is not clear

You can take a copy of this consent form, to keep. Feel free to take your time thinking about whether you would like to participate. By signing this form you will not give up any legal rights.

Overview of the Study:

The purpose of this study is to see if our program called, "Dose of Hope," changes people's attitudes about joining clinical research studies. We will connect churches, and persons attending churches, with Emory clinical research programs. For this project we will ask up to 210 people to participate.

Procedures:

For this project, we will get data through interviews, short surveys, focus groups, and other records. It should take no more than 35 minutes to do the surveys and 90 minutes of your time for an interview or focus group. Your interview may be recorded and later written out by study staff. We will call you by phone or write, text, or email to make sure that we can reach you and update any contact changes.

If you agree to join this study, we will randomly place you in one of two groups:

1) Group one will attend one 4-hour meeting and two 1-hour small group meetings. In the meetings you will talk about issues with research and why people do or do not join research studies. At the end of each meeting, you will be asked to complete a survey.
2) Group two will answer 3 surveys at different times: at the first visit, at 3 months, and at 6 months.

Why are you doing this study?

We will use the information collected from this study to learn about people's knowledge of ongoing local research. We also want to know what people think about research and why they would or would not want to volunteer for studies. Your replies will give us facts on people's awareness, attitudes, and beliefs on research.

New Information

It is possible that the researchers will learn something new during the study about the risks of being in it. If this happens, they will tell you about it. Then you can decide if you want to continue to be in this study or not. You may be asked to sign a new consent form that includes the new information if you decide to stay in the study.

Will my answers be kept private?

All of your answers will be kept private. Personal information will be coded to block who you are. We will also keep your information protected by password on computers. The computers will be stored in locked file cabinets in a locked office. In focus groups and interviews, no one will have a way of knowing which audio tape belongs to you. Nothing that will show who you are will be in any reports or papers. During small groups, focus groups, and interviews we will ask you to use code names so that no personal health information (PHI) shared can be linked to you. After the focus groups or interviews have been written out, the audio tapes will be erased. We keep all information about you confidential to the extent allowed by law. However, there is always a chance that any data given to us could become unprotected.

What are the risks to me?

The risks for being in this study are likely to be small. In small group sessions or focus groups you may feel uneasy sharing your personal thoughts and opinions about topics such as research studies. It is possible that during the focus group there may be a breech in confidentiality. We will use fake names instead of real names during the focus groups so as to reduce this risk. All information shared during the small group session or focus group will be kept as private as possible.

What are the benefits to me?

The data we get from you will not help you directly. Your answers will help us create better programs about research studies and change our teaching approaches to better fit people's needs.

Will I be paid?

You will be given cash or a gift card worth $50 for each survey you complete. The surveys will be given at the first visit, 3-month visit, and the 6-month visit for a total of $150. If you are asked to do an additional interview, you will be given cash or another gift card worth $20 at the end of the interview.

Confidentiality

Certain offices and people other than the researchers may look at study records. Government agencies and Emory employees overseeing proper study conduct may look at your study records. These offices include the Office for Human Research Protections, the funder(s), the Emory Institutional Review Board, the Emory Office of Research Compliance. Study funders may also look at your study records. Emory will keep any research records we create private to the extent we are required to do so by law. A study number rather than your name will be used on study records wherever possible. Your name and other facts that might point to you will not appear when we present this study or publish its results. Study records can be opened by court order. They may also be produced in response to a subpoena or a request for production of documents.

Authorization to Use and Disclose Health Information:

The privacy of your health information is important to us. We call your health information that identifies you, your "protected health information" or "PHI." To protect your PHI, we will follow federal and state privacy laws, including the Health Insurance Portability and Accountability Act (HIPAA). We refer to all of these laws in this form as the Privacy Rules. This section explains how we will use your PHI for this study.

The PHI that we may use or disclose (share) for this research study includes: name, address, phone number, medical history, test results, or any other information relating to your overall health status.

Purposes for Which Your PHI Will Be Used

If you sign this form, you give us your permission to use your PHI for the conduct and oversight of this research study.

If you sign this consent, you are giving permission to all health care providers who are connected with this research project at Emory University to use or release your health information that identifies you. The health information that researchers may use or release for this research includes all information collected during the research described in this informed consent document. The health information listed above may be used by and/or released to all Emory University research staff involved with the research described above. In addition, people and committees at Emory who are responsible for making sure that research is conducted correctly will have access to your health information to oversee the study. These offices include the Emory Institutional Review Board and the Emory Office of Research Compliance.

Emory University is required by the HIPAA Privacy Rule law to protect your health information. By signing this document, you are giving Emory University permission to use and/or release your health information for this research. Those persons who receive your health information may not be required by Federal privacy laws (such as the Privacy Rule) to protect it and may share this information with others without your permission, if permitted by laws governing them. If identifiers are removed from your PHI, then the remaining information will not be subject to the Privacy Rules. It may be used or disclosed with other people or organizations, and/or for other purposes.

You may change your mind and take back this Authorization at any time, except to the extent that Emory University has already acted based on this Authorization. To take back this Authorization, you must write to Dr. Paula Frew, The Hope Clinic, 603 Church Street, Decatur GA 30030. If you take back this Authorization, the researchers may still use and release health information they already have as necessary to maintain the reliability of the research study.

Expiration Date
Your permission to use and disclose your PHI will expire. The expiration will be at the end of the research study and any required record-keeping period.

Do I have to join this study?

The choice to join this study is yours. You may choose not to take part in the study. You do not have to answer questions that you do not wish to answer. You can leave the study at any time.

The researchers and funder also have the right to stop your participation in this study without your consent if:

- They believe it is in your best interest;
- You were to object to any future changes that may be made in the study plan;
- or for any other reason.

Contact information:

Contact Paula Frew at [404-712-8546 or pfrew@emory.edu]:

- if you have any questions about this study or your part in it,
- if you have questions, concerns or complaints about the research

Contact the Emory Institutional Review Board at 404-712-0720 or 877-503-9797 or irb@emory.edu:

- if you have questions about your rights as a research participant.
- if you have questions, concerns or complaints about the research.
- You may also let the IRB know about your experience as a research participant through our Research Participant Survey at http://www.surveymonkey.com/s/6ZDMW75.

You will be given a copy of this consent form to keep for yourself. If you are willing to join this study, please sign below.

_____

Name of Subject

_____   _____

Signature of Subject   Date
Time

_____   _____

Signature of Person Conducting Informed Consent Discussion   Date
Time

Appendix B – Dose of Hope Baseline Survey

ID#_____A

Location & Date: _____

An Assessment of Community Attitudes, Beliefs, and Perceptions toward Clinical Research

Thank you for taking the time to complete this survey. It should take no more than 20 minutes to complete this 134-itemquestionnaire. Your participation is completely voluntary. You may choose not to participate or not to answer any specific question. You may skip any question you do not wish to answer.

The purpose of this study is to learn about your attitudes regarding participating in clinical trials. This information will help us to improve community education programs and health communication strategies created for different populations. All of the information that you share with us and the material that we use to capture the information will only be accessible to the members of our research team. There is no right or wrong answer. Please answer each question as honest as possible. All answers are kept strictly confidential.

Thank you for taking the time to complete this survey.
We appreciate your participation!

This survey is being used to better understand community attitudes, beliefs, and perceptions toward clinical research studies and other new medical technologies to develop communication approaches. The survey is being conducted by Dr. Paula Frew of the Hope Clinic of the Emory Vaccine Center, 603 Church St. Decatur, GA, 30030.

If you still have questions or concern about your rights as a participant in this survey, you may contact the Chair of the Institutional Review Board of Emory University, who oversees the protection of human research participants. An IRB officer may be

As part of this research study, we will contact you about participation in clinical research studies. This information will only be used to contact you for research opportunities. To ensure the information stays up to date over this time period, we will briefly contact you once a month to allow you to update any contact information that has recently changed. Your information will not be shared with anyone.

Name:

Address:

City: State: Zip code:

Email:

Phone number:

Home: Office: Mobile:

Are you on facebook?   [   ] yes   [   ] no

   Do we have your permission to send you messages via facebook?   [   ] yes   [   ] no

We will never friend you, write on your wall, or contact you in any other way using facebook. This permission is only for private messages.

To ensure your contact information remains up to date, we will contact you once a month to allow you to update any of your information. What is your preferred method of contact?
Email [   ]   Phone [   ]   Facebook message [   ]

In the event that we are having trouble getting in contact with you for the follow-up questions, please provide the name and number of 3 additional people we can call in order to reach you.

1. Name:_____

Phone number:

Home: Office: Mobile:

2. Name:_____

Phone number:

Home: Office: Mobile:

3. Name:_____

Phone number:

Home:_____Office:_____Mobile:_____

Please fill in the blank space or check the box next to the response that best expresses your assessment of the items below.

A1-A12. Demographics and Community Affiliations:

A1.   What is your gender?

[ ] Male
[ ] Female

A2.   What is your date of birth? ____/____/_____
                                   mm/ dd/ yyyy

A3.   How old are you? _____years old

A4.   What is the highest level of school that you have completed?

[ ] K-8 grade
[ ] 9-11 grade
[ ] High school graduate/ GED
[ ] Technical/ Vocational or Associates
[ ] Bachelor degree
[ ] Master's degree
[ ] Doctorate

A5.   How would you describe your race?

[ ] African American/ Black
[ ] Caucasian/ White
[ ] Asian/ Asian American/ Pacific Islander
[ ] Native American/ American Indian/ Alaskan Native
[ ] Multiracial/ multicultural

A6.   How would you describe your ethnic background?

[ ] Hispanic/ Latino/ Chicano
[ ] non-Hispanic

A7.   Do you consider yourself:

[ ] Straight (Heterosexual)
[ ] Bisexual
[ ] Gay (Homosexual)/Queer
[ ] Don't Know/Questioning

A8.   What is your relationship status?

[ ] Single/Never Married
[ ] Married/ Domestic Partner

[ ] Divorced/ Separated
[ ] Widowed
[ ] Other (specify)_____

A9.   Which of the following best describes your current employment status?

[ ] Employed—full time
[ ] Employed—Part-time
[ ] Unemployed
[ ] Other (specify) _____

A10.   What is your annual household income (i.e., combined income of all members of your family)?

[ ] Less than $20,000
[ ] $20,001-$40,000
[ ] $40,001-$60,000
[ ] $60,001-$80,000
[ ] $80,001-$100,000
[ ] More than $100,001

A11.   Where do you primarily receive healthcare? *(select only one)*

[ ] Healthcare provider office
[ ] Community clinic or health center
[ ] Hospital
[ ] Prison clinic
[ ] Other (specify) _____

A12.   What are the sources where you obtain most health related information (check up to 3):

[ ]Family or friends   [ ] Doctor/nurse/pharmacist   [ ] Newspaper/magazine/TV
[ ]Health help line   [ ] Health department   [ ] Church
[ ]School   [ ] Internet   [ ] Healer
[ ]Public library   [ ] Other

B1-B24. Event Details/Site Perceptions:

B1.   In the past year, have you: *(select all that apply)*

[ ]Given blood
[ ]Signed an organ donation card or donated an organ
[ ]Given bone marrow
[ ]Given sperm or eggs
[ ]Donated your body to science
[ ]Given money to a healthcare cause
[ ]Been in a health research study

B2.   In the past year, about how many times have you been treated for an illness or condition by a healthcare provider*(select only one)*?

[ ]0 times
[ ]1-4 times
[ ]5-9 times
[ ]10 times or more

B3.   Do you have access to transportation to get to a healthcare provider, clinic, or hospital?

[ ]Always
[ ]Most of the time
[ ]Sometimes
[ ]Not often
[ ]Never

B4.   Has access to transportation ever limited you from visiting a healthcare facility?

[ ]Yes
[ ]No

B5.   Do you know where to go to be seen by a doctor, nurse, or other healthcare provider if you are sick?

[ ]Always
[ ]Most of the time
[ ]Sometimes
[ ]Not often
[ ]Never

B6.   Do you have a regular doctor?

[ ] Yes
[ ] No, *skip to question B9*

B7.   Do you trust your doctor?

[ ] Yes
[ ] No
[ ] Don't know/Not sure

B8.   Has your doctor ever recommended that you join in a clinical trial?

[ ] Yes
[ ] No
[ ] Don't know/Not sure

B9.   Do you know anyone who has been in a clinical trial?

[ ] Yes
[ ] No
[ ] Don't know/Not sure

B10.   Do you know anyone participating or who has participated in a clinical research study?

    [ ] Yes
    [ ] No, *skip to question B13*
    [ ] Don't know/Not sure

B11. How many persons participating in clinical research do you know? _____

B12. What is your relationship to the persons you know who are participating/have participated?
Check all that apply

    [ ] Relative
    [ ] Friend
    [ ] Co-worker
    [ ] Spouse/partner
    [ ] Other, please specify _____

B13. Have you seen/heard any advertisements for clinical research studies at the following places?

	Yes	No	Don't know/Not sure
Television	[ ]	[ ]	[ ]
Online	[ ]	[ ]	[ ]
Radio	[ ]	[ ]	[ ]

B14. Are you more likely to join a clinical research study after seeing the any of these ads?

    [ ] Yes, if so which one(s):
        [ ] Television
        [ ] Online
        [ ] Radio
    [ ] No
    [ ] Don't know/Not sure

B15. Would you be more likely to join a medical research study if a health care provider recommended it?

    [ ] Yes
    [ ] No
    [ ] Don't know/Not sure

B16. Do you think many of your friends would join a medical research study?

    [ ] Yes
    [ ] No
    [ ] Don't know/Not sure

B17-20. Place an X in the appropriate box for each question

	Yes	**No**	**Don't Know/ Not Sure**
In the past 12 months, was there a time when you didn't meet basic expenses such as food, clothing, or shelter?			
In the past 12 months, was there a time when you didn't pay full gas, electricity, or oil?			
In the past 12 months, was there a time when you had your home or cellular phone service suspended?			
In the past 12 months, was there a time when you couldn't afford leisure activities such as seeing movies or going out to dinner?			

B21. Do you get services, goods, or any support from any community organizations? If so, which ones?

_____

_____

B22. Are you involved in any activities or programs with any community organizations? If so, which ones?

_____

_____

B23. On a scale from 1 (definitely not) to 10 (definitely so), rank your likelihood of *contacting* Emory about being in a medical research study in the next 6 months:

    1   2   3   4   5   6   7   8   9   10

B24. On a scale from 1 (definitely not) to 10 (definitely so), rank your likelihood of *joining* a medical research study within the next 6 months:

    1   2   3   4   5   6   7   8   9   10

C1-C17. Attitudes about Clinical Research Study Participation
Please place an x in the appropriate box for each question to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 Strongly Agree	**2 Agree**	**3 Neutral/No Opinion**	**4 Disagree**	**5 Strongly Disagree**
My community would really benefit from clinical research studies.					

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
I like getting involved with clinical research studies.					
My actions can inspire other to act.					
My participation in a clinical research study would be very good.					
I benefit from health science research.					
I like to do good for others.					
My involvement in this program will result in more ethical research.					
My involvement in this program will improve my community's trust in clinical research.					
I believe that medical checkups are a benefit of clinical research study participation.					
I would benefit from the medical care associated with a clinical research study.					
Infectious disease and/or chronic illness are a serious concern in my immediate community.					
I would join a clinical research study because it would help to prevent disease/illness.					
I think being in a clinical research study would be worth the time and trouble involved.					

I have enough time to be in a clinical research study.					
Being in a clinical research study does not seem risky.					
Having to give blood for the clinical research study would not stop me from joining as a volunteer.					
I am concerned about my potential to get sick if I join a clinical research study.					

D1-D10. Clinical Study Participation
How likely are the following factors to influence your decision to participate in a medical research study or clinical trial?

	Very Likely	**Somewhat Likely**	**Not Likely at All**
Caring provider/study staff			
A welcome feeling at study site			
Immediate answers to your questions			
Discussion about the background of the study, including information and results from prior studies			
Positive experiences from other studies			
A specific interest by the staff in you			
A convenient location for the study site			
Appropriate money for time and travel to do study visits			
The wish to be a change agent in my community			
A track record of success with previous clinical studies at the study site			

E1-E14. Community Perceptions of Clinical Research Involvement
Please place an x in the appropriate box for each question, to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree	6 Not Applicable
I think my doctor would approve of my involvement in clinical research.						
I think my work colleagues would approve of my involvement in clinical research.						
I tend to be concerned about what people think of me, even if I don't know them.						
I generally do what my family expects of me.						
I would not want to do something my friends disapproved of.						
My immediate family would be supportive of my involvement in clinical research.						
If my superiors told me to do something I disagreed with, I would obey their wishes.						
Sometimes I do what my friends say to do, even though I know they are wrong						

Most people important to me think my involvement in a clinical research study is good.						
Most people important to me usually support my interests.						
If my pastor supported clinical research, I would be inclined to get involved.						
	1 **Strongly Agree**	**2** **Agree**	**3** **Neutral/No Opinion**	**4** **Disagree**	**5** **Strongly Disagree**	**6** **Not Applicable**
Most people who are important to me think I should participate in clinical research.						
Most people who are important to me would approve of my involvement in clinical research.						
Most people who are important to me would support my interest in participating in a clinical research						

F1-F11. Discrimination
In your lifetime, how often have you experienced racial discrimination in the following situations?

	Never	**Once**	**More than Once**	**Not Applicable**
At school				
Applying for a job				
At work				

In a store, restaurant, or other public place				
Getting medical care				
From the police or in the courts				
Volunteering for a medical research study				
Interacting with medical research study staff				
At a college or university				
At church or a faith organization				
At a community-based organization				

G1-G6. Volunteer Affiliations

Please place an x in the appropriate box for each question, to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 **Strongly Agree**	2 **Agree**	3 **Neutral/No Opinion**	4 **Disagree**	5 **Strongly Disagree**
I experience a sense of community through participating in clinical research.					
I feel a sense of belonging through my participation in clinical research.					
My involvement is helping to improve the health of others.					
I am advancing the public's health and well-being through my participation in clinical research.					
Getting involved in clinical research studies is liberating.					
I feel a sense of purpose by participating in clinical research.					

H1-H19. Medical Outcomes and Social Support
Please place an x in the appropriate box for each question to indicate how often each of the following kinds of support are available to you if you need it (1 = 'None of the Time,' 5 = 'All of the Time')

	1 None of the Time	2 A Little of the Time	3 Some of the Time	4 Most of the Time	5 All of the Time
Someone to help you if you were confined to a bed					
Someone you can count on to listen to you when you need to talk					
Someone to give you good advice about a crisis					
	1 None of the Time	2 A Little of the Time	3 Some of the Time	4 Most of the Time	5 All of the Time
Someone to take you to the doctor if you needed it					
Someone who shows you love and affection					
Someone to have a good time with					
Someone to give you information to help you understand a situation					
Someone to confide in or talk to about yourself or your problems					
Someone who hugs you					
Someone to get together with for relaxation					
Someone to prepare your meals if you were unable to do it yourself					
Someone whose advice you really want					

Someone to do things with to help you get your mind off things					
Someone to help with daily chores if you were sick					
Someone to share your most private worries and fears with					
Someone to turn to for suggestions about how to deal with a personal problem					
Someone to do something enjoyable with					
Someone who understands your problems					
Someone to love and make you feel wanted					

I1-I12. Level of Independence
Please place an x in the appropriate box for each question to indicate how much the following items apply to you (1 = 'Not at All,' 5 = 'An Extreme Amount')

	1 Not at All	2 A Little	3 A Moderate Amount	4 Very Much	5 An Extreme Amount
How much are you bothered by any limitations in performing your everyday living activities?					
How much do you need any medication to function in your daily life?					
How much do you need any medical treatment to function in your daily life?					
To what extent does your quality of life depend on the use of medical substances or medical aids?					

To what extent do you have problems with your transport?					
How much do difficulties with transport restrict your life?					

Please place an x in the appropriate box for each question to indicate how much the following items apply to you (1 = 'Not at All,' 5 = 'Completely')

	1 Not at All	2 A Little	3 Moderately	4 Mostly	5 Completely	6 Not Applicable
To what extent are you able to carry out your daily activities?						
How dependent are you on medications?						
Are you able to work?						
Do you feel able to carry out your duties?						
To what extent does the quality of your home meet your needs?						
To what extent do you have adequate means of transport?						

J1-J5. Security
Please place an x in the appropriate box for each question to indicate how you would answer the following questions (1 = 'Not at All,' 5 = 'Extremely')

	1 Not at All	2 Slightly	3 Moderately	4 Very	5 Extremely
How safe do you feel in your daily life?					
Do you feel you are living in a safe and secure environment?					
How much do you worry about your safety and security?					
How comfortable is the place where you live?					
How easily are you able to get good medical care?					

K1-K4. Level of Spirituality
Please place an x in the appropriate box for each question to indicate how much the following items apply to you (1 = 'Not at All,' 5 = 'An Extreme Amount)

	1 Not at All	2 A Little	3 A Moderate Amount	4 Very Much	5 An Extreme Amount
Do your personal beliefs give meaning to your life?					
To what extent do you feel your life to be meaningful?					
To what extent do your personal beliefs give you the strength to face difficulties?					
To what extent do your personal beliefs help you to understand difficulties in life?					

THANK YOU
for your valuable feedback!

Appendix C – Dose of Hope 3-month Control Survey

ID#_____

(3 mo Post Test)

Example: CL1971

Location & Date: _____

An Assessment of Community Attitudes, Beliefs, and Perceptions toward Medical Research

Thank you for taking the time to complete this survey. It should take no more than 20 minutes to complete this 137-item questionnaire. Your participation is completely voluntary. You may choose not to participate or not to answer any specific question. You may skip any question you do not wish to answer.

The purpose of this study is to learn about your attitudes regarding participating in clinical trials, obtaining vaccinations, and managing disabilities. This information will help us to improve community education programs and health communication strategies created for different populations. All of the information that you share with us and the material that we use to capture the information will only be accessible to the members of our research team. There is no right or wrong answer. Please answer each question as honestly as possible. All answers are kept strictly confidential.

Thank you for taking the time to complete this survey.
We appreciate your participation!

This survey is being used to better understand community attitudes, beliefs, and perceptions toward medical research, biomedical HIV prevention, and other new medical technologies to develop communication approaches. The survey is being conducted by Dr. Paula Frew of the Hope Clinic of the Emory Vaccine Center, 603 Church St. Decatur, GA, 30030.

If you still have questions or concern about your rights as a participant in this survey, you may contact the Chair of the Institutional Review Board of Emory University, who oversees the protection of human research participants. An IRB officer may be reached at (404) 712-0720.

Please fill in the blank space or check the box next to the response that best expresses your assessment of the items below.

A. Likelihood of Participation

A1-A5. Please place an x in the appropriate box for each question to indicate how likely you would be to perform the following statement (1 = 'Not at all,' 5 = 'Extremely')

I would join a research study if my _____ recommended it

	1 Not at all	2 Slightly	3 Moderately	4 Very	5 Extremely
Healthcare Provider					
Friend					
Family Member					
Faith Leader/Pastor					
Church					

A6. Are you already in contact with Emory about being in a medical research study?

        [ ] Yes, *skip to question A8*
        [ ] No
        [ ] Don't recall

A7. On a scale from 1 (definitely not) to 10 (definitely so), rank your likelihood of *contacting* Emory about being in a medical research study in the next 6 months:

       1   2   3   4   5   6   7   8   9   10

A8. Have you joined a medical research study since the first Dose of Hope session?

        [ ] Yes
        [ ] No
        [ ] Don't recall

A9. On a scale from 1 (definitely not) to 10 (definitely so), rank your likelihood of *joining* a medical research study within the next 6 months:

       1   2   3   4   5   6   7   8   9   10

B. Relationship with Healthcare Provider

B1. On a scale from 1 ('very poor') to 10 ('excellent'), *describe* your relationship with your current regular health care provider:

1   2   3   4   5   6   7   8   9   10

[   ] I do not have a healthcare provider currently, *skip to question B11*

B2-B10. Please place an x in the appropriate box for each question to indicate how much you agree with each statement about your current/regular healthcare provider (1 = 'Strongly Agree,' 5 = 'Strongly Disagree'):

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree	6 Not Applicable
I feel comfortable talking to my healthcare provider about immunizations.						
I feel comfortable going/talking to my healthcare provider for/about other preventive medical procedures such as screenings (for example: mammograms, hypertension, cholesterol).						
I feel a commitment to continuing a relationship with my healthcare provider.						
I would expend extra effort to continue seeing my healthcare provider.						

I feel loyal to my healthcare provider.					
I intend to make an appointment with my healthcare provider again.					
I would continue to do business with my healthcare provider even if their fees increase somewhat.					
I trust my healthcare provider's judgment.					
My healthcare provider has a lot of experience and usually knows best.					

B11. Describe your medical insurance policy.

[ ] Private insurance plan
[ ] Medicare
[ ] Medicaid
[ ] Combination of private insurance and Medicare
[ ] Other (please specify): _____
[ ] I do not have health insurance
[ ] I am not sure

C. Attitudes about the Flu and Immunization

C1. Did you receive this past season's flu shot (2012-2013)?

[ ] Yes
[ ] No, *skip to question C4*
[ ] Don't know/don't recall, *skip to question C5*

C2. List the reasons why you decided to get the flu shot (*Mark all that apply):*

[ ] I did not want to get the flu
[ ] I wanted to protect my family and/or my household members
[ ] Because the vaccination was convenient

[ ] Because the vaccination was free
[ ] I believed that getting the vaccination was a part of living a healthy lifestyle
[ ] Because the flu vaccine is nationally recommended
[ ] Because my family member recommended that I get the vaccine
[ ] Because my healthcare provider recommended that I get the vaccine
[ ] Other (please specify):_____

C3. Where did you get your last flu shot?

[ ] Primary Care doctor's office
[ ] OB/GYN doctor's office
[ ] Community/Public Health clinic
[ ] Hospital
[ ] Storefront clinic (CVS, RiteAid, etc.)
[ ] Prison clinic
[ ] School health clinic
[ ] Worksite health clinic
[ ] Other (please specify):_____
[ ] I did not get a flu shot
[ ] Don't know

C4. List the reasons why you decided not to get the flu shot (*Mark all that apply):*

[ ] The vaccine was too expensive
[ ] I could not locate a place that provided the flu vaccine
[ ] It was inconvenient for me to get the vaccine
[ ] I forgot to get the flu vaccine
[ ] I am allergic to the flu vaccine
[ ] I was worried about the possible side effects of the flu vaccine
[ ] I don't like to get vaccinations
[ ] I am scared of needles
[ ] Getting shots is painful
[ ] I don't think that vaccines are effective
[ ] I didn't think I was at risk for getting the flu
[ ] Other (please specify):_____

C5. In the past five years, how often have you received a seasonal flu shot?

[ ] 5 times (e.g., every year: 2009, 2010, 2011, 2012, 2013)
[ ] 2-4 times
[ ] 1 time
[ ] 0 times
[ ] Don't know/don't recall

C6. In the past year, has anyone in your family received the flu shot?

[ ] Yes (please specify):_____
[ ] No
[ ] Don't know

C7. Has anyone in your family refused to receive the flu shot?

       [   ] Yes (please specify):_____
       [   ] No
       [   ] Don't know

C8. In the past 12 months, did you get sick with the flu?

       [   ] Yes
       [   ] No, *skip to C11*
       [   ] Don't know, *skip to C11*

C9. How did you know that it was the flu? *(Mark all that apply)*

       [   ] The diagnosis was made by my doctor based on clinical signs and symptoms
       [   ] The diagnosis was confirmed based on laboratory tests
       [   ] I thought I had it but I didn't visit a doctor
       [   ] A friend or relative told me I had the flu
       [   ] A pharmacist told me I had the flu
       [   ] I got it from the flu shot
       [   ] Don't know

C10. Which of the following symptoms did you have? *(Mark all that apply)*

       [   ] Cough
       [   ] Runny nose
       [   ] Nasal congestion/ "stuffy nose"
       [   ] Itchy eyes
       [   ] Fever
       [   ] Headache
       [   ] Sore throat
       [   ] Vomiting
       [   ] Diarrhea
       [   ] Difficult breathing
       [   ] None of the above
       [   ] Other (please specify):

       _____

C11. In the past year, did anyone living with you acquire the flu?

       [   ] Yes (please specify, i.e., spouse, child): _____
       [   ] No
       [   ] Don't know/don't recall
       [   ] Not applicable/I live alone

C12. Please check the top reasons why you would get the flu shot *(Mark all that apply):*

       [   ] It is recommended by *the President of the United States*
       [   ] It is recommended by *my doctor*
       [   ] It is recommended by *my school or my employer*
       [   ] It is recommended by *my friends*

[ ] It is recommended by *a family member*
[ ] It is recommended by *my faith leader/my pastor*
[ ] It is recommended by *my herbalist/alternative medical therapist*
[ ] It is recommended by *a famous sports player or movie star*
[ ] It is recommended by *the Centers for Disease Control and Prevention (CDC)*
[ ] Because it will help prevent me from becoming sick from the flu virus
[ ] The flu is common in my community
[ ] I am worried about getting the flu
[ ] Other (please specify): _____

C13. Please check the top reasons that would keep you from getting the flu vaccine *(Mark all that apply):*

[ ] I am concerned that the vaccine will weaken my immune system
[ ] I feel that it is better for me to get the natural flu than get a vaccine
[ ] I am concerned about side effects
[ ] I don't think I am at risk for the flu
[ ] I don't think the flu is that dangerous
[ ] I think the vaccine won't work
[ ] I don't take vaccines
[ ] I think the vaccine will cause me harm
[ ] I have a moral or ethical objection to getting the vaccine
[ ] I have a religious objection to getting the vaccine
[ ] Getting shots is painful
[ ] Other (please specify): _____

C14. On a scale from 1 (definitely not) to 10 (definitely so), rank your likelihood of getting a flu vaccine patch in the next 2 years, if a vaccine patch becomes available:

1   2   3   4   5   6   7   8   9   10

C15. Please check the top reasons that would keep you from getting the vaccine patch *(Mark all that   apply):*

[ ] I am concerned that the vaccine will weaken my immune system
[ ] I feel that it is better for me to get the natural flu than get a vaccine
[ ] I am concerned about side effects
[ ] I don't think I am at risk for the flu
[ ] I don't think the flu is that dangerous
[ ] I think the vaccine won't work
[ ] I don't take vaccines
[ ] I think the vaccine will cause me harm
[ ] I have a moral or ethical objection to getting the vaccine
[ ] I have a religious objection to getting the vaccine
[ ] I think the patch will hurt to put on
[ ] Other (please specify): _____

C16. Have you heard of the H7N9 strain of the flu (bird flu)?

> [ ] Yes
> [ ] No
> [ ] Don't know/don't recall

C17. On a scale from 1 (definitely not) to 10 (definitely so), rank your likelihood of getting a flu vaccine for H7N9 (bird flu), once the vaccine becomes available:

> 1   2   3   4   5   6   7   8   9   10

C18. Please check the top reasons that would keep you from getting the bird flu vaccine *(Mark all that apply):*

> [ ] I am concerned that the vaccine will weaken my immune system
> [ ] I feel that it is better for me to get the natural flu than get a vaccine
> [ ] I am concerned about side effects
> [ ] I don't think I am at risk for the flu
> [ ] I don't think the flu is that dangerous
> [ ] I think the vaccine won't work
> [ ] I don't take vaccines
> [ ] I think the vaccine will cause me harm
> [ ] I have a moral or ethical objection to getting the vaccine
> [ ] I have a religious objection to getting the vaccine
> [ ] I think the patch will hurt to put on
> [ ] Other (please specify): _____

C19. How serious do you think the bird flu is compared to season flu?

> [ ] Not at all serious
> [ ] Somewhat serious
> [ ] Serious
> [ ] Very serious
> [ ] Extremely serious
> [ ] Don't know

C20. How serious do you think it would be if you got the season flu?

> [ ] Not at all serious
> [ ] Somewhat serious
> [ ] Serious
> [ ] Very serious
> [ ] Extremely serious
> [ ] Don't know

C21-28. Please place an x in the appropriate box to indicate whether you have received a vaccine for any of the following conditions in the past year:

Vaccine	Yes	No	Don't Know/Don't Recall
Chicken Pox			
Hepatitis B			
Measles, Mumps, Rubella (MMR)			
Meningococcal			
Pertussis			
Shingles			
Pneumonia			
Tetanus-Diphtheria (Td)			

C29. If you did receive one or more vaccine(s), where did you usually get the shot(s)?

[ ] Primary Care doctor's office
[ ] OB/GYN doctor's office
[ ] Community/Public Health clinic
[ ] Hospital
[ ] Storefront clinic
[ ] Prison clinic
[ ] School health clinic
[ ] Worksite health clinic
[ ] Other (please specify): _____
[ ] I did not get a shot for another vaccine-preventable illness
[ ] Don't know

C30-C41. Please place an x in the appropriate box for each question to indicate how much you agree with each statement about immunizations (1 = 'Strongly Agree,' 5 = 'Strongly Disagree'):

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
I want to be specifically told about any potential major side effects and how often they occur instead of being assured that a vaccine is safe.					
I feel like I have enough access to immunization information.					
I require more information about immunizations before making health-related decisions/ decisions about immunizations.					
Immunizations are an important part of a healthy lifestyle.					
My body can protect itself against vaccine diseases.					
I trust my healthcare provider to make decisions about which vaccines would be the best for me to receive.					
I worry that getting the flu shot would give me the flu.					
I would be *less likely* to get a flu vaccine if it gave me symptoms such as tiredness or fever.					
Immunizations can actually lead to illness.					
I would like to know more about what is in shots.					

I doubt whether vaccines really work.					
I can easily get the flu shot.					

D. Diffusion of Knowledge

D1-D3. Please place an x in the appropriate box for each question to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree'):

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree	6 Not Applicable
I would recommend the Dose of Hope study to someone who seeks my advice.						
I would say positive things about the Dose of Hope study to other people.						
I would recommend the Dose of Hope Study to other people.						

E. Network Analysis

E1-E9. Please place an x in the appropriate box for each question, to answer each statement. How often in the past month have you looked for health-related information from one of the following sources (1 = 'All the time,' 4 = 'Never'):

	1 All the time	2 Often	3 Sometimes	4 Never
Books/Brochures				
Magazines/Newspapers				
Internet				
TV/Radio				

Talks/Presentations				
Doctor or Healthcare Provider				
Family				
Friends				
Faith Leader/ Pastor				

E10-19. Please place an x in the appropriate box for each question to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree'):

I would trust health information from:

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
A Book/Brochure					
A Magazine/Newspaper					
The Internet					
The TV/Radio					
A Talk/Presentation					
My Doctor or Healthcare Provider					
My Family					
My Friends					

My Faith Leader/Pastor					
My Church					

F. Channels of Communication

F1.   If you have or were going to share the information you learned about clinical research studies, how would you share this information? (Check all that apply)

        [ ] Phone Call
        [ ] Text Message
        [ ] Email
        [ ] Social Networking Sites (Facebook, Twitter, Myspace)
        [ ] In Person
        [ ] Other (please specify):_____

G. Relative Advantage of Clinical Research

G1-G4. Please place an x in the appropriate box for each question, to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
Joining a research study would improve the quality of my life.					
The disadvantages of joining a research study far outweigh the advantages.					
I would benefit from the medical care received in a research study.					
Joining a research study would *not* benefit my community in any way.					

H. Study Compatibility
H1-H11. Please place an x in the appropriate box for each question, to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
Joining a research study would disrupt my life.					
Joining a research study would work with my schedule.					
Participating in research aligns with my personal values.					
Participating in a clinical study will help me to maintain my health and well being.					
It is easy for me to remember the instructions for a research study.					
I understand the process of joining a research study.					
Joining a research study would make me look good to others in my community.					
Joining a research study would make me look good at my church.					
People in my community who join research studies have more prestige than those who do not.					
People in my community who join research studies usually don't talk about it.					

Joining a research study is a badge of honor in my community.					

I. Study Complexity

I1-I6. Please place an x in the appropriate box for each question, to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
I believe that joining a research study would be hard for me.					
Filling out the forms to enroll in a research study are too much trouble.					
Joining a research study would require a lot of mental effort.					
I would have difficulty joining a research study because of transportation issues.					
It would be difficult to spend my time at the clinic for research study visits.					
It is difficult to understand an informed consent document.					

J. Research Observability

J1-J9. Please place an x in the appropriate box for each question, to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
I know where I can go to ask questions about research studies.					
I know where I can go to ask about joining a research study.					
There are enough people in my community who can help me learn about research studies.					
I know someone who has participated in a research study.					

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
I have seen the benefits of research studies firsthand in my community.					
I have seen what others do to join research studies.					
My community is not interested in research studies.					
I have had plenty of opportunities to learn about joining in a research study.					

I have not seen many other people joining research studies in my community.					

K. Study Involvement Communication

K1-K4. Please place an x in the appropriate box for each question, to indicate how much you agree with each statement (1 = 'Strongly Agree,' 5 = 'Strongly Disagree')

	1 Strongly Agree	2 Agree	3 Neutral/No Opinion	4 Disagree	5 Strongly Disagree
I would have no difficulty telling others about how to join a research study.					
I believe I could communicate to others the consequences of joining a research study.					
The consequences of joining a research study are clear to me.					
I would have difficulty explaining why joining a research study may or may not be helpful to someone.					

L. Abilities and Daily Living

L1-L15. Please place an x in the appropriate box to indicate if during the past month you had difficulty
with the following statements due to your health restrictions (1='No Difficulty,' 4='Too

	1 No difficulty	2 Some difficulty	3 Much difficulty	4 Too difficult to do	5 Not Applicable
Feeding yourself?					
Dressing yourself?					

Moving in and out of bed?					
Bathing yourself?					
Walking around your home?					
Walking several blocks?					
Doing house chores such as cleaning?					
Doing errands, such as grocery shopping?					
Driving a car?					
Using public transportation?					
Lifting heavy objects?					
Doing physical activity such as running?					
Visiting other peoples' homes?					
Participating in community activities, such as religious services, social activities, or volunteer work?					
Taking care of other people such as family members?					

M. Long-term Physical Abilities

M1-M4. Please place an x in the appropriate box to indicate if on a normal day you have difficulty with the following statements. If you have any temporary health issues at the moment, do not include them when choosing an answer.

	1 No difficulty	2 Some difficulty	3 Much difficulty	4 Too difficult to do	5 Not Applicable
Reading the newspaper? (with glasses if normally worn)					
Hearing a person during conversation? (with a hearing aid if you usually wear one).					
Speaking without difficulty?					
Walking up and down one flight of stairs?					

Please update us with any changes to your address or phone number here:

Name: _____

Address: _____

City: _____ Zip Code: _____

Phone Number: _____

THANK YOU
for your valuable feedback!

Appendix D – Codebook

Variable	What it is	Coding Options
PTID	patient id number	string of numbers
Church	Church	1 = Greater Piney Grove Baptist 2 = Turner Chapel AME 3 = Decatur SDA 4 = Greater Travelers Rest Baptist 5 = St. Philip AME 6 = Maranatha SDA
churchtype	type of church (ame, baptist, sda)	0 = ame 1 = baptist 2 = sda
health exposure	has the church been exposed to health education materials? (control vs. intervention cohort)	0 = control (no exposure to educational materials) 1 = intervention (exposure to educational materials)
Gender	Gender	0 = male 1 = female
Birthdate	Birthdate	date typed in
Age	Age	age typed in, continuous variable
diage	dichotomized age variable	0 = less than or equal to 64 1 = greater than or equal to 65
Education	Education	1 = K-8 grade 2 = 9-11 grade 3 = High School grad/GED 4 = Technical/Associates/Vocational 5 = Bachelor Degree 6 = Master Degree 7 = Doctorate
ceducation	further categorized education variable	0 = up to High school grad/GED 1 = Technical/Associates/Vocational 2 = Bachelor Degree 3 = Masters/Doctorate
Race	Race	1 = African American 2 = Caucasian/White 3 = Asian/Asian American/Pacific Islander 4 = Native American/American Indian/Alaskan Native 5 = Multiracial/Multicultural
Ethnicity	ethnicity (hispanic/non-hispanic)	0 = non-hispanic 1 = hispanic/latino/chicano

Sexuality	sexual orientation	1 = Straight
		2 = Bisexual
		3 = Gay/Homosexual/"Queer"
		98 = don't' know/questioning
Relationship	relationship status	1 = single/never married
		2 = married/domestic partner
		3 = divorced/separated
		4 = widowed
		5 = other
Relationship1	"other" option for relationship variable	written in
Employment	employment status	1 = employed full-time
		2 = employed part-time
		3 = unemployed
		4 = other
Employment1	"other" option for employment variable	written in
employmentd	dichotomized employment variable - employed vs. other (inc. retired)	0 = not employed 1 = employed
Income	Income	1 = less than 20,000
		2 = 20,001 - 40,000
		3 = 40,001 - 60,000
		4 = 60,001 - 80,000
		5 = 80,001 - 100,000
		6 = More than 100,001
cincome	further categorized income variable	0 = less than 20,000
		1 = 20,001 - 40,000
		2 = 40,001 - 80,000
		3 = 80,001+
Health	healthcare source	1 = healthcare community provider
		2 = community clinic or health center
		3 = hospital
		4 = prison clinic
		5 = other
Health1	"other" option for health variable	written in
BHealthSource	Where have you received your health information: Family or friends	0 = not checked 1 = checked
BHealthSource1	doctor/nurse/pharmacist	0 = not checked 1 = checked
BHealthSource2	newspaper/magazine/tv	0 = not checked 1 = checked

BHealthSource3	health help line	0 = not checked 1 = checked
BHealthSource4	health department	0 = not checked 1 = checked
BHealthSource5	Church	0 = not checked 1 = checked
BHealthSource6	School	0 = not checked 1 = checked
BHealthSource7	Internet	0 = not checked 1 = checked
BHealthSource8	Healer	0 = not checked 1 = checked
BHealthSource9	Public Library	0 = not checked 1 = checked
BHealthSource10	Other	0 = not checked 1 = checked
Bhealthfreq	how often have you used healthcare in the last year?	1 = 0 times 2 = 1-4 times 3 = 5-9 times 4 = 10 times or more
Btransport	how often do you have access to transportation to healthcare?	1 = always 2 = most of the time 3 = sometimes 4 = not often 5 = never
dBtransport	dichotomized btransport variable	0 = sometimes/not often/never 1 = always/most of time time
Btransport1	have you ever lacked transport to get to a healthcare provider?	0 = no 1 = yes
Bregdoc	do you have a regular doctor?	0 = no 1 = yes
Btrustdoc	do you trust your doctor?	0 = no 1 = yes 98 = don't know
Bdisc1	have you faced discrimination at school?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc2	have you faced discrimination applying for a job?	1 = never 2 = once 3 = more than once 4 = not applicable

Bdisc3	have you faced discrimination at work?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc4	have you faced discrimination in a store, at a restaurant, or another public place?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc5	have you faced discrimination getting medical care?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc6	have you faced discrimination from the police or in the courts?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc7	have you faced discrimination volunteering for a medical research study?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc8	have you faced discrimination interacting with medical research study staff?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc9	have you faced discrimination at a college or university?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc10	have you faced discrimination at church or faith-based organization?	1 = never 2 = once 3 = more than once 4 = not applicable
Bdisc11	have you faced discrimination at a community-based organization	1 = never 2 = once 3 = more than once 4 = not applicable
dbdisc1	dichotomized bdisc1 variable	0 = never 1 = once or more than once
dbdisc2	dichotomized bdisc2 variable	0 = never 1 = once or more than once
dbdisc3	dichotomized bdisc3 variable	0 = never 1 = once or more than once
dbdisc4	dichotomized bdisc4 variable	0 = never 1 = once or more than once

dbdisc5	dichotomized bdisc5 variable	0 = never
		1 = once or more than once
dbdisc6	dichotomized bdisc6 variable	0 = never
		1 = once or more than once
dbdisc7	dichotomized bdisc7 variable	0 = never
		1 = once or more than once
dbdisc8	dichotomized bdisc8 variable	0 = never
		1 = once or more than once
dbdisc9	dichotomized bdisc9 variable	0 = never
		1 = once or more than once
dbdisc10	dichotomized bdisc10 variable	0 = never
		1 = once or more than once
dbdisc11	dichotomized bdisc11 variable	0 = never
		1 = once or more than once
Bsafety1	how safe do you feel in your daily life?	1 = not at all
		2 = slightly
		3 = moderately
		4 = very
		5 = extremely
Bsafety2	do you feel you are living in a safe and secure environment?	1 = not at all
		2 = slightly
		3 = moderately
		4 = very
		5 = extremely
Bsafety3	how much do you worry about your safety and security?	1 = not at all
		2 = slightly
		3 = moderately
		4 = very
		5 = extremely
Bsafety4	how comfortable is the place you live?	1 = not at all
		2 = slightly
		3 = moderately
		4 = very
		5 = extremely
Bsafety5	how easily are you able to get good medical care?	1 = not at all
		2 = slightly
		3 = moderately
		4 = very
		5 = extremely
dbsafety1	dichotomized bsafety1 variable	0 = not at all/slightly/moderately
		1 = very/extremely
dbsafety2	dichotomized bsafety2 variable	0 = not at all/slightly/moderately
		1 = very/extremely

dbsafety3	dichotomized bsafety3 variable	0 = not at all/slightly/moderately 1 = very/extremely
dbsafety4	dichotomized bsafety4 variable	0 = not at all/slightly/moderately 1 = very/extremely
dbsafety5	dichotomized bsafety5 variable	0 = not at all/slightly/moderately 1 = very/extremely
Bspirit1	do your personal beliefs give meaning to your life?	1 = not at all 2 = a little 3 = a moderate amount 4 = very much 5 = an extreme amount
Bspirit2	to what extent do you find your life to be meaningful?	1 = not at all 2 = a little 3 = a moderate amount 4 = very much 5 = an extreme amount
Bspirit3	to what extent do your personal beliefs give you strength to face difficulties?	1 = not at all 2 = a little 3 = a moderate amount 4 = very much 5 = an extreme amount
Bspirit4	to what extent do your personal beliefs let you understand difficulties in your life?	1 = not at all 2 = a little 3 = a moderate amount 4 = very much 5 = an extreme amount
dbspirit1	dichotomized bspirit1 variable	0 = 1-3 1 = 4-5
dbspirit2	dichotomized bspirit2 variable	0 = 1-3 1 = 4-5
dbspirit3	dichotomized bspirit3 variable	0 = 1-3 1 = 4-5
dbspirit4	dichotomized bspirit4 variable	0 = 1-3 1 = 4-5
A1	I would join medical research if my healthcare provider recommended it	1 = not at all 2 = slightly 3 = moderately 4 = very 5 = extremely
A2	I would join medical research if my friend recommended it	1 = not at all 2 = slightly 3 = moderately 4 = very 5 = extremely

A3	I would join medical research if my family member recommended it	1 = not at all 2 = slightly 3 = moderately 4 = very 5 = extremely
A4	I would join medical research if faith leader/pastor recommended it	1 = not at all 2 = slightly 3 = moderately 4 = very 5 = extremely
A5	I would join medical research if my church recommended	1 = not at all 2 = slightly 3 = moderately 4 = very 5 = extremely
A6	Have you been in contact with Emory about participating in medical research?	0 = no 1 = yes 98 = don't know/don't recall
A7	what is the likelihood of you contacting emory re: participating in medical research	scale of 1-10, 1 = definitely not, 10 = definitely yes
A8	have you joined medical research since the first dose of hope session?	0 = no 1 = yes 98 = don't know/don't recall
A9	what is the likelihood of you joining medical research?	scale of 1-10, 1 = definitely not, 10 = definitely yes
B1	How would you rank your relationship with your healthcare provider?	scale of 1-10, 1 = very poor, 10 = very good
B1a	I don't have a healthcare provider currently	0 = not checked 1 = checked
dB1	dichotomized dB1 variable	0 = 1-5 1 = 6-10
B2	I feel comfortable talking to my healthcare provider about immunizations	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable

B3	I feel comfortable talking to my healthcare provider about preventive procedures	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable
B4	I feel a strong commitment with my healthcare provider	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable
B5	I would expend effort to keep seeing my healthcare provider	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable
B6	I feel loyal to my healthcare provider	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable
B7	I intend to make an appointment with my healthcare provider again	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable
B8	I would work with my healthcare provider even if my fees increase	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable
B9	I trust my healthcare providers judgment	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable

B10	My healthcare provider has experience and knows the best	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree 6 = not applicable
dB2	dichotomized B2 variable	0 = 3-5 1 = 1-2
dB3	dichotomized B3 variable	0 = 3-5 1 = 1-2
dB4	dichotomized B4 variable	0 = 3-5 1 = 1-2
dB5	dichotomized B5 variable	0 = 3-5 1 = 1-2
dB6	dichotomized B6 variable	0 = 3-5 1 = 1-2
dB7	dichotomized B7 variable	0 = 3-5 1 = 1-2
dB8	dichotomized B8 variable	0 = 3-5 1 = 1-2
dB9	dichotomized B9 variable	0 = 3-5 1 = 1-2
dB10	dichotomized B10 variable	0 = 3-5 1 = 1-2
B11	Describe your medical insurance policy	0 = not health insurance 1 = private insurance plan 2 = medicare 3 = medicaid 4 = combination of private insurance and medicaid 5 = other 98 = don't know
B11a	"other" option for B11 variable	written in
tB11	trichotomized insurance policy variable	0 = no insurance/other 1 = private insurance 2 = managed care/combination of managed care and private insurance

C1	have you received this seasons flu shot?	0 = no 1 = yes
C2A	I got the flu vaccine because I did not want to get the flu	0 = not checked 1 = checked
C2B	I got the flu vaccine because I wanted to protect my family and/or household	0 = not checked 1 = checked
C2C	I got the flu vaccine because it was convenient	0 = not checked 1 = checked
C2D	I got the flu vaccine because the vaccination was free	0 = not checked 1 = checked
C2E	I got the flu vaccine because vaccination is part of a healthy lifestyle	0 = not checked 1 = checked
C2F	I got the flu vaccine because the vaccine is nationally recommended	0 = not checked 1 = checked
C2G	I got the flu vaccine because a family member recommended it	0 = not checked 1 = checked
C2H	I got the flu vaccine because a healthcare provider recommended it	0 = not checked 1 = checked
C2I	I got the flu vaccine for other reasons	0 = not checked 1 = checked
C2J	write in for "other" option for C2I variable	written in
C3	where did you get your last flu shot?	0 = did not get flu shot 1 = primary care doctor's office 2 = ob/gyn office 3 = community/public health clinic 4 = hospital 5 = storefront clinic (CVS, Riteaid, etc.) 6 = prison clinic 7 = school health clinic 8 = worksite health clinic 9 = other 98 = don't know
C3a	write in for "other" option for C3 variable	written in
C4A	I did not get the flu shot because it was too expensive	0 = not checked 1 = checked

C4B	I did not get the flu shot because I could not locate a place that provided the flu vaccine	0 = not checked 1 = checked
C4C	I did not get the flu shot because it was inconvenient for me to get the flu shot	0 = not checked 1 = checked
C4D	I did not get the flu shot because I forgot to get the flu shot	0 = not checked 1 = checked
C4E	I did not get the flu shot because I am allergic to the flu shot	0 = not checked 1 = checked
C4F	I did not get the flu shot because I am worried about the possible side effects of the vaccine	0 = not checked 1 = checked
C4G	I did not get the flu shot because I don't like to get vaccinations	0 = not checked 1 = checked
C4H	I did not get the flu shot because I am scared of needles	0 = not checked 1 = checked
C4I	I did not get the flu shot because getting shots is painful	0 = not checked 1 = checked
C4J	I did not get the flu shot because I don't think vaccines are effective	0 = not checked 1 = checked
C4K	I did not get the flu shot because I didn't think I was at risk for getting the flu	0 = not checked 1 = checked
C4L	Other	0 = not checked 1 = checked
C4M	write in for "other" option for variable C4L	written in
C5	how often you got flu shot in last 5 yrs	0 = 0 times 1 = 5 times(every year) 2 = 2-4 times 3 = 1 time 98 = don't know/don't recall
reC5	recoded C5 variable	0 = 0/1 times 1 = 2-4 times 2 = 5 times(every year)
C6	has a family member got the flu shot in past year	0 = no 1 = yes 98 = don't know/don't recall

C6a	if yes, specify the family member (write in)	written in
C7	has anyone in the family refused to get flu shot	0 = no 1 = yes 98 = don't know/don't recall
C7a	if yes, specify the family member (write in)	written in
C8	in past 12 months, did you get sick with flu	0 = no 1 = yes 98 = don't know/don't recall
C9A	how did you know it was flu: doctor said so bc clinical signs/symptoms	0 = not checked 1 = checked
C9B	confirmed based on laboratory results	0 = not checked 1 = checked
C9C	thought I had it but didn't visit a doctor	0 = not checked 1 = checked
C9D	friend or relative told me I had the flu	0 = not checked 1 = checked
C9E	pharmacist told me I had the flu	0 = not checked 1 = checked
C9F	I got it from the flu shot	0 = not checked 1 = checked
C9G	Don't know	0 = not checked 1 = checked
C10A	what flu symptoms did you have: cough	0 = not checked 1 = checked
C10B	runny nose	0 = not checked 1 = checked
C10C	nasal congestion/stuffy nose	0 = not checked 1 = checked
C10D	itchy eyes	0 = not checked 1 = checked
C10E	fever	0 = not checked 1 = checked
C10F	headache	0 = not checked 1 = checked
C10G	sore throat	0 = not checked 1 = checked
C10H	vomiting	0 = not checked 1 = checked
C10I	diarrhea	0 = not checked 1 = checked

C10J	difficult breathing	0 = not checked 1 = checked
C10K	none of the above	0 = not checked 1 = checked
C10L	other (please specify)	0 = not checked 1 = checked
C10M	other (write in)	written in
C11	In the past year, did anyone living with you acquire the flu?	0 = no 1 = yes 2 = I live alone 98 = don't know/don't recall
C11a	write in	written in
C12A	top reasons you would get a flu shot: recommended by president	0 = not checked 1 = checked
C12B	recommended by my doctor	0 = not checked 1 = checked
C12C	recommended by school or employer	0 = not checked 1 = checked
C12D	recommended by my friends	0 = not checked 1 = checked
C12E	recommended by a family member	0 = not checked 1 = checked
C12F	recommended by faith leader/pastor	0 = not checked 1 = checked
C12G	recommended by herbalist/alternative medicine therapist	0 = not checked 1 = checked
C12H	recommended by famous sports player/movie star	0 = not checked 1 = checked
C12I	recommended by CDC	0 = not checked 1 = checked
C12J	will prevent me from becoming sick from flu virus	0 = not checked 1 = checked
C12K	flu is common in my community	0 = not checked 1 = checked
C12L	I am worried about getting the flu	0 = not checked 1 = checked
C12M	Other	0 = not checked 1 = checked
C12N	other (write in)	written in
C13A	top reasons you wouldn't get flu shot: concerned that vaccine will weaken immune system	0 = not checked 1 = checked

C13B	better to get natural flu that get a vaccine	0 = not checked 1 = checked
C13C	concerned about the side effects	0 = not checked 1 = checked
C13D	don't think I am at risk for the flu	0 = not checked 1 = checked
C13E	don't think the flu is that dangerous	0 = not checked 1 = checked
C13F	don't think the vaccine will work	0 = not checked 1 = checked
C13G	I don't take vaccines	0 = not checked 1 = checked
C13H	think the vaccine will cause me harm	0 = not checked 1 = checked
C13I	have moral/ethical objection to getting the vaccine	0 = not checked 1 = checked
C13J	have a religious objection to getting the vaccine	0 = not checked 1 = checked
C13K	getting shots is painful	0 = not checked 1 = checked
C13L	Other	0 = not checked 1 = checked
C13M	other (write in)	written in
C14	likelihood of getting flu vaccine patch in next two years if it's available	scale 1-10 1 = definitely not 10 = definitely yes
cC151	combined variable: C15v2K, C15v1D	0 = not checked 1 = checked
cC152	combined variable: C15v2J, C15v1F	0 = not checked 1 = checked
cC153	combined variable: C15v2F, C15v1C	0 = not checked 1 = checked
C15v1A	top reasons that would keep you from getting vaccine patch: concerned that vaccine will weaken immune system	0 = not checked 1 = checked
C15v1B	better to get natural flu that get a vaccine	0 = not checked 1 = checked
C15v1C	concerned about the side effects	0 = not checked 1 = checked
C15v1D	don't think I am at risk for the flu	0 = not checked 1 = checked
C15v1E	don't think the flu is that dangerous	0 = not checked 1 = checked

C15v1F	don't think the vaccine will work	0 = not checked 1 = checked
C15v1G	I don't take vaccines	0 = not checked 1 = checked
C15v1H	think the vaccine will cause me harm	0 = not checked 1 = checked
C15v1I	have moral/ethical objection to getting the vaccine	0 = not checked 1 = checked
C15v1J	have a religious objection to getting the vaccine	0 = not checked 1 = checked
C15v1K	I think the patch will hurt to put on	0 = not checked 1 = checked
C15v1L	other	0 = not checked 1 = checked
C15v1M	other (write in)	written in
C15v2A	top reasons that would keep you from getting vaccine patch: too expensive	0 = not checked 1 = checked
C15v2B	I could not locate a place that provided the flu vaccine	0 = not checked 1 = checked
C15v2C	It was inconvenient for me to get the vaccine	0 = not checked 1 = checked
C15v2D	I forgot to get the flu vaccine	0 = not checked 1 = checked
C15v2E	I am allergic to the flu vaccine	0 = not checked 1 = checked
C15v2F	I was worried about the possible side effects of the flu vaccine	0 = not checked 1 = checked
C15v2G	I don't like to get vaccinations	0 = not checked 1 = checked
C15v2H	I am scared of needles	0 = not checked 1 = checked
C15v2I	Getting shots is painful	0 = not checked 1 = checked
C15v2J	I don't think that vaccines are effective	0 = not checked 1 = checked
C15v2K	I didn't think I was at risk for getting the flu	0 = not checked 1 = checked
C15v2L	Other	0 = not checked 1 = checked
C15v2M	Other (write in)	written in
C16	have you heard of the H7N9 strain of the flu (bird flu)	0 = no 1 = yes 98 = don't know/don't recall

C17	likelihood of getting flu vaccine for H7N9 (bird flu) when it's available	scale 1-10 1 = definitely not 10 = definitely yes
C18A	top reasons keeping you from getting flu vaccine: vaccine will weaken my immune system	0 = not checked 1 = checked
C18B	better to get natural flu than to get a vaccine	0 = not checked 1 = checked
C18C	concerned about the side effects	0 = not checked 1 = checked
C18D	don't think I am at risk for the flu	0 = not checked 1 = checked
C18E	don't think the flu is that dangerous	0 = not checked 1 = checked
C18F	think the vaccine won't work	0 = not checked 1 = checked
C18G	I don't take vaccines	0 = not checked 1 = checked
C18H	I think the vaccine will cause me harm	0 = not checked 1 = checked
C18I	Have a moral or ethical objection to getting the vaccine	0 = not checked 1 = checked
C18J	Have a religious objection to getting the vaccine	0 = not checked 1 = checked
C18K	I think the patch will hurt to put on	0 = not checked 1 = checked
C18L	Other	0 = not checked 1 = checked
C18M	other (write in)	written in
C19	how serious do you think bird flu is to season flu	1 = not at all serious 2 = somewhat serious 3 = serious 4 = very serious 5 = extremely serious 98 = don't know
C20	how serious do you think it would be if you got the season flu	1 = not at all serious 2 = somewhat serious 3 = serious 4 = very serious 5 = extremely serious 98 = don't know

reC20	recoded C20 variable	0 = not at all serious/ somewhat serious 1 = serious/very serious/ extremely serious
C21	have received a vaccine for: Chicken pox	0 = no 1 = yes 98 = don't know/don't recall
C22	Hepatitis B	0 = no 1 = yes 98 = don't know/don't recall
C23	Measles, Mumps, Rubella (MMR)	0 = no 1 = yes 98 = don't know/don't recall
C24	Meningococcal	0 = no 1 = yes 98 = don't know/don't recall
C25	Pertussis	0 = no 1 = yes 98 = don't know/don't recall
C26	Shingles	0 = no 1 = yes 98 = don't know/don't recall
C27	Pneumonia	0 = no 1 = yes 98 = don't know/don't recall
C28	Tetanus-Diptheria	0 = no 1 = yes 98 = don't know/don't recall
C29	if you did receive the vaccines, where did you get them	0 = did not get any vaccine 1 = primary care doctor's office 2 = ob/gyn office 3 = community/public health clinic 4 = hospital 5 = storefront clinic 6 = prison clinic 7 = school health clinic 8 = worksite health clinic 9 = other 98 = don't know/don't recall

C29a	other (write in)	written in
C30	want to be told about vaccine's side effects and how they occur	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C31	I feel like I have enough access to immunization information	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C32	I want more info about immunizations before making decisions	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C33	immunizations are important for a healthy lifestyle	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C34	my body can protect itself against vaccine diseases	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C35	trust my provider to make decisions about which vacines would be the best for me to receive	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C36	worry that getting the flu shot would give me the flu	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C37	would be less likely to get a flu vaccine if it gave me symptoms such as tiredness or fever	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree

C38	immunizations can actually lead to illness	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C39	I would like to know more about what is in shots	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C40	I doubt whether vaccines really work	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
C41	I can easily get the flu shot	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
D1	I would recommend DoH to someone who asks	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
D2	I would say positive things about DoH to those who ask	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
D3	I would recommend DoH study to other people	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
dC30	dichotomized C30 variable	0 = 3-5 1 = 1-2
dC31	dichotomized C31 variable	0 = 3-5 1 = 1-2
dC32	dichotomized C32 variable	0 = 3-5 1 = 1-2
dC33	dichotomized C33 variable	0 = 3-5 1 = 1-2

dC34	dichotomized C34 variable	0 = 3-5
		1 = 1-2
dC35	dichotomized C35 variable	0 = 3-5
		1 = 1-2
dC36	dichotomized C36 variable	0 = 3-5
		1 = 1-2
dC37	dichotomized C37 variable	0 = 3-5
		1 = 1-2
dC38	dichotomized C38 variable	0 = 3-5
		1 = 1-2
dC39	dichotomized C39 variable	0 = 3-5
		1 = 1-2
dC40	dichotomized C40 variable	0 = 3-5
		1 = 1-2
dC41	dichotomized C41 variable	0 = 3-5
		1 = 1-2
D4	How much of the information did you read?	1 = all
		2 = most
		3 = quite a bit
		4 = some
		5 = none
D5	How much of what you learned at Dose of Hope did you share with at least one other person?	1 = all
		2 = most
		3 = quite a bit
		4 = some
		5 = none
D6	How much of the information you received at Dose of Hope did you show to at least one person?	1 = all
		2 = most
		3 = quite a bit
		4 = some
		5 = none
D7A	Friend	0 = not checked
		1 = checked
D7B	Family Member	0 = not checked
		1 = checked
D7C	Spouse/Primary Partner	0 = not checked
		1 = checked
D7D	Co-worker	0 = not checked
		1 = checked
D7E	Doctor/Health care provider	0 = not checked
		1 = checked
D7F	Pastor or church member	0 = not checked
		1 = checked

D7G	Other	0 = not checked 1 = checked
D7H	Did not share the information	0 = not checked 1 = checked
D7I	write in	written in
D8	To what extent have you talked to anyone about joining research studies	0 = not at all 1 = quite a bit 2 = some
D9A	Friend	0 = not checked 1 = checked
D9B	Family member	0 = not checked 1 = checked
D9C	Spouse/Primary partner	0 = not checked 1 = checked
D9D	Co-worker	0 = not checked 1 = checked
D9E	Doctor/heath care provider	0 = not checked 1 = checked
D9F	Pastor or church member	0 = not checked 1 = checked
D9G	Other	0 = not checked 1 = checked
D9H	write in	written in
D10	To what extent did you encourage anyone to join a research study	0 = not at all 1 = quite a bit 2 = some
D11A	Friend	0 = not checked 1 = checked
D11B	Family	0 = not checked 1 = checked
D11C	Spouse/Primary partner	0 = not checked 1 = checked
D11D	Co-worker	0 = not checked 1 = checked
D11E	Doctor/health care provider	0 = not checked 1 = checked
D11F	Pastor or church member	0 = not checked 1 = checked
D11G	Other	0 = not checked 1 = checked
D11H	write in	written in

E1	How often in the last month have you looked for health information in: Books/Brochures	1 = all the time 2 = often 3 = sometimes 4 = never
E2	magazines/newspapers	1 = all the time 2 = often 3 = sometimes 4 = never
E3	Internet	1 = all the time 2 = often 3 = sometimes 4 = never
E4	TV/Radio	1 = all the time 2 = often 3 = sometimes 4 = never
E5	Talks/Presentations	1 = all the time 2 = often 3 = sometimes 4 = never
E6	Doctor or Healthcare Provider	1 = all the time 2 = often 3 = sometimes 4 = never
E7	Family	1 = all the time 2 = often 3 = sometimes 4 = never
E8	Friends	1 = all the time 2 = often 3 = sometimes 4 = never
E9	Faith Leader or Pastor	1 = all the time 2 = often 3 = sometimes 4 = never
dE1	dichotomized E1 variable	0 = sometimes/never 1 = all the time/often
dE2	dichotomized E2 variable	0 = sometimes/never 1 = all the time/often
dE3	dichotomized E3 variable	0 = sometimes/never 1 = all the time/often
dE4	dichotomized E4 variable	0 = sometimes/never 1 = all the time/often

dE5	dichotomized E5 variable	0 = sometimes/never 1 = all the time/often
dE6	dichotomized E6 variable	0 = sometimes/never 1 = all the time/often
dE7	dichotomized E7 variable	0 = sometimes/never 1 = all the time/often
dE8	dichotomized E8 variable	0 = sometimes/never 1 = all the time/often
dE9	dichotomized E9 variable	0 = sometimes/never 1 = all the time/often
E10	I would trust health info from: a book/brochure	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E11	a magazine/newspaper	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E12	the Internet	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E13	the TV/Radio	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E14	a talk/presentation	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E15	my doctor or healthcare provider	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree

E16	my family	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E17	my friends	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E18	my faith leader/pastor	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
E19	my church	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
dE10	dichotomized E10 variable	0 = 3-5 1 = 1-2
dE11	dichotomized E11 variable	0 = 3-5 1 = 1-2
dE12	dichotomized E12 variable	0 = 3-5 1 = 1-2
dE13	dichotomized E13 variable	0 = 3-5 1 = 1-2
dE14	dichotomized E14 variable	0 = 3-5 1 = 1-2
dE15	dichotomized E15 variable	0 = 3-5 1 = 1-2
dE16	dichotomized E16 variable	0 = 3-5 1 = 1-2
dE17	dichotomized E17 variable	0 = 3-5 1 = 1-2
dE18	dichotomized E18 variable	0 = 3-5 1 = 1-2
dE19	dichotomized E19 variable	0 = 3-5 1 = 1-2
F1A	If you have info about clinical research studies, would you share it through: phone call	0 = not checked 1 = checked

F1B	text message	0 = not checked
		1 = checked
F1C	Email	0 = not checked
		1 = checked
F1D	social networking sites	0 = not checked
		1 = checked
F1E	in person	0 = not checked
		1 = checked
F1F	Other	0 = not checked
		1 = checked
F1G	other (write in)	written in
G1	joining a research study would improve the quality of my life	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
G2	the disadvantages of joining s research study far outweigh the advantages	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
G3	I would benefit from the medical care received in a research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
G4	Joining a research study would not benefit my community in any way	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H1	Joining a research study would disrupt my life	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H2	Joining a research study would work with my schedule	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree

H3	Participating in research aligns with my personal values	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H4	Participating in a clinical study will help me maintain my health and well being	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H5	It is easy for me to remember the instructions for a research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H6	I understand the process of joining a research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H7	Joining a research study would make me look good to others in my community	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H8	Joining a research study would make me look good at my church	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H9	People in my community who join research studies have more prestige than those who do not	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
H10	People in my community who join research studies typically do not talk about it	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree

H11	Joining a research study is a badge of honor in my community	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
I1	I believe that joining a research study would be hard for me	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
I2	Filling out the forms to enroll in a research study are too much trouble	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
I3	Joining a research study would require a lot of mental effort	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
I4	I would have difficulty joining a research study because of transportation issues	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
I5	It would be difficult to spend my time at the clinic for research study visits	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
I6	It is difficult to understand an informed consent document	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J1	I know where I can go to ask questions about research studies	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree

J2	I know where I can go to ask about joining a research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J3	There are enough people in my community who can help me learn about research studies	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J4	I know someone who has participated in a research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J5	I have seen the benefits of research studies firsthand in my community	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J6	I have seen what others do to join research studies	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J7	My community is not interested in research studies	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J8	I have had plenty of opportunities to learn about joining a research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
J9	I have not seen many other people joining research studies in my community	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree

K1	I would have no difficulty telling others about how to join a research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
K2	I believe I could communicate to others the consequences of joining s research study	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
K3	the consequences of joining a research study are clear to me	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
K4	I would have difficulty explaining why joining a research study may or may not be helpful to someone	1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree
L1	Do you have any difficulty: feeding yourself	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L2	dressing yourself	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L3	moving in and out of bed	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L4	bathing yourself	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable

L5	walking around your home	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L6	walking several blocks	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L7	doing house chores such as cleaning	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L8	doing errands such as grocery shopping	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L9	driving a car	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L10	using public transportation	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L11	lifting heavy objects	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable
L12	doing physical activity such as running	1 = no difficulty 2 = some difficulty 3 = much difficulty 4 = too difficult to do 5 = not applicable

L13	visiting other peoples' homes	1 = no difficulty
		2 = some difficulty
		3 = much difficulty
		4 = too difficult to do
		5 = not applicable
L14	participating in community activities	1 = no difficulty
		2 = some difficulty
		3 = much difficulty
		4 = too difficult to do
		5 = not applicable
L15	taking care of other people such as family members	1 = no difficulty
		2 = some difficulty
		3 = much difficulty
		4 = too difficult to do
		5 = not applicable
M1	on a normal day, do you have troubles: reading the newspaper (with glasses if normally worn)	1 = no difficulty
		2 = some difficulty
		3 = much difficulty
		4 = too difficult to do
		5 = not applicable
M2	hearing a person during a conversation (with a hearing aid if you usually wear one)	1 = no difficulty
		2 = some difficulty
		3 = much difficulty
		4 = too difficult to do
		5 = not applicable
M3	speaking without difficulty?	1 = no difficulty
		2 = some difficulty
		3 = much difficulty
		4 = too difficult to do
		5 = not applicable
M4	walking up and down one flight of stairs?	1 = no difficulty
		2 = some difficulty
		3 = much difficulty
		4 = too difficult to do
		5 = not applicable
F1	imputed bdisc1 variable	1 = never
		2 = once
		3 = more than once
F2	imputed bdisc2 variable	1 = never
		2 = once
		3 = more than once
F3	imputed bdisc3 variable	1 = never
		2 = once
		3 = more than once

F4	imputed bdisc4 variable	1 = never
		2 = once
		3 = more than once
F5	imputed bdisc5 variable	1 = never
		2 = once
		3 = more than once
F6	imputed bdisc6 variable	1 = never
		2 = once
		3 = more than once
F7	imputed bdisc7 variable	1 = never
		2 = once
		3 = more than once
F8	imputed bdisc8 variable	1 = never
		2 = once
		3 = more than once
F9	imputed bdisc9 variable	1 = never
		2 = once
		3 = more than once
F10	imputed bdisc10 variable	1 = never
		2 = once
		3 = more than once
F11	imputed bdisc11 variable	1 = never
		2 = once
		3 = more than once
dF1	dichotomized dF1 variable	0 = never
		1 = once or more than once
dF2	dichotomized dF2 variable	0 = never
		1 = once or more than once
dF3	dichotomized dF3 variable	0 = never
		1 = once or more than once
dF4	dichotomized dF4 variable	0 = never
		1 = once or more than once
dF5	dichotomized dF5 variable	0 = never
		1 = once or more than once
dF6	dichotomized dF6 variable	0 = never
		1 = once or more than once
dF7	dichotomized dF7 variable	0 = never
		1 = once or more than once
dF8	dichotomized dF8 variable	0 = never
		1 = once or more than once
dF9	dichotomized dF9 variable	0 = never
		1 = once or more than once
dF10	dichotomized dF10 variable	0 = never
		1 = once or more than once

dF11	dichotomized dF11 variable	0 = never
		1 = once or more than once
redf1	redichotomized dF1 variable	0 = never
		1 = once or more than once
redf2	redichotomized dF2 variable	0 = never
		1 = once or more than once
redf3	redichotomized dF3 variable	0 = never
		1 = once or more than once
redf4	redichotomized dF4 variable	0 = never
		1 = once or more than once
redf5	redichotomized dF5 variable	0 = never
		1 = once or more than once
redf6	redichotomized dF6 variable	0 = never
		1 = once or more than once
redf7	redichotomized dF7 variable	0 = never
		1 = once or more than once
redf8	redichotomized dF8 variable	0 = never
		1 = once or more than once
redf9	redichotomized dF9 variable	0 = never
		1 = once or more than once
redf10	redichotomized dF10 variable	0 = never
		1 = once or more than once
redf11	redichotomized dF11 variable	0 = never
		1 = once or more than once
FInstDisc	factor analysis variable for institutional discrimination	linear
FInstVol	factor analysis variable for voluntary situational discrimination	linear
Dummy Variables		
churchtype1	dummy variable if churchtype = 0	1 = churchtype is 0
		0 = churchtype is 1 or 2
churchtype2	dummy variable if churchtype = 1	1 = churchtype is 1
		0 = churchtype is 0 or 2
churchtype3	dummy variable if churchtype = 2	1 = churchtype is 2
		0 = churchtype is 0 or 1
t1B11	dummy variable if tB11 = 0	1 = tB11 is 0
		0 = tB11 is 1 or 2
t2B11	dummy variable if tB11 = 1	1 = tB11 is 1
		0 = tB11 is 0 or 2
t3B11	dummy variable if tB11 = 2	1 = tB11 is 2
		0 = tB11 is 0 or 1

Appendix E – SAS code

```
*************************************************************************
*Sahithi Boggavarapu
*MPH Candidate 2014
*Epidemiology
*Thesis Analysis
*Topic: Predictors of 2012-2013 influenza vaccination in elderly
minority population based *
*on data collected from faith-based settings
*Field Advisor: Dr. Paula Frew, PhD, MPH, MA
*Faculty Advisor: Dr. Kevin Sullivan, PhD, MPH, MHA
*************************************************************************
;

*open dataset;
libname a "\\trustedfs.cc.emory.edu\TS6\DOM\Infectious
Diseases\Research\57210 DOSEHOPE\Sahithi\THESIS";

*look at dataset;
proc contents data=a.sahithi_thesis_dataset1;
run;

*******************CREATE WORKING DATASET AND CLEAN DATA*************;
*original dataset has 333 variables, 211 observations;
data work.thesis;
set a.sahithi_thesis_dataset1;

*create variable called churchtype that categorizes church types in
baptist (1), AME (0) and SDA (2);
if church = 1 or church = 4 then churchtype = 1;
if church = 2 or church = 5 then churchtype = 0;
if church = 3 or church = 6 then churchtype = 2;

*label churchtype variable;
label churchtype = "church denomination";

*create variable called healthexposure that categorizes churches into
control (0) or intervention (1);
if church = 1 or church = 2 or church = 3 then healthexposure = 0;
else healthexposure = 1;

*label healthexposure variable;
label healthexposure = "exposure to health education materials in the
form of handouts and health presentations";

*create variable called diage that dichotomizes age variable;
if age le 64 then diage = 0;
else diage = 1;

*label diage variable;
label diage = "dichotomized age variable";

*correct relationship/relationship1 discrepancies;
if relationship1 eq "Married/divorced" then relationship = 3;
if relationship1 eq "deceased" then relationship = 4;
```

```
*correct employment/employment 1 discrepancies;
if employment1 = "Self-Employed" or employment1 = "self employed" then
employment = 1;
if employment1 = "Self employed-owner of agency; licensed professional
counselor" then employment = 1;
if employment1 = "semi-retired businessman" then employment = 2;

*dichotomize employment variable - variable = employmentd;
if employment = 1 or employment = 2 then employmentd = 1;
if employment = 3 or employment = 4 then employmentd = 0;

*label employmentd variable;
label employmentd = "dichotomized employment variable";

*recategorized education variable;
if education = 1 or education = 2 or education = 3 then ceducation = 0;
if education = 4 then ceducation = 1;
if education = 5 then ceducation = 2;
if education = 6 or education = 7 then ceducation = 3;

*label ceducation;
label ceducation = "recategorized education variable";

*recategorized income variable;
if income = 1 then cincome = 0;
if income = 2 then cincome = 1;
if income = 3 or income = 4 then cincome = 2;
if income = 5 or income = 6 then cincome = 3;

*label cincome variable;
label cincome = "recategorized income variable";

*make dichotomized btransport variable;
if btransport = 3 or btransport = 4 or btransport = 5 then dbtransport
= 0;
if btransport = 1 or btransport = 2 then dbtransport = 1;

*label dbtransport variable;
label dbtransport = "dichotomized btransport variable";

*recode all the 98/99/not applicables as missing;
if sexuality = 98 then sexuality = .;
if Btrustdoc = 98 then Btrustdoc = .;
if Bdisc1 = 4 then Bdisc1 = .;
if Bdisc2 = 4 then Bdisc2 = .;
if Bdisc3 = 4 then Bdisc3 = .;
if Bdisc4 = 4 then Bdisc4 = .;
if Bdisc5 = 4 then Bdisc5 = .;
if Bdisc6 = 4 then Bdisc6 = .;
if Bdisc7 = 4 then Bdisc7 = .;
if Bdisc8 = 4 then Bdisc8 = .;
if Bdisc9 = 4 then Bdisc9 = .;
if Bdisc10 = 4 then Bdisc10 = .;
if Bdisc11 = 4 then Bdisc11 = .;
if A6 = 98 then A6 = .;
if A8 = 98 then A8 = .;
```

```
if B2 = 6 then B2 = .;
if B3 = 6 then B3 = .;
if B4 = 6 then B4 = .;
if B5 = 6 then B5 = .;
if B6 = 6 then B6 = .;
if B7 = 6 then B7 = .;
if B8 = 6 then B8 = .;
if B9 = 6 then B9 = .;
if B10 = 6 then B10 = .;
if B11 = 98 then B11 = .;
if C3 = 98 then C3 = .;
if C5 = 98 then C5 = .;
if C6 = 98 then C6 = .;
if C7 = 98 then C7 = .;
if C8 = 98 then C8 = .;
if C11 = 98 then C11 = .;
if C16 = 98 then C16 = .;
if C19 = 98 then C19 = .;
if C20 = 98 then C20 = .;
if C21 = 98 then C21 = .;
if C22 = 98 then C22 = .;
if C23 = 98 then C23 = .;
if C24 = 98 then C24 = .;
if C25 = 98 then C25 = .;
if C26 = 98 then C26 = .;
if C27 = 98 then C27 = .;
if C28 = 98 then C28 = .;
if C29 = 98 then C29 = .;

*dichotomize discrimination variables;
if bdisc1 = 1 then dbdisc1 = 0;
if bdisc1 = 2 then dbdisc1 = 1;
if bdisc1 = 3 then dbdisc1 = 1;

if bdisc2 = 1 then dbdisc2 = 0;
if bdisc2 = 2 then dbdisc2 = 1;
if bdisc2 = 3 then dbdisc2 = 1;

if bdisc3 = 1 then dbdisc3 = 0;
if bdisc3 = 2 then dbdisc3 = 1;
if bdisc3 = 3 then dbdisc3 = 1;

if bdisc4 = 1 then dbdisc4 = 0;
if bdisc4 = 2 then dbdisc4 = 1;
if bdisc4 = 3 then dbdisc4 = 1;

if bdisc5 = 1 then dbdisc5 = 0;
if bdisc5 = 2 then dbdisc5 = 1;
if bdisc5 = 3 then dbdisc5 = 1;

if bdisc6 = 1 then dbdisc6 = 0;
if bdisc6 = 2 then dbdisc6 = 1;
if bdisc6 = 3 then dbdisc6 = 1;

if bdisc7 = 1 then dbdisc7 = 0;
if bdisc7 = 2 then dbdisc7 = 1;
if bdisc7 = 3 then dbdisc7 = 1;
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```
if bdisc8 = 1 then dbdisc8 = 0;
if bdisc8 = 2 then dbdisc8 = 1;
if bdisc8 = 3 then dbdisc8 = 1;

if bdisc9 = 1 then dbdisc9 = 0;
if bdisc9 = 2 then dbdisc9 = 1;
if bdisc9 = 3 then dbdisc9 = 1;

if bdisc10 = 1 then dbdisc10 = 0;
if bdisc10 = 2 then dbdisc10 = 1;
if bdisc10 = 3 then dbdisc10 = 1;

if bdisc11 = 1 then dbdisc11 = 0;
if bdisc11 = 2 then dbdisc11 = 1;
if bdisc11 = 3 then dbdisc11 = 1;

*label dichotomized discrimination variables;
label dbdisc1 = "dichotomized bdisc1 variable";
label dbdisc2 = "dichotomized bdisc2 variable";
label dbdisc3 = "dichotomized bdisc3 variable";
label dbdisc4 = "dichotomized bdisc4 variable";
label dbdisc5 = "dichotomized bdisc5 variable";
label dbdisc6 = "dichotomized bdisc6 variable";
label dbdisc7 = "dichotomized bdisc7 variable";
label dbdisc8 = "dichotomized bdisc8 variable";
label dbdisc9 = "dichotomized bdisc9 variable";
label dbdisc10 = "dichotomized bdisc10 variable";
label dbdisc11 = "dichotomized bdisc11 variable";

*dichotomize imputed discrimination variables;
if F1 le 1 then dF1 = 0;
if F1 gt 1 then dF1 = 1;
if F1 = . then dF1 = .;

if F2 le 1 then dF2 = 0;
if F2 gt 1 then dF2 = 1;
if F2 = . then dF2 = .;

if F3 le 1 then dF3 = 0;
if F3 gt 1 then dF3 = 1;
if F3 = . then dF3 = .;

if F4 le 1 then dF4 = 0;
if F4 gt 1 then dF4 = 1;
if F4 = . then dF4 = .;

if F5 le 1 then dF5 = 0;
if F5 gt 1 then dF5 = 1;
if F5 = . then dF5 = .;

if F6 le 1 then dF6 = 0;
if F6 gt 1 then dF6 = 1;
if F6 = . then dF6 = .;

if F7 le 1 then dF7 = 0;
if F7 gt 1 then dF7 = 1;
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```
if F7 = . then dF7 = .;

if F8 le 1 then dF8 = 0;
if F8 gt 1 then dF8 = 1;
if F8 = . then dF8 = .;

if F9 le 1 then dF9 = 0;
if F9 gt 1 then dF9 = 1;
if F9 = . then dF9 = .;

if F10 le 1 then dF10 = 0;
if F10 gt 1 then dF10 = 1;
if F10 = . then dF10 = .;

if F11 le 1 then dF11 = 0;
if F11 gt 1 then dF11 = 1;
if F11 = . then dF11 = .;

*label dichotomized imputed discrimination variables;
label dF1 = "dichotomized dF1 variable";
label dF2 = "dichotomized dF2 variable";
label dF3 = "dichotomized dF3 variable";
label dF4 = "dichotomized dF4 variable";
label dF5 = "dichotomized dF5 variable";
label dF6 = "dichotomized dF6 variable";
label dF7 = "dichotomized dF7 variable";
label dF8 = "dichotomized dF8 variable";
label dF9 = "dichotomized df9 variable";
label dF10 = "dichotomized df10 variable";
label dF11 = "dichotomized df11 variable";

*if missing value in dFs, but not in dbdiscs, move value over;
if dF1 = . then redf1 = dbdisc1;
else redf1 = dF1;

if dF2 = . then redf2 = dbdisc2;
else redf2 = dF2;

if dF3 = . then redf3 = dbdisc3;
else redf3 = dF3;

if dF4 = . then redf4 = dbdisc4;
else redf4 = dF4;

if dF5 = . then redf5 = dbdisc5;
else redf5 = dF5;

if dF6 = . then redf6 = dbdisc6;
else redf6 = dF6;

if dF7 = . then redf7 = dbdisc7;
else redf7 = dF7;

if dF8 = . then redf8 = dbdisc8;
else redf8 = dF8;

if dF9 = . then redf9 = dbdisc9;
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else redf9 = dF9;

if dF10 = . then redf10 = dbdisc10;
else redf10 = dF10;

if dF11 = . then redf11 = dbdisc11;
else redf11 = dF11;

*label dichotomized imputed discrimination variables;
label redF1 = "redichotomized dF1 variable";
label redF2 = "redichotomized dF2 variable";
label redF3 = "redichotomized dF3 variable";
label redF4 = "redichotomized dF4 variable";
label redF5 = "redichotomized dF5 variable";
label redF6 = "redichotomized dF6 variable";
label redF7 = "redichotomized dF7 variable";
label redF8 = "redichotomized dF8 variable";
label redF9 = "redichotomized df9 variable";
label redF10 = "redichotomized df10 variable";
label redF11 = "redichotomized df11 variable";

*dichotomize safety variable;
if bsafety1 = 1 or bsafety1 = 2 or bsafety1 = 3 then dbsafety1 = 0;
else dbsafety1 = 1;

if bsafety2 = 1 or bsafety2 = 2 or bsafety2 = 3 then dbsafety2 = 0;
else dbsafety2 = 1;

if bsafety3 = 1 or bsafety3 = 2 or bsafety3 = 3 then dbsafety3 = 0;
else dbsafety3 = 1;

if bsafety4 = 1 or bsafety4 = 2 or bsafety4 = 3 then dbsafety4 = 0;
else dbsafety4 = 1;

if bsafety5 = 1 or bsafety5 = 2 or bsafety5 = 3 then dbsafety5 = 0;
else dbsafety5 = 1;

*label dichotomized safety variables;
label dbsafety1 = "dichotomized bsafety1 variable";
label dbsafety2 = "dichotomized bsafety2 variable";
label dbsafety3 = "dichotomized bsafety3 variable";
label dbsafety4 = "dichotomized bsafety4 variable";
label dbsafety5 = "dichotomized bsafety5 variable";

*dichotomize spirituality variables;
if bspirit1 = 4 or bspirit1 = 5 then dbspirit1 = 1;
else dbspirit1 = 0;

if bspirit2 = 4 or bspirit2 = 5 then dbspirit2 = 1;
else dbspirit2 = 0;

if bspirit3 = 4 or bspirit3 = 5 then dbspirit3 = 1;
else dbspirit3 = 0;

if bspirit4 = 4 or bspirit4 = 5 then dbspirit4 = 1;
else dbspirit4 = 0;
```

```
*label dichotomized spirituality variables;
label dbspirit1 = "dichotomized bspirit1 variable";
label dbspirit2 = "dichotomized bspirit2 variable";
label dbspirit3 = "dichotomized bspirit3 variable";
label dbspirit4 = "dichotomized bspirit4 variable";

*dichotomize B1 - relationship with healthcare provider, 1-5, 6-10.
variable called dB1;
if B1 le 5 then dB1 = 0;
if B1 ge 6 then dB1 = 1;

*label variable dB1;
label dB1 = "dichotomized B1 variable";

*dichotomize B2=B10, called dB2, etc.;
if B2 lt 3 then dB2 = 1;
if B2 ge 3 then dB2 = 0;

if B3 lt 3 then dB3 = 1;
if B3 ge 3 then dB3 = 0;

if B4 lt 3 then dB4 = 1;
if B4 ge 3 then dB4 = 0;

if B5 lt 3 then dB5 = 1;
if B5 ge 3 then dB5 = 0;

if B6 lt 3 then dB6 = 1;
if B6 ge 3 then dB6 = 0;

if B7 lt 3 then dB7 = 1;
if B7 ge 3 then dB7 = 0;

if B8 lt 3 then dB8 = 1;
if B8 ge 3 then dB8 = 0;

if B9 lt 3 then dB9 = 1;
if B9 ge 3 then dB9 = 0;

if B10 lt 3 then dB10 = 1;
if B10 ge 3 then dB10 = 0;

*label dB2-dB10;
label dB2 = "dichotomized B2 variable";
label dB3 = "dichotomized B3 variable";
label dB4 = "dichotomized B4 variable";
label dB5 = "dichotomized B5 variable";
label dB6 = "dichotomized B6 variable";
label dB7 = "dichotomized B7 variable";
label dB8 = "dichotomized B8 variable";
label dB9 = "dichotomized B9 variable";
label dB10 = "dichotomized B10 variable";

*making sure all of the write ins/"other" options correspond with each
respective variable (B11a);
if B11a = "BCBS" then B11 = 1;
if B11a = "Blue Cross/Blue Shield PPO" then B11 = 1;
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if B11a = "Kaiser Permanente" then B11 = 1;
if B11a = "Tricare for Life" then B11 = 4;
if B11a = "on the job" then B11 = 1;

*trichotomize B11, called variable tB11;
if B11 = 0 or B11 = 5 then tB11 = 0;
if B11 = 1 then tB11 = 1;
if B11 = 2 or B11 = 3 or B11 = 4 then tB11 = 2;

*label variable tB11;
label tB11 = "trichotomized insurance variable";

*making sure all of the write ins/"other" options correspond with each
respective variable (variable C3);
if C3a = "Church health fair" then C3 = 3;
if C3a = "Walgreen's" then C3 = 5;
if C3a = "state department of health" then C3 = 3;

*recode variable C5, variable reC5;
if C5 = 0 then reC5 = 0;
if C5 = 1 then reC5 = 2;
if C5 = 2 then reC5 = 1;
if C5 = 3 then reC5 = 0;

*label variable reC5;
label reC5 = "recoded C5 variable";

*recode variable C20, variable reC20;
if C20 = 1 or C20 = 2 then reC20 = 0;
if C20 = 3 or C20 = 4 or C20 = 5 then reC20 = 1;

*label variable reC20;
label reC20 = "recoded C20 variable";

*making sure all of the write ins/"other" options correspond with each
respective variable (variable C29a);
if C29a = "((Also selected primary care office))" then C29 = 1;
if C29a = "Also worksite clinic" then C29 = 8;
if C29a = "Walgreen's" then C29 = 5;
if C29a = "state department of health" then C29 = 3;

*dichotomize C30-C41, called dC30, etc.;
if C30 lt 3 then dC30 = 1;
if C30 ge 3 then dC30 = 0;

if C31 lt 3 then dC31 = 1;
if C31 ge 3 then dC31 = 0;

if C32 lt 3 then dC32 = 1;
if C32 ge 3 then dC32 = 0;

if C33 lt 3 then dC33 = 1;
if C33 ge 3 then dC33 = 0;

if C34 lt 3 then dC34 = 1;
if C34 ge 3 then dC34 = 0;
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if C35 lt 3 then dC35 = 1;
if C35 ge 3 then dC35 = 0;

if C36 lt 3 then dC36 = 1;
if C36 ge 3 then dC36 = 0;

if C37 lt 3 then dC37 = 1;
if C37 ge 3 then dC37 = 0;

if C38 lt 3 then dC38 = 1;
if C38 ge 3 then dC38 = 0;

if C39 lt 3 then dC39 = 1;
if C39 ge 3 then dC39 = 0;

if C40 lt 3 then dC40 = 1;
if C40 ge 3 then dC40 = 0;

if C41 lt 3 then dC41 = 1;
if C41 ge 3 then dC41 = 0;

*label dC30-dC41;
label dC30 = "dichotomized C30 variable";
label dC31 = "dichotomized C31 variable";
label dC32 = "dichotomized C32 variable";
label dC33 = "dichotomized C33 variable";
label dC34 = "dichotomized C34 variable";
label dC35 = "dichotomized C35 variable";
label dC36 = "dichotomized C36 variable";
label dC37 = "dichotomized C37 variable";
label dC38 = "dichotomized C38 variable";
label dC39 = "dichotomized C39 variable";
label dC40 = "dichotomized C40 variable";
label dC41 = "dichotomized C41 variable";

*making sure all of the write ins/"other" options correspond with each
respective variable (variable F1G);
if F1G = "Church clubs" then F1E = 1 and F1F = 0;
if F1G = "by usps mail" then F1F = 1;
if F1G = "copies" then F1F = 1;
if F1G = "u.s. mail to family" then F1F = 1;
if F1G = "in group settings" then F1E = 1 and F1F = 0;
if F1G = "Whichever means are avai" then F1A = 1 and F1B = 1 and F1C =
1 and F1D = 1 and F1E = 1 and F1F = 0;

*making sure all of the write ins/"other" options correspond with each
respective variable (variable D11H);
if D11H = "I invited a friend, she declined" then D11A = 1 and D11G =
0;
if D11H = "Support group" then D11G = 1;
if D11H = "neighbor" then D11G = 1;
if D11H = "some strangers" then D11G = 1;

*making sure all of the write ins/"other" options correspond with each
respective variable (variable D9H);
if D9H = "Support group" then D9G = 1;
if D9H = "some strangers" then D9G = 1;
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*making sure all of the write ins/"other" options correspond with each
respective variable (variable D7I);
if D7I = "neighbors" then D7G = 1;
if D7I = "neighbor" then D7G = 1;
if D7I = "some strangers" then D7G = 1;

*dichotomize variables E1-E9;
if E1 = 3 or E1 = 4 or E1 = 5 then dE1 = 0;
else dE1 = 1;

if E2 = 3 or E2 = 4 or E2 = 5 then dE2 = 0;
else dE2 = 1;

if E3 = 3 or E3 = 4 or E3 = 5 then dE3 = 0;
else dE3 = 1;

if E4 = 3 or E4 = 4 or E4 = 5 then dE4 = 0;
else dE4 = 1;

if E5 = 3 or E5 = 4 or E5 = 5 then dE5 = 0;
else dE5 = 1;

if E6 = 3 or E6 = 4 or E6 = 5 then dE6 = 0;
else dE6 = 1;

if E7 = 3 or E7 = 4 or E7 = 5 then dE7 = 0;
else dE7 = 1;

if E8 = 3 or E8 = 4 or E8 = 5 then dE8 = 0;
else dE8 = 1;

if E9 = 3 or E9 = 4 or E9 = 5 then dE9 = 0;
else dE9 = 1;

*label dichotomized E1-E9 variables;
label dE1 = "dichotomized E1 variable";
label dE2 = "dichotomized E2 variable";
label dE3 = "dichotomized E3 variable";
label dE4 = "dichotomized E4 variable";
label dE5 = "dichotomized E5 variable";
label dE6 = "dichotomized E6 variable";
label dE7 = "dichotomized E7 variable";
label dE8 = "dichotomized E8 variable";
label dE9 = "dichotomized E9 variable";

*dichotomize variables E10-E19;
if E10 lt 3 then dE10 = 1;
else dE10 = 0;

if E11 lt 3 then dE11 = 1;
else dE11 = 0;

if E12 lt 3 then dE12 = 1;
else dE12 = 0;

if E13 lt 3 then dE13 = 1;
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else dE13 = 0;

if E14 lt 3 then dE14 = 1;
else dE14 = 0;

if E15 lt 3 then dE15 = 1;
else dE15 = 0;

if E16 lt 3 then dE16 = 1;
else dE16 = 0;

if E17 lt 3 then dE17 = 1;
else dE17 = 0;

if E18 lt 3 then dE18 = 1;
else dE18 = 0;

if E19 lt 3 then dE19 = 1;
else dE19 = 0;

*label dichotomized E10-E19 variables;
label dE10 = "dichotomized E10 variable";
label dE11 = "dichotomized E11 variable";
label dE12 = "dichotomized E12 variable";
label dE13 = "dichotomized E13 variable";
label dE14 = "dichotomized E14 variable";
label dE15 = "dichotomized E15 variable";
label dE16 = "dichotomized E16 variable";
label dE17 = "dichotomized E17 variable";
label dE18 = "dichotomized E18 variable";
label dE19 = "dichotomized E19 variable";

*for variable C1 (outcome), drop any observations that are not 0 or 1;
if C1 eq . then delete;
if C1 eq 98 then delete;


run;

***********making sure data cleaning worked*************************;

*making sure there are no extraneous values for church variable;
proc freq data=work.thesis;
tables church;
run;

*check to see if churchtype variable has been created correctly;
proc freq data=work.thesis;
tables church*churchtype/list;
run;

*check to see that healthexposure variable has been created correctly
and that it corresponds to the church variable;
proc freq data=work.thesis;
tables church*healthexposure/list;
run;

*making sure there are no extraneous values for gender variable;
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proc freq data=work.thesis;
tables gender;
run;

*making sure there are no extraneous values for age variable;
proc freq data=work.thesis;
tables age;
run;

*making sure coding for diage variable worked;
proc freq data=work.thesis;
tables age*diage/list;
run;

*making sure there are no extraneous values for education variable;
proc freq data=work.thesis;
tables education;
run;

*making sure there are no extraneous values for race variable;
proc freq data=work.thesis;
tables race;
run;

*do the race and ethnicity variables correspond?;
proc freq data=work.thesis;
tables race*ethnicity/list;
run;

*making sure there are no extraneous values for ethnicity variable;
proc freq data=work.thesis;
tables ethnicity;
run;

*making sure there are no extraneous values for sexuality variable;
proc freq data=work.thesis;
tables sexuality;
run;

*making sure the relationship/relationship1 variables correspond;
proc freq data=work.thesis;
tables relationship*relationship1/list;
run;

proc freq data=work.thesis;
tables relationship/list;
run;

*making sure the employment/employment1 variables correspond and that
employmentd variable is coded correctly;
proc freq data=work.thesis;
tables employment/list;
run;

proc freq data=work.thesis;
tables employment*employment1/list;
run;
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```
proc freq data=work.thesis;
tables employment*employmentd/list;
run;

*make sure education and ceducation correspond;
proc freq data=work.thesis;
tables education*ceducation/list;
run;

*making sure the income variable is coded correctly;
proc freq data=work.thesis;
tables income/list;
run;

*make sure income and cincome correspond;
proc freq data=work.thesis;
tables income*cincome/list;
run;

*make sure there are no extraneous variables for Btransport;
proc freq data=work.thesis;
tables btransport/list;
run;

*look at distribution of B1 - keeps increasing, skewed left;
proc freq data=work.thesis;
tables B1/list;
run;

*make sure B1 and dB1 correspond;
proc freq data=work.thesis;
tables B1*dB1/list;
run;

*make sure the B2-10 and dB2-10 variables correspond;
proc freq data=work.thesis;
tables B2*dB2/list;
run;

proc freq data=work.thesis;
tables B3*dB3/list;
run;

proc freq data=work.thesis;
tables B4*dB4/list;
run;

proc freq data=work.thesis;
tables B5*dB5/list;
run;

proc freq data=work.thesis;
tables B6*dB6/list;
run;

proc freq data=work.thesis;
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tables B7*dB7/list;
run;

proc freq data=work.thesis;
tables B8*dB8/list;
run;

proc freq data=work.thesis;
tables B9*dB9/list;
run;

proc freq data=work.thesis;
tables B10*dB10/list;
run;

*look at "other" option for B11 and B11a variable;
proc freq data=work.thesis;
tables B11*B11a/list;
run;

*make sure coding for tB11 and B11 work;
proc freq data=work.thesis;
tables B11*tB11/list;
run;

*distribution of tB11;
proc freq data=work.thesis;
tables tB11/list;
run;

*look at "other" option for C3a, make sure C3a and C3 coding works;
proc freq data=work.thesis;
tables C3a/list;
run;

proc freq data=work.thesis;
tables C3*C3a/list;
run;

*make sure C5 has no extraneous variables;
proc freq data=work.thesis;
tables C5/list;
run;

*make sure C5 and reC5 correspond correctly;
proc freq data=work.thesis;
tables C5*reC5/list;
run;

*look at "other" option for C29;
proc freq data=work.thesis;
tables C29a*C29/list;
run;

*look at "other" option for F1;
proc freq data=work.thesis;
tables F1G/list;
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```
run;

*look at "other" option for D11;
proc freq data=work.thesis;
tables D11H/list;
run;

*look at "other" option for D9;
proc freq data=work.thesis;
tables D9H/list;
run;

*look at "other" option for D7;
proc freq data=work.thesis;
tables D7I/list;
run;

*look at distribution for E1;
proc freq data=work.thesis;
tables E1/list;
run;

*make sure distribution of btrustdoc does not have 98s;
proc freq data=work.thesis;
tables btrustdoc/list;
run;

*look at bhealthsource distribution;
proc freq data=work.thesis;
tables bhealthsource/list;
run;

proc freq data=work.thesis;
tables bhealthsource1/list;
run;

proc freq data=work.thesis;
tables bhealthsource2/list;
run;

proc freq data=work.thesis;
tables bhealthsource3/list;
run;

proc freq data=work.thesis;
tables bhealthsource4/list;
run;

proc freq data=work.thesis;
tables bhealthsource5/list;
run;

proc freq data=work.thesis;
tables bhealthsource6/list;
run;

proc freq data=work.thesis;
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```
    tables bhealthsource7/list;
    run;

    proc freq data=work.thesis;
    tables bhealthsource8/list;
    run;

    proc freq data=work.thesis;
    tables bhealthsource9/list;
    run;

    proc freq data=work.thesis;
    tables bhealthsource10/list;
    run;

    *look at distribution of transport variables;
    proc freq data=work.thesis;
    tables btransport/list;
    run;

    proc freq data=work.thesis;
    tables btransport1/list;
    run;

    *make sure btransport and dbtranport variables coding correspond;
    proc freq data=work.thesis;
    tables btransport*dbtransport/list;
    run;

    *discrimination variables, make sure recoded variables correspond;
    proc freq data=work.thesis;
    tables bdisc1*dbdisc1/list;
    run;

    proc freq data=work.thesis;
    tables bdisc2*dbdisc2/list;
    run;

    proc freq data=work.thesis;
    tables bdisc3*dbdisc3/list;
    run;

    proc freq data=work.thesis;
    tables bdisc4*dbdisc4/list;
    run;

    proc freq data=work.thesis;
    tables bdisc5*dbdisc5/list;
    run;

    proc freq data=work.thesis;
    tables bdisc6*dbdisc6/list;
    run;

    proc freq data=work.thesis;
    tables bdisc7*dbdisc7/list;
    run;
```

```sas
proc freq data=work.thesis;
tables bdisc8*dbdisc8/list;
run;

proc freq data=work.thesis;
tables bdisc9*dbdisc9/list;
run;

proc freq data=work.thesis;
tables bdisc10*dbdisc10/list;
run;

proc freq data=work.thesis;
tables bdisc11*dbdisc11/list;
run;

*safety variables, make sure recoded variables correspond;
proc freq data=work.thesis;
tables bsafety1*dbsafety1/list;
run;

proc freq data=work.thesis;
tables bsafety2*dbsafety2/list;
run;

proc freq data=work.thesis;
tables bsafety3*dbsafety3/list;
run;

proc freq data=work.thesis;
tables bsafety4*dbsafety4/list;
run;

proc freq data=work.thesis;
tables bsafety5*dbsafety5/list;
run;

*health source variables (E);
proc freq data=work.thesis;
tables e1*de1/list;
run;

proc freq data=work.thesis;
tables e2*de2/list;
run;

proc freq data=work.thesis;
tables e3*de3/list;
run;

proc freq data=work.thesis;
tables e4*de4/list;
run;

proc freq data=work.thesis;
tables e5*de5/list;
```

```
run;

proc freq data=work.thesis;
tables e6*de6/list;
run;

proc freq data=work.thesis;
tables e7*de7/list;
run;

proc freq data=work.thesis;
tables e8*de8/list;
run;

proc freq data=work.thesis;
tables e9*de9/list;
run;

proc freq data=work.thesis;
tables e10*de10/list;
run;

proc freq data=work.thesis;
tables e11*de11/list;
run;

proc freq data=work.thesis;
tables e12*de12/list;
run;

proc freq data=work.thesis;
tables e13*de13/list;
run;

proc freq data=work.thesis;
tables e14*de14/list;
run;

proc freq data=work.thesis;
tables e15*de15/list;
run;

proc freq data=work.thesis;
tables e16*de16/list;
run;

proc freq data=work.thesis;
tables e17*de17/list;
run;

proc freq data=work.thesis;
tables e18*de18/list;
run;

proc freq data=work.thesis;
tables e19*de19/list;
run;
```

```
*spirituality variables;
proc freq data=work.thesis;
tables bspirit1*dbspirit1/list;
run;

proc freq data=work.thesis;
tables bspirit2*dbspirit2/list;
run;

proc freq data=work.thesis;
tables bspirit3*dbspirit3/list;
run;

proc freq data=work.thesis;
tables bspirit4*dbspirit4/list;
run;

*vaccine history variables, look at distributions;
proc freq data=work.thesis;
tables c20*c1/list;
run;

proc freq data=work.thesis;
tables c20*reC20/list;
run;

proc freq data=work.thesis;
tables c21/list;
run;

*look at distribution for outcome variable (C1);
proc freq data=work.thesis;
tables C1/list;
run;

**********This file contains coding for data analysis*****************;

*call in cleaned dataset;
%include "\\trustedfs.cc.emory.edu\TS6\DOM\Infectious
Diseases\Research\57210
DOSEHOPE\Sahithi\THESIS\sahithi_thesis_analysis.sas";

*descriptions and bivariate analyses;

*descriptive variables;
proc freq data=work.thesis;
tables church/list;
run;

proc freq data=work.thesis;
tables gender*c1/all;
run;

proc freq data=work.thesis;
tables diage*c1/all;
run;
```

```
proc freq data=work.thesis;
tables employmentd*c1/all;
run;

proc freq data=work.thesis;
tables healthexposure*c1/all;
run;

proc freq data=work.thesis;
tables churchtype*c1/all;
run;

proc freq data=work.thesis;
tables cincome*c1/all;
run;

proc freq data=work.thesis;
tables ceducation*c1/all;
run;

proc freq data=work.thesis;
tables tB11*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables tB11*c1/all;
where tB11= 0 or tB11 = 1;
run;

proc freq data=work.thesis;
exact or;
tables tB11*c1/all;
where tB11= 0 or tB11 = 2;
run;

proc freq data=work.thesis;
tables cincome*c1/all;
where cincome = 0 or cincome = 1;
run;

proc freq data=work.thesis;
tables cincome*c1/all;
where cincome = 0 or cincome = 2;
run;

proc freq data=work.thesis;
tables cincome*c1/all;
where cincome = 0 or cincome = 3;
run;

proc freq data=work.thesis;
tables ceducation*c1/all;
where ceducation = 0 or ceducation = 1;
run;
```

```
proc freq data=work.thesis;
tables ceducation*c1/all;
where ceducation = 0 or ceducation = 2;
run;

proc freq data=work.thesis;
tables ceducation*c1/all;
where ceducation = 0 or ceducation = 3;
run;

proc freq data=work.thesis;
tables relationship*c1/all;
run;

proc freq data=work.thesis;
tables relationship*c1/all;
where relationship = 1 or relationship = 2;
run;

proc freq data=work.thesis;
tables relationship*c1/all;
where relationship = 1 or relationship = 3;
run;

proc freq data=work.thesis;
tables relationship*c1/all;
where relationship = 1 or relationship = 4;
run;

proc freq data=work.thesis;
tables churchtype*c1/all;
where churchtype = 0 or churchtype = 1;
run;

proc freq data=work.thesis;
tables churchtype*c1/all;
where churchtype = 0 or churchtype = 2;
run;

*relationship with healthcare providers;
proc freq data=work.thesis;
tables btrustdoc*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables dB2*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables dB3*c1/all;
run;

proc freq data=work.thesis;
tables dB4*c1/all;
run;
```

```
proc freq data=work.thesis;
tables dB5*c1/all;
run;

proc freq data=work.thesis;
tables dB6*c1/all;
run;

proc freq data=work.thesis;
tables dB7*c1/all;
run;

proc freq data=work.thesis;
tables dB8*c1/all;
run;

proc freq data=work.thesis;
tables dB9*c1/all;
run;

proc freq data=work.thesis;
tables dB10*c1/all;
run;

proc freq data=work.thesis;
tables dB1*c1/all;
run;

*transportation;
proc freq data=work.thesis;
exact or;
tables dbtransport*c1/all;
run;

proc freq data=work.thesis;
tables btransport1*c1/all;
run;

*spirituality;
proc freq data=work.thesis;
tables dbspirit1*c1/all;
run;

proc freq data=work.thesis;
tables dbspirit2*c1/all;
run;

proc freq data=work.thesis;
tables dbspirit3*c1/all;
run;

proc freq data=work.thesis;
tables dbspirit4*c1/all;
run;
```

```sas
*discrimination and safety;
proc freq data=work.thesis;
tables redf1*c1/all;
run;

proc freq data=work.thesis;
tables redf2*c1/all;
run;

proc freq data=work.thesis;
tables redf3*c1/all;
run;

proc freq data=work.thesis;
tables redf4*c1/all;
run;

proc freq data=work.thesis;
tables redf5*c1/all;
run;

proc freq data=work.thesis;
tables redf6*c1/all;
run;

proc freq data=work.thesis;
tables redf7*c1/all;
run;

proc freq data=work.thesis;
tables redf8*c1/all;
run;

proc freq data=work.thesis;
tables redf9*c1/all;
run;

proc freq data=work.thesis;
tables redf10*c1/all;
run;

proc freq data=work.thesis;
tables redf11*c1/all;
run;

proc freq data=work.thesis;
tables dbsafety1*c1/all;
run;

proc freq data=work.thesis;
tables dbsafety2*c1/all;
run;

proc freq data=work.thesis;
tables dbsafety3*c1/all;
run;
```

```
proc freq data=work.thesis;
tables dbsafety4*c1/all;
run;

proc freq data=work.thesis;
tables dbsafety5*c1/all;
run;

*attitudes towards immunizations;
proc freq data=work.thesis;
tables dc30*c1/all;
run;

proc freq data=work.thesis;
tables dc31*c1/all;
run;

proc freq data=work.thesis;
tables dc32*c1/all;
run;

proc freq data=work.thesis;
tables dc33*c1/all;
run;

proc freq data=work.thesis;
tables dc34*c1/all;
run;

proc freq data=work.thesis;
tables dc35*c1/all;
run;

proc freq data=work.thesis;
tables dc36*c1/all;
run;

proc freq data=work.thesis;
tables dc37*c1/all;
run;

proc freq data=work.thesis;
tables dc38*c1/all;
run;

proc freq data=work.thesis;
tables dc39*c1/all;
run;

proc freq data=work.thesis;
tables dc40*c1/all;
run;

proc freq data=work.thesis;
tables dc41*c1/all;
run;
```

```
*sources of health information;
proc freq data=work.thesis;
tables bhealthsource*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource1*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource2*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource3*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource4*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource5*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables bhealthsource6*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource7*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource8*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables bhealthsource9*c1/all;
run;

proc freq data=work.thesis;
tables bhealthsource10*c1/all;
run;

proc freq data=work.thesis;
tables de1*c1/all;
run;

proc freq data=work.thesis;
tables de2*c1/all;
run;

proc freq data=work.thesis;
tables de3*c1/all;
```

```
run;

proc freq data=work.thesis;
tables de4*c1/all;
run;

proc freq data=work.thesis;
tables de5*c1/all;
run;

proc freq data=work.thesis;
tables de6*c1/all;
run;

proc freq data=work.thesis;
tables de7*c1/all;
run;

proc freq data=work.thesis;
tables de8*c1/all;
run;

proc freq data=work.thesis;
tables de9*c1/all;
run;

proc freq data=work.thesis;
tables de10*c1/all;
run;

proc freq data=work.thesis;
tables de11*c1/all;
run;

proc freq data=work.thesis;
tables de12*c1/all;
run;

proc freq data=work.thesis;
tables de13*c1/all;
run;

proc freq data=work.thesis;
tables de14*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables de15*c1/all;
run;

proc freq data=work.thesis;
tables de16*c1/all;
run;

proc freq data=work.thesis;
tables de17*c1/all;
```

```sas
run;

proc freq data=work.thesis;
tables de18*c1/all;
run;

proc freq data=work.thesis;
tables de19*c1/all;
run;

*vaccine history;
proc freq data=work.thesis;
tables rec5*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables rec5*c1/all;
where rec5 = 0 or rec5 = 1;
run;

proc freq data=work.thesis;
exact or;
tables rec5*c1/all;
where rec5 = 0 or rec5 = 2;
run;

proc freq data=work.thesis;
tables c6*c1/all;
run;

proc freq data=work.thesis;
tables c7*c1/all;
run;

proc freq data=work.thesis;
tables rec20*c1/all;
run;

proc freq data=work.thesis;
tables c21*c1/all;
run;

proc freq data=work.thesis;
tables c22*c1/all;
run;

proc freq data=work.thesis;
tables c23*c1/all;
run;

proc freq data=work.thesis;
exact or;
tables c24*c1/all;
run;

proc freq data=work.thesis;
```

```
    tables c25*c1/all;
    run;

    proc freq data=work.thesis;
    tables c26*c1/all;
    run;

    proc freq data=work.thesis;
    tables c27*c1/all;
    run;

    proc freq data=work.thesis;
    tables c28*c1/all;
    run;

    *create new working dataset for logistic regression analysis, make
    dummy variables and interaction terms in data step;
    data work.thesis1;
    set work.thesis;

    *set dummy variables for trichotomized variables;

    *for churchtype;
    if churchtype = 0 then churchtype1 = 0;
    if churchtype = 0 then churchtype2 = 0;

    if churchtype = 1 then churchtype1 = 1;
    if churchtype = 1 then churchtype2 = 0;

    if churchtype = 2 then churchtype1 = 0;
    if churchtype = 2 then churchtype2 = 1;

    *for tB11;
    if tB11 = 0 then t1B11 = 0;
    if tB11 = 0 then t2B11 = 0;

    if tB11 = 1 then t1B11 = 1;
    if tB11 = 1 then t2B11 = 0;

    if tB11 = 2 then t1B11 = 0;
    if tB11 = 2 then t2B11 = 1;

    *set up interaction terms;
    dc35xdiage = dc35*diage;
    dc35xredf10 = dc35*redf10;
    dc35xchurchtype1 = dc35*churchtype1;
    dc35xchurchtype2 = dc35*churchtype2;
    dc35xt1B11 = dc35*t1B11;
    dc35xt2B11 = dc35*t2B11;
    dc35xdc41 = dc35*dc41;
    dc35xdc36 = dc35*dc36;
    dc35xrec20 = dc35*rec20;
    dc35xc6 = dc35*c6;

    run;
```

```
*make sure dummy variable coding worked;
proc freq data=work.thesis1;
tables churchtype*churchtype1*churchtype2/list;
run;

proc freq data=work.thesis1;
tables tB11*t1B11*t2B11/list;
run;

*make sure interaction terms are coded correctly;
proc freq data=work.thesis1;
tables dc35xdiage*dc35*diage/list;
run;

proc freq data=work.thesis1;
tables dc35xredf10*dc35*redf10/list;
run;

proc freq data=work.thesis1;
tables dc35xchurchtype1*dc35*churchtype1/list;
run;

proc freq data=work.thesis1;
tables dc35xchurchtype2*dc35*churchtype2/list;
run;

proc freq data=work.thesis1;
tables dc35xt1B11*dc35*t1B11/list;
run;

proc freq data=work.thesis1;
tables dc35xt2B11*dc35*t2B11/list;
run;

proc freq data=work.thesis1;
tables dc35xdc41*dc35*dc41/list;
run;

proc freq data=work.thesis1;
tables dc35xdc36*dc35*dc36/list;
run;

proc freq data=work.thesis1;
tables dc35xrec20*dc35*rec20/list;
run;

proc freq data=work.thesis1;
tables dc35xc6*dc35*c6/list;
run;

*MODEL 1
*primary exposure = dc35;
*potential predictors of interest: diage, redf10, churchtype, tB11,
dc41, dc36, rec20
*potential interaction terms: dc35xdiage, dc35xredf10,
dc35xchurchtype1, dc35xchurchtype2, dc35xt1B11, dc35xt2B11,
                             dc35xdc41, dc35xdc36, dc35xrec20
```

```
 *analyze collinearity;
proc reg data=work.thesis1;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xdiage dc35xredf10 dc35xdc41
dc35xdc36 dc35xchurchtype1 dc35xchurchtype2 dc35xt1B11 dc35xt2B11/tol
vif collin;
run;

proc reg data=work.thesis1;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36/tol vif collin;
run;

*the model with no interaction terms have VIFs less than 5, so the
interaction terms are definitely causing collinearity
issues

*drop dc35*churchtype variables;
proc reg data=work.thesis1;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xdiage dc35xredf10 dc35xdc41
dc35xdc36/tol vif collin;
run;
*seems to be no more collinearity issues, all condition indices < 30;

*assess interaction;
*likelihood ratio test;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xdiage dc35xredf10 dc35xdc41
dc35xdc36;
run;
*-2logL for full model = 164.89;

proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36;
run;
*-2LogL for reduced model = 171.056;

*-2LogL(reduced)- -2LogL(full) = 171.056 - 164.89 = 6.1666

chi-square value for df = 4, alpha = 0.05 -- 9.488;

*backwards elimination;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xdiage dc35xredf10 dc35xdc41
dc35xdc36;
run;
*drop dc35xdiage;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xredf10 dc35xdc41 dc35xdc36;
run;
```

```
*drop dc35*dc36;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xredf10 dc35xdc41;
run;
*drop dc35xdc41;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xredf10;
run;

*assessed collinearity with gs model;
proc reg data=work.thesis1;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xredf10/collin vif tol;
run;
*collinearity looks good;

*confounding assessment;
*full model;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc41
dc36 dc35xredf10;
contrast 'dc35' dc35 1/est=exp;
contrast 'diage' diage 1/est=exp;
contrast 'redf10' redf10 1/est=exp;
contrast 'churchtype1' churchtype1 1/est=exp;
contrast 'churchtype2' churchtype2 1/est=exp;
contrast 't1B11' t1B11 1/est=exp;
contrast 't2B11' t2B11 1/est=exp;
contrast 'dc41' dc41 1/est=exp;
contrast 'dc36' dc36 1/est=exp;
contrast 'dc35 --> c1 when redf10 = 1' dc35 1 redf10 0 dc35xredf10
1/est=exp;
contrast 'dc35 --> c1 when redf10 = 0' dc35 1 redf10 0 dc35xredf10
0/est=exp;
run;

*no confounders in model;
proc logistic data=work.thesis1 descending;
model c1 = dc35 redf10 dc36 dc35xredf10;
run;

*just diage;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 dc36 dc35xredf10;
run;

*just churchtype;
proc logistic data=work.thesis1 descending;
model c1 = dc35 churchtype1 churchtype2 redf10 dc36 dc35xredf10;
run;

*just tB11 variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 t1B11 t2B11 redf10 dc36 dc35xredf10;
run;
```

```
*just dc41;
proc logistic data=work.thesis1 descending;
model c1 = dc35 dc41 redf10 dc36 dc35xredf10;
run;

*just diage and dc41;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 dc41 dc36 dc35xredf10;
run;

*just diage and tb11 variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 t1B11 t2B11 dc36 dc35xredf10;
run;

*just diage and churchtype variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 dc36 dc35xredf10;
run;

*just dc41 and tb11 variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 redf10 t1B11 t2B11 dc41 dc36 dc35xredf10;
run;

*just dc41 and churchtype variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 redf10 churchtype1 churchtype2 dc41 dc36 dc35xredf10;
run;

*just churchtype variables and tb11 variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 redf10 churchtype1 churchtype2 t1B11 t2B11 dc36
dc35xredf10;
run;

*DROP dc41;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 t1B11 t2B11 dc36
dc35xredf10;
run;

*DROP tb11 variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 churchtype1 churchtype2 dc41 dc36
dc35xredf10;
run;

*DROP diage;
proc logistic data=work.thesis1 descending;
model c1 = dc35 redf10 churchtype1 churchtype2 t1B11 t2B11 dc41 dc36
dc35xredf10;
run;
```

```sas
*DROP churchtype variables;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 t1B11 t2B11 dc41 dc36 dc35xredf10;
run;

*final model -
outcome = c1
exposure = dc35
other predictors = diage, redf10, t1B11, t2B11, dc41, dc36, dc35xredf10
dropped predictors from gold standard = churchtype1 churchtype2;
proc logistic data=work.thesis1 descending;
model c1 = dc35 diage redf10 t1B11 t2B11 dc41 dc36 dc35xredf10;
contrast 'dc35' dc35 1/est=exp;
contrast 'diage' diage 1/est=exp;
contrast 'redf10' redf10 1/est=exp;
contrast 't1B11' t1B11 1/est=exp;
contrast 't2B11' t2B11 1/est=exp;
contrast 'dc41' dc41 1/est=exp;
contrast 'dc36' dc36 1/est=exp;
contrast 'dc35 --> c1 when redf10 = 1' dc35 1 redf10 0 dc35xredf10
1/est=exp;
contrast 'dc35 --> c1 when redf10 = 0' dc35 1 redf10 0 dc35xredf10
0/est=exp;
run;

*take the final model and run it using the proc genmod method for
assessing prevalence ratio;
proc genmod data=work.thesis1 descending;
model c1 = dc35 diage redf10 t1B11 t2B11 dc41 dc36 dc35xredf10/dist=bin
link=log;
estimate 'dc35' dc35 1;
estimate 'diage' diage 1;
estimate 'redf10' redf10 1;
estimate 't1B11' t1B11 1;
estimate 't2B11' t2B11 1;
estimate 'dc41' dc41 1;
estimate 'dc36' dc36 1;
estimate 'dc35 --> c1 when redf10 = 1' dc35 1 redf10 0 dc35xredf10 1;
estimate 'dc35 --> c1 when redf10 = 0' dc35 1 redf10 0 dc35xredf10 0;
run;
```