

Title: Impact of Discrimination in Healthcare on Patterns of Doctor Visits Over Time

Short Title: Impact of Discrimination on Patterns of Doctor Visits

Authors: Michael D. Green, B.A.;¹ Qing Yang, Ph.D.;² Hanzhang Xu, Ph.D.;^{2,3} Radha Dhingra, M.D., Ph.D.;¹ Heather R. Farmer, Ph.D.;⁴ Roland J. Thorpe Jr. Ph. D;⁵ Matthew E. Dupre, Ph.D.^{1,6}

Affiliation:

- 1) Department of Population Health Sciences, Duke University School of Medicine, Durham, NC
- 2) Duke University School of Nursing, Duke University, Durham, NC
- 3) Center for the Study of Aging and Human Development, Duke University, Durham, NC
- 4) Department of Human Development and Family Sciences, University of Delaware, Newark, DE
- 5) Johns Hopkins Alzheimer's Disease Resource Center for Minority Aging Research, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- 6) Department of Sociology, Duke University, Durham, NC

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Corresponding Author Contact Information:

Michael D. Green
Department of Population Health Sciences,
Duke University School of Medicine
215 Morris St,
Durham, NC, 27701
michael.d.green@duke.edu
ORCID - 0000-0002-4982-8154

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Key Points

Question: Is perceived discrimination in healthcare settings associated with long-term patterns of doctor visits among middle-aged and older adults?

Findings: In this prospective cohort study of United States adults aged 50 to 80, perceived discrimination in healthcare was associated with increased likelihood of belonging to high-frequency doctor visit patterns over 14 years of follow-up, even after adjusting for sociodemographic and health-related factors.

Meaning: Discrimination in healthcare may contribute to fragmented or intensive healthcare utilization patterns, underscoring the need to address discrimination as part of efforts to improve care quality and equity.

Importance: Discrimination in healthcare disrupts trust and can negatively influence patients.

However, the impact of experiencing discrimination on long-term patterns of healthcare utilization is unknown.

Objective: To assess how perceived discrimination in healthcare settings is associated with longitudinal patterns of doctor visits among middle-aged and older adults in the United States.

Design: Prospective cohort study of US adults in the Health and Retirement Study (HRS) who were followed every 2 years for up to 14 years (2008–2020).

Setting: US population-based cohort study.

Participants: Adults aged 50-80 years at baseline who completed the HRS psychosocial questionnaire, answered the question on discrimination in healthcare settings, had complete covariate information, and had at least two waves of follow-up data.

Exposure: Discrimination in healthcare settings was measured at baseline as the self-reported frequency of “receiving poorer treatment than others from doctors or hospitals.” Responses were dichotomized to indicate any experience of discrimination.

Main Outcomes and Measures: Number of doctor visits in the prior two years were reported by participants at each wave. Group-based trajectory models (GBTM) were used to identify distinct longitudinal trajectories (patterns) of doctor visits over time. Multinomial logistic regression models were used to examine associations between discrimination in healthcare and trajectories of doctor visits while adjusting for sociodemographic, behavioral, and health-related factors.

Results: Among 13,422 participants (mean age ~63.0 years [± 8.0]), approximately 19.4%, reported experiencing discrimination in healthcare at baseline. Results identified five major patterns of doctor visits over time: “Low” (~2 visits/year, 35.5%), “Frequent” (~4.5 visits/year, 33.3%), “Frequent-to-High” (~4.5 to 9 visits/year, 13.7%), “High-to-Frequent” (~13.5 to 6 visits/year, 10.3%), and “High” (~11+ visits/year, 6.3%). Discrimination in healthcare was more prevalent among participants with higher-utilization patterns and among those with greater disease burden and social vulnerability. Compared to participants with Low doctor visits, perceived discrimination was significantly greater in those with High-to-Frequent (relative risk ratio [RRR]=1.38; 95% CI, 1.17–1.63; $P<.001$) and High (RRR=1.62; 95% CI, 1.30–2.03; $P<.001$) patterns of doctor visits.

Conclusions and Relevance: Discrimination in healthcare settings is associated with greater numbers of doctor visits, possibly indicating it as a marker of poor quality of care.

- 95 Keywords (1-7) Healthcare Discrimination, Discrimination in Healthcare, Perceived
- 96 Discrimination, Group Based Trajectory Model (GBTM), Healthcare Utilization, Doctor Visits

Introduction

Experiencing discrimination in healthcare is a barrier to equitable healthcare delivery, and limits the possibility of optimal health outcomes.¹⁻³ From a patient-centered standpoint, facing negative experiences in healthcare erodes patients' trust in their providers and the healthcare system,⁴ which in turn, potentially influences how patients engage with health systems and the management of their health conditions.^{3,5,6} Despite this, the long-term impact of experiencing discrimination on healthcare utilization is unknown.

Discrimination in healthcare is when people are treated unfairly or overlooked because of who they are or who others think they are.⁷ Reasons that people attribute experiences of discrimination can include sociodemographic characteristics such as age, sex, and race, as well as social class, sexual orientation, or other factors.⁸ Race, ethnicity, and disability are among the factors most commonly associated with unfair treatment in healthcare settings.^{15,16} Patients who experience discrimination in healthcare settings may exhibit distinct patterns in their doctor visits over time;⁹ and these differences could stem from various reasons.¹⁰⁻¹³ For example, discrimination may signal poor quality of care leading to unmet medical needs, worsening health-status, and, as a result, more frequent or fragmented healthcare utilization.¹⁴ Additionally, the health needs of individuals significantly influence their healthcare-seeking behaviors.^{17,18} Middle-aged and older adults have greater healthcare needs.^{19,20} These adults also exhibit a high likelihood of experiencing discrimination in healthcare settings.^{21,22} Therefore, it is crucial to consider both sociodemographic characteristics that are associated with varying reports of discrimination and markers of health status that need different treatment intensities,^{9,23-25} where treatment plans and the number of visits will differ for conditions with varying etiologies and prognoses.²⁶ Therefore, it is crucial to identify heterogenous patterns of healthcare utilization to help understand the impact of discrimination.

Using the largest ongoing prospective cohort study of middle-aged and older adults in the United States, we examined whether individuals who reported discrimination in healthcare

had distinct patterns of doctor visits over time. To achieve this objective, we first identified the major patterns of doctor visits occurring during follow-up. We then assessed how perceived discrimination was associated with the likelihood of exhibiting specific patterns of doctor visits. Finally, the associations were assessed while adjusting for a range of sociodemographic, behavioral, and health-related factors.

Methods

Study Participants

Our analysis used data from the Health and Retirement Study (HRS), the largest ongoing nationally representative longitudinal study of U.S. adults over age 50. The HRS is sponsored by the National Institute on Aging (NIA U01AG009740) and is conducted by the University of Michigan.²⁹ The HRS has accumulated over three decades of data on more than 40,000 individuals since its launch in 1992. The core survey for the HRS is conducted every 2 years, and comprehensive details on its methodology and response rates are documented elsewhere.³⁰ Beginning in 2006, the HRS selected a random half-sample of respondents to collect detailed psychosocial data.^{31,32} Subsequent psychosocial data were collected in the remaining half-sample in 2008, and data collection occurred every four years after each half-sample initially provided data through 2020.

The study was limited to adults aged 50-80 at baseline who responded to the question about their exposure to discrimination in healthcare settings from 2008 to 2020 (n=17,642). We examined the patterns of doctor visits for individuals up to age 80 at baseline to limit the influence of healthcare utilization related to end-of-life care at advanced ages. We excluded individuals who did not report at least one doctor visit or hospitalization at baseline (n=1,619) to capture those with potential exposure to discrimination in a healthcare setting. We also excluded individuals who provided only baseline data and lacked longitudinal follow-up (n=2,257). Participants with missing data on study covariates (n=344; ~2.5%) were also

excluded from the analyses. The final analytic sample included 13,422 individuals who provided at least two waves of follow-up data with non-missing doctor visits over the 14 years of follow-up. All HRS participants provided written informed consent. Our study was approved by the Duke University Health System Institutional Review Board (Pro00108869).

Discrimination in Healthcare Settings

Perceived discrimination in healthcare settings was measured using an item from the Everyday Discrimination Scale (EDS), a validated instrument designed to capture the frequency of discriminatory experiences across various daily contexts, including interactions in retail, dining, and other social environments.³³ In 2008, the HRS incorporated an additional item into the psychosocial survey specifically focused on discrimination in healthcare settings, which asked respondents, "In your day-to-day life how often have any of the following things happened to you: You receive poorer service or treatment than other people from doctors or hospitals." Due to the limited variability in the reported frequency of experiencing healthcare discrimination we dichotomized the responses to distinguish those who had never encountered discrimination from those who had—categorizing "never" to represent "no experience of healthcare discrimination" and combining all other response options ("less than once a year," "a few times a year," "a few times a month," "at least once a week," "almost every day") into one to represent "any experience of healthcare discrimination"—based on previously used approaches.^{34,35} This variable was employed as a time-constant exposure at baseline.

Outcome

Participants were asked at each wave if they had visited a doctor in the past two years and, if so, how many times. Preliminary analyses assessed the full range of reported doctor visits (0-900) and several winsorized thresholds were evaluated for upper limits (i.e., 20+, 30+, 40+, and 50+ visits) to account for extreme/uncommon values. Our final analyses included

counts of doctor visits from 0-50+ - with approximately 2.92% (n=390) of participants reporting more than 50 doctor visits in a reported wave.

Covariates

Analyses included the participants' baseline sociodemographic characteristics, health behaviors, and clinical characteristics to account for factors that could influence exposure to discrimination and/or patterns of healthcare utilization. Sociodemographic factors included age (in years), gender (female or male), race and ethnicity (Non-Hispanic White, Non-Hispanic Black, or Hispanic), educational attainment (in years), total household wealth based on assets per household member (log-transformed), marital status (currently married/partnered or not), and health insurance status (insured or uninsured). Health behaviors included smoking status (never smoker, former smoker, or current smoker), daily alcohol consumption (0 drinks, 1-2 drinks, or 3+ drinks), and physical inactivity (physically active or not). Measures of health status included number of difficulties with activities of daily living ([ADL]s; count), body mass index (BMI), and self-reported doctor diagnoses of high blood pressure, diabetes, heart disease, stroke, cancer, and arthritis.

Statistical Analysis

We use group-based trajectory models (GBTM) to examine underlying heterogeneity in the longitudinal patterns of doctor visits during follow-up. The GBTM were estimated with the *traj* package in Stata 18.5.³⁶ This data-driven approach allowed for the identification of distinct subgroups within the population that exhibited similar trajectories of doctor visits over time.^{37,38,39} The optimal number of groups was identified based on assessments of Bayesian information criteria (BIC), average posterior probabilities (AvePP), odds of correct classification (OCC), 95% confidence intervals (CI), and entropy.^{40,41} In our preliminary analyses, we assessed the distributions of doctor visits and determined that zero-inflated Poisson models were most

appropriate for modeling the counts of doctor visits over time. Preliminary analyses also examined mortality as a source of non-random attrition using the “dropout” function in *traj*.^{38,42} Mortality over the 14-year follow-up period was generally low (16.6%) and did not change the results. The parameter estimates for the final model are presented in Supplementary Table 1.

Next, we used multinomial logistic regression models to examine the associations between discrimination in healthcare settings reported at baseline and patterns of care visit over time (trajectory group membership), in both unadjusted (model 1) and covariate-adjusted (model 2) models. For the multinomial logistic regression models, we used the most common trajectory of doctor visits identified from GBTM to compare with other trajectories. We then examined additional comparisons between clinically informative trajectories of doctor visits. For instance, a patient might have multiple comorbidities that require many doctor visits to develop a comprehensive care management plan. Alternatively, a patient could have fewer initial visits, but their needs may escalate over time. *P* values < 0.05 were considered statistically significant. All analyses were performed using Stata 18.5 (StataCorp LP, College Station, TX).

Results

Patterns of Doctor Visits Over Time

We identified five distinct patterns of doctor visits over time (Figure 1). The two most common patterns of doctor visits were relatively stable over time, representing approximately 2 yearly visits (“Low” group; 35.51%) and approximately 4.5 yearly doctor visits (“Frequent” group; 33.26%). Two additional patterns showed significant changes in doctor visits over time. The “Frequent-to-High” group (13.70%) indicated about 4.5 doctor visits each year and gradually increased to more than 9 yearly doctor visits over the study period. Conversely, the “High-to-Frequent” group (10.28%) showed an inverse pattern, starting with over 13 yearly visits and gradually decreasing to a lower but still frequent level of about 6 yearly visits. Lastly, there was a “High” group (6.25%) which characterized participants with consistently high numbers of

doctor visits throughout the study period, with nearly monthly visits. In Supplementary Figure 1, there was little variation for the shape of the distribution in responses for the discrimination question.

The average age of our sample at is 63.05 (standard deviation $\pm$ 7.97), and 19.39% reported any discrimination. Baseline characteristics of individuals across the five trajectory groups are presented in Table 1. Across all groups, the majority of individuals were Non-Hispanic White. The Low group was the youngest (mean age 61.6), with the lowest rates of most comorbid health conditions and lowest levels of discrimination in healthcare (17.0%). The Frequent group had relatively low experiences of discrimination (18.9%) but a greater burden of chronic conditions. The High-to-Frequent group reported greater discrimination in healthcare (24.0%) was the oldest on average (64.4 years) and faced significant health challenges. The Frequent-to-High group (13.7%) had a similar health profile to the High-to-Frequent group, with a high prevalence of chronic conditions but reported moderate discrimination (18.9%). The High group (6.3%) had the poorest health. This group had the lowest socioeconomic status and the highest reported discrimination in healthcare (29.6%).

Association between Discrimination and Trajectories

Table 2 presents results from the multinomial logistic regression models of the association between discrimination in healthcare and doctor visit trajectory group membership. Overall, in the unadjusted models, individuals who reported discrimination in healthcare settings had significantly higher likelihood of following trajectories with more frequent doctor visits than those who did not report discrimination. Compared with the Low group, results showed that discrimination was associated with a 13% higher relative risk of being in the Frequent group (relative risk ratio [RRR]=1.13, $P=0.021$), a 54% higher relative risk of being in the High-to-Frequent group (RRR=1.54, $P<0.001$), and more than double the relative risk of being in the High group (RRR=2.04, $P<0.001$). After adjusting for sociodemographic, behavioral, and health-

related covariates, the associations were attenuated but remained significant for the High-to-Frequent (RRR=1.38, $P<0.001$) and High (RRR=1.62, $P<0.001$) groups only. The association with the Frequent group was no longer statistically significant (RRR=1.11, $P=0.066$).

Figure 2 illustrates the results from the multinomial logistic regression models using different reference groups that reflect similar levels of doctor visits at the start or end of the trajectory (the estimates are provided in Supplementary Table 2). We highlight these groups to better understand the association between discrimination and changing patterns of doctor visits among individuals who begin or conclude care at comparable levels. When comparing the High-to-Frequent (~13.5 yearly visits decreasing to ~6) and the Frequent (~4 yearly visits), discrimination was associated with a 24% higher relative risk of membership in the group which starts with high amounts of visits then decreasing. Discrimination was associated with a 36% lower relative risk of starting with a high number of visits in the Frequent-to-High (~4.5 yearly visits increasing to ~9) compared to the High Group (11+ Visits).

Discussion

We identified 5 major longitudinal patterns of doctor visits in a large cohort of U.S. middle-aged and older adults. Our findings suggest that discrimination in healthcare was associated with exhibiting high-frequency patterns doctor visits over time. The associations persisted after accounting for sociodemographic, behavioral, and health factors. Persistent discrimination can hinder effective patient-provider communication, resulting in fragmented or ineffective care that necessitates repeated visits.^{27,43} Additionally, this pattern may reflect a cycle where experiencing discrimination contributes to psychological stress and poor health management, leading to more frequent doctor visits as health conditions progress. This association indicates the potential for discrimination to deepen health inequities, as affected individuals may experience both the direct harm of biased care and the indirect consequences of unmanaged or poorly managed chronic conditions.

We identified that middle-aged and older adults who starts with higher doctor visits either slightly decline to a still high level or sharply decline. Likelihood of exhibiting these patterns varied for those who reported discrimination. Those who reported discrimination had a significantly higher probability of exhibiting a High-to-Frequent pattern compared to the Low or Frequent pattern. However, those who reported discrimination did not have a significant association with the High pattern when compared to the High-to-Frequent pattern. Prior to adjustment for sociodemographic and health factors, there was a higher likelihood of group membership for the High pattern for those who report discrimination, but after considering these factors, that association was attenuated. This is noteworthy because the High pattern was associated with worse health-status, this might indicate that steepness of the decline is a function of health status rather than experiencing discrimination.

Discrimination has a history of being evaluated as a chronic psychological stressor that is a consequence of unequal social treatment.⁴⁴⁻⁴⁶ Discrimination in healthcare as measured in this study is a delineation from this framing as a general stressor experienced across various settings, discrimination attributed to healthcare settings provide health systems an opportunity to measure and modify their practices. Recently, healthcare dissatisfaction has been evaluated alongside discrimination in healthcare as a marker of healthcare quality. These quality measures are independently associated with an increased risk of dementia.⁴⁷ While discrimination in healthcare can be stressful for patients, our findings suggest that individuals at the highest risk of reported discrimination are also those who receive the most care. Notably, the risk of discrimination is significantly higher than the risk associated with any of the sociodemographic characteristics or the risk for most of the health-related factors. Discrimination in healthcare can be effectively used as a tool to assess the quality-of-care services provided. The cost of services provided to individuals is higher for those who experience discrimination than those who do not.^{48,49} Quality of care is in the interest of both health systems focused on cost savings, alongside the doctors and patients who seek to

improve their patients' health. Further research into changes in their health status could clarify whether the declines in visits reflect a change in their health status, or if the discrimination and other factors they face are the cause of this change. Additionally, inclusion of more racial/ethnic groups, consideration of broader age group categories, and time-varying covariates would complement this analysis.

We believe our results are statistically rigorous and present a thoughtful analysis that reflects real-world disease prognosis. GBTM has been critiqued as a method which can generate spurious findings when Average Posterior Probability is the sole criterion for evaluating model fit.⁵⁰ To address this concern we, assessed model fit using Average Posterior Probability, entropy, Bayesian Information Criterion, Odds of Correct Classification, and 95% CIs. We further evaluated our trajectories qualitatively by comparing our generated trajectories to plausible care patterns. For example, if an individual had an onset of a condition such as kidney failure, it would be plausible for them to start out with frequent visits and then require more doctor visits over time. If an individual had a condition that was temporary, it would make sense for them to start out with a high amount of doctor visits, then to decline to frequent.

Limitations

There are some limitations to consider when interpreting our results. We used a single item to evaluate discrimination, instead of a full-scale assessment. To our knowledge, there are no scales of discrimination in healthcare settings that have been psychometrically validated for use in a diverse sample of middle-aged and older adults. While many scales have been validated for population subgroups, with the intention of better understanding their experiences, few have been constructed for broad use as a quality improvement tool.⁵¹⁻⁵⁶ A psychometrically validated assessment, complemented by qualitative inquiry, could provide additional context for impact of the perceived discrimination on subsequent doctor visits patterns. Our sample is limited to those who responded to the HRS. While this study design and sampling approach are

robust, they may have excluded perspectives of marginalized individuals or those who were unable to complete the survey. Furthermore, our approach may not have adequately accounted for unobserved confounding, limiting our ability to draw causal conclusions from our findings. We did not stratify by sociodemographic characteristics for our analysis, which could cause different trends to emerge. For example, individuals who attribute perceived discrimination to a disability are less likely to seek follow-up care.⁵⁷ Evaluating how discrimination impacts the care trajectories of aging populations with disabilities and functional limitations, could be a crucial future consideration alongside other populations. The self-perception of aging is both positively and negatively connected to perceived healthcare discrimination.⁵⁸ We did not explore positive perception of aging in our analysis or ageism, but future studies could consider this as a reason for divergence in discrimination experiences and care-seeking behavior amongst middle-aged and older adults.

Conclusion

Our findings underscore the multifaceted impact of discrimination in healthcare on patterns in healthcare utilization over time. This study highlights the persistent and potentially costly implications of discriminatory experiences. It calls attention to the need for more nuanced, inclusive research that captures the diversity of lived experiences across sociodemographic lines. Addressing discrimination in healthcare is not only a moral imperative, but also a pragmatic one. Discrimination in healthcare directly affects patient trust, care efficiency, and system-wide costs. Interventions designed to reduce discriminatory practices could mitigate the cycle of fragmented care and improve outcomes for those most affected.

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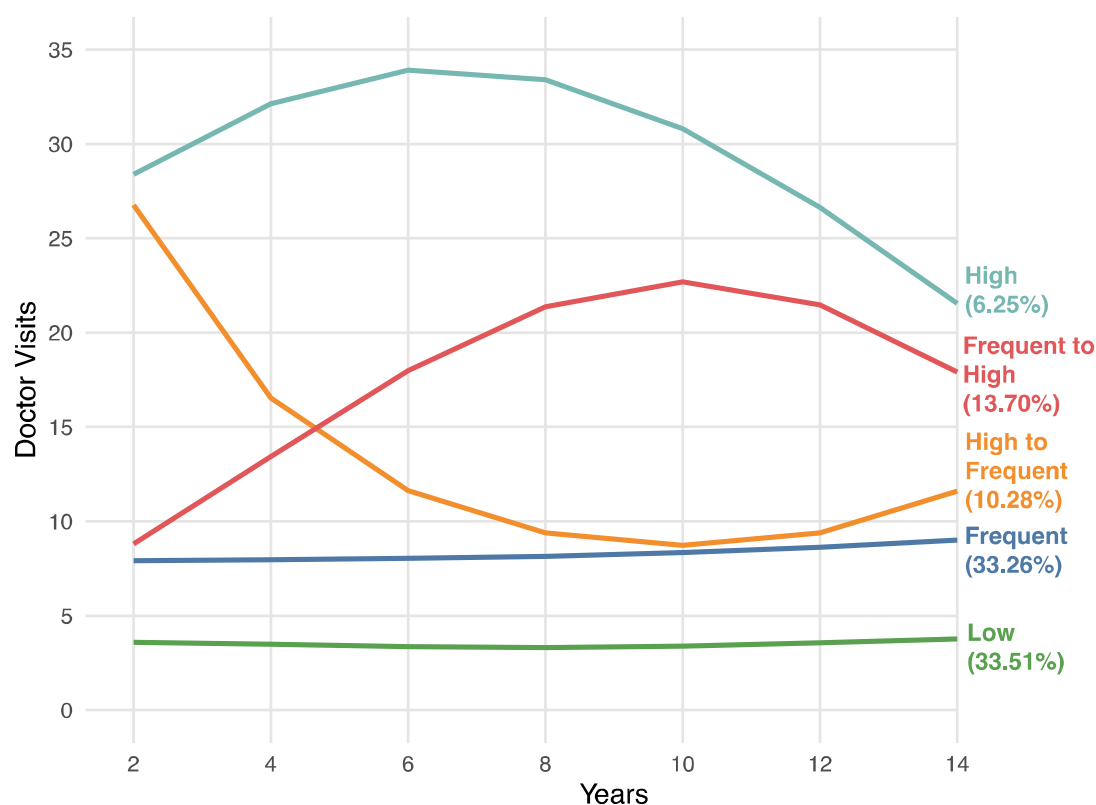
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Figure 1. Estimated Trajectories of Doctor Visits Over Time in Middle-Aged and Older Adults, Health and Retirement Study 2008-2020 (N=13,422)



Note: The estimates were derived using a group-based trajectory model that assumes a zero-inflated Poisson distribution for the number of doctor visits over time.

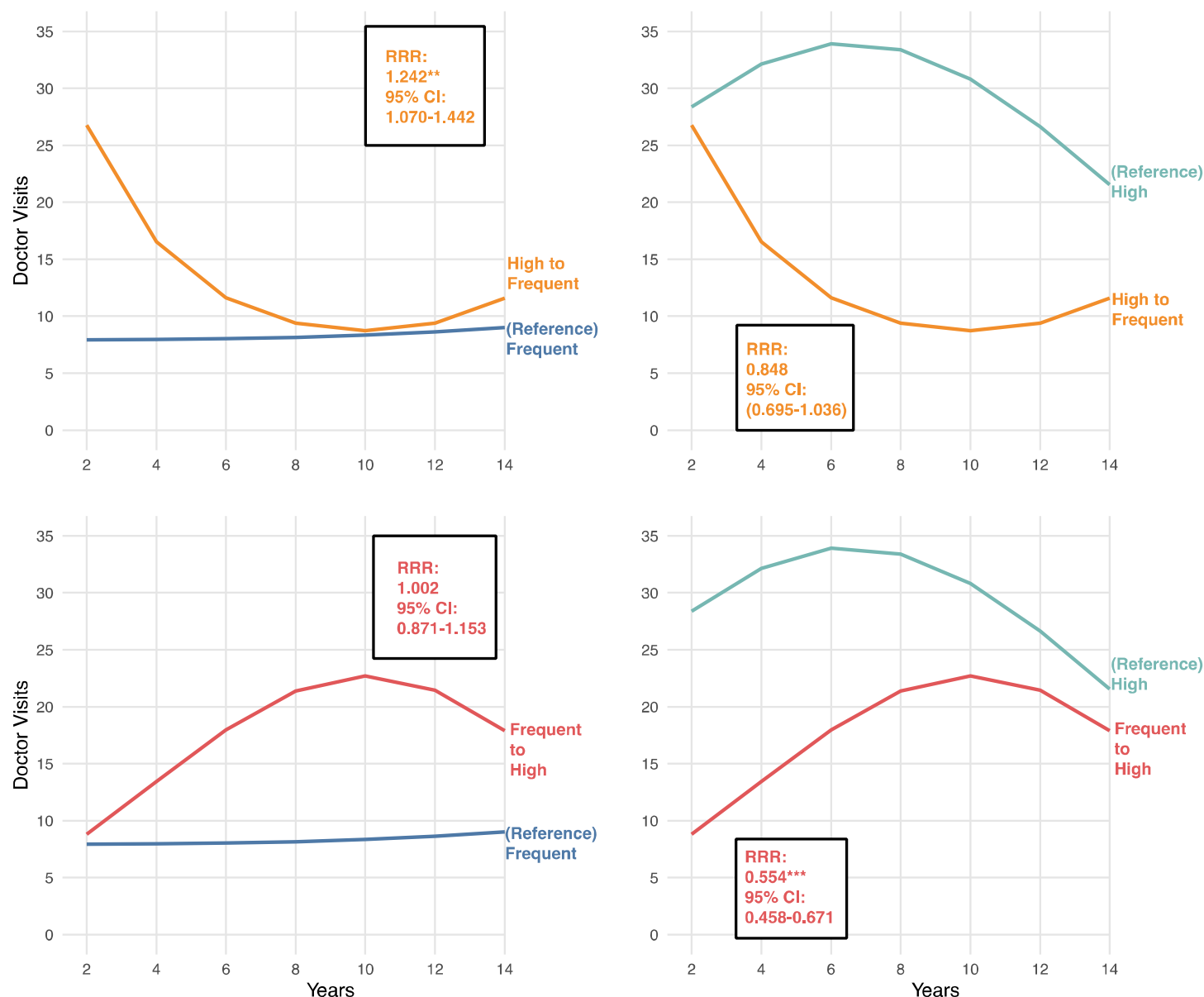
535 **Table 1.** Baseline Characteristics of Individuals in Identified Trajectory Groups of Doctor Visits,
536 Health and Retirement Study 2008-2020. (N=13,422)

Variables	Trajectory of Doctor Visits				
	Low	Frequent	High-to-Frequent	Frequent-to-High	High
n	4940 (35.51%)	4512 (33.26%)	1392 (10.28%)	1773 (13.70%)	825 (6.25%)
Discrimination in Healthcare	842 (17.0%)	851 (18.9%)	334 (24.0%)	335 (18.9%)	244 (29.6%)
Age	61.55 (7.88)	63.72 (7.83)	64.42 (7.93)	64.19 (8.00)	63.59 (7.97)
Male Gender	2250 (45.5%)	1776 (39.4%)	529 (38.0%)	705 (39.8%)	290 (35.2%)
Race and Ethnicity					
Non-Hispanic White	3480 (70.4%)	3377 (74.8%)	984 (70.7%)	1329 (75.0%)	628 (76.1%)
Non-Hispanic Black	1022 (20.7%)	852 (18.9%)	295 (21.2%)	321 (18.1%)	158 (19.2%)
Hispanic	438 (8.9%)	283 (6.3%)	113 (8.1%)	123 (6.9%)	39 (4.7%)
Married	3218 (65.1%)	2933 (65.0%)	807 (58.0%)	1093 (61.6%)	492 (59.6%)
Education, Years	13.19 (2.83)	13.36 (2.72)	12.96 (2.83)	13.16 (2.84)	13.08 (2.74)
Wealth	5.64 (3.23)	5.80 (3.45)	5.28 (3.98)	5.43 (3.75)	5.09 (4.18)
Uninsured	434 (8.8%)	267 (5.9%)	54 (3.9%)	97 (5.5%)	32 (3.9%)
Smoking Status					
Never Smoker	2287 (46.3%)	1997 (44.3%)	547 (39.3%)	700 (39.5%)	321 (38.9%)
Former Smoker	1846 (37.4%)	1914 (42.4%)	620 (44.5%)	780 (44.0%)	353 (42.8%)
Current Smoker	807 (16.3%)	601 (13.3%)	225 (16.2%)	293 (16.5%)	151 (18.3%)
Drinking Status					
Moderate Consumption (1-2 drinks daily)	1266 (25.6%)	1019 (22.6%)	225 (16.2%)	324 (18.3%)	106 (12.8%)
No Consumption (0 drinks daily)	2641 (53.5%)	2633 (58.4%)	956 (68.7%)	1134 (64.0%)	596 (72.2%)
Heavy Consumption (3+ drinks daily)	1033 (20.9%)	860 (19.1%)	211 (15.2%)	315 (17.8%)	123 (14.9%)
Physically Inactive	2155 (43.6%)	2322 (51.5%)	921 (66.2%)	1040 (58.7%)	572 (69.3%)
ADL Limitations	0.07 (0.26)	0.12 (0.32)	0.25 (0.44)	0.18 (0.38)	0.34 (0.47)
Body Mass Index	28.42 (5.67)	29.56 (6.30)	29.85 (6.79)	29.84 (6.50)	30.97 (7.62)
Hypertension	2151 (43.5%)	2704 (59.9%)	941 (67.6%)	1130 (63.7%)	556 (67.4%)
Heart Problem	534 (10.8%)	849 (18.8%)	401 (28.8%)	428 (24.1%)	292 (35.4%)
Stroke	183 (3.7%)	252 (5.6%)	139 (10.0%)	137 (7.7%)	116 (14.1%)
Diabetes	551 (11.2%)	1013 (22.5%)	402 (28.9%)	482 (27.2%)	273 (33.1%)
Cancer	371 (7.5%)	527 (11.7%)	264 (19.0%)	256 (14.4%)	163 (19.8%)
Arthritis	1950 (39.5%)	2554 (56.6%)	942 (67.7%)	1155 (65.1%)	631 (76.5%)
Psychiatric Condition	468 (9.5%)	766 (17.0%)	324 (23.3%)	417 (23.5%)	306 (37.1%)
Continuous variables presented as means with standard deviations in parenthesis. Categorical and binary variables presented as counts with percentages in parenthesis. Wealth is log-adjusted. <i>Abbreviations:</i> ADL = Activities of Daily Living.					

Table 2. Multinomial Estimates of Association Between Discrimination in Healthcare and Trajectory Group Membership of Middle Aged and Older Adults, Health and Retirement Study 2008-2020. (N=13,422)

Reference Group	Low											
Comparator Group	Frequent			High-to-Frequent			Frequent-to-High			High		
	RRR	95% CI	P-Value	RRR	95% CI	P-Value	RRR	95% CI	P-Value	RRR	95% CI	P-Value
Unadjusted Model												
Discrimination in Healthcare	1.13	(1.02-1.26)	0.021	1.54	(1.33-1.77)	<0.001	1.13	(0.99-1.30)	0.079	2.04	(1.73-2.42)	<0.001
Adjusted Model												
Discrimination in Healthcare	1.11	(0.99-1.24)	0.066	1.38	(1.18-1.61)	<0.001	1.04	(0.89-1.20)	0.629	1.62	(1.35-1.95)	<0.001
Age	1.02	(1.02-1.03)	<0.001	1.02	(1.01-1.03)	<0.001	1.02	(1.02-1.03)	<0.001	1.01	(0.99-1.02)	0.379
Male	0.72	(0.66-0.79)	<0.001	0.74	(0.65-0.85)	<0.001	0.77	(0.68-0.87)	<0.001	0.68	(0.57-0.80)	<0.001
Non-Hispanic Black	0.81	(0.72-0.91)	<0.001	0.79	(0.66-0.94)	0.007	0.69	(0.59-0.81)	<0.001	0.62	(0.50-0.78)	<0.001
Hispanic	0.80	(0.67-0.95)	0.011	1.04	(0.81-1.33)	0.755	0.86	(0.68-1.08)	0.188	0.56	(0.39-0.82)	0.003
Married	1.09	(0.99-1.20)	0.068	0.91	(0.79-1.04)	0.175	0.98	(0.87-1.11)	0.773	1.09	(0.92-1.30)	0.339
Education	1.07	(1.05-1.09)	<0.001	1.08	(1.05-1.11)	<0.001	1.08	(1.06-1.11)	<0.001	1.10	(1.07-1.14)	<0.001
Wealth	1.00	(0.99-1.01)	0.922	0.97	(0.96-0.99)	0.008	0.97	(0.96-0.99)	0.004	0.98	(0.96-1.00)	0.11
Uninsured	0.87	(0.73-1.03)	0.111	0.50	(0.37-0.68)	<0.001	0.77	(0.60-0.98)	0.034	0.50	(0.34-0.74)	0.001
Smoking Status												
Former Smoker	1.12	(1.02-1.23)	0.018	1.26	(1.10-1.45)	0.001	1.24	(1.09-1.41)	0.001	1.20	(1.00-1.43)	0.049
Current Smoker	0.97	(0.85-1.11)	0.651	1.11	(0.92-1.36)	0.280	1.23	(1.03-1.46)	0.024	1.17	(0.92-1.48)	0.212
Drinking Status												
No Consumption (0 drinks)	1.02	(0.91-1.13)	0.781	1.43	(1.20-1.69)	<0.001	1.25	(1.08-1.46)	0.003	1.73	(1.37-2.18)	<0.001
Heavy Consumption (3+ drinks)	1.01	(0.89-1.15)	0.878	1.14	(0.92-1.41)	0.237	1.15	(0.95-1.38)	0.144	1.46	(1.10-1.95)	0.009
Physically Inactive	1.08	(0.99-1.18)	0.085	1.62	(1.41-1.86)	<0.001	1.25	(1.11-1.42)	<0.001	1.61	(1.35-1.92)	<0.001
Activities of Daily Living	1.10	(1.03-1.18)	0.005	1.32	(1.23-1.43)	<0.001	1.22	(1.13-1.32)	<0.001	1.44	(1.33-1.56)	<0.001
BMI	1.01	(1.01-1.02)	0.001	1.00	(0.99-1.01)	0.608	1.01	(1.00-1.02)	0.090	1.01	(1.00-1.03)	0.058
Hypertension	1.57	(1.44-1.73)	<0.001	1.82	(1.58-2.10)	<0.001	1.65	(1.45-1.87)	<0.001	1.62	(1.35-1.94)	<0.001
Heart Problem	1.45	(1.28-1.65)	<0.001	2.13	(1.81-2.49)	<0.001	1.75	(1.51-2.04)	<0.001	2.65	(2.20-3.20)	<0.001
Stroke	1.09	(0.88-1.33)	0.435	1.38	(1.07-1.77)	0.013	1.21	(0.95-1.55)	0.121	1.74	(1.32-2.30)	<0.001
Diabetes	1.94	(1.72-2.20)	<0.001	2.21	(1.88-2.60)	<0.001	2.27	(1.95-2.64)	<0.001	2.61	(2.15-3.16)	<0.001
Cancer	1.40	(1.21-1.61)	<0.001	2.38	(1.99-2.86)	<0.001	1.72	(1.44-2.06)	<0.001	2.46	(1.98-3.06)	<0.001
Arthritis	1.53	(1.40-1.68)	<0.001	2.02	(1.76-2.32)	<0.001	1.97	(1.74-2.23)	<0.001	2.80	(2.33-3.38)	<0.001
Psychiatric Condition	1.78	(1.56-2.03)	<0.001	2.04	(1.72-2.42)	<0.001	2.337	(2.00-2.73)	<0.001	3.35	(2.77-4.06)	<0.001

Figure 2. Multinomial Estimates of Association between Discrimination in Healthcare Settings and Trajectory Group Membership with varying Comparator Groups based on the Similar Number of Doctor Visits, Health and Retirement Study (N=13,422)



Note: Models adjust for sociodemographic background, health behaviors, and general health status. Reference categories are indicated with parenthesis. **= $p < 0.01$ ***= $p < 0.001$. Abbreviations: RRR = Relative Risk Ratio.

