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Rashmi Maya Raveendran April 9, 2025

What's Good for the Goose May Not Be Good for the Gander: An Analysis of Cardiovascular Disease Risk Comprehension Amongst South Asian Americans

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An abstract of
a thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
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Bachelor of Science with Honors

Anthropology

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Abstract

What's Good for the Goose May Not Be Good for the Gander: An Analysis of Cardiovascular Disease Risk Comprehension Amongst South Asian Americans

By Rashmi Maya Raveendran

Cardiovascular disease (CVD) is the leading cause of death in the world, and research has shown that South Asian Americans (SAAs) demonstrate higher rates of CVD risk factors such as elevated cholesterol, hypertension, and diabetes. CV mortality and morbidity are also higher in South Asians with standard biomarkers for risk. Currently, there is little research highlighting the population's understanding of this health disparity. Given the value that health education and comprehension provide for improved patient outcomes, this study aims to assess knowledge of CVD amongst SAAs. A 10-minute online survey was nationally administered, where SAA participants were asked to indicate whether a series of factual statements about CVD risk were true or false. Various survey participants also opted to complete a post-survey online interview. The data collected from survey respondents (N=61) were quantitatively analyzed using logistic and linear regression models, and interview data (N=7) was qualitatively analyzed to detect common themes and patterns. Participants were more likely to indicate that a true statement was true (accuracy >58%) than to indicate that a false statement was false (accuracy <37%). Increased social media use and knowledge of the MASALA study were potential predictors of specific question accuracy and overall accuracy across the survey ($p<0.05$), respectively, when controlling for various sociodemographic predictors. Interview data demonstrated that having a familial or personal tie to someone with CVD was associated with increased awareness of CVD risk factors and knowledge. Additionally, interview data suggests SAAs face challenges in internalizing the threat of CVD as something pertinent to the population due to a lack of representation in discourse about CVD and a lack of specific care from healthcare providers. Ultimately, this study provides initial insights into comprehension of CVD risk among SAAs and highlights key factors shaping knowledge of this disparity in the population. While overall knowledge among this survey population was relatively low, this work provides the groundwork for future research and assessments of populational understanding, including identifying potential solution routes that best support SAAs in their efforts to mitigate risk for CVD.

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Acknowledgements

I want to dedicate this project to my parents and the entirety of my family, whose sacrifices throughout their lives made it possible for me to attend Emory and have the ability to explore my personal and professional interests in the millions of ways I have wanted to. I also want to thank them for helping guide me through this thesis's creation and supporting my ideas wholeheartedly. I want to thank my advisor, Dr. Craig Hadley, for believing in my project and allowing me to pursue this work, all whilst serving as a kind mentor who gave me unwavering support and made this project a reality. I want to thank my committee members, Dr. Kristen Broehl-Droke and Dr. Megha Shah, not just for their support in completing this thesis but also for their continued mentorship in my career as a student and for giving me the unparalleled opportunity to pursue my academic interests beyond the walls of Emory. I also want to thank Dr. Robert Paul for consistently helping me construct my project proposal and engaging in countless meetings to help me identify advisors, project ideas, and inspirations. I would like to thank Mr. Langston Jenkins for his support in the Anthropology honors program in every scheduling and logistical detail; this project would not have been possible without his work. I want to thank Pamela Beniwal (21Ox, 23C) for her time and willingness to meet with me and help me plan my project. Her thesis, "The Effect of Commercialization, Militarization, and Stigmatization of the Breast Cancer Awareness Movement on Breast Cancer Patients," inspired and influenced my project and demonstrated excellence in anthropological research in pursuing my own project. This project would not have been conducted without the support of all these individuals, alongside many others. I hope this work will continue to contribute to compelling academic work that focuses on lived human experiences of health disparities and exists as a legacy and testament to the support others have invested in me to complete this project.

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I. Introduction

Ia. Rationale and Relevance

Cardiovascular disease (CVD) is the leading cause of death in the world and has been the leading cause in the United States (U.S.) since 1921 (Martin et al. 2024; Amini et al. 2021; National Heart, Lung, and Blood Institute, 1998). Due to the enormous scope of CVD and its impact, disparities in cardiovascular disease rates and its associated risk factors are present all across the world. For example, research has shown that South Asian Americans (SAAs) demonstrate higher rates of CVD risk factors such as elevated cholesterol compared to Europeans (Kanaya et al., 2014; Rabanal et al., 2017), premature hypertension compared to Filipino, "other Asian," non-Hispanic White, and Chinese populations (Kianoush et al., 2022; Fei et al., 2017; Reddy et al., 2022), and diabetes compared to whites, African Americans, Latinos, and Chinese Americans (Narayan & Kanaya, 2020; Kanaya et al., 2014). South Asians also face higher mortality rates of atherosclerotic CVD despite fewer biological differences between SAAs and other Asian Americans or ethnic groups (Volgman et al., 2018; Joseph et al., 2023). Abnormally, cardiovascular risk, mortality, and morbidity are also higher in South Asians with standard biomarkers for CVD risk (Rehmann et al., 2018; Palaniappan et al., 2018; Gupta et al., 2006).

It is evident that risk assessment for CVD progression amongst South Asians is vastly underestimated. This effect is primarily due to the concern that most CVD risk assessment models are conducted on Caucasian populations (J. Patel, 2021; Hussain et al., 2013; A. P. Patel et al., 2021; Sofogianni et al., 2022). Even though U.S. campaigns and prevention guidelines for heart health exist (i.e., AHA's Life's Simple 7 & 8, Go Red for Women), these are still defined using the existing risk assessment tools and are not appropriate measures for all people, specifically SAAs (J. Patel, 2021; Gopal & Usher-Smith, 2016). One of the few risk assessment

models that have included cohorts of South Asians in their development is in the United Kingdom called QRISK2, and has been found to have a more accurate estimation of South Asian cardiovascular risk than the previous model, Framingham Risk Score (Franke et al., 2021; Tillin et al., 2014; Hippisley-Cox et al., 2008). However, these studies still emphasize that South Asian risk in QRISK2 is still underestimated, and its use of South Populations from the United Kingdom limits its generalizability to SAAs.

More recently, promising progress has been made in developing CVD risk assessment models based on SAAS. The most prominent national study being conducted is the Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study, which researches factors that lead to heart disease in SAAs. Additionally, the U.S. House passed the South Asian Heart Health Awareness and Research Act in 2021 to direct funding to programs and research focused on atherosclerotic cardiovascular disease (ASCVD) risk among SAAs (U.S. Congress H.R.2771 2021).

However, while these developments are promising and indicate the importance of investigating this disparity, little research highlights SAA's comprehension of this public health epidemic. Ultimately, the impact of ongoing research, policy changes, and community health interventions requires an understanding of what SAAs themselves can comprehend about this health disparity. Without this information, developing health interventions for SAAs that cater to their specific needs and existing knowledge base is complex. As such, this aims to analyze existing comprehension rates of cardiovascular disease among SAAs. Investigating this topic will provide insight into patient perspectives that can better direct SAAs and physicians in navigating the upcoming years of transforming SAA heart health.

Ib. Background and Literature Review

South Asian Cardiovascular Disease Risk

South Asians face increased CVD risk, specifically ASCVD, compared to other ethnic groups or populations. Observational studies demonstrate that South Asians have higher hospitalization and mortality rates from ASCVD and when compared to other ethnic populations (Volgman et al., 2018; Klatsky et al., 2011; Gupta et al., 2022), South Asian ethnicity is also associated with increased risk for coronary heart disease (CHD) compared to East Asian, Black Hispanic, White, Multi-ethnic, unclassified Asian populations, and "European counterparts" with only diabetes being a stronger predictor of CHD risk (Pursnani & Merchant, 2020; Forouhi et al. 2006). This increased risk has also been found in populations of South Asians living in the U.S. (Talegawkar et al., 2016); Joseph et al., 2023; Deshpande et al., 2023). Moreover, the 2018 to 2019 American Heart Association/American College of Cardiology (AHA/ACC) considers South Asian identity as an increased risk predictor of cardiometabolic diseases (Grundy et al., 2019), indicating the rising importance of this health disparity and its implications in estimating CVD risk for South Asians.

This increased risk of South Asians for CVD is not well understood, and ongoing research to determine mechanisms is well underway. However, many research studies have found that traditional risk factors do not predict CVD risk for South Asians as well as it might for other ethnic populations. Inflammatory biomarkers and adipocytokines are not associated with coronary artery calcium, a marker of subclinical atherosclerosis, in South Asians and may have an independent pathophysiology in this population (Nasir et al., 2018; Agarwala et al., 2023). Additionally, despite South Asians having lower body mass index (BMI) values and lower prevalence of obesity, there are still higher rates of metabolic syndrome across the population (Palaniappan et al., 2010; Misra et al., 2019), and associations between lipoprotein A (Lp(a)) and aortic valve calcium that present in Black and White populations are not seen in South Asians

even though South Asians have higher median Lp(a) levels than White, Hispanic and Chinese populations (Makshood et al., 2020; Reyes-Soffer, 2022). These findings not only demonstrate the complexity of ongoing research in determining the underlying mechanisms that determine CVD risk and outcomes in South Asians but also show the amount of uncertainty that exists in these current research endeavors and highlight the importance of addressing this disparity.

Health Knowledge & Outcomes

A critical component of health is education, literacy, and comprehension among patients. Knowledge and awareness can immensely affect disease progression and individuals' health practices for most health outcomes. Existing research has thoroughly explored the effect of general education on health outcomes. Studies have found that increased education improves physical activity and frequency of health checkups (Park & Kang, 2008; García-Mayor et al., 2021; Rocliffe et al., 2024), as well as decreasing risk scores and mortality risk (Farquhar et al., 1990; Magnani et al., 2023; Sasson & Hayward, 2019). Moreover, further studies have demonstrated a link between knowledge of disease risk factors and being more prone to adopting healthy lifestyle practices (Lynch et al., 2006; Homko et al., 2008; Imes et al., 2014). These findings support the idea that knowledge and education are essential when considering determinants of health and the respective outcomes and could be vital intervention routes to improve health outcomes in populations.

Health literacy is another means of measurement of knowledge and is essential in predicting health outcomes. Health literacy is "the degree to which individuals can find, understand, and use information and services to inform health-related decisions and actions for themselves and others" (National Institutes of Health, 2021). Low health literacy rates are associated with adverse health outcomes (DeWalt et al., 2004; Berkman et al., 2011), and people

with lower health literacy rates were still more likely to revisit emergency departments despite higher education levels (Shahid et al., 2022; Griffey et al., 2015). These studies show that health-specific understanding is critical in predicting health outcomes beyond schooling knowledge. These findings indicate the importance of improving health-focused knowledge and literacy among populations facing increased risk of disease to improve health outcomes for populations. This claim is also supported by research that states that improvements in health literacy can increase the use of preventive healthcare services and the rate of medical adherence for patients (Baker et al., 2002; Fleary et al., 2019).

Though most research primarily focuses on the effects of general education, schooling, and literacy on general health outcomes, some studies have begun to explore these effects in CVD and its manifestation on health outcomes within specific populations. One study found that CVD risk generally decreased with higher knowledge regarding CVD in China, and risk was highest among individuals with lower CVD knowledge (Liu et al., 2020). Similar effects were found among women of reproductive age, with one study finding that lack of knowledge regarding CVD symptoms and risk factors among women of reproductive age not only increased adverse health outcomes but also was associated with delayed diagnosis of disease (Alshakarah et al., 2023). Health-seeking behavior has also been found to increase alongside increased CVD risk awareness among Australian women affected by gestational hypertension or pre-eclampsia (Atkinson et al., 2023), and inadequate knowledge regarding CVD risk is a major predictor of health-seeking behavior among individuals in Sub-Saharan Africa (Boateng et al., 2017). These respective studies demonstrate that health education and knowledge are strongly associated with CVD health outcomes across a variety of populations around the world. More specifically, these findings indicate a generic trend that decreased knowledge of CVD risk factors is associated with

adverse health outcomes. Supporting interventions to increase CVD risk knowledge and comprehension in these populations could improve CVD outcomes, disease progression, and overall risk for countless individuals.

However, while evidence supports that knowledge of CVD risk assessment improves health outcomes in populations around the world, less research has explored CVD knowledge and awareness among South Asian populations, particularly SAAs. A study found that South Asians have limited CVD knowledge (Kumar et al., 2020), but this data was collected from India and the United Kingdom. One study found that SAAs in Illinois knew little or nothing about CHD and did not believe CHD was preventable (Kandula et al., 2011). While this study provides essential information regarding SAA CVD risk in the U.S., its findings are not entirely generalizable to the broader U.S. population and do not include direct interview conversations with research participants.

As such, there is still a need for further research into CVD risk comprehension rates among SAAs across the U.S., which is the aim of this study. While health education programs catered to South Asians can be successful in reducing CVD risk factors (Vafaei et al., 2023; Sathe et al., 2013), to address the existing health disparity with increased CVD risk among South Asians, more research is needed to deeply understand how South Asian populations respond to and feel about the topic of cardiovascular disease. This study aims to contribute to ongoing research regarding SAA comprehension of CVD risk to provide insightful information for research teams and healthcare workers seeking to implement health or educational intervention programs to address this health disparity. To curate health-specific guidelines and recommendations that improve education and literacy about CVD risk among SAAs, research

into SAA understanding is critical to support future educational endeavors with equity and understanding of population needs.

Ic. Research Hypothesis and Structure

To determine general comprehension rates of CVD among SAAs, this research study will collect quantitative and qualitative data that provides insights into the general understanding of CVD risk among SAAs. The quantitative data will be collected through an online survey, asking various demographic questions, true/false questions regarding CVD and increased risk for SAAs, and sliding scale questions determining the survey participants' community and social perceptions. The qualitative data will be collected via post-survey interviews with survey participants who wish to discuss their understanding of CVD and the increased risk for SAAs. Through these interviews, participants can expand their knowledge of CVD and their South Asian communities.

While limited research exists that assesses population-level understanding of CVD knowledge, one study found that many South Asians believed that coronary heart disease is not preventable and demonstrated low awareness of modifiable risk factors (Kandula et al., 2011). This led to a hypothesis that SAAs in this study may demonstrate lower knowledge of risk factors for CVD and its prevalence among South Asians. Sociodemographic predictors such as female gender, higher level of education, and employment have also been found to be common predictors of increased health literacy and knowledge of disease among various populations (Sargsyan et al., 2024; Verney et al., 2020), indicating these predictors and similar demographic predictors may be associated with comprehension of CVD risk among SAAs.

Ultimately, the goal of this research is to contribute to ongoing conversations regarding South Asian comprehension of CVD in hopes that this information can be utilized by health education programs and healthcare providers to optimize CV care for this population.

II. Methods

IIa. Survey Structure and Recruitment Methods

The research design used in this study is a multi-methods approach to collect quantitative and qualitative data that helps understand comprehension rates of CVD among SAAs. This protocol was approved by the Emory Institutional Review Board prior to starting data collection as the study works with human subjects.

For quantitative data collection, a 10-minute survey was administered to SAAs across the U.S. via a convenience sample, utilizing community organizations close to the researchers and religious worship sites found through online internet searches. The survey was created and administered through Qualtrics, an experience management company based in Seattle, Washington (Qualtrics, 2023). Virtual and in-person recruitment methods were used to recruit participants to complete the survey. Virtually the research survey was emailed to major Hindu temples, mosques, Jain temples, Sikh temples, and monasteries across the U.S. to encourage participation from a broader population of communities that are primarily South Asian and to request the survey recruitment fliers and links were shared with community members. Major Hindu temples, mosques, Jain temples, Sikh temples, and monasteries for all states were researched online (Appendix, Table 19). The majority of locations were contacted unless an email address was not publicly available or there was no central location in a respective state.

The survey flyer was also posted at various in-person restaurants and community centers in states local to the primary researcher: Minnesota and Georgia. Moreover, in-person

recruitment also included speaking to individuals on college campuses and community events to encourage further participation in the survey.

After obtaining digital consent at the start of the survey, if someone opted to complete it, the participants were asked the following demographic questions (Table 2), with the respective answer choice options designated below each question. If no answer choice options are listed below, the question is free-response.

Table 1. Demographic Questions in Qualtrics Survey

1. What is your age?
2. What city and state is your primary residence located? Example: Atlanta, GA
3. What is your sex? a. Male b. Female c. Non-binary/third gender d. Prefer not to say e. Other (with the option for free response)
4. What is the highest degree or level of school you have completed? If currently enrolled, highest degree received. a. Nursery school to 8th grade b. High school graduate, diploma or the equivalent (for example: GED) c. Associate degree d. Bachelor's degree e. Master's degree f. Doctorate degree g. Other (with the option for free response) h. I do not have a degree or have not completed any level of school
5. If you are currently enrolled in an educational school program, please indicate what level of school you are currently completing. a. Nursery school to 8th grade b. High school graduate, diploma or the equivalent (for example: GED) c. Associate degree d. Bachelor's degree e. Master's degree f. Doctorate degree g. Other (with option for free response) h. I am not currently in an educational school program
6. For employment status, are you currently a. Employed for wages b. Self employed

c. Out of work and looking for work
d. Out of work but not currently looking for work
e. A student
f. Military
g. Retired
h. Other (with option for free response)
i. Unemployed

7. Please state your religious affiliation.
   a. Christianity
   b. Islam
   c. Hinduism
   d. Buddhism
   e. Folk religions
   f. Other (with the option for free response)
   g. No religious affiliation

8. Do you follow any specific dietary patterns or restrictions? (Select all that apply)
   a. Vegetarian
   b. Vegan
   c. Gluten-Free
   d. Dairy-Free
   e. Low-Carb
   f. Keto
   g. Paleo
   h. Other (with the option for free response)
   i. No specific dietary restrictions

9. Did you immigrate to the United States?
   a. Yes, I immigrated to the United States (if yes, please write the country from which you immigrated from)
   b. No, I was born in the U.S.
   c. No, I do not live in the U.S.
   d. Other (with the option for free response)

10. Are you South Asian? South Asian is defined as having at least one biological parent of South Asian descent from Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, or Sri Lanka.
    a. Yes
    b. No

11. If you are of South Asian descent, from what country or countries is your ancestry from?
    a. Afghanistan
    b. Bangladesh
    c. Bhutan
    d. India
    e. Maldives
    f. Nepal
    g. Pakistan

h. Sri Lanka i. Other (with the option for free response) j. I am not South Asian
12. Have you been diagnosed with a cardiometabolic disease within the past five years? (including, but not limited to, hypertension, coronary artery disease, stroke, type 2 diabetes, dyslipidemia, obesity, etc.) a. Yes b. No c. I don't know
13. Are you currently a practicing United States board-certified physician, or specifically a cardiologist? a. Yes – Physician b. Yes – Physician and Cardiologist c. No
14. Are you a part of one or more of the following populations: prisoner, individual with cognitive disability or impairment, pregnant woman, or an individual with an impaired decision-making capacity? a. Yes b. No c. I don't know

Table 1. Demographic Questions Used in the Qualtrics Survey to Gather Participant Background Information.

Regarding eligibility, if participants were under the age of 18, not living in the U.S., not South Asian, or answered "Yes" to either or both questions 13 and 14, the survey was programmed to be terminated by Qualtrics as these individuals were not eligible to complete the rest of the study. Following the demographic questions, survey participants eligible to continue the survey were asked a series of true or false questions regarding heart disease (Table 2), specifically focused on CVD risk assessment models and the increased risk among SAAs. The following table depicts the true and false questions of survey participants, which were asked in the same order for all participants. A higher accuracy score on the respective true-or-false questions was used to measure and indicate enhanced CVD risk comprehension.

Table 2. True or False Questions in Qualtrics Survey

1. Fat is stored predominantly in the liver for all individuals. a. True b. False c. I don't know

2. South Asians account for 60 percent of the world's heart disease patients.
   a. True
   b. False
   c. I don't know

3. Lipoprotein(a) is a type of fat in the body that's a genetically determined risk factor for heart disease and stroke.
   a. True
   b. False
   c. I don't know

4. South Asians have higher levels of fat that increase heart disease risk compared to Caucasians, but have lower levels of this fat compared to African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions.
   a. True
   b. False
   c. I don't know

5. South Asians develop coronary artery disease up to 10 years earlier than Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions, on average.
   a. True
   b. False
   c. I don't know

6. South Asians often have higher levels of high-density lipoprotein (HDL) cholesterol than Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions.
   a. True
   b. False
   c. I don't know

7. A cardiovascular disease risk model is like a calculator that helps doctors predict the chances of someone having heart disease based on their health and lifestyle. This model is based on research which studied how things like age, family history of heart disease, and smoking habits, etc., are associated with people who have heart problems.
   a. True
   b. False
   c. I don't know

8. The research models that U.S. doctors use to predict heart disease risk for patients are generally the same models for all individuals.
   a. True
   b. False
   c. I don't know

9. The research models that U.S. doctors use to predict heart disease risk for patients are updated annually to reflect new research and demographic shifts.
   a. True

b. False c. I don't know
10. The research models that U.S. doctors use to predict heart disease risk for patients are based primarily on data from Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, and Pacific Islanders. a. True b. False c. I don't know
11. South Asians tend to have higher levels of abdominal fat compared to Caucasians, East Asians, and African Americans. a. True b. False c. I don't know
12. Shortness of breath is a common symptom of heart disease in South Asians. a. True b. False c. I don't know

Table 2. True or False Questions Designed to Assess Knowledge of Cardiometabolic Health and Risk Factors in a Qualtrics Survey.

After completing the true or false questions to the best of the respondent's ability, the final component of the survey questions consisted of sliding scale questions (Table 4), where participants were asked their agreement status about various statements. Survey participants had the opportunity to select between strongly disagree (1), somewhat disagree (2), neither agree nor disagree (3), somewhat agree (4), strongly agree (5), or not applicable. The following statements were included in the sliding scale questions for participants to agree or disagree with. The order of the statements was presented in the same order, as shown below, for all participants.

Table 3. Sliding Scale Questions in Qualtrics Survey

1**.** I am connected to my South Asian identity.
2**.** I am connected to my religious identity.
3**.** I often eat a South Asian typical diet (at least 4-5 meals a week)
4**.** I regularly think about my heart health.
5**.** I have trust in my healthcare providers.
6**.** I know what the MASALA research study is.
7**.** I know of policy changes being made to promote research investigating heart health among South Asians.
8**.** I regularly use social media (Facebook, Instagram, TikTok, X, Snapchat, etc.)

9**.** I feel confident in my answers to the earlier true/false questions.

Table 3. Sliding Scale Questions Measuring Participants' Connection to Identity, Health Awareness, and Knowledge in the Qualtrics Survey.

After completing all survey questions (Tables 1, 2, and 3), survey participants were allowed to submit an email address to schedule an interview with the primary researcher only if they preferred to. A post-survey interview was not a mandatory component of the research study. The survey was open to participants for about four and a half months between October and February of 2025 before being closed by the researchers to commence quantitative analysis on the existing data responses.

IIb. Quantitative Data Analysis: Survey Responses

Data Cleaning

Data was cleaned to begin the analysis and ensure the finalized data met all the study requirements. The dataset was exported from Qualtrics with 115 responses. All responses that only contained responses for the demographic questions were removed by rows in the exported Excel spreadsheet, as well as any responses that were below 10% completed. Next, rows in the exported Excel spreadsheet removed any submissions that included individuals under the age of 18, physicians or cardiologists, or those not in the U.S. Finally, minor edits were made to various responses in the survey dataset that were typographic errors, including changing a response of state from “MJ” to “New Jersey” as the associated city with this response was listed was Edison, changing “Blooming ton Mn” to “Bloomington, Minnesota” and changing “Lawrence ville” to “Lawrenceville Georgia.” Each change was accurate when cross-referencing each response's latitude and longitude data.

After completing the data cleaning phase in the exported Excel spreadsheet before analysis, the final dataset included responses from 61 individuals. However, among these 61 responses, various responses were marked as “nearly” completed by Qualtrics (89-97%

completed). Several of these responses were marked as under 100% completed if the respondents did not click to the ending page or view the post-survey interview page after completing all the survey questions. In order to maximize the sample size of the study, the dataset entitled "sacvd" was imported into R to view the demographic distributions of the whole "sacvd" dataset and the smaller "sacvd100" dataset that only contained responses that Qualtrics marked as 100% completed (n=53).

Determining Dataset for Analysis

To determine if there were any differences between these two datasets, demographic distributions of the following variables were calculated for each dataset to determine if there were significant differences between the two populations ("sacvd" and "sacvd100"): age, sex, geographic distribution in the U.S., highest degree earned, religious affiliation, employment status, diet, immigration status, geographic distribution by South Asian country of origin, and presence of cardiometabolic disease. The supplemental appendix includes all data distributions of these variables for both data sets (Figures 3-5).

The distributions of the respondents across each of the respective variables were determined to be equivalent, as the distributions of responses for the demographic questions across various categories did not significantly change between the two datasets. As such, the "sacvd" dataset with all 61 responses was used for analysis throughout the study. To begin the quantitative analysis with the "sacvd" dataset, several libraries and packages were loaded into R Studio, "an integrated development environment for R, a programming language for statistical computing and graphics" (R Core Team, 2023). The downloaded packages and libraries must employ various analytical and plotting techniques using R.

It is also essential to note that the variables indicating a respondent's geographic location in the U.S. and by South Asian country of origin were not included in the analysis. This choice was made as the distributions of the data contained minimal sample sizes across 14 categories, and one category (Massachusetts) had significantly higher numbers or high proportions of Indian and Sri Lankan respondents with minimal responses representing other South Asian countries of origin. Adjusting the data to only two or three categories was not appropriate for these geographic distributional outcomes; thus, these variables were not adjusted and not investigated in further analysis.

Adjusting Data Distributions

After observing each variable's numeric and visual distributions, selected adjustments were performed to assist in further data analysis as various variables were largely skewed towards one response. The first set of data adjustments was applied to the categorical variables. The religion variable comprised 65.5% of responses from Hindu respondents, so a new, adjusted variable was created using R to mark respondents as either "Hindu" or "Other." The highest degree earned variable comprised 43.3% of responses with a master's degree and 26.7% of responses with a bachelor's degree, so a new, adjusted variable was created using R to mark respondents as either having a "Graduate Degree" (Masters or Doctorate) or having a "Bachelor's Degree or Lower" to ensure equal distribution across categories. The employment status variable comprised 70.6% of responses from those employed for wages, so a new, adjusted variable was created using R to mark responses as either being "Employed for wages" or "Other." The diet variable comprised 45.5% of responses from individuals with no specific dietary restrictions, so a new, adjusted variable was created using R to mark responses as either having "No specific dietary restrictions" or "Other." The immigration status variable comprised 70% of responses

from individuals who had immigrated to the U.S., so a new, adjusted variable was created using R to mark responses as either being an immigrant to the U.S. or other, grouping those born in the U.S. and not born in the U.S. as a separate category. Finally, the presence of cardiometabolic disease variable, which indicated whether the respondent currently had a diagnosed cardiometabolic disease, contained one "I don't know" response, which was not considered in the analysis and denoted as an “NA”" value using R code. The variables for geographic distribution either by state of residence in the U.S. or by South Asian country of origin were not reorganized or utilized in the analysis due to skewed distributions towards various states and countries, and small sample sizes present for each group that could not be effectively or equitably recategorized into two levels.

Prior to adjusting the quantitative variable distributions in the dataset, which included the age variable alongside all sliding scale questions, a histogram was also visualized for each distribution to determine if it was skewed or normally distributed. Upon observation of the distributions for each quantitative variable, it was decided to adjust the sliding scale (SS) variables, as many demonstrated severe skews.

The first step in this data adjustment procedure involved creating a new subset of variables, adding one to each SS variable in preparation for future logistic regression analysis. This regression method requires values not to be zero to conduct analysis and test that assumptions are met to perform the analytical method. The range of the new variables now occurred from one to six instead of zero to five. These new variables were then further adjusted. To maintain consistency across the adjusted variables, all SS variables were blocked into two categories: "Less than or Equal to 3" or "Greater than 3." These adjusted variables were utilized for the remainder of the study in chi-squared and Fisher's exact tests. However, model

assumptions were also tested for linear and logistic regression, so further investigation of relationships using chi-squared and Fisher's tests did not occur.

After the data adjustments were conducted, a demographic table was then created to summarize the relative distributions of each variable in the data set, including standard statistical summaries for the quantitative variable of age and each SS variable type, and how many responses by number and percentage made up each category of the other variables such as *Sex*, *Geographic Location in the U.S.*, and by *South Asian Country of Origin*, *Highest Degree Earned*, *Religion*, *Employment Status*, *Diet*, *Immigration Status*, and *Presence of Cardiometabolic Disease*.

Creating Accuracy Variables

After the respective adjustments and data cleaning steps were employed for every variable in the dataset except the true-or-false questions, new accuracy variables were created. A new variable was created for every respective true-or-false question, which denoted respective accuracy on each question. For each of these new accuracy variables, each response was either encoded as “Correct” or “Incorrect,” with those answering with “I don’t know” also being labeled as “Incorrect” to minimize potential errors in analysis, ensure a binary dependent variable and because a statement of not knowing the fact is indicative of not being able to answer the question correctly. The following answers were utilized to determine whether a true or false response was encoded as correct or incorrect in R Studio (Table 5). Upon creating the accuracy variables for each true-or-false question, pie charts were created to summarize the accuracy of the total study population for each respective question.

Table 4. Correct Answers for True or False Survey Questions

FALSE (TF1): Fat is stored predominantly in the liver for all individuals.
TRUE (TF2): South Asians account for 60 percent of the world's heart disease patients.

TRUE (TF3): Lipoprotein(a) is a type of fat in the body that's a genetically determined risk factor for heart disease and stroke.
FALSE (TF4): South Asians have higher levels of fat that increase heart disease risk compared to Caucasians, but have lower levels of this fat compared to African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions.
TRUE (TF5): South Asians develop coronary artery disease up to 10 years earlier than Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions, on average.
FALSE (TF6): South Asians often have higher levels of high-density lipoprotein (HDL) cholesterol than Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions.
TRUE (TF7): A cardiovascular disease risk model is like a calculator that helps doctors predict the chances of someone having heart disease based on their health and lifestyle. This model is based on research which studied how things like age, family history of heart disease, and smoking habits, etc., are associated with people who have heart problems.
FALSE (TF8): The research models that U.S. doctors use to predict heart disease risk for patients are generally the same models for all individuals.
FALSE (TF9): The research models that U.S. doctors use to predict heart disease risk for patients are updated annually to reflect new research and demographic shifts.
FALSE (TF10): The research models that U.S. doctors use to predict heart disease risk for patients are based primarily on data from Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, and Pacific Islanders.
TRUE (TF11): South Asians tend to have higher levels of abdominal fat compared to Caucasians, East Asians, and African Americans.
TRUE (TF12): Shortness of breath is a common symptom of heart disease in South Asians.

Table 4. Correct answers for true or false survey questions that was administered to South Asian Americans through the Qualtrics survey.

In addition to re-coding each true-or-false question into an accuracy variable, two additional variations of this variable were created. In preparation for performing a logistic regression to assess the relationship between the quantitative variables in the dataset and accuracy, an additional binary accuracy variable was created, which coded the value of zero for “Incorrect” responses and one for “Correct” responses. Moreover, a total summary score was calculated for each respondent. This score was calculated in R Studio, which calculated the number of “Correct” responses each respondent selected out of the 12 total true-or-false

questions on the survey, which was then converted and reported as a percentage. The statistical summary of the total "Summary Score" variable was also written into the demographic table to provide an overview of the overall accuracy distribution across the study population.

Chi-Squared and Fishers Tests – Unadjusted Model

Given the skewed distributions observed in the SS variables, a series of chi-squared and Fisher's exact tests were run to determine if any outcomes regarding the prediction of accuracy differences were detected utilizing the categorized SS variables instead of as continuous, numerical variables. Each SS variable, as well as each demographic predictor (age, sex, highest degree earned, employment, religion, diet, immigration status, and presence of cardiometabolic disease), were input into a loop function in R Studio that created a contingency table of observed counts for the relationship between each predictor and each true or false accuracy question, one at a time. This table calculated the expected counts under the assumption of independence between the two variables, which is used to assess if the observed distribution significantly deviates from what would be expected if no relationship existed between the predictor variable and each respective true or false question. A Fisher's exact test was used if the expected counts were less than five. The chi-squared tests tend toward higher levels of inaccuracy with smaller sample sizes, with a marker of five being a common threshold for expected counts. The Fisher's test calculates the probability of obtaining the observed distribution, making it a more flexible analytical method for smaller datasets.

After testing these assumptions, the same loop function ran the correctly determined test to independently assess the relationship between each predictor variable and accuracy on each true or false question. Any test that presented an output with a p-value less than 0.05 to highlight predictors that may be significant predictors of accuracy on various true or false questions. However, to maintain consistency, only logistic regression methods were utilized for further

analysis. Moreover, each SS variable varied in its respective distribution of respondents, so the categories of 'less than or equal to 3' or 'greater than 3' may have influenced the distribution and interpretation of each variable. Thus, further analysis of the outcomes of the chi-squared and Fisher's exact tests was not utilized to minimize future assessment of the recategorized variables of SS distributions.

Evaluation of Potential Assumption Violations for Logistic Regression

Logistic regression was utilized to determine if a relationship existed between the various predictor variables in the survey and the binary accuracy variable as an outcome. The first key assumption of logistic regression is having a binary dependent variable, which is met, as the accuracy on the True or False questions can only be “Correct” or “Incorrect” and had already been previously re-coded into a binary accuracy variable where “Correct” was encoded as one and “Incorrect” was encoded as zero. The second key assumption of logistic regression is the independence of observations, where one person’s response should not influence another’s, and each observation must be independent. This assumption is met as the survey was structured so that each participant provided only one observation, which was also cross-referenced with the final IP addresses within the dataset, which indicated distinct individual responses. The following assumption tested was testing for multicollinearity in the dataset. The variance inflation factor (VIF) test was employed in R Studio to measure how much the variance of a respective regression coefficient becomes inflated by being correlated with the other predictor variables. This was tested for effects between the Age and SS Variables, which were continuous and numeric in nature, and in another test for the remainder of demographic predictors, which were categorical. If an output VIF variable is greater than 5, this suggests high multicollinearity, and any relationship between a predictor variable and accuracy was noted to compare to later analysis.

After testing for multicollinearity, the following assumption to test was the linearity assumption, which assumes the relationship between the quantitative predictor variables and the log-odds of the outcome variable is linear. To test this, a logistic regression model includes the original predictor variable and its respective log-transformed version of the variable. If the model output indicates that a log-transformed term is significant ($p<0.05$), this suggests that the relationship between the predictor and log odds of the outcome variable is not linear, which violates the assumption. If any log-transformed term was significant, this term was highlighted to correctly determine which predictors should be carefully considered in future analysis. Intercepts were not included in the final output table as they were irrelevant to the data interpretation of predictor effects of variables included in the model.

The final assumption tested before running a logistic regression was determining if any outstanding outliers may significantly influence the regression model. The Cook's distance test was utilized to assess changes in the predicted values when a specific observation or set of observations is removed. As a threshold, an observation with a Cook's distance value greater than one is considered highlight influential. Using R programming language, Cook's distance values were calculated for each relationship between a predictor variable and an accuracy question. Any observations that produced a value greater than R noted one and later used to compare logistic regression models with and without outliers to determine the actual effect of various predictors on true or false question accuracy.

Logistic Regression Model – Unadjusted Model

After assessing which assumptions are met in logistic regression and considering the predictors that may violate assumptions for their accuracy prediction, an unadjusted logistic regression test was run in R Studio with all predictor variables in the dataset. Age, each SS variable type, sex, highest degree earned, religion, employment status, diet, immigration status,

and presence of cardiometabolic disease, were all individually paired with each true or false accuracy questions 1-12 in a logistic regression model in one loop function in R. Only tests that produced significant relationships were output into a table and selected for further analysis. An odds ratio was also calculated and reported in the table for each relationship to further understand the relationships between these predictors and accuracy for various true or false questions. All output tables included the predictor variable, the true or false question, a relationship coefficient, an odds ratio, the 95% confidence interval lower and upper values, and the p-value. The odds ratio was considered a result of quantitative analysis that provides a specific overview of how various predictors may or may not be able to predict the accuracy of CVD risk knowledge.

Logistic Regression Model – Sequentially Adjusted Model

After determining significant relationships between various predictor variables and true or false question accuracy, a sequentially adjusted logistic regression model was performed. Each pair of significant predictors and true or false questions from the unadjusted model were then put into a new set of logistic regression tests that added one additional covariate. This was run for every test to ensure each model included the significant predictor, as well as either age, each other SS variable type, sex, highest degree earned, religion, employment status, diet, immigration status, and presence of cardiometabolic disease. Each variable was only added one at a time and in separate tests to determine if any predictors affected the significance of the relationships found in the unadjusted model. An output table was displayed if there were any significant predictors. If no more predictors remained significant after the inclusion of one other variable, a table was output to show all relationships that were no longer significant and include which variable was included in the adjusted model. All output tables included the predictor

variable, the true or false question, a relationship coefficient, an odds ratio, the 95% confidence interval lower and upper values, and the p-value.

Logistic Regression Model – Fully Adjusted Model

Using the variables found to affect the significance of the relationships between predictor variables and true or false accuracy from the sequentially adjusted model, a fully adjusted model was performed alongside the same SS variable predictors found to be statistically significant predictors of accuracy in the unadjusted model. Each significant SS variable predictor was input into a logistic regression model with each covariate, which caused a loss of significance in any relationship found in the sequentially adjusted model. The same covariates were used in each fully adjusted model to maintain consistency across tests. An output table was created if any significant relationships ($p<0.05$) between predictors and accuracy were found. No table was created if no significant relationships were found. A Firth-type logistic regression model was also performed to determine if any significant relationships were detected using a model designed for small datasets.

Evaluation of Potential Assumption Violations for Linear Regression

Simple and multiple linear regression tests were run to determine if a relationship exists between various predictor variables in the dataset and overall accuracy. The variables included in the linear regression were Age, SS Variables 1-9, Sex, Highest Degree Earned, Employment Status, Religion, Diet, Immigration Status, and Presence of Cardiometabolic Disease. Before conducting these tests, the model was fit into a linear regression model to evaluate if any assumptions of the model were violated prior to conducting analysis. The model diagnostics of the dataset variables were visualized to ensure the model fits the data in "sacvd." A histogram of the residuals from the linear regression model was then produced to assess the normality of the differences between the observed values of overall accuracy, encoded by the "SummaryScore"

variable, and the predicted values by the linear regression model. A Q-Q plot was also generated to investigate the normality of residuals further, ensuring the validity of key linear regression assumptions prior to analysis: linearity, homoscedasticity, and normally distributed residuals. Any violations of the model assumptions were noted and carefully considered in subsequent analysis.

While the diet variable was included in the initial linear regression model as a predictor, the diagnostic plots revealed that the variable introduced influential leverage points and model instability in violation of the linear regression assumptions. Given the limited contribution of the variable to the model and its disproportionate influence, the variable diet was excluded in the final linear regression models to adhere to the validity of the linear regression model and its assumptions.

Linear Regression Model for Total Summary Score for Accuracy with Predictors

Simple and multiple linear regression tests were run to determine if a relationship exists between predictor variables in the data set and overall accuracy. After an evaluation of the variable distributions and their compliance with linear regression models, the variables included in the linear regression were Age, SS Variables 1-9, Sex, Highest Degree Earned, Employment Status, Religion, Immigration Status, and Presence of Cardiometabolic Disease. Overall accuracy indicated a respondent's overall accuracy across all 12 true or false questions and was encoded as a percentage out of 100 under the variable "Summary Score"

An unadjusted, sequentially, and fully adjusted model was run using linear regression. For the unadjusted model, each selected variable was tested one by one for prediction of total summary score, and a table was produced to display only predictors that were found to be statistically significant predictors of overall accuracy ($p<0.05$). In this study, only "Knowledge of MASALA" (SS6) was a statistically significant predictor of overall accuracy.

The selected predictor, SS6 that were found to be statistically significant, was then put into a sequentially adjusted model, where every other predictor variable included in the model was added one at a time to detect if the addition of any variables caused a loss of significance between the predictors and overall accuracy. A table was produced to display only covariates that were found to disrupt the significance between the initial predictors found in the unadjusted model. In this study, only "Knowledge of Policy Changes" (SS7) made SS6 no longer a statistically significant predictor.

Finally, a fully adjusted model was run to test the relationship between the significant predictor, SS6, from the unadjusted model, detected covariate from the sequentially adjusted model, SS7, and other demographic predictor variables in the data set (Age, Sex, Highest Degree Earned, Employment, Religion, Immigration Status, and Presence of Cardiometabolic Disease). A linear regression model was run with each of the following combinations of variables:

- Summary Score as predicted by SS6 and SS7
- Summary Score as predicted by SS6, SS7, Age, Sex, Highest Degree Earned, Employment, Religion, Immigration Status, and Presence of Cardiometabolic Disease.
- Summary Score as Predicted by SS1, SS2, SS3, SS4, SS5, SS6, SS7, SS8, SS9, Age, Sex, Highest Degree Earned, Employment, Religion, Immigration Status, and Presence of Cardiometabolic Disease.

Any statistically significant relationships were noted as a final result that provides a specific understanding of how a particular predictor may or may not be able to predict the accuracy of CVD risk knowledge.

IIc. Qualitative Data Analysis: In-Depth Interviews

If a survey participant did provide an email address to schedule a post-survey interview, participants were contacted via email to select an interview time that worked best for the

participant. Once a time was confirmed, a calendar invite was sent to both the researcher and the respective participant, and all interviews took place over Zoom. On this online communications platform, users can connect via video, audio, or phone call and chat (Zoom Video Communications, Inc., 2023). Before beginning the interview, oral informed consent was obtained for each individual to complete the interview and record it using Zoom.

A pre-existing set of guiding questions were asked to interview participants (Table 6). As the interview progressed, additional questions were asked to inquire more about discussion points that came up during respective interviews. While the additional questions varied slightly by interview, they all focused on the general theme of cardiovascular disease among SAAs and the best approaches to supporting this population in tackling this health disparity. The questions were asked differently in each interview, based on the best way to transition between conversation topics per given interview. Not all questions were asked in each respective interview to best accommodate the diverse and unique experiences of everyone interviewed.

Table 5. Pre-Prepared, Guiding Interview Questions

What were your initial thoughts and feelings when completing the survey?
Did you know about disproportionate rates of CVD among South Asians prior to this study?
Did you find anything interesting about the information in the study? Why did you find it interesting?
Do you think you feel well educated on this topic?
Based on any knowledge that you have on this topic of CVD among South Asians, where did you first hear about this information?
Do you regularly talk and think about your cardiovascular health?
Do you feel any different after completing the survey?
What were your initial thoughts and feelings when completing the survey?
Did you know about disproportionate rates of CVD among South Asians prior to this study?

Table 5. Guiding Interview Questions to Explore Participants' Perspectives and Awareness of Cardiovascular Disease (CVD) Among South Asians.

The length of the interview varied, ranging from 8 to 45 minutes, and was based on the time it took to complete all interview questions and the respective availability of each research participant. The interviews were recorded on Zoom, and the platform autogenerated a transcript.

Interview transcripts were then de-identified. Using the audio recordings of the interviews, the interview transcripts were edited to ensure efficient readability of the transcript was possible, including removing filler words and repeated words from speaking and ensuring the transcript matched the recording at every point of the interview. After this process, the interview transcript, without any audio recording, was solely used for analysis.

The primary researcher analyzed the interview data qualitatively to denote common themes or track changing viewpoints within and across interviews. Common themes, keywords, and novel insights were tracked in MAXQDA (VERBI Software, n.d.) and analyzed as a final result indicating SAA perspectives on the topic of CVD and increased risk for disease.

III. Results

IIIa. Quantitative Data

Summary of Dataset

One hundred and fifteen respondents began the survey, with 61 completing at least 50% of the way through the survey and meeting all eligibility criteria. Of these 61, 53 were marked as 100% complete by Qualtrics. After determining there were no district differences between either subset of respondents, the entire dataset "sacvd" (N=61) was utilized for analysis. Summary tables were generated for all variables in the dataset to provide an overarching view of the study population. Statistical summaries were calculated for all quantitative variables (Table 6), including each variable's mean, median, standard deviation, minimum, and maximum value.

Table 6. Statistical Summaries for Quantitative Variables

Descriptive Statistics for Quantitative Variables					
Variable Name	Mean	Median	Standard Deviation	Min	Max
Age	42	43	15	19	73
Summary Score	45	42	20	0	92
Connection to Religious Identity	5	6	1	2	6
Religosity	4	5	2	1	6
Regular Consumption of South Asian Typical Diet	5	5	1	2	6
Regular Thought About Heart Health	4	4	2	2	6
Trust in Healthcare Providers	5	5	1	1	6
Knowledge of MASALA	2	2	1	1	6
Knowledge of Policy Changes	2	2	1	1	6
Regular Social Media Use	4	5	2	1	6
Confidence in Survey Accuracy	4	4	1	1	6
Data source: SACVD (2024-2025)					

Table 6. Numerical summaries of each quantitative variable in the dataset. Age represents the age in years of the respondent. “Summary Score” reflects the overall percentage accuracy across all true or false questions for each respondent. Each SS variable reflects a sliding scale question in the dataset with 1 reflecting strongly disagree and 6 reflecting strongly agree.

A summary table was also designed for categorical variables (Table 7), which reflects the number of respondents by count and percentage for each category of every respective categorical variable present in the dataset.

Table 7. Demographic Distributions of Data for Categorical Variables

Demographic Distribution of Data for Categorical Variables

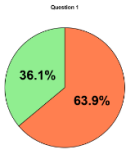
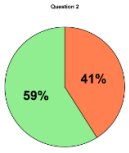
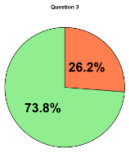
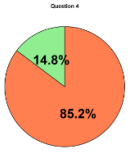
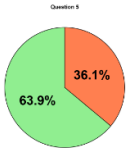
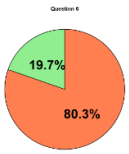
Variable	Category	Count	Percentage
Sex	Female	36	59.0
	Male	25	41.0
Highest Degree Earned	High school graduate, diploma or the equivalent (for example: GED)	10	16.4
	Bachelors degree	17	27.9
	Masters degree	26	42.6
	Doctorate degree	8	13.1
Employment Status	Employed for wages	36	70.6
	A student	11	21.6
	Retired	1	2.0
	Other	1	2.0
	Unemployed	2	3.9
Religion	Christianity	7	11.9
	Islam	4	6.8
	Hinduism	38	64.4
	Buddhism	1	1.7
	Other	1	1.7
	No religious affiliation	8	13.6
Diet	Vegetarian	21	37.5
	Vegan	1	1.8
	Low-Carb	2	3.6
	Paleo	1	1.8
	Other	5	8.9
	No specific dietary restrictions	26	46.4
Immigration Status	Yes, I immigrated to the U.S. (if yes, please write the country from which you immigrated from)	43	70.5
	No, I was born in the U.S.	16	26.2
	Other	2	3.3
Presence of Cardiometabolic Disease	Yes	11	18.3
	No	49	81.7
South Asian Country of Origin	Bangladesh	1	1.6
	India	39	63.9
	Pakistan	3	4.9
	Sri Lanka	18	29.5
United States State of Origin	California	3	4.9
	Florida	2	3.3
	Georgia	5	8.2
	Illinois	1	1.6
	Massachusetts	19	31.1
	Minnesota	9	14.8
	Nebraska	3	4.9
	New Jersey	8	13.1
	New York	1	1.6
	Ohio	4	6.6
	Pennsylvania	1	1.6
	South Dakota	1	1.6
	Tennessee	2	3.3
	Texas	2	3.3

Data source: SACVD (2024-2025)

Table 7. Distribution summaries of each categorical variable in the dataset. The "count" reflects the number of respondents per category, and "percentage" reflects the percentage of each level represented within a variable.

After the demographic distributions were visualized, the overall accuracy for each true or false question in the dataset was also visualized using a pie chart (Table 8) to show the percentage of respondents who responded correctly and incorrectly. The question with the highest accuracy was true or false statement 12 (79.6% correct), and the question with the lowest accuracy was true or false statement 10 (9.8% correct).

Table 8. Accuracy for True or False Survey Questions

Question 1 (False): Fat is stored predominantly in the liver for all individuals.	
Question 2 (True): South Asians account for 60 percent of the world's heart disease patients.	
Question 3 (True): Lipoprotein(a) is a type of fat in the body that's a genetically determined risk factor for heart disease and stroke.	
Question 4 (False): South Asians have higher levels of fat that increase heart disease risk compared to Caucasians, but have lower levels of this fat compared to other groups.	
Question 5 (True): South Asians develop coronary artery disease up to 10 years earlier than other racial/ethnic groups, on average.	
Question 6 (False): South Asians often have higher levels of HDL cholesterol than other groups.	

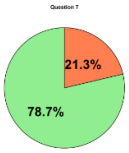
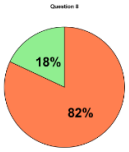
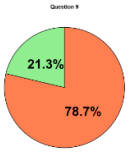
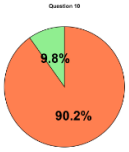
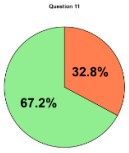
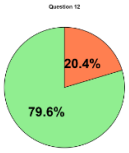
Question 7 (True): A cardiovascular disease risk model helps doctors predict heart disease risk based on health and lifestyle factors.	
Question 8 (False): The research models that U.S. doctors use to predict heart disease risk for patients are the same for all individuals.	
Question 9 (False): The research models that U.S. doctors use to predict heart disease risk are updated annually.	
Question 10 (False): U.S. heart disease risk models are based primarily on data from various racial/ethnic groups.	
Question 11 (True): South Asians tend to have higher levels of abdominal fat compared to other groups.	
Question 12 (True): Shortness of breath is a common symptom of heart disease in South Asians.	
Data source: SACVD (2024-2025)	

Table 8. Accuracy by percentage for each true or false question in the survey (N=61). The portion represented by a green color reflects the percentage who answered correctly, and the portion represented by a red color reflects the percentage who answered incorrectly for each respective question.

Overall, the dataset was primarily made of respondents who were Hindu, employed, Indian or Sri Lankan, immigrants to the U.S., and did not have a diagnosed cardiometabolic disease. Adjusted variables to normalize distributions of various variables were performed prior to analyzing to minimize potential bias or error in estimates.

For all respondents across the dataset, accuracy differed by whether the question was correctly true or false. For all statements that were correctly true, accuracy was always above 58%. However, for all statements that were correctly false, accuracy was always below 37%.

Chi-squared and Fisher's Exact Test Results – Unadjusted

After testing whether a chi-squared or Fisher's test was required, the respective tests were performed, and a table was produced that showed which categorical predictor variables were found to be statistically significant predictors of accuracy on various true or false questions (Table 9). Only SS variables were found to be statistically significant predictors of the accuracy of various true or false questions, with no other demographic variables demonstrating significance.

Table 9. Chi-squared and Fisher's Exact Test Unadjusted Model Significant Results

Significant Chi-square / Fisher's Test Results

Predictor Variable	True or False Question	Test Type	P-Value	Odds Ratio	95% CI (Lower)	95% CI (Upper)
Religiosity	Question 9	Fisher's Exact	0.025	0.204	0.039	1.000
Regular Consumption of SA Diet	Question 3	Fisher's Exact	0.012	5.479	1.223	26.227
Regular Consumption of SA Diet	Question 12	Fisher's Exact	0.037	4.805	0.873	27.114
Regular Thought About Heart Health	Question 4	Fisher's Exact	0.048	0.190	0.027	1.033
Trust in Healthcare Providers	Question 3	Fisher's Exact	0.000	13.138	2.507	93.851
Knowledge of Policy Changes	Question 3	Fisher's Exact	0.049	Inf	0.997	Inf
Regular Social Media Use	Question 5	Chi-squared	0.047	NA	NA	NA
Confidence in Survey Accuracy	Question 12	Fisher's Exact	0.008	7.341	1.371	52.366

Data source: SACVD (2024-2025)

Table 9. The table presents significant associations between predictor variables and accuracy on various true or false questions based on chi-square and Fisher's tests. The test that was run depended on whether assumptions were met to run a chi-squared test or not. For each predictor, the table lists the p-value, calculated odds ratio if applicable, and a 95% confidence interval for the estimated odds ratio.

Given that each SS variable tested in the chi-squared and Fisher's exact tests were all separated into two levels as either being "Low" or "High," outcomes regarding accuracy were interpreted with respect to only two levels. Respondents with high religiosity had 79.6% lower odds of answering Question 9 correctly than those with low religiosity ($p = 0.025$; $OR = 0.204$;

95% CI: 0.039–1.000). Respondents with high consumption of a "South Asian typical diet" were 5.48 and 4.81 times more likely to correctly answer questions 3 ($p = 0.012$; OR = 5.479; 95% CI: 1.223–26.227) and 12 ($p = 0.037$; OR = 4.805; 95% CI: 0.873–27.114), respectively. Respondents with a high frequency of thoughts about heart health had 81.0% lower odds of answering Question 4 correctly than those with a lower frequency of thoughts about heart health ($p = 0.048$; OR = 0.190; 95% CI: 0.027–1.033). Respondents with high trust in healthcare providers were 13.14 times more likely to answer Question 3 correctly than those with lower trust ($p < 0.001$; OR = 13.138; 95% CI: 2.507–93.851).

While the variable assessing knowledge of policy changes was significantly associated with accuracy on Question 3 ($p = 0.049$), the calculated odds ratio was "infinite," indicating issues with sparse data or sample size. Moreover, while high social media use was associated with accuracy on Question 5 ($p = 0.047$), the odds ratio estimate could not be calculated due to data limitations, potentially sparse data, or small sample sizes.

Lastly, respondents with high confidence in their accuracy on the survey questions were 7.34 times more likely to answer Question 12 correctly compared to those with lower confidence ($p = 0.008$; OR = 7.341; 95% CI: 1.371–52.366).

Logistic Regression – Evaluation of Model Assumptions

After evaluating multicollinearity between the continuous, numerical SS and Age variables in the data set using VIFs, the only VIF value greater than 5 that was detected was between religiosity (SS2) predicting true or false Question 7 (VIF = 7.378184). The relationship between religiosity and true or false Question 7 was later found insignificant in logistic regression analysis. No further analysis or consideration was required in the study.

After evaluating multicollinearity between the binary demographic predictors in the data set using VIFs, several VIF values were greater than 5, particularly for the relationships between predictors and accuracy for true or false questions 3, 6, 8, and 12. The results indicated potential multicollinearity between predictors, focusing on the variables of Diet, Employment Status, and Immigration Status for true or false questions 9 and 10. However, none of the observed demographic predictor variables in these models were found to be significant predictors of accuracy in adjusted logistic regression models. Consequently, no further analysis or consideration of this effect was required in the study.

Following the multicollinearity evaluation, the linearity assumption of logistic regression determined various relationships between predictor variables and accuracy on true or false questions that demonstrated p-values less than 0.05. The results were compiled into one output table (Table 10).

Table 10. Linearity Assumption of Unadjusted Logistic Regression: Significant Results

Linearity Assumption Test: Unadjusted Model						
Predictor (SS or Age)	True/False Question	Coefficient	Odds Ratio	95% CI (Lower)	95% CI (Upper)	P-Value
log(SS6_plus1)	Question 2	1.486	4.418	1.149	16.985	0.031
SS5_plus1	Question 3	0.672	1.958	1.197	3.202	0.007
log(SS5_plus1)	Question 3	2.495	12.118	1.972	74.487	0.007
SS7_plus1	Question 3	0.813	2.255	1.050	4.840	0.037
log(SS7_plus1)	Question 3	1.548	4.702	1.153	19.173	0.031
SS9_plus1	Question 3	0.521	1.683	1.044	2.715	0.033
log(SS9_plus1)	Question 3	1.783	5.949	1.186	29.843	0.030
SS4_plus1	Question 4	−0.881	0.414	0.216	0.796	0.008
log(SS4_plus1)	Question 4	−2.900	0.055	0.007	0.421	0.005
SS8_plus1	Question 5	0.419	1.520	1.078	2.144	0.017
log(SS8_plus1)	Question 5	1.312	3.712	1.293	10.656	0.015
SS6_plus1	Question 7	1.578	4.844	1.082	21.678	0.039
log(SS6_plus1)	Question 7	2.417	11.208	1.426	88.079	0.022
log(SS7_plus1)	Question 7	1.804	6.074	1.378	26.766	0.017
SS2_plus1	Question 9	−0.557	0.573	0.369	0.889	0.013
log(SS2_plus1)	Question 9	−1.909	0.148	0.034	0.638	0.010
SS6_plus1	Question 11	1.261	3.529	1.035	12.030	0.044
log(SS6_plus1)	Question 11	2.036	7.660	1.382	42.461	0.020
log(SS8_plus1)	Question 11	1.110	3.035	1.068	8.625	0.037
log(SS9_plus1)	Question 11	1.646	5.188	1.134	23.745	0.034
log(SS9_plus1)	Question 12	1.921	6.825	1.186	39.282	0.031

Data source: SACVD (2024-2025)

Table 10. The table shows results from the unadjusted linearity assumption test for logistic regression. The linear and log-odds models of each continuous, numeric predictor (Age and SS Variables) were tested, with the table showing the calculated coefficient, odds ratio, 95% confidence interval, and p-value for each respective relationship and predictor. Significant relationships between the log-odds models indicate potential non-linear relationships.

Several relationships that were later found to be significant did demonstrate significance in both the log-transformed and the untransformed models. These relationships were noted for consideration in further analysis of the results from all logistic regression models.

A subsequent test for the linearity assumption was run as a fully adjusted model, including all the SS Predictor variables and Age in one model. Only the relationship between the untransformed model of the SS6 Variable (Knowledge of MASALA) and true or false Question 1 was found to be significant (Table 11). This relationship was later found to be an insignificant relationship regardless and was not considered further in the analysis.

Table 11. Linearity Assumption of Log Odds in Adjusted Logistic Regression Significant Results

Linearity Assumption Test: Fully Adjusted Model						
Sliding Scale Predictor	Question #	Coefficient	Odds Ratio	95% CI (Lower)	95% CI (Upper)	P-Value
Knowledge of MASALA (SS6)	Question 1	3.790	44.252	1.019	1,922.331	0.049

Data source: SACVD (2024-2025)

Table 11. The table shows results from the fully adjusted linearity assumption test for logistic regression. The linear and log-odds models of each continuous, numeric predictor (Age and SS Variables) were tested in the same model, with the table showing the calculated coefficient, odds ratio, 95% confidence interval, and p-value for each respective relationship and predictor.

Lastly, for the test of high influence observations through Cook's test, observations 22 and 29 were noted to be high influence data points in the model predicting true or false Question 4 accuracy from the predictor variables of Age and all SS variables. The test also noted observation 30 as a high-influence data point in the model predicting true or false Question 10 accuracy from the same predictor variables. These observations were noted to be considered in further analysis after running logistic regression results to determine if high-influence data points may shape or mask the actual effect of various predictor variables on accuracy.

Logistic Regression – Unadjusted Model Results

The following predictor variables were assessed in this analysis: age, SS variables 1-9, which represented each sliding scale question on a scale of 1-6, sex, highest degree earned, religion, employment status, diet, immigration status, and presence of cardiometabolic disease. In the unadjusted model, each predictor was tested individually in a logistic regression model to determine if any variable significantly increased the chance of answering a specific question correctly. Odds ratios were calculated and summarized to highlight the outcomes only for statistically significant relationships ($p<0.05$) among all the relationships tested (Table 12). Only these relationships were considered for further analysis to centralize analysis on predictors that affected accuracy. No demographic predictors, such as Sex, Highest Degree Earned, Diet,

Religion, Employment, Immigration Status, and Presence of Cardiometabolic Disease, were found to be significant.

Table 12. Logistic Regression Unadjusted Model: Significant Results

Logistic Regression Results ($p < 0.05$): Unadjusted Model

Predictor Variable	True or False Question	Coefficient	Odds Ratio	95% CI (Lower)	95% CI (Upper)	P-Value
Religiosity	Question 9	−0.550	0.577	0.361	0.877	0.013
Regular Thought About Heart Health	Question 4	−0.880	0.415	0.194	0.743	0.008
Trust in Healthcare Providers	Question 3	0.641	1.898	1.200	3.196	0.009
Knowledge of MASALA	Question 7	1.414	4.113	1.313	18.778	0.045
Knowledge of MASALA	Question 11	1.245	3.474	1.315	13.114	0.042
Knowledge of Policy Changes	Question 3	0.764	2.147	1.122	5.271	0.049
Regular Social Media Use	Question 5	0.408	1.503	1.102	2.111	0.013
Confidence in Survey Accuracy	Question 3	0.487	1.627	1.040	2.658	0.039

Data source: SACVD (2024-2025)

Table 12. The table shows results from the unadjusted logistic regression model. Each predictor was tested individually as a predictor of accuracy on each true or false question. The final table showed the calculated coefficient, odds ratio, 95% confidence interval, and p-value for each respective relationship and predictor.

The results from the unadjusted logistic regression model provide an understanding of potential relationships between quantitative variable predictors and accuracy on various true or false questions throughout the survey. Increased religiosity decreased the odds of answering Question 9 correctly by 42.3% ($p = 0.013$; OR = 0.577; 95% CI: 0.361–0.877), and more regular thought about heart health decreased the odds of answering Question 4 correctly by 58.5% ($p = 0.008$; OR = 0.415; 95% CI: 0.194–0.743). Increased trust in healthcare providers also increased the odds of answering question 3 correctly 1.90 times ($p = 0.009$; OR = 1.898; 95% CI: 1.200–3.196).

Greater knowledge of the MASALA study was found to increase the odds of correctly answering Question 7 and Question 11 by 4.11 ($p = 0.045$; OR = 4.113; 95% CI: 1.313–18.778) and 3.48 times ($p = 0.042$; OR = 3.474; 95% CI: 1.315–13.114), respectively. Greater knowledge of ongoing policy changes related to SAA heart health also increased the odds of correctly

answering Question 3 by 2.15 times (p = 0.049; OR = 2.147; 95% CI: 1.122–5.271). More regular social media use was found to increase the odds of answering Question 5 correctly by 1.503 times (p = 0.013; OR = 1.503; 95% CI: 1.102–2.111), and greater confidence in the respondent regarding their assessment of overall accuracy increased the odds of answering Question 3 correctly by 1.627 times (p = 0.039; OR = 1.627; 95% CI: 1.040–2.658).

Logistic Regression – Sequentially Adjusted Model Results

In the sequentially adjusted model, each significant SS predictor from the unadjusted model (Table 12) was tested individually in a logistic regression model to determine if any potential variables altered the significance of the relationships. The first results table captured every relationship that was no longer significant (p>0.05) and which covariate was included in the model that resulted in that effect (Table 13).

Table 13. Logistic Regression Sequentially Adjusted Model: No Longer Significant Results

Logistic Regression Results (p>0.05): Sequentially Adjusted Model							
Predictor	Question #	Adjusted For	Coefficient	Odds Ratio	95% CI (Lower)	95% CI (Upper)	P-Value
Religiosity	Question 9	Diet	−0.743	0.476	0.138	1.115	0.127
Trust in Healthcare Providers	Question 3	Employment	0.323	1.381	0.788	2.438	0.251
Trust in Healthcare Providers	Question 3	Religion	0.243	1.275	0.714	2.271	0.398
Knowledge of MASALA	Question 7	Sex	1.329	3.776	1.256	17.594	0.059
Knowledge of MASALA	Question 7	Diet	1.473	4.363	1.091	42.157	0.136
Knowledge of MASALA	Question 11	Sex	1.131	3.100	1.257	11.533	0.054
Knowledge of MASALA	Question 11	Employment	1.119	3.063	1.159	11.980	0.070
Knowledge of MASALA	Question 11	Diet	1.060	2.887	1.023	20.335	0.157
Knowledge of MASALA	Question 11	Religion	1.154	3.170	1.203	12.896	0.068
Knowledge of Policy Changes	Question 3	Sex	0.791	2.205	1.091	5.710	0.057
Knowledge of Policy Changes	Question 3	Employment	0.909	2.483	1.128	7.921	0.062
Knowledge of Policy Changes	Question 3	Diet	0.192	1.211	0.630	2.802	0.597
Knowledge of Policy Changes	Question 3	Religion	0.925	2.521	1.184	7.800	0.051
Knowledge of Policy Changes	Question 3	Cardiometabolic Disease	0.752	2.122	1.095	5.249	0.056
Regular Social Media Use	Question 5	Employment	0.386	1.472	1.003	2.257	0.058
Regular Social Media Use	Question 5	Religion	0.279	1.321	0.952	1.873	0.102
Confidence in Accuracy	Question 3	Diet	0.418	1.519	0.672	3.589	0.311
Confidence in Accuracy	Question 3	Religion	0.357	1.429	0.857	2.467	0.175
Data source: SACVD (2024-2025)							

Table 13. The table shows results from the sequentially adjusted logistic regression model. Each covariate was tested individually alongside a previously found predictor of accuracy from the unadjusted model. The final table showed the calculated coefficient, odds ratio, 95% confidence interval, and p-value for each respective predictor.

The second results table captured every relationship that remained significant after adjustment (p>0.05) and which covariate was included in the model (Appendix, Table 20). This table included all remaining predictors and covariates that did not affect the significance of previous relationships detected in the unadjusted model.

The results from the sequentially adjusted logistic regression model show how several predictors initially found to be significant in the unadjusted model can lose significance after adjustment with specific covariates in the dataset. These findings indicate that confounding

factors of diet, religion, employment status, sex, or cardiometabolic disease may have influenced the previously observed relationships.

After adjusting for diet, religiosity was no longer found to be a significant predictor of accuracy on true-or-false Question 9 ($p = 0.127$). After adjusting for employment ($p = 0.251$) or religion ($p = 0.398$), trust in healthcare providers was no longer a significant predictor of accuracy on true-or-false Question 3.

Adjustment for sex caused a loss of significance in knowledge of the MASALA study as a predictor of accuracy for true or false Question 7 ($p = 0.059$) and Question 11 ($p = 0.054$). Similarly, after adjusting for diet, knowledge of the MASALA study was no longer a significant predictor of accuracy for true or false Question 7 ($p = 0.136$) or Question 11 ($p = 0.157$). After adjusting for employment status ($p = 0.070$) or religion ($p = 0.068$), knowledge of the MASALA study was no longer a significant predictor of accuracy on true or false Question 11. Adjustment for sex ($p = 0.057$), employment ($p = 0.062$), diet ($p = 0.597$), religion ($p = 0.051$), or presence of cardiometabolic disease ($p = 0.056$) caused knowledge of policy changes to lose significance as a predictor of accuracy for true or false Question 3.

After adjusting for employment ($p = 0.058$) or religion ($p = 0.112$), regular social media use was no longer a significant predictor of accuracy on true or false Question 5. Finally, after adjusting for diet ($p = 0.311$) or religion ($p = 0.175$), confidence in overall accuracy was no longer found to be a significant predictor of accuracy on true or false Question 3.

Logistic Regression – Fully Adjusted Model Results

Using the variables found to affect the significance of the relationships between predictor variables and true or false accuracy from the sequentially adjusted model, a fully adjusted model was performed alongside the same SS variable predictors found to be statistically significant

predictors of accuracy in the unadjusted model. This included the covariates of diet, employment status, sex, religion, and presence of cardiometabolic disease.

Upon running this fully adjusted logistic regression model, no variables were found to be statistically significant predictors of accuracy on any true or false questions.

Due to the potential small sample sizes present in the data set, a Firth logistic regression was also run on the full model to detect if any relationships may be detected with a model more suited to smaller sample sizes and sparse data. An output table was created that displayed any relationships that did have a statistically significant predictor variable (Table 14).

Table 14. Firth Logistic Regression Fully Adjusted Model: Significant Results

Firth Logistic Regression Results (p<0.05): Fully Adjusted Model						
Predictor Variable	True/False Question	Coefficient	Odds Ratio	95% CI (Lower)	95% CI (Upper)	P-Value
Regular Social Media Use	Question 5	1.088	2.967	1.288	41.200	0.006
Data source: SACVD (2024-2025)						

Table 14. The table shows results from the fully adjusted Firth logistic regression model. Each covariate found to disrupt the significance of predictors detected from the unadjusted model were run all together in one model. The final table showed the calculated coefficient, odds ratio, 95% confidence interval, and p-value for the respective relationship and predictor that was significant (p<0.05).

With this model, higher social media use increased the odds of answering true or false Question 5 correctly by 2.97 times (p = 0.006; OR = 2.97, 95% CI: 1.29–41.20) holding sex, employment status, diet, religion, and presence of cardiometabolic disease constant.

Linear Regression – Evaluation of Model Assumptions

Prior to conducting linear regression tests, the predictor and outcomes variables were fit into a linear regression model to evaluate if any assumptions of the model were violated prior to conducting analysis. The model diagnostics, a histogram of the residuals, and a Q-Q plot were generated to further investigate the normality of residuals, ensuring the validity of key linear regression assumptions prior to analysis: linearity, homoscedasticity, and normally distributed residuals (Figure 1).

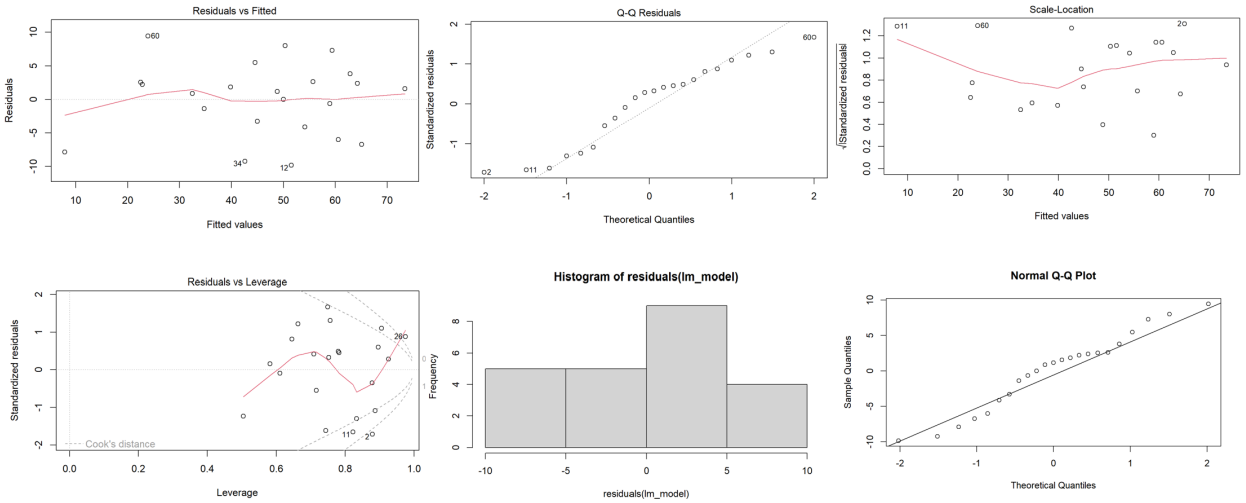


Figure 1. Diagnostic Plots for Linear Regression Assumptions (Including Diet)
The figure displays diagnostic plots assessing the assumptions of linear regression, including residuals vs. fitted values, Q-Q plots, scale-location, residuals vs. leverage, and a histogram of residuals. The plots evaluate linearity, normality, homoscedasticity, and influential points. This model included the diet variable.

While the variable of diet was included in the initial linear regression model as a predictor, the diagnostic plots revealed the variable introduced influential leverage points and model instability, especially depicted in the "Residuals vs. Leverage" plot and the partial left skew in the histogram of the residuals. Given the contribution of disproportionate influence to the model, the diet variable was excluded in the final linear regression models to adhere to the validity of the linear regression model and its assumptions.

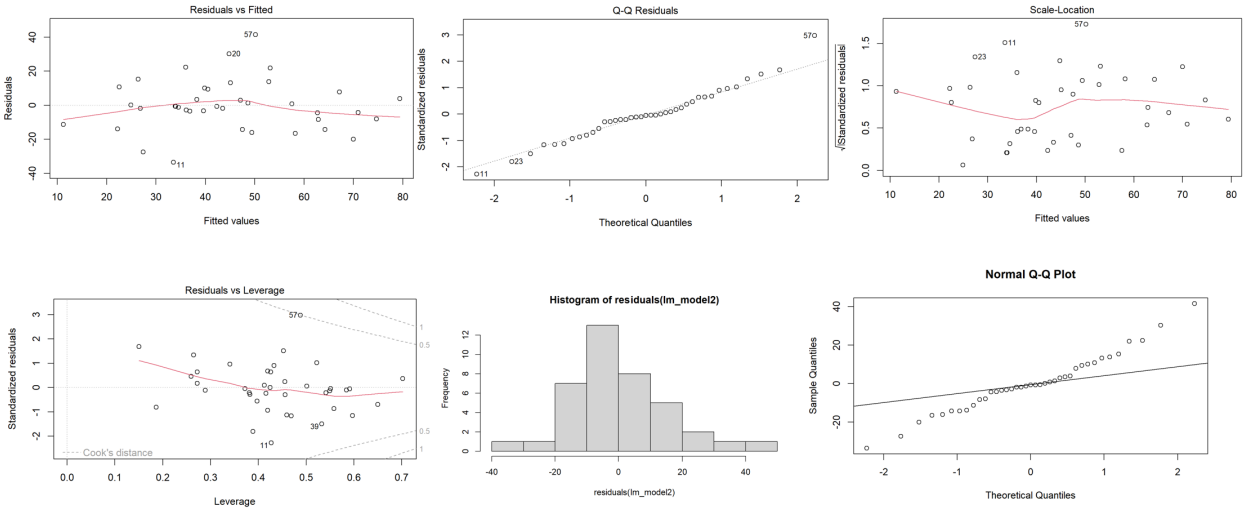


Figure 2. Diagnostic Plots for Linear Regression Assumptions (Excluding Diet)

The figure displays diagnostic plots assessing the assumptions of linear regression, including residuals vs. fitted values, Q-Q plots, scale-location, residuals vs. leverage, and a histogram of residuals. The plots evaluate linearity, normality, homoscedasticity, and influential points. This model excluded the diet variable.

Linear Regression – Unadjusted Model Results

The first linear regression test was run as an unadjusted model. Each variable in the data set utilized for analysis was individually input into the model to assess if any variable was associated with overall accuracy across all 12 true or false survey questions. An output table was created to capture any statistically significant relationship, indicated by a p-value of less than 0.05 (Table 15).

Table 15. Linear Regression Unadjusted Model: Significant Results

Linear Regression Results (p<0.05): Unadjusted Model							
Predictor	Beta Coefficient	Std. Error	t Value	P-Value	95% CI (Lower)	95% CI (Upper)	R-Squared
Knowledge of MASALA	5.844	2.124	2.751	0.008	1.680	10.007	0.136
Data source: SACVD (2024-2025)							

Table 15. The table shows results from the unadjusted linear regression model. Each predictor was tested individually as a predictor of total accuracy. The final table showed the beta coefficient, standard error, t value, p-value, 95% confidence interval, and R^2 value for each significant ($p<0.05$) predictor of accuracy.

In the unadjusted model, a one-point increase in knowledge of the MASALA study was associated with a 5.844-point increase in total accuracy score ($p = 0.008$). Knowledge of the MASALA study explained 13.6% of the variance found in overall accuracy scores within the data set ($R^2 = 0.136$).

Linear Regression – Sequentially Adjusted Model Results

The subsequent linear regression test occurred using a sequentially adjusted model with each other variable in the data set individually added to determine if the significance between knowledge of the MASALA study and overall accuracy remained significant. Each variable was only added one at a time and in separate tests to determine if any predictors affected the significance of the relationships found in the unadjusted model. An output table was created to capture any variable that, when adjusted for in the linear regression model, caused a loss of

significance in the relationship between knowledge of MASALA and overall accuracy (Table 16).

Table 16. Linear Regression Sequentially Adjusted Model: Significant Results

Sequential Adjustment: SS Predictor Lost Significance							
SS Predictor	Adjusted For	Beta Coefficient	Std. Error	t Value	95% CI (Lower)	95% CI (Upper)	P-Value
Knowledge of MASALA	Knowledge of Policy Changes	4.662	2.522	1.848	−0.282	9.605	0.071
Data source: SACVD (2024-2025)							

Table 16. The table shows results from the sequentially adjusted linear regression model. Each covariate was tested individually alongside a previously found predictor of accuracy from the unadjusted model. The final table showed the beta coefficient, standard error, t value, p-value, 95% confidence interval, and R^2 value for each no longer significant ($p>0.05$) predictor of accuracy.

In the sequentially adjusted model, after adjusting for participant knowledge of ongoing policy changes that focus on South Asian CV health and research, knowledge of the MASALA study was no longer a significant predictor of overall accuracy ($p = 0.071$), indicating knowledge of policy changes and the MASALA study may covary and the initially significant relationship may be explained by knowledge of policy changes instead of MASALA.

Linear Regression – Fully Adjusted Model Results

Several fully adjusted models were run to determine a greater understanding of the relationship between knowledge of the MASALA study and overall accuracy across the survey. The first model included knowledge of the MASALA study (SS6) and knowledge of policy changes (SS7) and tested all other predictor variables in the data set. The other SS variables were not included (Table 17).

Table 17. Linear Regression Fully Adjusted Model Without All SS Predictors: Significant Results

Linear Regression Results ($p < 0.05$): Fully Adjusted Model Without All 'SS' Predictors						
Predictor	Beta Coefficient	Std. Error	t Value	P-Value	95% CI (Lower)	95% CI (Upper)
Knowledge of MASALA	8.952	3.716	2.409	0.023	1.670	16.235
Female Sex	21.347	7.979	2.676	0.012	5.709	36.985
Data source: SACVD (2024-2025)						

Table 17. The table shows results from the fully adjusted linear regression model. Each covariate, aside from SS variables 1-5, 8, and 9, was run all together in one model. The final table showed the beta coefficient, standard error, t value, p-value, 95% confidence interval, and R^2 value for each significant ($p<0.05$) predictor of accuracy.

In this fully adjusted model, a one-point increase in knowledge of the MASALA study was associated with an 8.952-point increase in total accuracy score when controlling for knowledge of policy changes, sex, age, highest degree earned, employment status, religion, immigration status, and presence of cardiometabolic disease ($p = 0.023$; $\beta = 8.95$, 95% CI: 1.67–16.24). Additionally, compared to the males in this model, females scored 21.347 points higher on average than males when controlling for knowledge of MASALA, knowledge of policy changes, age, highest degree earned, employment status, religion, immigration status, and presence of cardiometabolic disease ($p = 0.012$; $\beta = 21.35$, 95% CI: 5.71–36.99).

The second fully adjusted model included knowledge of the MASALA study (SS6) and knowledge of policy changes (SS7) and tested all other predictor variables in the data set. The other SS variables were included (Table 18).

Table 18. Linear Regression Fully Adjusted Model With All SS Predictors: Significant Results

Linear Regression Results ($p < 0.05$): Fully Adjusted Model With All 'SS' Predictors						
Predictor	Beta Coefficient	Std. Error	t Value	P-Value	95% CI (Lower)	95% CI (Upper)
Knowledge of MASALA	11.044	4.459	2.477	0.021	2.304	19.783
Data source: SACVD (2024-2025)						

Table 18. The table shows results from the fully adjusted linear regression model. Each covariate was run all together in one model. The final table showed the beta coefficient, standard error, t value, p-value, 95% confidence interval, and R2 value for each significant ($p<0.05$) predictor of accuracy.

In this fully adjusted model, a one-point increase in knowledge of the MASALA study was associated with a 11.044-point increase in total accuracy score when controlling for all SS variables, sex, age, highest degree earned, employment status, religion, immigration status, and presence of cardiometabolic disease ($p = 0.021$; $\beta = 11.044$, 95% CI: 2.304–19.783).

IIIb. Qualitative Data

Seven interviews were conducted throughout the study and only with respondents who elected to complete the post-survey interview. Each interview took place on Zoom and ranged from 8 to 45 minutes, depending on the topics discussed and the participant's available time. After each interview, the audio transcript was utilized to review the audio recording a final time to confirm the accuracy of the transcripts produced in Zoom. Each interview was analyzed to detect common themes, patterns, and key insights within and across all interviews. Each interview was deidentified and referred to only by a participant number in order of analysis for each transcript. All interview results in this section utilize “they” and “them” pronouns to assist in identifying participant identities, though all results refer to one participant at a time.

Participant 1

Participant 1 began their interview by discussing their initial thoughts and feelings while completing the survey. The participant discussed feeling relatively familiar with the topic of CVD and its increased risk among South Asians. The participant expressed that several of the questions and information pieces across the survey "aligned with many of the things" they had been reading and trying to incorporate into their lives.

Though the participant expressed having a general knowledge of the questions and information presented throughout the survey, they expressed that the specific statistic that 60% of world heart disease patients are South Asian seemed "pretty high," saying, "I knew that South Asians had higher risk factors, but I didn't know it was that high." The participant also spoke briefly about their knowledge of the MASALA study and other risk factors, suggesting that the statistics were "glaring" but still "in the theme of what I knew about specifically."

When asked to recount the sources the participant used to obtain their pre-existing knowledge, Participant 1 said it most came from their research and reading. In addition to

finding and reading about the MASALA study, the participant also mentioned a documentary about high diabetes prevalence in South Asian countries like India. They said:

"*The specific documentary was on the impact of British colonialism on Indian food habits and how that eventually impacted sort of their metabolic diseases. The pre-colonial time, food habits were much healthier, and the during the colonial time is when the white rice was indeed introduced to Indian food, and also some of the white, you know, wheat flour, sort of more bleached wheat flour was introduced. A lot of the unhealthy habits were introduced according to that documentary happened in the British colonial period*."

The participant focused on lessons like these as part of "news that's coming out about South Asians. "The participant's only personal interest was being cognizant of and aware of information about the South Asian community.

Participant 1 then discussed whether they saw similar interests in research within their community. They said that some people they knew discussed the topic, but the participant did not know how much time they spent on actual investigation or research. They stated that health and disease risk awareness also increased as the participant and their community entered older age groups, making individuals more proactive or alert regarding health and wellness. The participant further elaborated on these ideas by saying:

"*I think many of them are aware of some of the increased risk for South Asians, but how much they know the specific numbers and what you need to do in order to reduce the risk, etc., they may not be aware of all of these, although there is some awareness of this increased risk*."

In terms of how to address these concerns, the participant explained their thoughts about the topic of CVD and its increased risk among South Asians. They first stated its importance, expressing that the topic is "something the South Asians, especially in the diaspora communities, should be aware of" due to the availability of "highly processed foods," the prevalence of "overeating habits," and generally not being "very active." The participant said that they even felt they should begin to incorporate more health practices into their life after completing the survey, and they would want others "to start seriously adopting habits to improve."

When discussing the importance of sharing this knowledge with other South Asians, Participant 1 also described how it would be helpful "even for physicians to be aware," saying, "Physicians could be more specific to South Asians." They stated:

"*Many of the physicians may not have read all of these, they may not, they may know at a high level, but to specifically tell a South Asian origin patient what to do, how to do it, it is, you know, to be fine-tuned, specific to that population, may not be the standard procedure, and maybe that's something you know, to be thought about in terms of incorporating into that*."

To explore further routes to disseminate information about CVD risk to broader populations of South Asians, the participant explained that they know some community organizations sometimes bring in physicians to speak about topics such as this but have not seen this happen in the city where they live. Regardless, the participant recommended relying on community organizations to spread information, saying, "You could contact the president of these organizations and share this information with them so that it gets distributed in their newsletters, networks, etcetera., at least some sort of link to this information where they can get it or invite specifically." They also referred to podcasts, either health or South Asian related, to discuss the topic and bring experts in the field to share their perspectives, such as the individuals leading the MASALA study.

Participant 2

Participant 2 first began by explaining that their work in cancer research made them more familiar with concepts of disease and expressed that the questions throughout the survey "covered a good area in the risk factors for these cardiometabolic diseases," despite not knowing every specific fact about the topic of CVD and its increased risk among South Asians. In addition to the participants' background in research, they expressed that much of their preexisting knowledge also comes from information they hear on the radio, particularly NPR. In fact, the participant explained that the fact that about 60% of world heart disease patients were comprised

of South Asians was something they had heard on NPR before. Participant 2 explained that by listening to these talks and through their background in research, they had read a lot about disease but were not mainly focused on cardiovascular medicine.

When speaking about knowledge that the participant had not known prior to completing the survey, they expressed their surprise at some of the information, including the high levels of "fat deposits in the Southeast Asians." This information made them wonder if these effects were genetic, environmental, or potentially both. While the participant explained knowing that higher percentages of people with CVD are South Asians, they were surprised that this was the case because of their understanding of diet practices in the U.S.:

"*The reason I thought I was surprised is because in here, in the U.S. and Western countries, they eat a lot of meat and all those kinds of things, and you would expect that they would have higher amount of fat deposits. But the Southeast Asians, we barely eat meat and other fat food over there. Because I grew up there, we didn't really eat much. How did they get these kinds of deposits and ultimately end up the disease*?"

"Participant 2' continued to wonder if this was about genetics or other factors and questioned why that was the case. When asked if these thoughts of cardiovascular health were typical for the participant, they explained that while they read a substantial amount of disease and health-related publications for their job, they "don't really do research" about their own health, and it is "all work-related." When it came to discussing if these topics were also well-discussed in other communities, the participant said they hadn't "really done outside of work other than my family," but they "think it's a good idea to spread that word, because not too many people knew about these details."

The participant then also began discussing their perceptions of how individuals seek out information about health and CVD specifically. They expressed that more and more people are trying to read about and find more out about various diseases. While they express that older

generations and populations in Sri Lanka, the South Asian country of origin for this participant, may not have immense knowledge, younger populations have more expansive backgrounds. They stated that this is partly due to shifts in the importance of education:

"*Now people have a lot of information. Maybe they are reading about it. Maybe they talk like we talk. Say, for example, if I know something, I tell some of my friends, and then probably that that would spread out, or something, because I think people are much more educated now than before*."

Despite this increased discussion, however, Participant 2 stated that they didn't think most people knew about the specific increased risk for CVD among South Asians. They said the statistic of 60% of world heart disease patients being South Asians is a "huge number" and that they "don't know whether they know that kind of high risk we have," with 'they' referring to other South Asian individuals.

Participant 2 also noted the importance of personal connection in affecting others' knowledge about disease and health. They said, "It's a family thing. Right? So, then those people take even extra care. They go and read about it." The participant even referred to a specific moment when their friend was discussing their diet and food choices and how this related to the friend's family's high risk for CVDs. The participant summarizes how familial connections to disease could increase a person's desire to learn more, especially as something they have seen in their own research work: "If they had some relationship with that kind of thing, then they probably go and read." They also added that "people who have some connections, they take extra time to read and understand now that everything is available."

Participant 2 then adds that this lack of connection for some might cause people to not do "any work" or "pay attention" to specific diseases and potential risks. Specifically in relation to South Asians as well, the participant explains that a lot of current conversations they hear and take part in are related to diet, sugars, and fat, but not CVDs. While the participant expressed

optimism that the "people who don't have any idea will learn," they continued to state that if people did not have a personal background in a certain topic, "they don't have any interest in reading about it." The participant said educating people and getting the word about information in the survey are important steps in the right direction.

Participant 3

Participant 3 first discussed their feelings of confidence prior to completing the survey. The participant explained that they felt they would have a good gauge of the questions due to their background studying biology and the fact that they felt heart disease is "something that the general public tends to have a little bit more knowledge of." As the participant completed the survey, however, they said they realized they knew "a lot less particularly about how like heart disease adversely affects South Asians" than they had previously thought. The participant explained that while they saw conversations about diabetes, obesity, and weight gain very prevalent in their family, they did not feel like conversations about CVD were common, especially conversations about "how pertinent it is in our population."

In more specific consideration of the participant's previous knowledge, they said:

"*I kind of assumed in general that, like, we probably have a higher prevalence of like heart disease in our like ethnic group, just because, like of higher rates, of like diabetes and obesity. And I know those things are interrelated.*"

However, the participant expressed surprise at the magnitude of the statistic stating that 60% of the world's heart disease patients are South Asian by saying, "I was kind of shocked to find out that it was like that high. I did not expect it to be that high at all." They further explained that while they felt relatively confident in questions strictly about biology and physiology, such as where fat is stored, they felt more surprised by the demographic-specific questions that highlighted the increased rates of heart disease within South Asian populations.

Regarding community and whether CVD risk is well discussed, the participant referenced that recently, the topic started to become more discussed due to their parent's friend having a heart attack many years ago and having to undergo bypass surgery afterward. The participant explained that after this event, their parents' community started to discuss the topic more:

"*After that happened, their entire friend group started looking more into, I guess, risk factors or things. They started taking the fact that their cholesterol is high a little bit more seriously. They were like; maybe we should look into things that we can do to reduce this that don't necessarily involve just taking medication, what lifestyle changes can we make*."

The participant then continues a similar theme as earlier, stating that the most common conversations they had heard prior to recent changes surrounded diabetes and sugar levels, expressing that CVD was not something as commonly discussed until recently:

"*It was always just the things as a South Asian person you need to watch are your sugar levels, because most of us are pre-diabetic, and you have to be very careful about kinds of exercise you do and how you eat, and when you eat because we are more prone to holding weight in specific parts of our body. But, I don't think cardiovascular disease is something we ever really spoke about until more recently*."

Participant 3 then transitioned from these ideas into a discussion about ways to increase awareness about the topic of heart disease, particularly among South Asians who do not have a personal connection to someone with CVD. The participant expressed their beliefs about why several South Asians might not find CVD to be a pertinent issue. They describe this by referencing advertisements for medications or products intended for individuals who have undergone surgery and need tools to keep stents or grafts clean. The participant said:

"*We don't see people who look like us in these kinds of advertisements, and I feel like that makes it kind of hard for us to view ourselves as someone who this issue can actually target. Because you never really hear about it and then the medications that are targeted towards things, or even ads towards increasing exercise to lower your risk don't necessarily have people who look like they are South Asian in the videos."*

Using this thought about internalization, the participant explained that, in general, "things will spread like wildfire" in South Asian communities in group chats or in religious community

spaces where many people congregate. Participant 3 suggested that "targeting the settings" where South Asians commonly are or use online could be helpful for advertising specific information to the population. However, the participant continues to echo the feelings of lack of representation in information about CVD, saying, "I've definitely noticed it's hard for us to view this issue as something that's important to us when we don't really see it as being very heavily represented even in the South Asian media." These topics made it difficult for the participant to internalize the prevalence of CVD within the population beyond their own family. The participant also notes that when considering family history, their other family members were unaware of CVD risk in their history, which they described as shocking and part of their reasoning for why many South Asians may not deeply understand personal CVD risk.

The participant also referred to social media as a potential tool to disseminate information to South Asians, saying, "The advent of social media has made it a lot easier for us to stay in communication." They further explained that they have seen social media use across generations, leading to their conclusion that "taking advantage of the digital age, and especially that these older communities who are more at risk for this are finally starting to turn towards it, I feel like that's definitely someplace, for placing these kinds of advertisements."

In their concluding remarks, the participant said that after completing the survey they "actually did a lot more research into it afterwards. I was like reading up a lot more about the risks of heart disease for the South Asian community." The participant repeated again that the lack of knowledge of their family history was something they discovered after wanting to learn more from other family members, posing a feeling of surprise for the participant.

Participant 4

Participant 4 began by discussing their initial thoughts and feelings while completing the survey. Though the participant expressed not having any specific feelings about the survey and its questions, they said they felt "surprised" that they did not know the answers to some of the true-or-false questions. They also explained that their previous knowledge consisted of knowing "there is a difference" in risk for CVD "between different racial groups" but "did not know the specifics of the Asian population."

The participant also explained their previous knowledge largely came from reading, "whether it's the, you know, the publications that I subscribe to, or news journal articles that I see." Due to this existing knowledge base, Participant 4' explained that while the information they learned about in the survey was not surprising, it was new. The participant was previously unaware that the "Southeast Asian population has a higher prevalence for heart disease."

Regarding community, the participant expressed that they had not heard others discussing the topic of CVD among South Asians but had seen consideration of CVD in one of their friends. Participant 4 said that this particular friend is considerably "health conscious" and also explained that this person's mom and dad had a heart attack, being incredibly proactive with his dad between the time of his mom and dad's heart attacks.

The participant also discussed ways that information about CVD and increased risk among South Asians could be presented to the general population. To explain their ideas, they focused on a concept used in finance:

"*In the finance world, people's 4 01 K. What they found out is, if you automatically enroll people when they start work and then automatically increase the amount that they put into their retirement account by one or 2%, those individuals in that system have a way higher incidence of money saved versus, and people can opt-out at any time they want, versus where people have to proactively sign up for these things*."

The participant further explains that the question of "How do you help people make the right decision?" particularly fascinates them. When connecting this idea back to CVD and increased risk among South Asians, the participant said:

"I am wondering if you could partner with, you know, my mom goes to, I don't know which Indian store. She goes to buy her food. But if you could somehow market in certain topics, like when you're at an Indian store, right? You're thinking about food. That's just like one piece of this puzzle."

A final component of focus for Participant 4 during their interview was elaborating on their thoughts on generational differences in comprehending changes to diet and exercise. The participant explained that as individuals who "grew up in Sri Lanka in a small fishing village," they and their parents' generations were used to walking everywhere, and it was not common to "proactively think about exercise." The participant then explains that while these generations "don't eat junk food," they still consume "a lot of starch through rice" and "eat a lot of fried foods." The shift to living in the U.S., where exercise is a more proactive activity, then became something that "doesn't resonate with that first generation" as before, they "haven't had to think about the healthy aspects of it, because we lived such an active life, and we ate a lot of fresh food."

Participant 5

Participant 5 expressed that one of their initial thoughts while completing the survey was learning that a predominant amount of research within cardiovascular medicine is done on "Caucasian or American people" and not South Asians. They found this piece of information relatively interesting and expressed, "It's not correct," that South Asians are measured with Caucasian or American individuals.

The participant was then asked more about their pre-existing knowledge before completing the survey. Participant 5 expressed that as a Sri Lankan individual, specifically, they

knew that heart attacks were widespread among Sri Lankans, especially with women in menopause. The participant also expressed that their mother had had a heart attack, which prompted the participant to do further research into the topic to understand more about potential reasons why that had happened. The participant learned that South Asians have narrower arteries than "Americans," as they described it. They also expressed that personal connection was important to conversations surrounding CVD by saying:

"*I would say, with my friends and family overall, they are more concerned, more health conscious, knowing that Sri Lankans do have more heart attacks, more heart issues, more diabetics. Diabetes and hypertension are main causes in Sri Lankan community or Indian community. They talk more about that.*"

As the participant continued to elaborate on previous knowledge of increased CVD risk among South Asians, a conversation about diet also arose. Participant 5 said that they knew "a lot of heart attacks happen with South Asian people" and thought one reason could be that South Asians use a lot of coconut in their diet, including the participant themself. They also noted that while many South Asians are thinner and "look very healthy," they can still have "fat in bellies" and "massive heart attacks," referring back to the participant's own experience with their mother having a heart attack. The participant expressed that with their diet, they do not consistently think about how it pertains to their health, especially when eating various "fatty foods."

The participant was then asked about the community to highlight their thoughts on how CVD was discussed in their life. Participant 5 expressed that they talk about cardiovascular health within their friend circle. However, the participant makes a point to note that they do not believe this applies to many people in Sri Lanka, specifically. Participant 5 explains that this may be due to the culture in the U.S. to have more knowledge about various topics.

Regarding the community, the participant also expressed that, beyond Internet research, talking and communicating with friends and family was a common way to obtain information

about CVD and its increased risk among South Asians. The participant expressed that they did not participate in any other community events where information about this topic was presented or shared.

Participant 5' also spoke briefly about their perspectives on physicians or other healthcare providers sharing information about this disparity. The participant shared their feelings based on personal experiences, saying:

"It's okay. But they don't explain. Okay, South Asian people have more heart issues or more metabolic issues. They don't talk like that. But they do, you know, focus on more health eating and exercise things like that."

In final remarks, the participant expressed their future interest in finding and hearing about more research focused on South Asians specifically and for individuals within their age demographic.

Participant 6

Participant 6 began by discussing what aspects of the survey were familiar or unfamiliar. They first mentioned they "didn't know about the MASALA study." While the participant expressed that they didn't know about many of the facts in the survey, they were not surprising to them: "I didn't know that South Asian Indians have a higher incidence of diabetes and heart disease. I thought it was just diet-related."

About their own practices and diet, the participant described their whole food, plant-based diet that they had been engaging in for over a decade. They believed that the diet had a "human impact on all chronic diseases" and helped them achieve optimal health outcomes for someone in their age group. Due to this experience, they have "done extensive reading on the subject" of diet and health and try to advocate for others to follow a similar diet. The participant shares that this advocacy is conveyed through a "WhatsApp group with close to 100 people," and the participant will "barrage them with the information trying to motivate them" to eat the same

way as 'Participant 6.' Several individuals in this WhatsApp group are South Asians, but not all are.

The participant shared that they have seen South Asians with lower BMI still have bypass surgeries done, but believe that others who have lower BMI and follow a whole food, plant-based have better outcomes in not having many bypass surgeries. The participant even referred to an instance of one specific friend who began to change their practice after having a severe heart attack: "he had an event, heart attack, and then they found out that he had 98% blockage. And then he changed immediately, you know, based on that, and I told him you were lucky you didn't die."

In discussing the participant's advocacy work, the participant described the types of people they face when trying to convince others to change their diet and overall health practices. They stated:

"*You can divide the people into 3 categories. Some are very receptive immediately, to tell them, and maybe it's because they know me, and they know that, you know I'm a pretty knowledgeable person. They immediately change. Others are skeptical. And they may. They may just ignore me, and they don't want, or they may change later, you know, because of some life event happens, and they remember me what I said, and they change. But the 3rd group are people who are completely opposed to it. It doesn't matter how much I try to explain. It's almost impossible*."

The participant explained that several people will also "make fun" of them or "double down on what they're doing" when they try to share their perceived benefits of a whole food, plant-based diet. Despite this, the participant said they "persevere" and still make an effort to share information about specific diets and their links to health outcomes. The participant hopes that even if someone does not change immediately, they might change one day: "You may not change today, but at least I'm planting a seed in your mind saying that there is a concept called if you eat this way if you give you better health. At least there is an idea in the mind." The

participant further explained that the seeds of ideas can be a gradual process of understanding: "It's not inevitable that you have to suffer from these chronic diseases. So, you know, for many of them. It comes later. It comes gradually."

One particular anecdote that was discussed related to these ideas of gradual change and personal connection and was about a religious leader in the participant's community:

"*There is a religious leader here. He's actually a Swamiji. I told him almost 9, 10 years back he didn't change. He made fun of me; he said, 'What you're eating is all cattle food.' But about 3 years back, something happened, and now he has changed, and his health has improved a lot, and he travels all over the country, lecturing people on religious topics, and he's told me that people see him, and many people have changed. My answer to you is we have to keep trying. You never know*."

Participant 6 also discussed that specifically for heart disease, prevention is essential because the "first symptom of heart disease" is "not a heart attack, it's death," and among "those who get the first heart attack, 17% of those they die with the first heart attack." The participant explained that many people "think that you're somehow going to find out your heart attack, and then you'll have a chance to change your diet," which the participant did not believe was the case. They mentioned that many people work retroactively, saying if "they have had heart attacks or cardiovascular events, they have changed their health."

Despite the efforts the participant makes to share information about diet and its relation to health, they explained that it can still be tough to convince people to change their minds:

"It's just natural, you know, because, you see, you meet people, they're okay with you as a friend or an acquaintance. But the moment you try to convince them, they're like, who the heck are you? You know they may not tell you to face, but it is that attitude and you're directly challenging what they believe in."

The participant explained that experiences like these encouraged them to find new techniques and approaches to talk and engage with others in their advocacy work. They explained that they cannot be "overbearing" but need to present information in a way that plans a

small seed. The participant also explained that in their advocacy, they "don't comment on people's belief systems."

One point of disappointment that the participant expressed was about what information was presented in the MASALA study. The participant said:

"*I went to the MASALA study site, right? I'm surprised that they don't have links to the websites I mentioned. It is scandalous because, you know, this is the best thing you see based on evidence today. The best thing you can do for your health is to follow a whole food, plant-based diet, avoid oils completely, which means cooking without oil. No fried foods. Even olive oil is not good for you*."

The participant elaborated on this by saying they were a "bit disappointed that they don't have a prescription" of how individuals should eat.

Participant 6 concluded the interview by echoing the importance of advocating for diet changes within their community. They wanted to echo the idea of planting seeds into others' minds to foster long-term change and have "the biggest impact" on the world. While the participant said that the work they do "on a personal level, one-on-one," they do think that getting organizations together to do a more significant project would be "a big help."

Participant 7

Participant 7 began the interview by discussing their overall feelings and thoughts regarding the survey and how they felt while completing it. The participant expressed not knowing the answer to many questions, including selecting "I don't know" for several options. The participant, however, did express that they felt relatively familiar with the general idea that South Asians face a higher risk of cardiovascular disease compared to other racial and ethnic groups. They explained that what was less familiar was how this works, referencing a mechanistic understanding of this disparity. In navigating these feelings, the participant said,

"Going through the questions was very interesting. I think it made me aware of a lot of things that I was unfamiliar with and things that I have to become more familiar with."

As Participant 7 further explained their pre-existing knowledge of the topic prior to the survey, the participant referred to information regarding the effects of colonization of South Asian countries:

"I've *read some articles on just how generally, I think, the history of colonization in a lot of South Asian countries and the very high prevalence of famine and undernutrition in a lot of these countries, during times of colonization, have greatly impacted current rates of, I think, things like diabetes and obesity, and also, cardiovascular risk of cardiovascular disease in South Asian communities.*"

The participant explained that this knowledge was obtained by reading articles and posts on social media that they explored out of interest. One particular social media they highlighted was "Brown History," an Instagram page that posts a lot of information about South Asian figures throughout history. Participant 7 continues to echo the use of social media as a primary way for them to obtain information, and much of what they follow and see is based on personal interest, causing them to look more into particular topics.

The interview then shifted into conversations regarding the community and the participant's thoughts on how CVD was discussed in their life. The participant expressed that cardiovascular health was not profoundly discussed in the communities in which they are involved. They explained, though, that in cases where it was talked about more regularly, it was often among family members due to a history of heart attacks and other conditions in their family history. The participant explains how a personal connection to CVD connects to regular conversations about the topic by saying:

"I think the only communities in which I hear it being talked about are really like my family because I have family members who have had heart attacks and have had heart issues in the past, and I think because of that, they've become more interested and more aware of issues affecting their health. So, it's really like only in circles in which there are people who have first

handedly experienced any sort of cardiovascular issues. Those are communities in which I see people actually talking about cardiovascular health."

The participant also stated they did not know as much about metabolic diseases precisely, referencing that metabolic concerns are not as prevalent in their family compared to heart disease.

Discussing how personal connections related to understanding CVD transitioned into a conversation about how information could be presented to South Asians who have no connection to CVD themself or in their family. Participant 7 first discussed social media as a potential avenue or route for presenting information. The participant explained that they know many people "who are more active on social media things and are very actively consuming content." They explain that Instagram and TikTok are standard tools used by people across several generations. Participant 7 further explains that social media could be advantageous because they believe hearing information from a physician or other healthcare provider can be hard to hear. Consequently, this can minimize a desire to "genuinely want to act." The participant recounts personal recollections of individuals they have seen demonstrate this in saying:

"*I feel like a lot of South Asian people, particularly like older adults I interact with, don't often want to believe what people say to them or don't care enough to actually act on anything that they hear their doctors tell them about their own health, because they think that they're overacting or overreacting or something.*"

Participant 7 further explained that their experiences with this made them see social media as a potential tool to alleviate this concern and disseminate information in a way that is a lot easier to access and consume. They say:

"When a lot of South Asian people that I come into contact with especially don't want to hear it from their healthcare provider but want to hear it from someone who's like a more relatable source, like from a family member from social media or something like that. So, I think that's a good avenue to go through."

The participant stated that hearing information from a family member could be another route that, at times, might be more successful than social media as "you are probably more likely to trust information that comes from them" and "information coming from your family is probably very likely to influence your own thoughts on your own health." The participant predicted that hearing something from a family member might be more impactful than hearing something from a stranger on social media but consistently expressed that each route posed benefits.

In their final thoughts and conclusions, Participant 7 also reflected on their personal experiences with the survey and how their perspectives changed after completing the survey. The participant expressed an increased motivation to investigate CVD risk among South Asians going forward. Moreover, the participant explained that the survey reshaped their perspective of CVD prevalence among South Asians. They said in the past, "the health issues that have affected my family" are ones they "considered as isolated issues that only happen have only happened to those specific people." If their affected family members were older, they felt that it was "not something that's going to affect me." In completing the survey, however, they said they realized "this is actually a topic that I have to care about, and is something that affects me every day, and the fact that issues that have happened in my family are not isolated cases."

IV. Discussion

IVa. Assessment of Overall Understanding of CVD Risk Among SAAs

Across all true or false questions included in the survey, accuracy (determined by the percentage of respondents that answered "correct") was higher for true statements than for false statements (Table 8). This outcome could result from limited knowledge among the population, which leads to difficulties in identifying true or false information. However, the results may also be influenced by random guessing from respondents, or it is simply harder to correctly detect

false statements without a strong foundational understanding of the topic, which might be needed to recognize inaccuracies in specific knowledge. Moreover, the higher accuracy in identifying factual statements may be attributed to a truth bias, where individuals often default to believing information is true when they do not have sufficient knowledge to distinguish between correct and incorrect statements (Levine & McCornack, 1991).

The overall mean and median accuracy scores across all twelve questions for respondents were 45 and 42%, respectively (Table 6), demonstrating a relatively low (<50%) level of understanding among participants in the study. These results indicate, in conjunction with several findings from interviews where participants expressed that many of the facts in the survey were "new" pieces of information, that overall comprehension of CVD risk among SAAs is low, particularly in assessing specific facts regarding this health disparity. Additionally, the median score for knowledge of the MASALA study and ongoing policy changes surrounding SAA heart health was 2, indicating minimal knowledge of prominent research efforts and policy initiatives to address increased CVD risk among SAAs in the survey population. This finding indicates that awareness and understanding of this health disparity may be limited among SAAs, highlighting a potential gap in health knowledge and education that should be addressed in future research, community health, and advocacy efforts.

IVb. Knowledge-Based Predictors: Associations and Covariation

Various predictors in the data set were designated as "knowledge-based predictors" that highlighted how specific knowledge about studies and policy changes relating to SA heart health may inform understanding of CVD risk among SAAs. These variables included knowledge of the MASALA study and policy changes to promote research investigating heart health among SAAs.

In the unadjusted logistic regression model, knowledge of the MASALA study significantly increased the odds of correctly answering true or false Questions 7 and 11 (Table 12). This suggested that knowledge of the MASALA study may initially appear to predict a greater understanding of what a cardiovascular disease risk model is and that South Asians tend to have higher levels of abdominal fat compared to Caucasians, East Asians, and African Americans. However, these associations were no longer significant after adjusting for potential confounding variables in the data set. The predictive value of Question 7 accuracy was lost after controlling for sex or diet, and the prediction of Question 11 accuracy was lost after controlling for sex, employment, diet, or religion (Table 13). This attenuation of effects suggests that the association between knowledge of the MASALA study and accuracy may be explained by other demographic factors, such as eating habits, occupation, religious affiliation, or sex, rather than an independent effect of the MASALA study knowledge itself. The fully adjusted logistic regression model supported this finding, as the association remained non-significant when controlling for all covariates. Moreover, both the linear and log-odds models of this knowledge-based predictor were found to be statistically significant when testing the linearity assumption, suggesting that while knowledge of the MASALA study may be a meaningful predictor of accuracy, there is a possibility that the relationship may not be strictly linear and could benefit from further investigation into non-linear effects.

Interestingly, in the unadjusted linear regression model, knowledge of the MASALA study was associated with an increase in overall accuracy across all twelve true or false questions (Table 15). This suggested that an increased knowledge of the MASALA study may initially predict a greater understanding of CVD risk among SAAs. However, these associations were no longer significant after adjusting for potential confounding variables in the data set. The

predictive value of overall accuracy was lost after controlling for knowledge of policy changes. This attenuation of effects suggests that the association between knowledge of the MASALA study and overall accuracy may be explained by general knowledge of policy changes being enacted to promote awareness of increased SAA risk for CVD rather than an independent effect of MASALA study knowledge itself. However, in subsequent, fully adjusted linear regression models, the significance of this relationship emerged again. In the fully adjusted model controlling for all covariates except SS variables 1-5, 8, and 9, both knowledge of the MASALA study and identifying as female (Table 17) were found to increase overall accuracy, with only knowledge of the MASALA found to increase overall accuracy when all covariates and every SS variable was controlled for (Table 18). These findings suggest that knowledge of the MASALA study may be an independent predictor of understanding CVD risk among SAAs after accounting for several sociodemographic and knowledge, attitude and perception, and behavioral-based predictors. However, it is important to note that sparse data and limited sample size may contribute to imprecise estimates, as evidenced by wide confidence intervals and limited variation in all predictor variables, potentially affecting the accuracy of this observed relationship.

Regarding the other knowledge-based predictor variable, in the unadjusted logistic regression model (Table 12), increased knowledge of policy changes being made to promote research investigating heart health among SAAs was found to increase the odds of correctly answering true or false Question 3. In a Fisher's exact test (Table 9), increased knowledge of policy changes was associated with accuracy on Question 3. However, the odds ratio was calculated to be infinite, likely due to a complete separation of data where all participants with "high" knowledge answered the question correctly. These findings suggested that knowledge of

ongoing policy changes may initially appear to predict a greater understanding that lipoprotein(a) is a type of fat in the body that's a genetically determined risk factor for heart disease and stroke. However, this association was no longer significant after adjusting for potential confounding variables in the data set. The predictive value of Question 3 accuracy was lost after controlling for employment status, diet, religious affiliation, sex, and presence of cardiometabolic disease (Table 13). This attenuation of effects suggests that the association between knowledge of policy changes and accuracy may be explained by other demographic factors such as eating habits, occupation, religious affiliation, whether someone has a cardiometabolic disease, or sex rather than an independent effect of policy change knowledge itself. The fully adjusted logistic regression models further supported this finding, as the association remained non-significant when controlling for all covariates. Moreover, both the linear and log-odds models of this knowledge-based predictor were found to be statistically significant when testing the linearity assumption (Table 10), suggesting that while knowledge of policy changes may be a meaningful predictor of accuracy, there is a possibility that the relationship may not be strictly linear and could benefit from further investigation into non-linear effects.

Overall, while knowledge-based predictors in the study initially appeared to improve accuracy on various understandings of CVD risk among SAAs, these associations were attenuated after adjusting for sociodemographic, attitude and perception-based, and behavioral-based predictors, suggesting that knowledge may covary with broader life characteristics, beliefs, and practices. Notably, knowledge of the MASALA study emerged as a potential independent predictor of overall accuracy across all twelve questions on the survey, highlighting its potential as a predictor of accuracy but underscoring the need for future research that implements more expansive sample sizes and considerable variation in data.

IVc. Attitude and Perception-Based Predictors: Associations and Covariation

Various predictors in the data set were designated as "attitude and perception-based predictors" that highlighted how specific beliefs, trust, or perceived understanding might inform understanding CVD risk among SAAs. These variables included religiosity, trust in healthcare providers, and confidence in survey accuracy. No variables in this group were significant predictors of overall accuracy in the linear regression models. This suggests that attitude and perception-based predictors may independently predict a broader understanding of CVD risk among SAAs once other sociodemographic, knowledge-based, and behavioral-based predictors are accounted for.

In the unadjusted logistic regression model (Table 12) and Fisher's exact test (Table 9), decreased religiosity, indicating a weaker connection to religion, and increased trust in healthcare providers were found to increase the odds of correctly answering true or false Questions 9 and 3, respectively. This suggested that religiosity may initially appear to predict a weaker understanding that the research models that U.S. doctors use to predict heart disease risk for patients are not updated annually, and trust in healthcare providers may initially appear to predict a greater understanding that lipoprotein(a) is a type of fat in the body that's a genetically determined risk factor for heart disease and stroke. However, these associations were no longer significant after adjusting for potential confounding variables in the data set. The predictive value of Question 9 accuracy was lost after controlling for diet (Table 13), and the predictive value of Question 3 accuracy was lost after controlling for employment or religion (Table 13). This attenuation of effects suggests that the association between religiosity and trust with accuracy may be explained by eating habits, occupation, or religious affiliation rather than an independent effect of religiosity or trust itself. The fully adjusted logistic regression models further supported these findings, as the association remained non-significant when controlling for

all covariates. Moreover, both the linear and log-odds models of each attitude and perception-based predictor were found to be statistically significant when testing the linearity assumption (Table 10), suggesting that while religiosity or trust in healthcare providers may be a meaningful predictor of accuracy, there is a possibility the relationship may not be strictly linear and could benefit from further investigation into non-linear effects.

In the unadjusted logistic regression model, confidence in survey accuracy increased the odds of correctly answering true or false Question 3 (Table 12). In contrast, the unadjusted Fisher's exact test found that increased confidence increased the odds of correctly answering true or false Question 12 (Table 9). This suggested that higher confidence in knowledge may initially appear to predict knowledge of what lipoprotein(a) is and that shortness of breath is a common symptom of heart disease in South Asians. However, after adjusting for potential confounding variables in the data set, the predictive association with Question 3 was no longer significant. The predictive value of Question 3 accuracy was lost after controlling for diet or religion (Table 13). This attenuation of effects suggests that the association between confidence and accuracy may be explained by eating habits or religious affiliation rather than an independent effect of confidence itself. The fully adjusted logistic regression models further supported these findings, as the association remained non-significant when controlling for all covariates. Moreover, both the linear and log-odds models of the predictor were found to be statistically significant when testing the linearity assumption (Table 10), suggesting that while confidence in accuracy may be a meaningful predictor, there is a possibility that the relationship may not be strictly linear and could benefit from further investigation into non-linear effects. Only the log-odds model of the predictor was found to be statistically significant when testing the linearity assumption for

prediction Question 12 accuracy (Table 10), indicating the relationship between confidence and Question 12 might be better captured through a non-linear model in future investigation.

Overall, while attitude and perception-based predictors in the study initially appeared to improve accuracy on various understanding of CVD risk among SAAs, these associations were attenuated after adjusting for sociodemographic, knowledge-based, and behavioral-based predictors, suggesting that attitudes and perception may covary with broader life behavior, knowledge, beliefs, and practices. Additionally, several relationships may be non-linear, demonstrating a need for further investigation of effects between attitude and perception-based predictors and accuracy.

IVd. Behavioral-Based Predictors: Associations and Covariation

Various predictors in the data set were designated as "behavioral-based predictors," highlighting how personal behaviors may inform understanding of CVD risk among SAAs. These variables included regular thoughts about heart health, social media use, and consumption of a typical SA diet.

In the unadjusted Fisher's exact test, regular consumption of a typical SA diet increased the odds of correctly answering true or false Questions 3 and 12 (Table 9). This suggested that regular consumption of an SA typical diet may initially appear to increase understanding of what lipoprotein(a) is and that shortness of breath is a common symptom of heart disease in South Asians. However, this relationship was not detected in the logistic regression models, likely due to sparse data and skewed data distributions of the predictor variable. This may have affected the significance depending on how the data were categorized.

Interestingly, in the unadjusted Fisher's exact test (Table 9) and logistic regression model (Table 12), increased occurrence of regular thought about heart health decreased the odds of correctly answering true or false Question 4. This significance was detected with or without the

presence of prominent outliers noted from Cook's distance test. Additionally, in the sequentially adjusted logistic regression model, regular thought about heart health remained a significant predictor after controlling for age, sex, highest degree earned, employment status, diet, religion, immigration status, and presence of cardiometabolic disease (Appendix, Table 20), suggesting regular thought about heart health may be a potential, independent predictor of understanding that South Asians have higher levels of fat that increase heart disease risk compared to Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions, after controlling for other covariates. However, these findings were not demonstrated in the fully adjusted logistic regression models, as the association remained non-significant when controlling for all covariate and other knowledge, attitude, and perception-based predictors at once, suggesting that regular thought about heart health may not independently influence accuracy when considering all potential confounders. Moreover, both the linear and log-odds models of this behavioral-based predictor were found to be statistically significant when testing the linearity assumption (Table 10), suggesting that while regular thought about heart health may be a meaningful predictor of accuracy, there is a possibility the relationship may not be strictly linear and could benefit from further investigation into non-linear effects.

Lastly, in the unadjusted logistic regression model (Table 12), increased social media use increased the odds of correctly answering true or false Question 5. In the chi-squared test (Table 9), while social media use was associated with accuracy on Question 5, an odds ratio could not be calculated because the test only assessed associations instead of odds. These findings suggested that social media use may initially appear to predict a greater understanding that South Asians develop coronary artery disease up to 10 years earlier than Caucasians, African

Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions, on average. However, these associations were no longer significant after adjusting for potential confounding variables in the data set. The predictive value of Question 5 accuracy was lost after controlling for employment or religion (Table 13). This attenuation of effects suggests that the association between social media use and accuracy may be explained by eating habits or occupation rather than an independent effect of social media use itself. While the fully adjusted logistic regression model showed that the association remained non-significant when controlling for all covariates, in the Firth logistic regression model, social media use was associated with increased odds of correctly answering Question 5 (Table 18). This finding suggests that regular social media use may be associated with an increased understanding that South Asians develop coronary artery disease up to 10 years earlier than Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in various regions, on average, when utilizing a model that adapts to detect differences in samples of smaller size. However, the result should still be interpreted cautiously, given the model differences and potential for sparse data bias. Moreover, both the linear and log-odds models of the predictor were found to be statistically significant when testing the linearity assumption (Table 10), suggesting that while social media use may be a meaningful predictor of accuracy, there is a possibility the relationship may not be strictly linear and could benefit from further investigation into non-linear effects.

Overall, behavioral-based predictors demonstrated mixed associations with accuracy. While some associations were significant in unadjusted models, these were later attenuated when adjusting for other sociodemographic, knowledge-based, and attitude and perception-based predictors, suggesting that relationships with eating practices, knowledge, and personal beliefs

may confound the considered behaviors. Notably, social media use was found to be a potential independent predictor of accuracy, suggesting a possible link between social media use and increased knowledge that South Asians develop coronary artery disease up to 10 years earlier than Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions, on average. However, these findings should be interpreted cautiously, with the additional potential for non-linear relationships warranting further research.

IVe. Perceptions and Sources of Individual Knowledge Regarding CVD Risk

Across participant interviews, similar perceptions of individual understanding of CVD risk were present. Nearly all participants described having some previous understanding of CVD risk and its potential to differ across populations. However, many still expressed learning at least one new piece of information about this health disparity they had not previously understood. Some participants expressed having more confidence and knowledge than others. Regardless, based on this interplay between previous knowledge but still not knowing everything about the topic, several participants explained that while some facts they learned were "new," they were "not surprising." The only statement that was mentioned as being "surprising" was the statistic that 60% of the world's heart disease patients are South Asian, which was explicitly noted by Participants 1 and 3. These findings, in conjunction with the average confidence of participants in the survey being relatively high (Table 7), suggest that knowledge regarding CVD risk among SAAs is more common than expected, which is the opposite of the hypothesis that knowledge regarding CVD risk among SAAs would be relatively low. Instead, the findings indicate that SAAs may have an awareness of the threat of CVD within the population, positioning future advocacy or educational work in a new way that is more focused on building knowledge as opposed to founding it.

Sources of pre-existing knowledge among participants also varied across interviews, including social media, occupation, coursework in school, published research papers found through personal interest, and the radio. Participants 1 and 7 also noted that they previously learned about the history of British colonialism and the consequential introduction of starchy, high-carb foods into typical South Asian diets, which they used as a part of their knowledge that South Asians may face higher rates of cardiometabolic disease. The exact pre-existing knowledge determined from these findings varied across participants, with some expressing they felt comfortable about the biology of CVD but not the social disparities and others expressing they didn't know the answers to most of the true or false questions. These findings suggest that while awareness of CVD risk among SAAs may be present, understanding of the specificities and details behind this disparity may be limited, indicating a need for specific educational tools to be created for this population. These findings also support the hypothesis that knowledge of CVD risk among SAAs may be limited, indicating that improvement in comprehension should still be well-considered in addressing this health disparity. Participant 6 even discussed their disappointment in studies like MASALA for not indicating prescribing specific diet and lifestyle practices for readers, demonstrating a desire for culturally tailored, specific resources that the SAA population can utilize.

In support of future efforts, a desire for more information was found among participants. Participants 3 and 7 expressed that their interest in the topic heightened after completing the survey, which led them to do more research into scientific understanding of perceived risk. Participant 5 inquired about further information they could find after the interview to learn more, and Participant 6 discussed their desire to see health improvement for all. Ultimately, these outcomes demonstrate a progressive and open mindset among several SAAs to learn more about

CVD risk and its prevalence among this population. This outcome provides an optimistic framework for researchers, clinicians, community health workers, and more in current and future work supporting a population eager to learn more about navigating this disparity.

IVf. Effects of Community Relevance and Personal CVD Ties on Comprehension

One common theme that arose for several interview participants was discussing whether the topic of CVD, in general, or its increased risk among South Asians, was prevalent within their communities. Through the majority of interviews, participants expressed that people discussing CVD in their community was generally uncommon. However, in cases where community knowledge was witnessed, these were often cases, where knowledge about CVD was pertinent to a community or a personal tie to CVD, was present.

Regarding the topic's relevance to a particular community, the research findings suggest that the level of community knowledge and awareness about CVD depends on a specific community's shared beliefs, health outcomes, and values. Participants 1 and 3 referred to conversations about health and disease being more prevalent in communities of older individuals, demonstrating an effect of relevance to the population affecting community discussion. Some participants also noted generational differences that affect the relevance of CVD within communities. Participant 2 referred explicitly to the rising importance of education. Because of this, younger populations might have a more expansive knowledge base about the topic because of the increased value of education and information dissemination in the current generation. They believed that older generations may not have that same value of rapid knowledge sharing in their communities, which may be why older generations may not discuss or know about CVD risk as often. Participant 4 also shared their thoughts on generational differences, focusing on differences between immigration and first-generation populations in the U.S. By explaining how everyday practices of immigrant populations in South Asia required an

active lifestyle and consumption of fresh foods, the participant suggested that the community values of proactivity towards exercise and a healthy diet may be less prevalent among immigrant populations. These findings also were related to an interview point from Participant 5, who shared that they believed the knowledge of CVD risk in Sri Lanka might not be as high as in the U.S. due to the value of education and rapid knowledge dissemination in the U.S, indicating a potential location difference that also affects community relevance.

Overall, the findings suggest that differing values and norms in a community can affect whether a disease topic is relevant enough to be commonly discussed or considered. These results are insightful because they indicate that factors such as geographic location, age, or generation status can cause differentiation in community awareness, demonstrating a need to investigate specific community perceptions of CVD risk among SAAs.

Regarding personal ties to CVD, all the interview participants, except 'Participant 1,' also discussed how individuals who knew someone who dealt with a heart attack or other heart condition, either themselves or a friend or family member, appeared more interested in sharing information about the topic, making changes to their lifestyle, and engaging in broader community discourse regarding CVD risk. Participant 2 also shared how this practice is common for many diseases, including in their scope of work within cancer research. They expressed that people whose family members are living with cancer are more likely to read further information and educate themselves on the disease. As such, these findings show that personal and community interest in the topic of CVD can be shaped by whether an individual has had firsthand experience or connection to someone with CVD. We suggest that having a personal connection to CVD as an SAA can increase community discussion and individual knowledge of how CVD risk is elevated among South Asians. These outcomes support our evidence for the

hypothesis that personal connection to disease can increase awareness or understanding of the health concerns and risks associated with the disease. These findings are also significant in identifying a potential target route for increasing awareness among South Asians of their increased risk of developing CVDs. Education materials can be catered to the population in a way that prioritizes awareness and early detection of risk factors among individuals who do not have a family history of CVD or a personal tie to another individual dealing with CVD.

The connection between personal ties and awareness of CVD among SAAs has also intertwined with the capacity of change and alteration an individual is willing to allow in their existing lifestyle, specifically diet, and exercise. In the discussion regarding their personal advocacy work, Participant 6 discussed the challenges they faced when encouraging others to follow a whole-food, plant-based diet to improve health outcomes. They expressed being made fun of, being turned away, and others even doing the opposite and increasing their practice of non-whole foods and plant-based diets. The participant explained that it can be hard to convince others of changes to a lifestyle people already know about. However, they also shared that a community member did change after the individual had a significant health scare and has completely changed their diet and lifestyle practices. These findings fit within the context of our larger argument, suggesting that personal connection to CVD can also shape one's desire or willingness to implement certain lifestyle practices into a daily routine to improve health. These findings also indicate a potential apprehension within the SAA community that can pose various challenges in not only increasing awareness of CVD risk among the population but also witnessing changes in lifestyle habits. Similar to how Participant 6 defined the importance of proactive care instead of waiting for an individual to have a heart attack to witness change, these findings suggest that future efforts to share information with SAAs on how to decrease the risk

for CVD should be socially conscious of practices and norms that are pervasive in an individual's life and make it difficult for them to change or alter. Efforts should be culturally considerate of these practices and work to find a solution for everyone that does not rely on a personal connection to CVD but makes minor alterations to the daily lifestyle habits of the population.

IVg. Factors Affecting the Internalization of Perceived Risk

A key finding is also a lack of internalization of the threat of risk. This finding was well discussed by Participant 3, who highlighted the lack of representation of South Asian figures in advertisements for medications or lifestyle plans to combat CVD, saying, "It is kind of hard for us to view ourselves as someone who this issue can actually target." Participant 7 also described how their perspectives changed after completing the survey, realizing that CVD is something to care about both for themselves and their community, saying that the "issues that have happened in my family are not isolated cases." These ideas highlight a challenge various SAAs face in internalizing the pressing threat of CVD among their population and provide potential support for the hypothesis that SAAs may have lower knowledge of risk. The inability of an individual to place themselves into a narrative of disease could be a potential reason several SAAs may not understand the topic of CVD and its increased risk among South Asians as a whole.

Moreover, this lack of internalization may also manifest through a more prominent focus on diabetes care among SAAs. While important to discuss, Participants 2 and 3 highlight that discussions about diabetes, diet, and sugar levels are more common in their communities. Subsequently, both participants consider these to be more common and CVD conversations to be less common. While important, more prominent discussions regarding diabetes care in SAA communities alongside a minimal focus on CVD may also pose a potential concern in ensuring SAAs can internalize and process the threat of CVD risk. These results indicate that a significant focus on metabolic diseases may be associated with individuals overlooking CVD risk.

The final consideration of internalizing risk was discovered through the participant's perspectives on physicians. Participant 1 explained that from their perspective, while physicians may generally know about this health disparity, they may not know how to "specifically tell a South Asian origin patient what to do, how to do it, it is, you know, to be fine-tuned, specific to that population." Participant 5 further elaborated on these ideas by saying their care is "okay, but they don't explain. ‘Okay, South Asian people have more heart issues or more metabolic issues.’ They don't talk like that. But they do, you know, focus on more healthy eating and exercise." From the patient perspective, Participant 7 added that many individuals they have seen in their communities "don't care enough to actually act on anything that they hear their doctors tell them about their own health, because they think that they're overreacting."

These findings highlight a lack of specificity in health care for SAAs, intertwined with a lack of reception for physician advice from various population members. When considering the results that demonstrated a challenge for internalization of CVD as a serious threat among SAAs, these findings suggest that a lack of specific care from physicians can contribute to the view that CVD risk is not as pressing for this specific population. Subsequently, suppose individuals consider what physicians say to be an overreaction. In that case, population-tailored care could be a potential solution to help SAA patients understand their risks while ensuring physicians provide focused care for a population facing a significant health disparity.

Ultimately, the findings regarding the internalization of perceived risk are potentially a key explanation for why overall knowledge and awareness of this topic may be minimal. Determining solution routes that address the lack of representation of and population-tailored care towards SAAs in the field of cardiovascular medicine could be vital in ensuring that comprehension of a significant health disparity is well understood by the population it affects.

IVh. Potential Solutions and Future Directions

This study's key focus was identifying potential solution routes to improve understanding of CVD risk among SAAs. Several interview participants spoke directly to their personal thoughts about what ways information dissemination might be most effective and what they and their communities personally resonate with when it comes to learning about CVD risk.

The first recommendation is to utilize social media to share and present facts, statistics, and suggestions to SAA populations to increase understanding and awareness that the population faces an increased risk of developing CVD. Several interview participants highlighted social media as a tool they currently use, and social media was found to have a potential association with increased knowledge that South Asians develop coronary artery disease up to 10 years earlier than Caucasians, African Americans, Hispanics, East Asians, Middle Eastern Populations, Pacific Islanders, and Indigenous Populations in Various Regions, on average. It is essential to note that the survey population indicated high regular use of social media, with a median sliding scale score of 5 out of 6 (Table 6), so this preference might be more applicable to this specific group of respondents. However, this finding could also indicate that social media use is prevalent and important among SAAs, amplifying the value of social media as a potential tool to share information with SAAs. The participants also referenced podcasts and radio stations as other ways to increase awareness.

Another potential direction is to refocus efforts to educate and increase awareness of this health disparity among SAAs through tools catered to individuals' specific, everyday needs. Several participants explained that they would like to know specific action items that they can work on and that non-specific care from physicians can create a challenge in internalizing CVD risk, which is something necessary to consider. Future research that allows a deeper understanding of what needs SAAs specifically want to be addressed could provide insight into

how to shape future education and awareness promotion materials. Moreover, catering to the population's specific needs can maximize community members' ability to be more in tune and aware of the topic, potentially increasing the likelihood that more individuals will be able to understand precautions about CVD risk even without a personal connection to CVD. SAAs can be community advocates and learn to educate others through this method, as focused care and consideration for the population can highlight why this disparity should be taken seriously.

A final suggestion is also to expand data collection efforts to assist in determining more accurate predictors of comprehension that can be used to identify potential populations of interest that may require more focus to increase understanding of this health disparity. Having a more thorough understanding of what specific pieces of information SAAs do or do not know could be essential to understanding how to effectively structure education and awareness efforts moving forward, ultimately helping maximize the populational reach of this work and improve populational understanding of a health disparity directly affecting them.

IVi. Study Limitations

The first limitation of this study is the small sample size of the survey (N=61) and the interviews (N=7). Particularly for analysis of the survey data, the limited sample size can create challenges for estimation, leading to biased or unstable estimates that are only captured by wide confidence intervals, as there is less data available for the models to utilize in estimation. Smaller sample sizes also present the risk of convergence complications in regression models, causing the detection of effects to be challenging. While the sample size of the interview portion of the study was sufficient for thorough analysis, the smaller sample meant the interview participants were also selected from a small, not fully representative sample of the SAA population. Thus, future studies incorporating a greater sample size of interviews that collect data from diverse

participants could provide more precise insights regarding comprehension of CVD risk among SAAs that apply to the broader population.

A limitation of the study data was the limited variation in responses across variables. The lack of variation may have reduced statistical power, limiting the ability to detect true associations and relationships between variables in the data set. Moreover, minimal variation can lead to biased and unstable association estimates produced by the analytical models. Future studies could expand the length of the data collection period to allow for sufficient counts to be obtained for all outcomes of data set variables. Minimal variation from the sample also reduces the generalizability of the study, a threat to external validity. The majority of the respondents in the survey were Hindu, employed, and followed no dietary restrictions.

Additionally, the respondents appeared to use social media regularly while having lower knowledge of the MASALA study and ongoing policy changes. This population distribution may have introduced bias into the study estimates and made findings potentially applicable to specific populations of SAAs. More extensive data collection in the future that captures more representative data of the diverse SAA diaspora could enable more generalizable and applicable findings toward the greater SAA population.

Another important note for limitation of the study is the use of selected true or false questions in the survey as a measurement of accuracy. While the use of true or false questions provided the benefit of increased participant engagement with the survey by minimizing the expected respondent response time and effort and has been found to characterize participant understanding more effectively than multiple choice questions with informational answers (Brassil & Couch, 2019), free response questions may provide a deeper understanding of participant thinking outside of a strict, specific conception of knowledge (Hubbard et al., 2017).

While using true or false questions can provide initial understandings of SAA understanding of CVD risk, future studies may benefit from free response questions that allow a deeper understanding of comprehension rates to assess what is currently known within the population. Moreover, the true or false questions may have been difficult to interpret, so the survey could have benefitted from having the option to explain their thinking or understanding through free-response questions. This application in future studies would also allow for participants not comfortable completing an interview to still have the opportunity to explain and elaborate on various complexities of their thinking and existing knowledge.

V. Conclusion

Overall, this research study provides initial insights into comprehension of CVD risk among SAAs and highlights key factors shaping knowledge of this disparity in the population. The study provides the groundwork for future research to investigate specific relationships between sociodemographic factors and comprehension and ways for educational and advocacy efforts to directly support the population their work intends to serve. While overall knowledge among this survey population was relatively low, this work provides a starting point for assessing populational understanding that can be built off of to determine what factors affect comprehension and how to best support SAAs in their efforts to mitigate risk for CVD.

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VII. Appendix

VIIa. Researched and Contacted Religious and Spiritual Centers Across the U.S.

Table 19. Researched and Contacted Religious and Spiritual Centers Across the U.S.

Hindu Temples	Monasteries	Sikh Temples	Jain Temples	Mosques
Alabama: Hindu Temple & Cultural Center of Birmingham	Alabama: Alabama Chan Meditation Center, Birmingham	Alabama: Sikh Society of Alabama, Birmingham	Alabama: Jain Society of Greater Birmingham, Birmingham	Alabama: Hoover Crescent Islamic Center, Hoover
Alaska: Hindu Temple of Alaska	Alaska: Sitagu Buddha Vihara, Anchorage	Alaska: Sikh Gurdwara of Alaska, Anchorage	Arizona: Jain Temple of Arizona, Phoenix	Alaska: Islamic Community Center of Anchorage, Anchorage
Arizona: Maha Ganapati Temple of Arizona	Arizona: Wat Promkunaram, Lake Havasu City	Arizona: Sikh Gurdwara Sahib Phoenix, Phoenix	Arkansas: Jain Center of Arkansas, Little Rock	Arizona: Islamic Community Center of Phoenix, Phoenix
Arkansas: Hindu Association of Northwest Arkansas	Arkansas: Arkansas Vipassana Association, Eureka Springs	Arkansas: Sikh Temple of Arkansas, Little Rock	California: Jain Center of Southern California, Buena Park	Arkansas: Masjid Al-Noor, Fayetteville

California: BAPS Shri Swaminarayan Mandir, Chino Hills, and Malibu Hindu Temple, Calabasas	California: City of Ten Thousand Buddhas, Ukiah, and Insight Meditation Center, Redwood City	California: San Jose Sikh Gurdwara, San Jose, and Sikh Center of San Francisco Bay Area, El Sobrante	Colorado: Jain Center of Colorado, Aurora	California: Islamic Center of Southern California, Los Angeles, and Zaytuna College, Berkeley
Colorado: Hindu Temple and Cultural Center of the Rockies	Colorado: Shambhala Mountain Center, Red Feather Lakes	Colorado: Colorado Singh Sabha, Denver	Connecticut: Jain Temple of Connecticut, South Windsor	Colorado: Colorado Muslim Society, Denver
Connecticut: Shree Umiya Mataji Mandir, Newington	Connecticut: Chuang Yen Monastery, Carmel	Connecticut: Sikh Gurdwara Sahib of Connecticut, Newington	Florida: Jain Society of South Florida, Weston	Connecticut: Bridgeport Islamic Community Center, Bridgeport
Delaware: Hindu Temple of Delaware	Delaware: Delaware Insight Meditation Center, Newark	Delaware: Sikh Center of Delaware, Newark	Georgia: Jain Temple of Georgia, Norcross	Delaware: Islamic Society of Delaware, Newark
Florida: Hindu Temple of Central Florida, Orlando, and Shiva Vishnu Temple of South Florida, Fort Lauderdale	Florida: Wat Florida Dhammaram, Kissimmee, and Miami Shambhala Meditation Group, Miami	Florida: Sikh Society of Central Florida, Orlando, and Miami Sikh Temple, Southwest Ranches	Illinois: Jain Society of Metropolitan Chicago, Bartlett	Florida: Islamic Center of Orlando, Orlando, and Islamic Society of Tampa Bay Area, Tampa
Georgia: BAPS Shri Swaminarayan Mandir, Lilburn, and Hindu Temple of Atlanta	Georgia: Atlanta Soto Zen Center, Atlanta	Georgia: Guru Nanak Mission Society of Atlanta, Norcross, and Sikh Study Circle of Atlanta, Norcross	Indiana: Jain Society of Greater Indianapolis, Indianapolis	Georgia: Al-Farooq Masjid, Atlanta, and Roswell Community Masjid, Roswell
Hawaii: Sri Venkateswara Temple, Honolulu	Hawaii: Palolo Zen Center, Honolulu	Hawaii: Sikh Gurdwara Sahib of Hawaii, Honolulu	Iowa: Jain Society of Iowa, Des Moines	Hawaii: Muslim Association of Hawaii, Honolulu
Idaho: Shri Sita Ram Foundation - Idaho Hindu Temple, Boise	Idaho: Boise Dharma Center, Boise	Idaho: Sikh Gurdwara Sahib, Boise	Kansas: Jain Temple of Kansas City, Lenexa	Idaho: Islamic Center of Boise, Boise
Illinois: BAPS Shri Swaminarayan Mandir, Bartlett, and Hindu Temple of Greater Chicago, Lemont	Illinois: Zen Buddhist Temple of Chicago, Evanston	Illinois: Sikh Religious Society of Chicago, Palatine, and Gurdwara Sahib of South Chicago, Chicago	Kentucky: Jain Society of Greater Cincinnati, Louisville	Illinois: Islamic Foundation North, Libertyville, and Mosque Foundation, Bridgeview
Indiana: Hindu Temple of Central Indiana, Indianapolis	Indiana: White River Buddhist Temple, Indianapolis	Indiana: Guru Nanak Sikh Society, Indianapolis, and Gurdwara Guru Nanak Darbar, Merrillville	Maryland: Jain Society of Metropolitan Washington, Silver Spring	Indiana: Alhuda Foundation, Fishers, and Islamic Center of Bloomington, Bloomington
Iowa: Hindu Temple and Cultural Center of Iowa, Madrid	Iowa: Cedar Rapids Zen Center, Cedar Rapids	Iowa: Sikh Gurdwara of Iowa, West Des Moines	Massachusetts: Jain Sangh of New England, Burlington	Iowa: Mother Mosque of America, Cedar Rapids
Kansas: Hindu Temple and Cultural Center of Kansas City	Kansas: Kansas Zen Center, Lawrence	Kansas: Sikh Gurdwara of Kansas City, Shawnee	Michigan: Jain Society of Greater Detroit, Farmington Hills	Kansas: Islamic Center of Johnson County, Overland Park
Kentucky: Hindu Temple of Kentucky, Louisville	Kentucky: Lexington Shambhala Center, Lexington	Kentucky: Sikh Society of Kentucky, Louisville	Minnesota: Jain Center of Minnesota, Plymouth	Kentucky: Islamic Center of Kentucky, Lexington
Louisiana: Hindu Temple of Greater New Orleans	Louisiana: Magnolia Grove Monastery, Batesville	Louisiana: Sikh Society of Louisiana, Baton Rouge	Missouri: Jain Center of Greater St. Louis, Manchester	Louisiana: Masjid Al-Rahim, New Orleans, and Islamic Society of Greater New Orleans, Kenner
Maine: Maine Hindu Temple, Westbrook	Maine: Portland Insight Meditation Community, Portland	Maine: Gurdwara of Maine, Scarborough	Nebraska: Jain Center of Nebraska, Omaha	Maine: Islamic Society of Portland Maine, Portland

Maryland: Sri Siva Vishnu Temple, Lanham, and Siva Vishnu Temple, Columbia	Maryland: Blue Lotus Temple, Woodstock	Maryland: Guru Nanak Foundation of America, Silver Spring, and Gurdwara Singh Sabha of Washington Metropolitan Area, Lanham	Nevada: Jain Center of Las Vegas, Las Vegas	Maryland: Islamic Society of Baltimore, Baltimore, and Dar Al-Taqwa Islamic Center, Ellicott City
Massachusetts: New England Shirdi Sai Temple, Groton	Massachusetts: Insight Meditation Society, Barre, and Cambridge Insight Meditation Center, Cambridge	Massachusetts: New England Sikh Study Circle, Milford, and Gurdwara Guru Nanak Darbar, Medford	New Jersey: Jain Center of Central New Jersey, Franklin Township	Massachusetts: Islamic Society of Boston Cultural Center, Boston, and Islamic Society of Greater Worcester, Worcester
Michigan: Bharatiya Temple, Troy, and Shri Shirdi Saibaba Sansthan Temple, Livonia	Michigan: Zen Buddhist Temple, Ann Arbor	Michigan: Gurdwara Sahib Singh Sabha of Michigan, Canton, and Sikh Gurdwara Sahib of Michigan, Rochester Hills	New Mexico: Jain Society of New Mexico, Albuquerque	Michigan: Islamic Center of America, Dearborn, and Islamic Center of East Lansing, East Lansing
Minnesota: Hindu Temple of Minnesota, Maple Grove	Minnesota: Clouds in Water Zen Center, St. Paul	Minnesota: Sikh Society of Minnesota, Bloomington	New York: Jain Center of America, Elmhurst	Minnesota: Dar Al-Hijrah Islamic Center, Minneapolis, and Al-Tawba Masjid, Eden Prairie
Mississippi: Hindu Temple Society of Mississippi, Brandon	Mississippi: Magnolia Grove Monastery, Batesville	Mississippi: Sikh Society of Mississippi, Jackson	Ohio: Jain Center of Cincinnati-Dayton, Bellbrook	Mississippi: Islamic Center of Hattiesburg, Hattiesburg
Missouri: Hindu Temple of St. Louis	Missouri: Mid-America Buddhist Association, Augusta	Missouri: Guru Nanak Darbar Sikh Temple, Kansas City	Oklahoma: Jain Association of Oklahoma, Edmond	Missouri: Dar Al-Jalal Masjid, St. Louis, and Islamic Society of Greater Kansas City, Kansas City
Montana: Montana Hindu Temple, Bozeman	Montana: Tibetan Buddhist Temple, Red Lodge	Montana: Sikh Temple, Billings	Oregon: Jain Society of Oregon, Portland	Montana: Islamic Center of Bozeman, Bozeman
Nebraska: Hindu Temple, Omaha	Nebraska: Nebraska Zen Center, Omaha	Nebraska: Sikh Temple, Omaha	Pennsylvania: Jain Sangh of Pittsburgh, Monroeville	Nebraska: Omaha Islamic Center, Omaha, and Islamic Foundation of Lincoln, Lincoln
Nevada: Hindu Temple of Las Vegas	Nevada: Dhamma Wheel Meditation Society, Las Vegas	Nevada: Guru Nanak Gurdwara, Las Vegas	Tennessee: Jain Society of Middle Tennessee, Nashville	Nevada: Masjid Ibrahim, Las Vegas
New Hampshire: Hindu Temple of New Hampshire, Nashua, and Shirdi Sai Temple, Nashua	New Hampshire: Aryaloka Buddhist Center, Newmarket	New Hampshire: Sikh Temple of New Hampshire, Nashua	Texas: Jain Society of North Texas, Plano	New Hampshire: Islamic Society of Greater Manchester, Manchester, and Islamic Society of Seacoast Area, Portsmouth
New Jersey: BAPS Shri Swaminarayan Mandir, Robbinsville, and Hindu Temple & Cultural Society of USA, Bridgewater	New Jersey: New Jersey Buddhist Vihara & Meditation Center, Princeton	New Jersey: Garden State Sikh Association, Bridgewater, and Guru Nanak Sikh Sabha, Sewaren	Utah: Jain Temple of Utah, South Jordan	New Jersey: Islamic Center of Passaic County, Paterson, and Islamic Society of Central Jersey, Monmouth Junction
New Mexico: Hindu Temple Society of New Mexico, Albuquerque	New Mexico: Upaya Zen Center, Santa Fe	New Mexico: Sikh Gurdwara of Albuquerque, Albuquerque	--	New Mexico: Islamic Center of New Mexico, Albuquerque
New York: Hindu Temple Society of	New York: Zen Mountain Monastery,	New York: Sikh Cultural Society Inc., Richmond	--	New York: Islamic Cultural Center of New

North America (Flushing Temple), Flushing, and Ganesh Temple, Queens	Mount Tremper, and Tibet House US, New York City	Hill, and Sikh Center of New York Inc., Jamaica		York, New York City, and Islamic Center of Long Island, Westbury
North Carolina: Hindu Society of North Carolina, Morrisville, and HSNC & Cultural Center of Charlotte	North Carolina: Kadampa Center for the Practice of Tibetan Buddhism, Raleigh	North Carolina: Sikh Gurudwara of North Carolina, Durham	--	North Carolina: Islamic Association of Raleigh, Raleigh, and Muslim Community Center of Charlotte, Charlotte
North Dakota: Hindu Temple Fargo-Moorhead, Fargo	North Dakota: Fargo Zen Group, Fargo	North Dakota: Sikh Society of North Dakota, Fargo	--	North Dakota: Fargo Islamic Center, Fargo
Ohio: Hindu Temple of Greater Cincinnati, Cincinnati, and Hindu Temple of Toledo	Ohio: Columbus Karma Thegsum Chöling, Columbus	Ohio: Guru Nanak Foundation of Greater Cleveland, Richfield, and Sikh Temple Dayton, Beavercreek	--	Ohio: Islamic Center of Greater Cincinnati, West Chester Township, and Islamic Center of Cleveland, Parma
Oklahoma: Hindu Temple of Greater Oklahoma City	Oklahoma: Great Plains Zen Center, Chouteau	Oklahoma: Sikh Gurdwara of Oklahoma, Oklahoma City	--	Oklahoma: Islamic Society of Greater Oklahoma City, Oklahoma City
Oregon: Hindu Temple of Greater Portland, Beaverton	Oregon: Dharma Rain Zen Center, Portland	Oregon: Sikh Gurdwara of Oregon, Portland	--	Oregon: Islamic Center of Portland, Portland
Pennsylvania: Sri Venkateswara Temple, Penn Hills, and Hindu Jain Temple, Monroeville	Pennsylvania: Shambhala Meditation Center of Philadelphia, Philadelphia	Pennsylvania: Sikh Society of Pennsylvania, Bensalem, and Sikh Society of Greater Harrisburg, Harrisburg	--	Pennsylvania: Islamic Society of Greater Harrisburg, Steelton, and Islamic Society of Greater Philadelphia, Philadelphia
Rhode Island: Rhode Island Hindu Temple, Cranston	Rhode Island: Providence Zen Center, Cumberland	Rhode Island: Sikh Temple, Providence	--	Rhode Island: Masjid Al-Islam, North Smithfield
South Carolina: Hindu Temple and Cultural Center of South Carolina, Ladson	South Carolina: Greenville Zen Group, Greenville	South Carolina: Sikh Religious Society of South Carolina, Greenville	--	South Carolina: Islamic Society of Greenville, Greenville
South Dakota: Hindu Temple of Siouxland, Sioux Falls	South Dakota: Dakota Zen Center, Sioux Falls	South Dakota: Sikh Temple of Sioux Falls, Sioux Falls	--	South Dakota: Islamic Center of Sioux Falls, Sioux Falls
Tennessee: Sri Ganesha Temple, Nashville, and Hindu Cultural Center of Tennessee, Knoxville	Tennessee: Nashville Zen Center, Nashville	Tennessee: Sikh Gurdwara of Tennessee, Nashville	--	Tennessee: Islamic Center of Nashville, Nashville, and Masjid Al-Islam, Memphis
Texas: Sri Meenakshi Temple, Pearland, and BAPS Shri Swaminarayan Mandir, Stafford	Texas: Zen Center of Houston, Houston, and Austin Zen Center, Austin	Texas: Sikh Center of San Antonio, San Antonio, and Sikh Center of Houston, Houston	--	Texas: Islamic Society of Greater Houston, Houston, and Islamic Association of North Texas, Richardson
Utah: Sri Ganesha Hindu Temple of Utah, South Jordan	Utah: Urgyen Samten Ling Gonpa, Salt Lake City	Utah: Sikh Temple Utah, West Jordan	--	Utah: Khadeeja Islamic Center, West Valley City
Vermont: Hindu Temple of Vermont, Burlington	Vermont: Vermont Zen Center, Shelburne	Vermont: Sikh Center of Vermont, Essex Junction	--	Vermont: Islamic Society of Vermont, Colchester
Virginia: Hindu Temple of Virginia, Sterling	Virginia: Ekoji Buddhist Temple, Fairfax Station	Virginia: Guru Nanak Foundation of America, Chantilly	Virginia: Jain Society of Northern Virginia, Fairfax	Virginia: Dar Al-Hijrah Islamic Center, Falls Church, and All Dulles

				Area Muslim Society, Sterling
Washington: Hindu Temple & Cultural Center, Bothell, and Vedic Cultural Center, Sammamish	Washington: Seattle Soto Zen, Seattle, and Kadampa Meditation Center Washington, Seattle	Washington: Sikh Center of Seattle, Renton	Washington: Jain Society of Seattle, Bellevue	Washington: Islamic Center of Washington, Seattle, and Islamic Center of Tacoma, Tacoma
West Virginia: Hindu Temple of West Virginia, Moundsville	West Virginia: Dharma Mountain Zen Center, Thomas	West Virginia: Sikh Association of West Virginia, Charleston	--	West Virginia: Islamic Center of Morgantown, Morgantown
Wisconsin: Hindu Temple of Wisconsin, Pewaukee	Wisconsin: Madison Insight Meditation Group, Madison	Wisconsin: Sikh Religious Society of Wisconsin, Brookfield	Wisconsin: Jain Temple of Wisconsin, Franklin	Wisconsin: Islamic Society of Milwaukee, Milwaukee
Wyoming: Wyoming Hindu Temple, Sheridan	Wyoming: Mountain Stream Meditation Center, Nevada City	Wyoming: Wyoming Sikh Temple, Cheyenne	--	Wyoming: Wyoming Islamic Center, Laramie

Table 19. Hindu temples, mosques, Jain temples, Sikh temples, and monasteries contacted across all 50 U.S. states for survey recruitment. Centers were excluded if no email address was available or if no major location existed in a state.

VIIb. R Programming Code for Survey Analysis

All supplemental data and code are available at:

https://github.com/rmravee/ThesisSupplementalData

VIIc. Supplemental Data Tables and Figures

The following supplemental data tables and figures are included that summarize the data distributions between the full "sacvd" data set and "sacvd100" subset (Figures 0A-C), and a table summarizing what relationships between predictor variables and true or false accuracy questions remained significant after adjusting for various confounders in the data set.

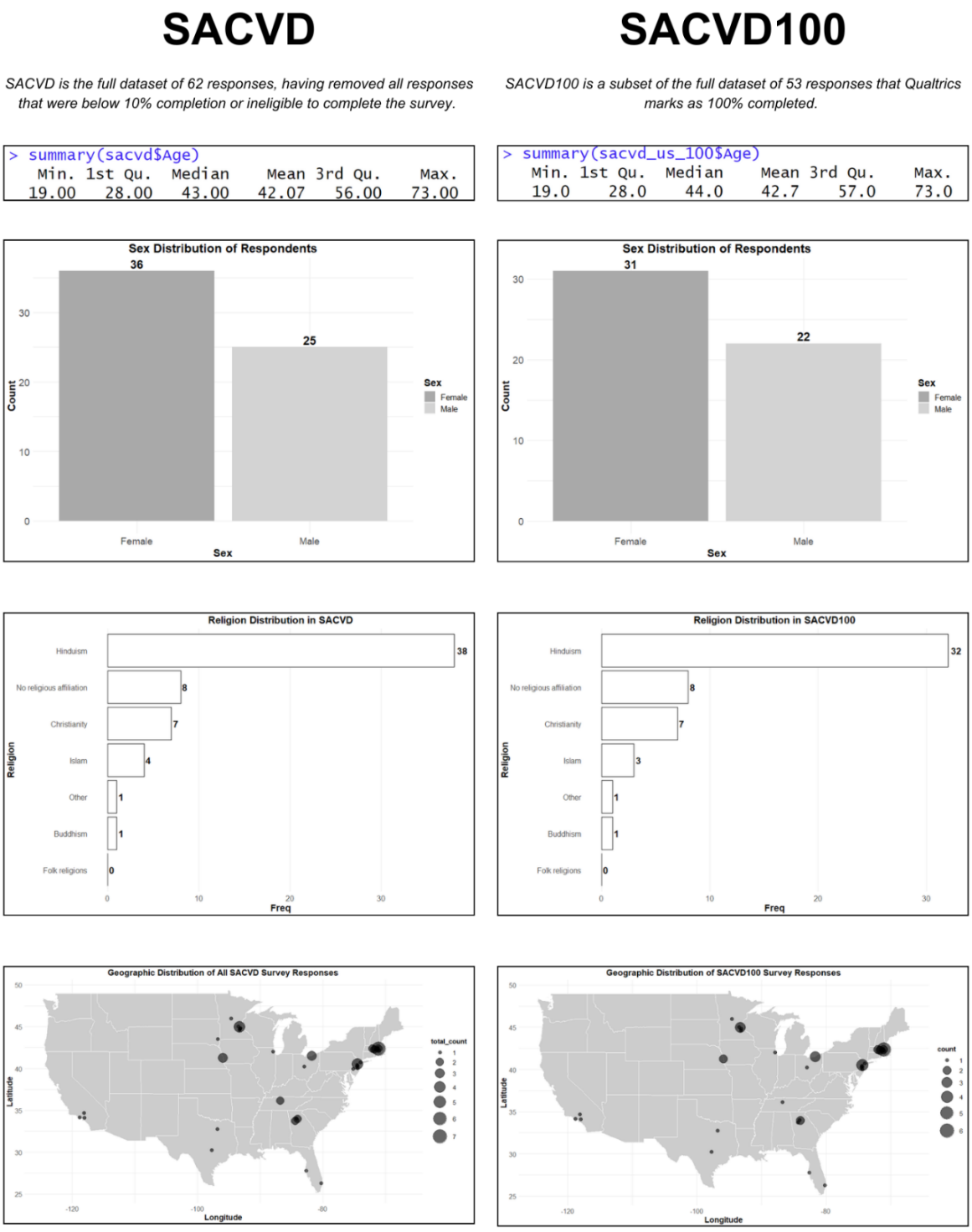

Figure 3. Comparisons of Data Distributions Between "sacvd" and "sacvd100"

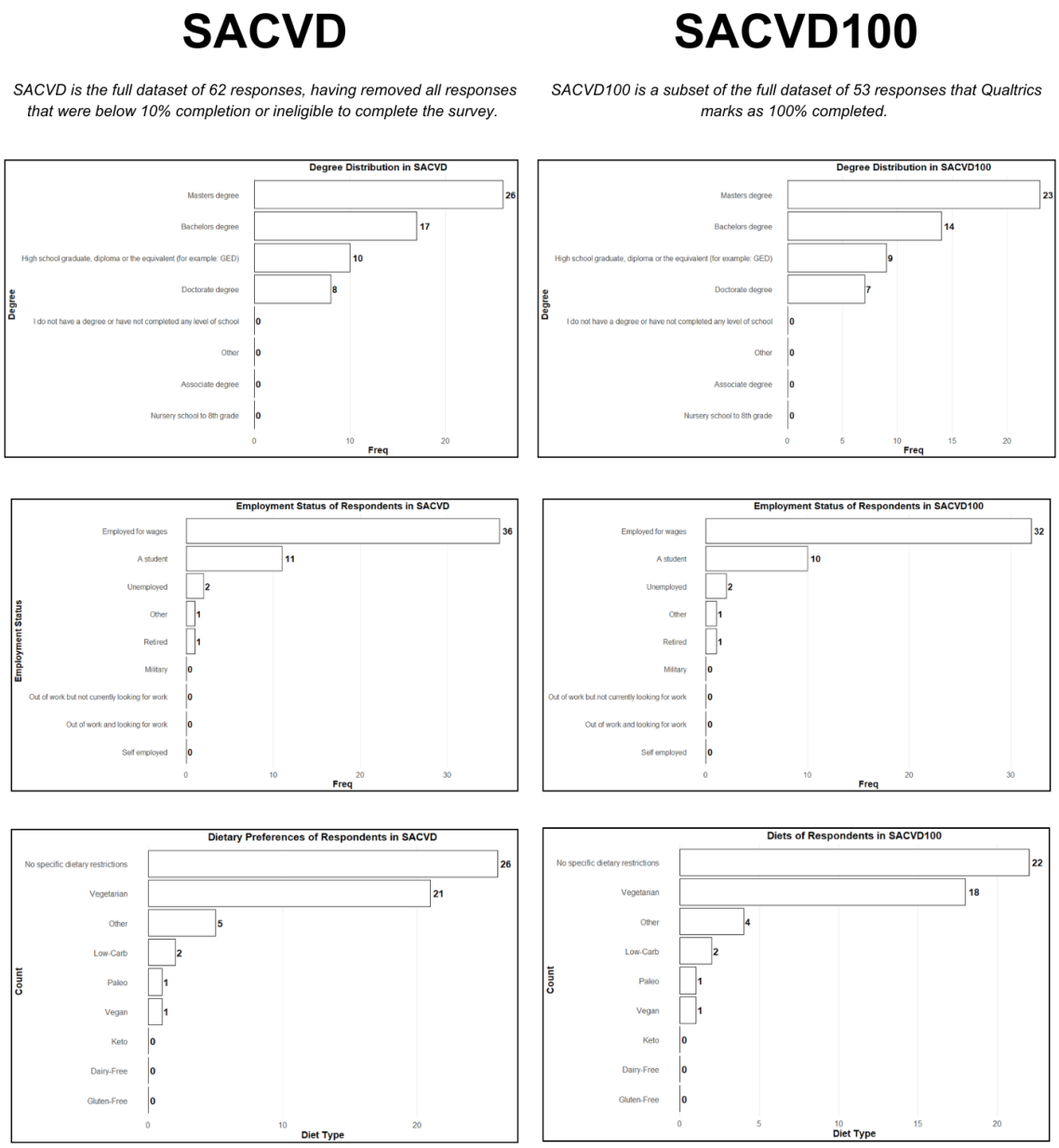

Figure 4. Comparisons of Data Distributions Between "sacvd" and "sacvd100" (Cont.)

SACVD	SACVD100
SACVD is the full dataset of 62 responses, having removed all responses that were below 10% completion or ineligible to complete the survey.	*SACVD100 is a subset of the full dataset of 53 responses that Qualtrics marks as 100% completed.*

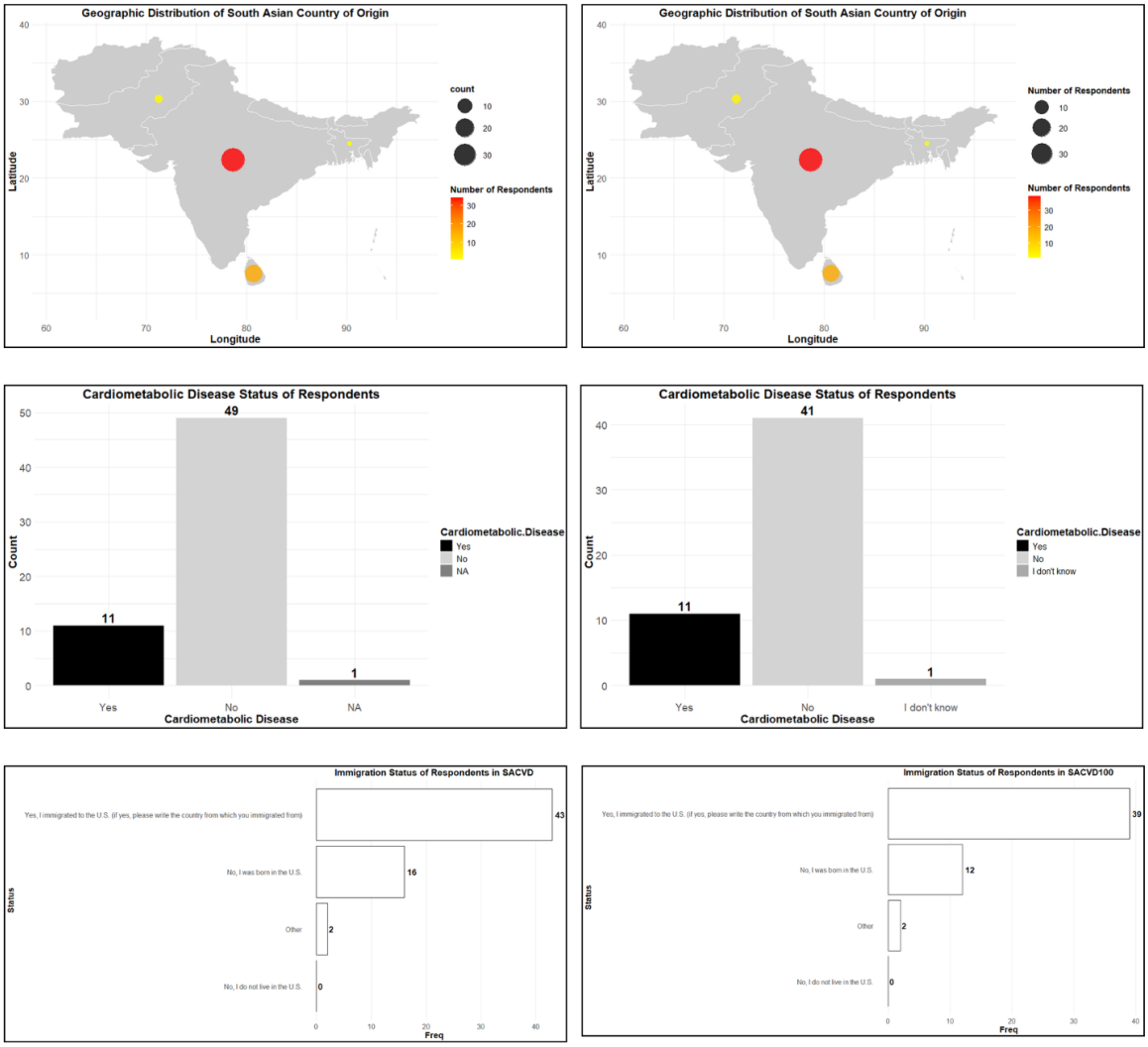

Figure 5. Comparisons of Data Distributions Between "sacvd" and "sacvd100" (Cont.)

Table 20. Logistic Regression Sequentially Adjusted Model: Remained Significant Results

Logistic Regression Results ($p<0.05$): Sequentially Adjusted Model

Predictor	Question #	Adjusted For	Coefficient	Odds Ratio	95% CI (Lower)	95% CI (Upper)	P-Value
Religiosity	Question 9	Age	−0.557	0.573	0.357	0.874	0.013
Religiosity	Question 9	Sex	−0.549	0.577	0.361	0.878	0.014
Religiosity	Question 9	HighestDegree	−0.553	0.575	0.359	0.875	0.013
Religiosity	Question 9	Employment	−0.729	0.483	0.268	0.790	0.007
Religiosity	Question 9	Religion	−0.490	0.613	0.364	0.989	0.049
Religiosity	Question 9	Immigration Status	−0.524	0.592	0.369	0.905	0.020
Religiosity	Question 9	Cardiometabolic Disease	−0.535	0.586	0.367	0.893	0.016
Regular Thought About Heart Health	Question 4	Age	−0.881	0.414	0.194	0.743	0.008
Regular Thought About Heart Health	Question 4	Sex	−0.901	0.406	0.186	0.737	0.008
Regular Thought About Heart Health	Question 4	HighestDegree	−0.901	0.406	0.187	0.747	0.009
Regular Thought About Heart Health	Question 4	Employment	−0.896	0.408	0.185	0.754	0.010
Regular Thought About Heart Health	Question 4	Diet	−1.188	0.305	0.072	0.728	0.032
Regular Thought About Heart Health	Question 4	Religion	−0.914	0.401	0.161	0.811	0.022
Regular Thought About Heart Health	Question 4	Immigration Status	−0.881	0.415	0.194	0.744	0.008
Regular Thought About Heart Health	Question 4	Cardiometabolic Disease	−0.880	0.415	0.196	0.741	0.008
Trust in Healthcare Providers	Question 3	Age	0.672	1.958	1.229	3.347	0.007
Trust in Healthcare Providers	Question 3	Sex	0.686	1.985	1.221	3.470	0.009
Trust in Healthcare Providers	Question 3	HighestDegree	0.661	1.936	1.214	3.310	0.009
Trust in Healthcare Providers	Question 3	Diet	0.966	2.627	1.301	7.038	0.019
Trust in Healthcare Providers	Question 3	Immigration Status	0.638	1.892	1.196	3.193	0.010
Trust in Healthcare Providers	Question 3	Cardiometabolic Disease	0.696	2.005	1.231	3.518	0.008
Knowledge of MASALA	Question 7	Age	1.578	4.844	1.376	25.121	0.039
Knowledge of MASALA	Question 7	HighestDegree	1.419	4.132	1.340	18.870	0.043
Knowledge of MASALA	Question 7	Employment	1.555	4.735	1.351	23.746	0.039
Knowledge of MASALA	Question 7	Religion	1.509	4.522	1.357	22.349	0.042
Knowledge of MASALA	Question 7	Immigration Status	1.485	4.415	1.341	21.769	0.044
Knowledge of MASALA	Question 7	Cardiometabolic Disease	1.425	4.157	1.319	19.076	0.044
Knowledge of MASALA	Question 11	Age	1.261	3.529	1.318	13.879	0.044
Knowledge of MASALA	Question 11	HighestDegree	1.252	3.499	1.294	13.478	0.044
Knowledge of MASALA	Question 11	Immigration Status	1.221	3.392	1.303	12.854	0.044
Knowledge of MASALA	Question 11	Cardiometabolic Disease	1.273	3.572	1.331	13.715	0.040
Knowledge of Policy Changes	Question 3	Age	0.813	2.255	1.169	5.552	0.037
Knowledge of Policy Changes	Question 3	HighestDegree	0.772	2.163	1.131	5.306	0.046
Knowledge of Policy Changes	Question 3	Immigration Status	0.814	2.256	1.165	5.580	0.038
Regular Social Media Use	Question 5	Age	0.419	1.520	1.092	2.192	0.017
Regular Social Media Use	Question 5	Sex	0.408	1.504	1.098	2.120	0.014
Regular Social Media Use	Question 5	HighestDegree	0.389	1.475	1.048	2.135	0.030
Regular Social Media Use	Question 5	Diet	1.079	2.942	1.579	7.394	0.004
Regular Social Media Use	Question 5	Immigration Status	0.412	1.510	1.080	2.185	0.020
Regular Social Media Use	Question 5	Cardiometabolic Disease	0.486	1.625	1.158	2.381	0.007
Confidence in Accuracy	Question 3	Age	0.521	1.683	1.064	2.813	0.033
Confidence in Accuracy	Question 3	Sex	0.550	1.734	1.073	3.012	0.033
Confidence in Accuracy	Question 3	HighestDegree	0.489	1.630	1.041	2.671	0.039
Confidence in Accuracy	Question 3	Employment	0.533	1.704	1.027	3.026	0.048
Confidence in Accuracy	Question 3	Immigration Status	0.537	1.710	1.082	2.852	0.028
Confidence in Accuracy	Question 3	Cardiometabolic Disease	0.472	1.602	1.019	2.632	0.048

Data source: SACVD (2024-2025)