

# Compliance With Routine Health Checkup Visits Among California-Based Minority Men: A Survey Study

American Journal of Men's Health  
January-February 1–13  
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DOI: 10.1177/15579883241309752  
journals.sagepub.com/home/jmh  


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## Abstract

The literature on health care disparities among U.S. minority men remains limited, and post-pandemic changes in the health care delivery system may uniquely affect this population. We assessed the factors influencing California-based minority men's compliance with routine health checkup. An IRB-approved survey was conducted electronically by convenience sampling between October 2022 and July 2023. Data was collected on demographics, socioeconomic status, health insurance, and routine checkup attendance. Health insurance literacy was assessed by self-reported ability to locate insurance-covered clinics and health care information. The data was analyzed using random forest modeling with both feature importance and SHAP values for interpretability, and logistic regression analysis. A total of 266 male respondents participated. Of these, 60.5% were under 30 years old, and 66.9% identified as Latino/Hispanic. The majority were employed (82.7%), insured (84.9%), and earned less than \$50,000 annually (64.5%). While 71.8% were connected to a clinic or hospital, only 50.8% attended routine health checkup, and 6.8% had visited a doctor in the past year. Key factors influencing compliance included zip code, connection to a clinic and the ability to locate a clinic covered by insurance. These findings highlight that half of insured minority men in California under 60 years of age are not attending routine checkups, suggesting significant barriers related to accessibility and health insurance literacy. Addressing these disparities could improve health care utilization and outcomes in this population.

## Keywords

health care access, minority, barriers, men, man, routine health care checkup, COVID-19, post-pandemic, health insurance, health insurance literacy, zip code, transportation, employment, social media, Hispanic, Latinx, Black, barriers

Received May 31, 2024; revised November 19, 2024; accepted December 8, 2024

## Introduction

Recent studies have shown that men have higher morbidity and mortality rates compared to women. Complex and multifaceted causes attributed to socioeconomic, ethnic, and geographical differences have been identified for these higher rates of death and illness in men (Abualhaija, 2022). A previous study found that only 39% of men reported going to an annual doctor's appointment, with the majority stating that they only go to the doctors when ill (Cleveland Clinic, 2024). This in turn limits men's access to not only regular checkups but also preventive care like cancer screening and other forms of

preventive testing, which are essential for early detection, treatment, and overall, healthy daily living.

Men's lack of health care utilization is often attributed to cultural and social norms surrounding men's

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attitudes and feelings toward health care utilization. A Cleveland Clinic survey found that 72% and 77% of men regarded doing household chores and shopping as more preferable activities than visiting the doctor (2019). In addition, this lack of health care utilization may also be attributed to insufficient awareness and education efforts specifically targeting men's health. A 2016 study observed that only 37% of state public health departments had online health care information catering specially to men, whereas only 27% possessed an office or coordinator designated to men's health (Fadich et al., 2016). This lack of health resources tailored to men's health may further impact the stigmatization of men seeking medical care and ultimately, men's utilization of health resources.

Financial barriers have been specifically identified as a major contributing factor specifically to U.S. men's avoidance of health care. It has been found that 38% of U.S. men avoid or delay their doctor's appointments or prescription filling due to high medical costs (Cleveland Clinic, 2024). Due to these financial barriers, many Americans evidently rely on insurance to mitigate such high costs. However, the possession of insurance in the United States appears to be gendered, as it has been discovered that over half of the uninsured population of the United States is male, despite there being more women than men in America (Novak et al., 2019). Lack of health insurance is therefore a major barrier to U.S. men's health resource utilization as high out-of-pocket costs make health care largely inaccessible. Therefore, such barriers in health care access and utilization are then only exacerbated for men of color, men of low-income backgrounds, and other marginalized groups of men that face frequent lack of insurance and additional barriers when accessing health care due to poverty, discrimination, and other systemic issues (Berchick, 2021).

Men in the United States, especially Black and Hispanic men of low socioeconomic status, are more likely to experience health care disparities and are less likely to utilize preventive health services compared to women or white men (Wippold et al., 2024). Lack of health insurance is one of the major barriers for Black and Hispanic men to access health care; however, even those with health insurance may experience various other barriers such as a low level of trust in available health care (Hammond et al., 2010), a low level of health literacy reference (Levy & Janke, 2016), and a low level of health insurance literacy (Tipirneni et al., 2018), defined as the ability of a person to obtain and use health insurance effectively to access health care.

Most of the data on men's health care use are from studies conducted prior to the COVID-19 pandemic;

however, the COVID-19 pandemic has changed U.S. health care delivery significantly. There is increased mistrust in health care organizations in the United States (Ojikutu et al., 2022), and with the significant advancement of digital health technology (Knutsen et al., 2023), individuals can receive health care at home (Pandit et al., 2024) without needing health insurance. In addition, social media has since become a routine source of health information (Chen & Wang, 2021).

A routine health checkup (RHC) at doctor's office is recommended for adults for timely health risk factor recognition, improved prevention, early chronic disease diagnosis, and treatment (Liss et al., 2021). In addition, the Los Angeles County of California is the most populous county in the United States and has a population greater than that of 40 other U.S. states (U.S. Census Bureau, 2023). Therefore, we conducted a descriptive study among a diverse group of men, with 91% of respondents being men of color, in the Los Angeles County to understand the role of socioeconomic factors, health insurance, health insurance literacy, and social media use on compliance with their RHC.

## Method

The study aims to evaluate health insurance literacy and uncover health care barriers by analyzing data from a customized survey tool. A 21-question Google Forms survey (Appendix) was developed by modifying a validated survey tool to assess the health insurance literacy (Paez et al., 2014). No personal identifiers were collected and the study was approved by the Western Institutional Review Board (WIRB) under an exempt status (WIRB No. 20214136). The convenience sampling method was used to collect data, as over 30 MiOra health educators from California State University Los Angeles and Long Beach Public Health Departments distributed the survey link electronically to their community by email and on social media. The participant being a man and 18 years or older were the only inclusion criteria. The survey was conducted, and responses were collected between October 2022 and July 2023. Data were collected on participant demographics, socioeconomic status, health insurance, access to health resources, locational information, and routine checkup compliance. Age was divided into 30 years old and under, 30 to 59 years old, and over 60 years old, while annual income was divided by \$25,000 or less, \$25,000 to 49,000, and over \$50,000.

Duplicate data and responses with missing data were removed. The data were analyzed utilizing summary statistics, multivariate analysis, machine learning predictive models using Python, including Pandas, MatPlotLib, and SciKit libraries. For such machine learning models, the data were split up into 80% training and 20% testing data. In addition, K-means Clustering, Logistic Regression, and Random Forest machine learning algorithms were implemented. The K-means clustering was applied to identify geospatial clusters, grouping individuals based on geographic proximity. Logistic Regression and Random Forest models were used to predict how demographic and locational factors contribute to routine checkup compliance as the response variable, with Random Forest offering enhanced interpretability through SHAP (SHapley Additive exPlanations) values to clarify the influence of each feature on individual predictions. All model evaluation scores, including accuracy, sensitivity, and specificity, were above 0.90. Oversampling was used to address any imbalances in the data set.

## Results

### Demographics

A total of 266 responses were available for analysis (Table 1); 8.6% respondents reported that they were assigned female gender at birth but identified as male; they were included in the analysis. Most respondents, 161 (60.5%), were young adults being 30 years of age or younger, 90 (33.8%) were 31 to 59 years of age, 178 (66.9%) identified as Latino/Hispanic, 36 (13.5%) identified as Asian, 18 (6.8%) identified as Black/African American, and 24 (9%) identified as White (Table 1). The majority of the respondents, 197 (74.1%), were not married, 237 (89.1%) identified as heterosexual, and 194 (72.9%) scheduled their own appointments (Table 2).

Most men, 238 (84%), reported having access to social media and most men used multiple social media platforms. The most frequently used social media platform was Instagram (50.6%), followed by TikTok (43.6%), Facebook (39.8%), and Twitter-X (4.6%); 141 men reported that they got health information from word of mouth (WOM) (53.0%) and 133 by news (50.0%). Only 2 (0.01%) reported getting information from their doctor/clinic, and 3 (0.01%) reported getting health information from their employer (Table 2).

The majority of the respondents, 220 (82.7%) reported being employed, 172 (64.7%) had annual

**Table 1.** Demographics of the Respondents

Demographics	N	%
Age		
30 and under	161	61.0
31–59	90	34.2
60+	15	5.6
Assigned gender at birth		
Male	243	91.4
Female	23	8.6
Sexual orientation		
Heterosexual	237	89.1
Queer	29	10.9
Annual income		
Under 25K	110	41.4
25–50K	62	23.3
50K+	94	35.3
Marital status		
Married	69	26.0
Single	197	74.0
Employment status		
Employed	220	82.0
Unemployed	46	18.0
Ethnicity		
Hispanic/Latino	178	67.0
Asian	36	13.5
Black/African American	18	6.8
White	24	9.0
Biracial, Middle Eastern or Pacific Islander	10	3.8
Health insurance coverage	226	85
Knowledge of where to find clinics that accept health insurance	200	75.2
Routine checkup compliance	135	51.0
Attending doctor within past year	18	6.8
Scheduling appointments yourself	194	72.9
Transportation to appointments	254	95.5
Social media use	238	89.5
Canceling doctor visit often		
Yes	21	7.9
No	236	88.7
Sometimes	7	2.6
N/A	2	0.7
Access to information on health care	212	79.7
Connection to a clinic or hospital	191	71.8

income of less than \$50,000, and 254 (95.5%) had transportation to the doctor appointments (Table 3). Most, 226 (84.9%), reported to have health insurance (Table 3), 191 (71.8%) reported being a patient at a clinic or hospital, 200 (75.2%) said they know where to find a clinic covered by their health insurance, and 212 (79.7%) reported that they know how to find information on health care (Table 3). The annual income level did not influence having health insurance; 83.6%, 84%, and 87% of the respondents with annual income of less than \$25,000, \$25,000 to \$50,000, and over \$50,000, respectively, reported having health insurance.

**Table 2.** The Effect of Ethnicity/Race on Attendance to Routine Checkup Visits

Ethnicity	Hispanic/ Latino, %	Asian, %	Black/African American, %	p
Employed	89	79	88	>.05
Annual income <\$25K	39	64	27	<.05 comparing Hispanic/ Latino versus Asian
\$25–\$50K	38	11	50	<.05
>\$50K	23	25	22	>.05
Connected to a clinic	72	83	50	>.05
Has health insurance	86	83	88	>.05
Has access to information on health care	78	80	83	>.05
Knows how to find a clinic that accepts health insurance	75	77	77	>.05
Attends routine checkup visits	47	64	38	≤0.05

**Table 3.** The Demographic Distribution of LA County Respondents Based on Their SPAs (Service Planning Areas)

Demographics	SPAs 1/6 (49, 34.8%), %	SPAs 2/3/4/5 (92, 65.2%), %
Hispanic/Latino	77.6	58.7
Black/African American	12	3.3
Biracial	4	4.3
Asian	2	17.4
Middle Eastern	0	4.3
Native Hawaiian or Pacific Islander	0	4.3
White	0	17.4
Under 30 years of age	53.1	64
30–60 years of age	43	32
60+ years of age	2	5.4
Reported being queer	8	13
Married	24.5	26
<\$25K	35	39
\$25-50K	33	29
>\$50K	33	33
Reported having social media	86	80.4

Only 135 (50.7%) of the men reported attending routine checkup visits, and only 18 (6.8%) men reported visiting a doctor within the past year. Twenty-three (64%) of men who identified as Asian reported attending RHCs compared to 84 (47%) of men who identified as Hispanic/Latino and 7 (38%) of men who identified as Black/African American. The age distribution, employment rate, health insurance coverage, being connected to a clinic or hospital, ability to find a clinic covered by health insurance, and ability to find health information did not vary between Asian, Hispanic/Latino, and Black/African American respondents.

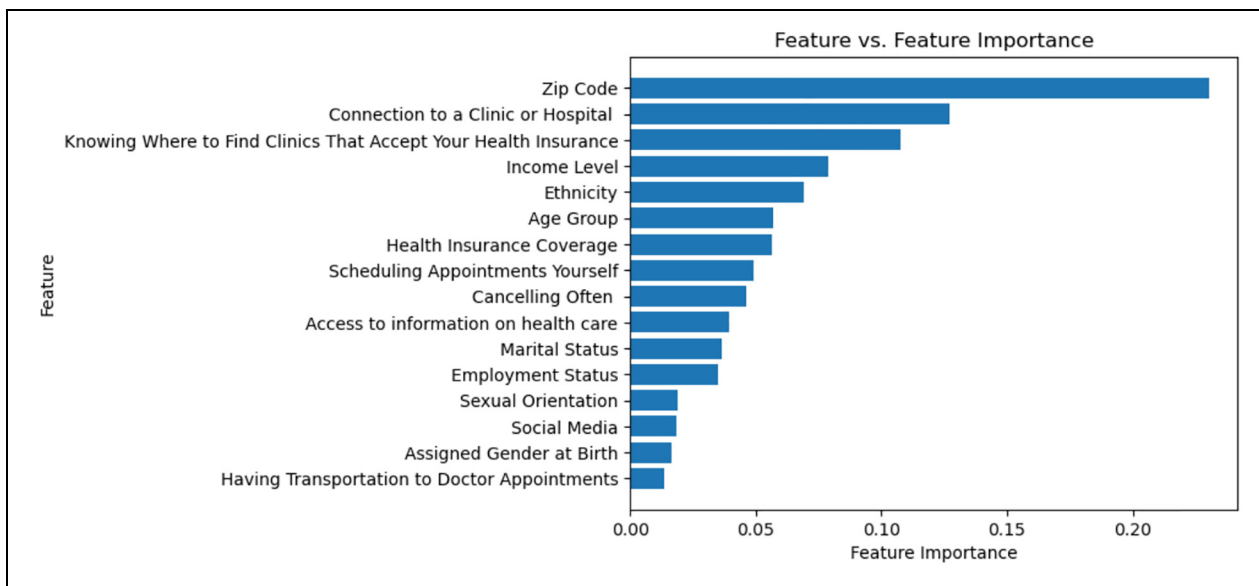
### Factors Influencing the Compliance With RHC Visits

Random forest and logistic regression analyses are well-suited to handle smaller data sets while still

providing reliable and valid results. Exploratory random forest model suggested that respondents' zip code (0.23 feature importance), connection to a clinic or a hospital (0.13 feature importance), and the ability to find clinics covered by one's insurance (0.11 feature importance) had the largest influence on RHC attendance (Figure 1).

We repeated the random forest analysis for only the Los Angeles County population and observed the same results (data not shown); zip code (0.21 feature importance), connection to a clinic or a hospital (0.18 feature importance), and the service planning area (SPA) of the respondent (0.13 feature importance) were the top three factors that influenced the RHC attendance. Among the Los Angeles County residents, having health insurance influenced their likelihood to attend routine checkup (0.11 feature importance). We did not perform any additional analysis given that the sample size for each SPA and each sub-population was very small.

The SHAP summary plots indicate that geographic, access-related, and socioeconomic factors play a significant role in predicting health care compliance (Figure 2 and Figure 3). Key features like "Connection to a Clinic or Hospital," "Health Insurance Coverage," "Zip," and "SPA (Service Planning Area)" are highly influential for both compliance and noncompliance outcomes. Routine compliance (Class 1) is associated with positive values in these features, suggesting that access to health care resources increases compliance likelihood. Conversely, noncompliance (Class 0) is linked to factors such as lower income and limited knowledge about health care options, indicating that socioeconomic barriers may reduce routine health care engagement. Overall, access to health care, geographic location, and socioeconomic status emerge as critical determinants of health care compliance.



**Figure 1.** The Random Forest Model and Importance Scores of the Relative Contribution of Each Input Variable (Feature) on Compliance With Routine Checkup Visits

In the Random Forest model, zip code was the most influential factor (0.21 feature importance) in predicting routine checkup attendance within Los Angeles County. However, in the SHAP analysis, while zip code remained an important factor, it was not the top influencer; instead, “Connection to a Clinic or Hospital” had a slightly stronger impact on compliance with routine checkup attendance (data not shown).

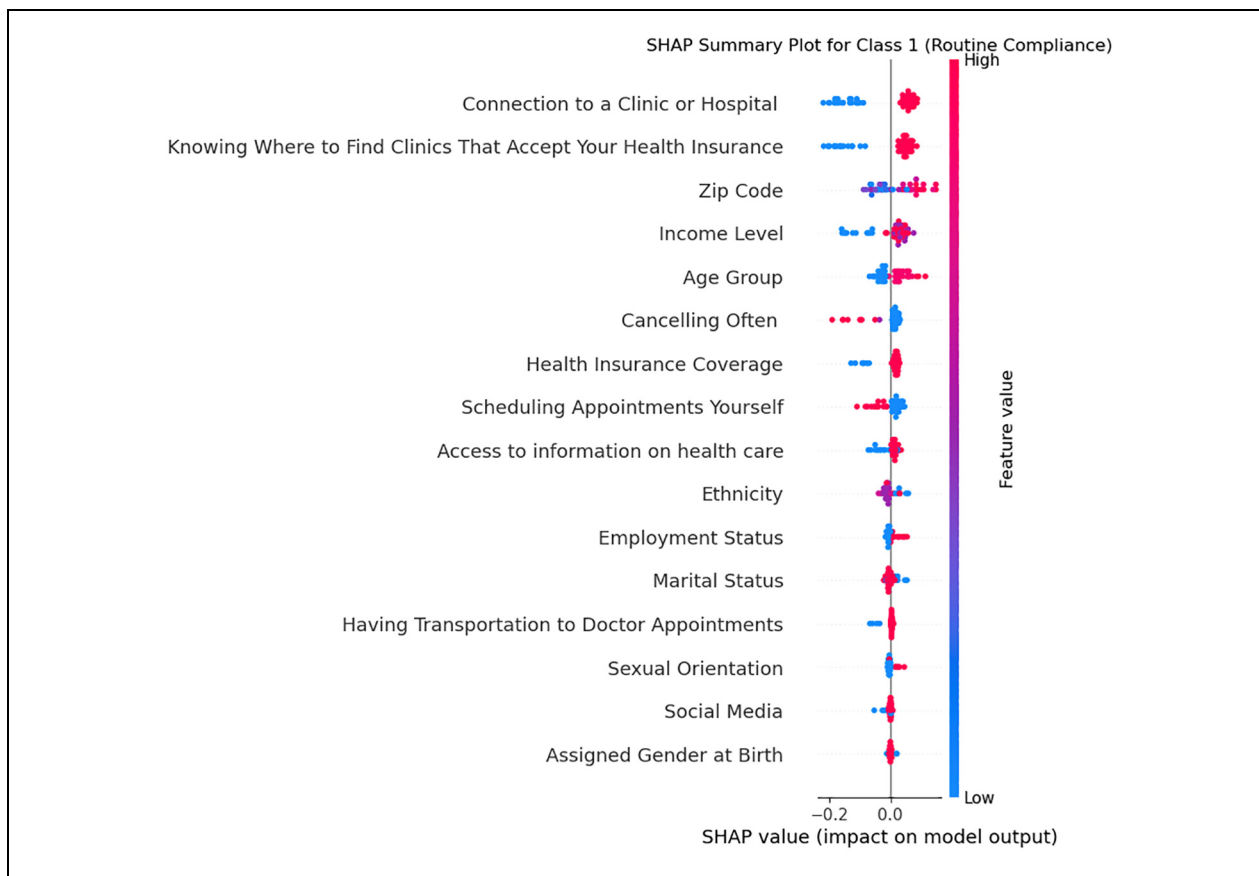
### Discussion

There are limited data on U.S. minority men’s preventive health care-seeking behavior following COVID-19 pandemic. We conducted a survey study in California among a diverse group of urban, low-income, and minority men. The majority reported being employed, had transportation, had health insurance, and have already been connected to or received care at a clinic or hospital. However, only half of those surveyed reported attending RHC visits, and only 7% had a doctor visit in the last year.

It has been shown that men and younger adults are less likely to attend preventive care visits (Wippold et al., 2024), and that minorities are more likely to have barriers for preventive health care (Levy & Janke, 2016). In our study, the RHC attendance rate for mostly minority, young California men was 51% and similar to the 66% reported by Reynolds and Fisher (2020) by using 2015 to 2016 California Health Interview Survey (CHIS) data from California men. The insurance rate was similar between the two

studies—89% of the participants were insured in the 2015 to 2016 CHIS, whereas 84.9% were insured in our study. In our study, only 9% of the respondents were White, whereas in the CHIS study, 56% were White. In our study, close to two thirds of the respondents were less than 30 years of age, and there were no respondents between the ages of 60 and 64 years. In the CHIS study, 16.9% of the respondents were 60 to 64 years of age. Older people are more likely to attend preventive care visits (Wippold et al., 2024), and CHIS data showed that preventive care visits were more common (32%) among people with chronic diseases such as asthma, diabetes, heart disease, and hypertension as compared to the rate (10%) among people without a chronic disease (Reynolds & Fisher, 2020). We did not collect data on general health status or chronic diseases of the respondents; however, younger people, who constituted the vast majority of our sample, on average are less likely to have chronic diseases (Wippold et al., 2024).

The RHC attendance rate observed in our study is lower than that reported in the 2021 to 2022 National Health Interview Survey (NHIS) from U.S. adults, where 81.6% (81.0%–82.3%) of the respondents attended outpatient wellness visit. In that study, 90.1% of the respondents were insured in 2022. This difference may partly be explained by the fact that 62.8% of the respondents were White and 51.6% of the respondents were female in the 2021 to 2022 NHIS, and it has been found that women and White men are more likely to attend preventive care visits



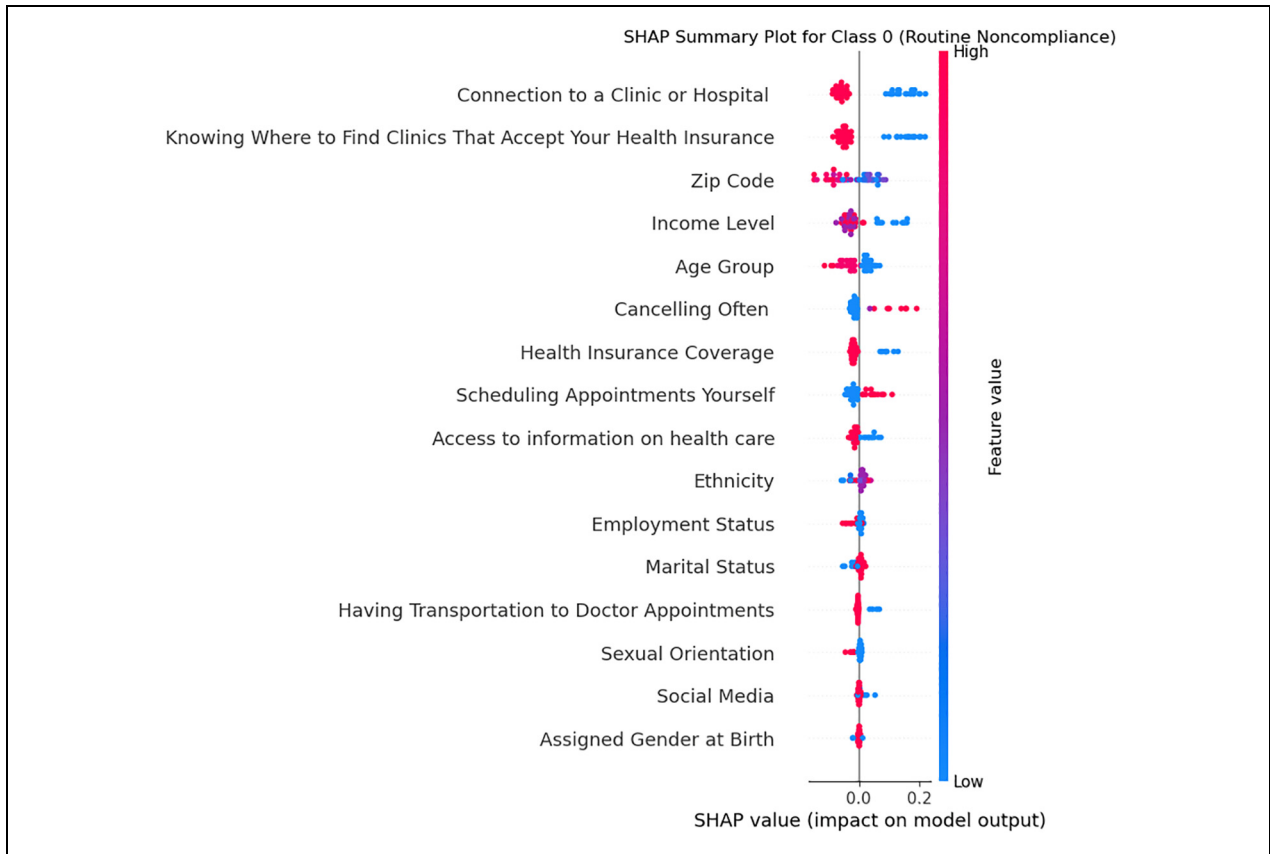
**Figure 2.** SHAP Summary Plots for Routine Checkup Compliance

(Wippold et al., 2024). The investigators did not report data from minority men separately.

According to the NHIS, the wellness visit rate in 2022 was lower than the previous year and lower than the pre-pandemic period (Alba et al., 2024). Investigators suggested that there may be several reasons for decreased wellness visit rate such as fear of exposure to pathogens at the provider's office, lower appointment availability due to increased demand and provider shortage, and broader use of telemedicine among non-elderly adults ages 19 to 64 years including minorities. The data on telemedicine use among minorities are mixed; some papers suggest higher telemedicine use among Black and Latino people compared to White people, and other papers suggest the opposite (Lee et al., 2024). Recently, Marcondes et al. (2024) examined data from Medicare members and observed that telemedicine uptake was more frequent in the Southwest and Northeast United States—two geographic regions where Black and Hispanic populations are high.

We also found that zip code had the strongest influence on RHC visit attendance. Similarly, Freeland

et al. (2023) have shown that there were county-level geospatial clusters of high and low health insurance coverage for different race/ethnic groups aged 18 to 64 years both prior to and during the pandemic. In our study, the majority of the respondents reported being insured, and the forest tree analysis did not suggest insurance to be a big influence on routine health care attendance; however, when we examined the data from the Los Angeles County only, we observed health insurance to be a significantly important influencer (Figure 2). SHAP analysis highlighted "Connection to a Clinic or Hospital" as the strongest predictor of health care compliance, emphasizing access-related factors over geographic ones, whereas the Random Forest model identified zip code as the most influential feature. This discrepancy arises because SHAP captures feature interactions, suggesting that direct health care access may impact compliance more deeply than location alone. A pre-pandemic study from 2018 investigating men's health-seeking behavior showed that having health insurance contributed greatly to men attending their annual wellness checks (Mahalik & Backus-Dagirmanjian,



**Figure 3.** SHAP Summary Plots for Routine Non-compliance

2018). In our study, approximately two thirds of the respondents reported to be a patient in a clinic or hospital; however, the routine checkup adherence rate was low even for those patients with an established provider. Although lack of insurance may affect some Los Angeles County minority men’s compliance with preventive care visits, increased use of telemedicine may explain the low preventive care visit rate in our study (Alexander et al., 2020). Alexander et al. have examined serial data from the IQVIA National Disease and Therapeutic Index and showed that in the last quarter of 2020, only 59.1% of the visits were office-based, and that the adoption of telemedicine was similar between White and Black patients and the highest in the Pacific region (26.8% visits). More recently, Morgan et al. (2024) used data from the American Board of Family Medicine’s PRIME Registry and have shown that telehealth usage was the greatest among Hispanic/Latino patients (17%) and those living in urban areas (12%). We have not assessed telemedicine use for preventive care in this study; however, this is an emerging part of

post-pandemic change in health care delivery and must be included in future surveys.

In our study, the majority of the respondents were single. Previous studies have shown that male health behavior may be influenced by women (Norcross et al., 1996). Specifically, married men aged 18 to 64 years are more likely to have a health care visit within the past year compared to non-married men (Blumberg et al., 2014). In addition, a spouse may be responsible for booking or scheduling primary care appointments for men (Reczek et al., 2018). We observed that a family member or a friend made health care appointments for roughly 25% of the insured minority men. The random forest analysis of data from Los Angeles County showed that men who scheduled their own medical appointment were more likely to attend RHC.

Social media and WOM became important sources of health information after the pandemic (Pauli et al., 2023). It has been observed that men are more likely than women to use social media platforms to search for health-related information, and men prefer their own internet search over communication with a primary care

physician (Bidmon & Terlutter, 2015). In our study, nearly all of the men had access to social media, and 53% stated that they get information by WOM. The spread of health information on social media and through WOM possesses both advantages and disadvantages due to the speed of information spread, the difficulty in controlling the spread of inaccurate information, and biases in the queries influencing the web search engines (Kacperski et al., 2023), as well as biases emergent due to advertising organizations (Mowshowitz & Kawaguchi, 2002). However, reliable sources of health information are also potentially available on social media. Even before the COVID-19 pandemic, 80% of the state health departments (Jha et al., 2016) and associations such as the American Cancer Society (2023) or health care systems such as Kaiser Permanente had an online/social media presence; however, these do not appear to be used frequently as a source for accurate health information. Less than 2% of our respondents stated that they obtained health information from their clinic, doctor, or work.

There are limitations present in this current study. First, the overall sample size was small, as the data were collected via convenience sampling and mostly from low-income urban Hispanic/Latino men; however, random forest modeling is a robust method and performs well when the data are collected through convenience sampling and when certain groups have small sample sizes (Xu et al., 2023). In addition, the survey was administered in English, which could have limited the participation of immigrant men with poor English skills. Recent data suggest that Hispanic adults with limited comfort speaking English may be less likely to use preventive health care services (Hall et al., 2022). Also, we did not collect data on the education level of the respondents, and the health insurance literacy was assessed in a limited fashion. In addition, the survey responses were subjective and entirely self-reported by the respondents, and we did not verify the validity of the responses. In addition, this Google Forms survey was an electronic tool, meaning that technical barriers and differences in device access and digital capabilities could have limited certain individuals from participation.

## Conclusions

In an electronic anonymous survey study of minority California-based men younger than 60 years of age, the most important factors that influenced attendance with routine checkups were patient's zip code, being connected to a clinic/hospital, and knowing where to find clinics covered by one's insurance. The health

care system is complex, and with advancing technology, it is only becoming even more complex with an increasing number of convenient platforms emerging for patients to interact with providers or receive health care such as telemedicine, mobile health clinics that provide mostly preventive care (Malone et al., 2020), wearable technologies, Amazon health, social networking platforms, and artificial intelligence (AI)-based health. Minority men's interactions with their own health and the health care system are complex, often limited, and understudied. More studies are needed with consideration to the availability of these alternative health care delivery platforms and with focus on these underrepresented populations.

## Appendix

Link to Google Forms survey: [https://docs.google.com/forms/d/1v0EzBvW0XcyoEWm4Z3yNz834ooqkxcz4\\_RIRqHXOJjc/edit](https://docs.google.com/forms/d/1v0EzBvW0XcyoEWm4Z3yNz834ooqkxcz4_RIRqHXOJjc/edit)

Written Version:

1. What is your age group
  - a) 30 and under
  - b) 31–59
  - c) 60 and above
2. What is your assigned gender at birth?
  - a) Male
  - b) Female
  - c) Prefer not to say
3. What is your sexual orientation?
  - 1) heterosexual
  - 2) gay/queer
  - 3) bisexual
4. What is your ethnicity?
  - a) Black/African American
  - b) Hispanic/Latino
  - c) White
  - d) Asian
  - e) Native Hawaiian or Pacific Islander
5. What is your income?
  - a) less than \$25,000
  - b) \$25,000 to \$50,000
  - c) more than \$50,000
6. What is your marital status?
  - a) Married
  - b) Single
7. What is your employment status?
  - a) Employed
  - b) Unemployed
8. What is your ZIP code?
9. Do you have health insurance?
  - a) yes
  - b) no



10. If so, what type?
11. Do you have a clinic or hospital you go to currently?
  - a) yes
  - b) no
12. Do you know where to access information on health care?
  - a) yes
  - b) no
13. Do you know where to find clinics that accept your health insurance?
  - a) yes
  - b) no
14. Do you go to all your routine checkups?
  - a) yes
  - b) no
15. Who makes these appointments?
  - a) spouse
  - b) yourself
  - c) family member
  - d) other
16. Do you have transportation to doctor appointments?
  - a) yes
  - b) no
17. When was the last time you went to the doctors?
  - a) less than 2 years ago
  - b) less than 5 years ago
  - c) longer than 5 years ago
  - d) others
18. Do you cancel often?
  - a) yes
  - b) no
19. What will motivate you to go for routine checkups? Or access health care regularly?
20. What are your thoughts about health care access?
21. Do you have social media?
  - a) yes
  - b) no
22. If so, which platforms do you use?
  - a) Facebook
  - b) Instagram
  - c) Twitter
  - d) TikTok
  - e) Pinterest
  - f) others
23. Where do you hear health information from?
  - a) word of mouth
  - b) social media
  - c) news
  - d) other

## Acknowledgments and Credits

2023–2024 MiOra Spring CSULA and CSULB Health Ambassador Cohort.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research study was funded by MiOra.

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