Published in final edited form as:
Prev Med. 2008 August ; 47(2): 161–166. doi:10.1016/j.ypmed.2008.05.009.

Does Differential Prophylactic Aspirin Use Contribute to Racial and Geographic Disparities in Stroke and Coronary Heart Disease (CHD)?

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Abstract

Context—Aspirin use may reduce the risk of stroke and CHD. Differential use for vascular prophylaxis may contribute to racial and geographic disparities in stroke and CHD morbidity or mortality.

Objective—To assess the prevalence and predictors of aspirin use for primary prophylaxis of stroke in the general population free of clinically diagnosed stroke or CHD.

Design and Setting—Cross-sectional analysis of 16,908 participants (age 45 or greater), from a population-based national cohort study (REasons for Geographic And Racial Differences in Stroke) enrolled from February 2003-August 2006 with oversampling from the southeastern Stroke Belt and African Americans. Individuals with a prior stroke or CHD, or regular use of aspirin for pain relief were excluded from analyses.

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Main Outcome Measures—Aspirin use and reasons for use were assessed using a computer-assisted telephone interview.

Results—Prophylactic aspirin use was substantially higher among whites (34.7%) than African Americans (27.2%; p < 0.0001). There was a higher prevalence of aspirin use for prophylaxis in the Stroke Belt (32.1%) than in the rest of the nation (30.8%; p=0.07). After adjustment for measures of socioeconomic status, the odds ratio of aspirin use in the rest of the nation compared to Stroke Belt was 0.90 (95% CI 0.84,0.97). There was a higher likelihood of prophylactic aspirin use among participants who were white, male, older, past cigarette smokers, or of higher socioeconomic status (higher income or education).

Conclusions—In this study, aspirin use to prevent stroke and CHD was higher among whites than African Americans, raising the possibility that differential aspirin use could contribute to the racial disparities in vascular disease mortality. Counter to our hypothesis, aspirin use was more common in the Stroke Belt than the rest of the country, so differential aspirin use in the Stroke Belt is unlikely to contribute to geographic disparities in stroke.

Précis—In this cross-sectional analysis of 16,908 participants, aspirin use was more common in the Stroke Belt than the rest of the country.

Keywords

Aspirin; Stroke; Stroke Belt; Geographic Disparities

Introduction 2898

The reason(s) for the high stroke mortality in the "Stroke Belt" remains incompletely explained. The well-documented Stroke Belt region is associated with ~ 40% to 50% higher stroke mortality than other regions. Recent reports identify at least 10 published hypotheses of the causes of the Stroke Belt, including SES differences, quality of health care, lifestyle, CVD risk factors and hypertension. Additionally, overall stroke mortality rates are 50% higher in African Americans compared to whites with a larger disparity at younger ages, but, the standard risk factors explain only about 30-40% of the racial difference.

There are few reported data on aspirin use by race and geographic region. As a result, we evaluated the use of aspirin taken for primary prophylaxis of stroke and CHD in the The REasons for Geographic And Racial Differences in Stroke (REGARDS) study. We postulated that differences between prophylactic aspirin use would be lower in the Stroke Belt than in other regions and in blacks compared to whites. We were also interested in patterns of use of prophylactic aspirin and differences across these geographic and racial populations.

METHODS

Study Population

REGARDS is a national cohort of community dwelling individuals over age 45 years recruited with approximately equal representation of whites and blacks, men and women. Twenty percent of the sample was randomly selected from the "buckle" of the Stroke Belt (coastal plain region of North Carolina, South Carolina, and Georgia), 30% from the Stroke Belt states (remainder of North Carolina, South Carolina, and Georgia plus Alabama, Mississippi, Tennessee, Arkansas, and Louisiana), and the remaining 50% from the other 40 contiguous states. Individuals were identified from commercially available lists of residents, and recruited using an initial mailing followed by telephone contact. Between January 25, 2003 and September 19, 2006, 248,005 telephone numbers were called to recruit participants. Defined according to standards recommended by Morton et al, (2006) the response rate was 44.7% (36,983/82,834), and the cooperation rate was 64.6% (36,983/57,253).

Demographic information and medical history were obtained by trained interviewers using a computer-assisted telephone interview (CATI). Consent was obtained verbally by telephone and subsequently in writing during a follow-up in-home visit. A brief physical exam including anthropometric and blood pressure measurements, blood samples, and an electrocardiogram was conducted in-person, 3-4 weeks after the telephone interview. Participants were followed by telephone at six-month intervals for surveillance of medical events including potential stroke events. The study methods were reviewed and approved by all involved Institutional Review Boards. Additional methodological details are provided elsewhere

As of August 31, 2006, REGARDS had enrolled and examined 24,271 participants. We excluded 4,186 participants self-reporting CHD (defined as any self-reported myocardial infarction/heart attack, coronary artery bypass surgery, coronary angioplasty with or without stenting, or evidence of myocardial infarction from ECG), 1659 self-reporting stroke, and 883 self reporting both stroke and CHD. In addition, we excluded an additional 624 participants who were using aspirin for pain relief, and 11 participants for whom we were unable to determine the indication for aspirin use. This resulted in an analysis cohort of 16,908 participants who were considered prophylactic aspirin users.

The primary independent variables were self-described race (or current residency in the "Stroke Belt"). Factors considered as potentially confounding the relation between region and race with aspirin use were grouped into demographic measures, measures of socio-economic status, and cardiovascular risk factors. Demographic factors included age (defined in 10-year strata starting with age 45) and gender. Measures of socio-economic status included family income and education (defined in strata see table 2). Cardiovascular risk factors included self-reported perceived health (on as 5-point scale from Poor to Excellent), hypertension (SBP>140 mmHg, or DBP > 90 mmHg, or self-reported use of antihypetensive medications), diabetes (fasting glucose > 126 mg/dL or non-fasting glucose > 200 mg/dL or self-reported use of diabetes medications), dyslipidemia (total cholesterol ≥ 240 mg/dL, low-density cholesterol ≥ 160 mg/dL, high density cholesterol ≤ 40 or self reported use of lipid lowering medications), smoking status (never, past, or current), and alcohol use (never, past, or current).

Finally, the prevalence of prophylactic aspirin use was also examined by quartile of the Framingham Coronary Disease Risk Score (FCDRS), which were used as summary indexes of the coronary disease and stroke risk factor burden (respectively) for each participant. These scores reflect the 10-year probability of CHD or stroke given the individual's demographic and risk factor profile. The FCDRS includes age, sex, systolic blood pressure, diastolic blood pressure, total cholesterol, high density cholesterol, diabetes and current cigarette smoking. The FSRS includes age, sex, history of heart disease, systolic blood pressure, use of anti-hypertensive medications, diabetes, current cigarette smoking, atrial fibrillation and left ventricular hypertrophy (LVH). LVH was defined by centrally adjudicated ECG using the Minnesota code. Atrial fibrillation was assessed by self-report or the study ECG.

Statistical Analysis—The primary goal of the analysis was assess racial and geographic variations in prophylactic aspirin use. The modeling approach was taken to first describe univariate differences (Table 1), and then describe associations in incremental models to allow the reader to assess the impact potential confounding variables on these associations. These models followed the logic of first adjusting for demographic factors that are inherent to the individual, with additional adjustment for socioeconomic status characteristics of the individual related to access to health care. There was then additional adjustment for prevalent risk factors reflecting the participants health status. The univariate correlates of prophylactic aspirin use were assessed among the predictors described above using Chi-square testing (SAS 9.1, Cary, NC).

Logistic regression was employed to assess the multivariable association between participant characteristics and aspirin use in a set of incremental models, first considering demographic factors (age, race, sex, and region), then adding indices of SES (income and education), then perceived general health, and finally, self-reported CVD risk factors (hypertension, diabetes, dyslipidemia, cigarette smoking and alcohol use). The focus of these analyses was to address the question of differential elective aspirin use among generally healthy individuals for prevention of cardiovascular diseases. The very small number of regularly taking aspirin for pain relief (624 or 2.6% of participants) were deleted from the analysis because the conditions requiring treatment may themselves be associated with increased risk for incident cardiovascular disease (for example, rheumatoid arthritis or other inflammatory processes). Regional differences in these underlying diseases would confound the potential positive benefit of prophylactic aspirin use.

In an analysis limited to those using aspirin for prophylaxis only, logistic regression was employed to identify factors associated with the use of high (325mg) dose with low (80-175 mg) dose ASA. Finally, associations of the primary and confounding factors with joint prophylactic use of aspirin and other non-steroidal pain relievers were considered.

RESULTS

Of the 16,908 participants included in the analysis, 5311 (31.5%) reported prophylactic aspirin use (see Table 1). Aspirin use was more common among whites (34.7%) than African Americans (27.2%, $p \leq 0.0001$). Residents of the Stroke Belt were slightly more likely to use aspirin for prophylaxis (32.1%) compared to 30.8% in other regions (P=0.07). Counter to our hypothesis, the incremental multivariable models predicting prophylactic aspirin use (Table 2) demonstrated that after adjustment for SES the odds of aspirin use in the Stroke Belt region were approximately10% greater than the rest of the nation (p = 0.005). Further adjustment for other risk factors modestly mediated the magnitude of the association (OR changing from 0.90 to 0.93) and somewhat reduced the level of significance (from p= 0.0054 to 0.0476). The multivariable models also suggest higher prophylactic aspirin use among older participants, with those over 65 years having nearly a 3-fold higher odds of using aspirin than participants aged 45-54. Higher income and education, hypertension, diabetes, dyslipidemia, former smoking, and current alcohol use were also associated with greater odds of aspirin use. Other factors associated with higher use of prophylactic aspirin were male sex, older age, higher income or education, hypertension, diabetes, dyslipidemia, current alcohol use, past cigarette use, and high Framingham CHD or Stroke risk score. Prophylactic aspirin use did not differ by self-perceived health.

The demographic factor-adjusted odds ratio of aspirin use in black participants was 0.75, indicating they had a 25% lower odds of using aspirin than whites. While adjustment for SES measures partially attenuated this estimate, (odds increasing from 0.75 to 0.82), further adjustment for risk factors yielded an odds ratio of 0.71 (95% CI 0.65-0.77).

Of those using aspirin for prophylaxis, the majority (75%) took self-reported low dosages of 175 mg daily or less (see Table 3), While there was no geographic difference in the aspirin dose (p = 0.079), the use of 175 mg daily or less of aspirin was more common than the use of 325 mg daily or more in whites (77.3%) than African Americans (70.9%), and in women (79.1%) than men (71.1%). Use of low dose aspirin was also more common among those of a higher socio-economic status (higher income and more education), without diabetes, never smokers, current or never alcohol intake, and at higher coronary risk as indexed by the FCRS and FSRS. Few participants used concomitant aspirin and NSAIDs (4.4%), If one wishes to put these data into some kind of theoretical clinical perspective, and one assumes the 20% reduction seen in meta-analyses is consistent between the races, our finding of a 34.7% use of aspirin in whites would be associated with a population reduction in stroke of 6.9% (0.20 × 0.347), while the same reduction in African Americans would be 5.4% (0.20 × 0.272), or a 1.5% difference in stroke risk between the groups. In the age-range included in REGARDS (age 45 and over), African Americans have a stroke incidence that is approximately 40% higher than whites (Kissela et al, 2004), and these results suggest that approximately 3.8% (1.5/40) of this excess incidence in African Americans is potentially attributable to the higher aspirin use among whites. These racial differences in rates of prophylactic aspirin use were relatively unaffected by covariate adjustment for potential confounding factors.

DISCUSSION

We hypothesized that use of aspirin might be lower in the stroke belt regions, and that this lower aspirin use could contribute to an increased stroke incidence in the stroke belt. Counter to our hypothesis, rather than finding a lower rate of aspirin use in the stroke belt, the use of aspirin was actually approximately 6-10% higher than in other regions compared to the stroke belt (unadjusted OR 0.94: 95% CI 0.88 -1.00, adjusted OR 0.90, 95% CI 0.84-0.97 - see Table 2). Aspirin use was more common among whites (34.7%) compared to African Americans (27.2%, p≤0.0001), so that a larger proportion of whites might enjoy the protective benefits of aspirin for stroke and heart disease prevention. Thus, differential aspirin use could contribute to the known racial disparity in stroke mortality. Meta-analyses suggest that use of aspirin is associated with approximately a 20% reduction in the risk of stroke. Importantly, there are few published data that test the assumption of equal efficacy of aspirin in African American and white populations, a question that will be assessed as stroke events accrue in the REGARDS study. While it is illogical to discuss the proportion of the geographic excess of stroke that can be explained by the higher use of a protective treatment in the high-risk region, one could speculate on the impact of the lower aspirin use among African Americans on the racial disparity in stroke risk. If one assumes that African Americans are suffering approximately 52.5% higher stroke mortality than their white counterparts both among those using and not using aspirin, that the 27.2% prevalence of aspirin use estimated herein is representative nationally, and that aspirin is associated with 30% benefit, then the estimated racial difference in stroke risk is 40.0% ((0.272 × 1.525 × (1 - 0.30)) + (0.728 × 1.525) = 1.40) which is approximately the observed racial disparity. However, if the prevalence of aspirin use could be modified to the 34.7% in whites (an additional 7.5% of African Americans receive the 30% benefit of aspirin) and no other changes are made, then similar calculations result in an estimated racial disparity of 36.6%. Hence, one may speculate that the racial disparity of aspirin could reduce the racial disparity in stroke from 40.0% to 36.6%, and hence accounts for 8.6% ((40.0 - 36.6) / 40.0 = 0.086 or 8.6%) of the racial disparity in stroke.

Results of this study are similar to previous findings in smaller studies that investigated racial disparities in prevalence of aspirin use. Brown et al, using data collected from the Behavioral Risk Factor Surveillance System (BRFSS) reported a prevalence of aspirin use of 37.1% in whites and 28.6% in African Americans. The Third National Health and Nutrition Examination Survey (NHANES III) reported data on prevalence of aspirin use in patients with diabetes. Adults surveyed (n=1503) were considered to be regular aspirin users if they took aspirin ≥15 times during the previous month. Among the participants that did not report history of CVD, 13% used aspirin regularly. Non-Hispanic whites were 2.5 times as likely to use aspirin regularly as non-Hispanic blacks, Mexican-Americans, or individuals of other races. The odds of regular aspirin use, which increased with age, were greater for individuals >40 years than for those 21 - 39 years of age. The NHANES data revealed no significant differences in regular aspirin use by sex, educational attainment, or family income. The REGARDS study findings of greater aspirin use in males and in those with greater socioeconomic status may be a function of the greater variety of patients (patients with and without diabetes) and the greater sample size of REGARDS

One ARIC study analyzed data on aspirin use in a 2 week period from population based samples in four US communities. Results from the ARIC study support our findings of greater aspirin use for vascular prophylaxis in white, male, and higher stroke risk patients. In the ARIC study 30% of whites and 11% of blacks reported routine use of aspirin. In contrast to the findings in the REGARDS study, there was considerable variation in the prevalence of aspirin use among the four centers of the ARIC study, with Jackson Mississippi (a stroke belt state) having the lowest prevalence of aspirin use while Minneapolis (non-stroke belt state) having the highest prevalence. Also, in contrast to the current findings, in ARIC, there was an inverse relationship between self-perceived general health and aspirin use. These different findings may be attributed to a smaller sample size in ARIC and to the limited geographic area of participant residence, **or to temporal changes from 1996 to the data assessed in this study.**

Rondondi and colleagues assessed aspirin use for primary prophylaxis of CHD in older adults in 2163 subjects. Similar to the findings in the REGARDS study, aspirin use was less frequent among black participants (13%) compared to white participants (20%). In contrast to REGARDS findings was the absence of a correlation between diabetes and increased prevalence of aspirin use. Data from the Rondondi study were collected in 1997-98 and 2002-2003. This may indicate a trend toward greater aspirin use in patients with diabetes. Apparently, the message to use aspirin in higher risk populations is being heard. Specifically, in our analysis, there was a 50-70% higher odds of aspirin use in those patients with hypertension, diabetes, or dyslipidemia after accounting for other factors. Also, there were increases in aspirin use across the quartiles of the Framingham heart disease and stroke risk scores.

Socio-economic status proved to be a confounder since there was clearly a lower likelihood of aspirin use among participants with lower socio-economic status (see discussion below), and there was lower socio-economic status in the Stroke Belt relative to the rest of the nation. As such, without adjustment for socio-economic status the magnitude of the lower rates of aspirin use in the rest of the nation relative to the Stroke Belt are underestimated (i.e., it is lower in the rest of the nation despite the rest of the nation having a higher socio-economic status).

The REGARDS study is subject to several limitations. Aspirin use and the presence of some risk factors were based on self report **(ie the risk factors taken by the CATI vs those that were laboratory results)**. Also, aspirin use in the REGARDS study was determined by telephone interview. Individuals without telephones were excluded from selection into the study population. These individuals may be of lower socioeconomic status and therefore be less likely to be taking aspirin for vascular prophylaxis. This could have resulted in inflating the number of individuals in the population who are taking aspirin for prophylaxis. Further, we do not have data to address the issue of participants with aspirin contraindications such as allergy or intolerance, bleeding disorders, or anticoagulant therapy; we are assuming (as treating physicians do) that aspirin use by residents of a region or by members of a race will have an overall average benefit similar to those members of other regions and races. For example, that the average 30% reduction of risk shown for aspirin would be similar for general residents of the stroke belt as well as from other regions (and for African Americans as well as whites).

Findings from this study suggest there is an opportunity for decreasing stroke rates through education of patients and health care providers on the importance of aspirin in stroke

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prevention, with an emphasis on increasing aspirin use in African American, female, or lower socioeconomic status patients.

Acknowledgements

This research project is supported by a cooperative agreement U01 NS041588 from the National Institute of Neurological Disorders and Stroke, National Institutes of Health, Department of Health and Human Service. The authors acknowledge the participating investigators and institutions for their valuable contributions: University of Alabama at Birmingham, Birmingham, Alabama (Study PI, Data Coordinating Center, Survey Research Unit): George Howard DrPH, Leslie McClure PhD, Virginia Howard MSPH, Libby Wagner MA, Virginia Wadley PhD, Rodney Go PhD; University of Vermont (Central Laboratory): Mary Cushman MD; Wake Forest University (ECG Reading Center): Ron Prineas MD PhD; Alabama Neurological Institute (Stroke Validation Center, Medical Monitoring): Camilo Gomez MD, David Rhodes RN, Susanna Bowling MD; University of Arkansas for Medical Sciences (Survey Research): LeaVonne Pulley PhD; University of Cincinnati: Brett Kissela MD, Dawn Kleindorfer MD; Examination Management Services Incorporated (In-Person Visits): Andra Graham; National Institute of Neurological Disorders and Stroke, National Institutes of Health (funding agency): Claudia Moy, Ph.D.

Representatives of the funding agency have been involved in the review and approval of the manuscript but not directly involved in the collection, management, analysis or interpretation of the data.

References

Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomized trials of antiplatelet therapy for the prevention of death, myocardial infarction and stroke in high risk patients. BMJ 2002;324:71–86. [PubMed: 11786451]2002

Berger JS, Roncaglioni MC, Avanzini F, Pangrazz Ii, Tognoni G, Brown DL. Aspirin for the Primary Prevention of Cardiovascular Events in Women and Men Sex-Specific Meta-analysis of Randomized Controlled Trials. JAMA 2006;295:306–313. [PubMed: 16418466]

Ballantyne CM, Hoogeveen RC, Bang H, Coresh J, Folsom AR, Chambless LE, Myerson M, Wu KK, Sharrett AR, Boewinkle E. Lipoprotein-Associated Phospholipase A_2, High-Sensitivity C-Reactive Protein, and Risk for Incident Ischemic Stroke in Middle-aged Men and Women in the Atherosclerosis Risk in Communities (ARIC) Study. Arch Intern Med 2005;165:2479–2484. [PubMed: 16314544] 2005

Campbell CL, Smyth S, Montalescot G, Steinhubl SR. Aspirin Doses for prevention of cardiovascular disease; A systematic review. JAMA 2007;297:1018–1024.2007

D'Agostino RB, Wolf PA, Belanger AJ, Kannel WB. Stroke risk profile: adjustment for antihypertensive medication. The Framingham Study. Stroke 1994;25(1):40–43. [PubMed: 8266381]1994

D'Agostino S, Grundy S, Sullivan LM, Wilson P, the CHD Risk Prediction Group. Validation of the Framingham Coronary Heart Disease Prediction Scores: Results of a Multiple Ethnic Groups Investigation. JAMA 2001;286(2):180–187. [PubMed: 11448281]2001

Howard VJ, Cushman M, Pulley LV, et al. The Reasons for Geographic and Racial Differences in Stroke (REGARDS) Study: Objectives and desigh. Neuroepidemiology 2005;26:135–143. [PubMed: 15990444]2005

Kissela B, Schneider A, Kleindorfer D, Khoury J, Miller R, Alwell K, Woo D, Szaflarski J, Gebel J, Moomaw C, Pancioli A, Jauch E, Shukla R, Broderick J. Stroke in a biracial population: the excess burden of stroke among blacks. Stroke 2004;35:426–431. [PubMed: 14757893]2004

Morton LM, Cahill J, Hartge P. Reporting participation in epidemiologic studies: A survey of practice. Am J Epidemiol 2006;163:197–203. [PubMed: 16339049]2006

Ridker PM, Cushman M, Stampfer MJ, et al. Inflammation, aspirin and the risk of cardiovascular disease in apparently healthy en. NEJM 1997;336:973–979. [PubMed: 9077376]1997

Rodondi N, Vittinghoff E, Cornuz J, Butler J, Ding J, Satterfield S, Newman AB, Harris TB, Hulley SB, Bauer DC, Health, Aging, and body composition study research group. Aspirin use for the primary prevention of coronary heart disease in older adults. Am J Med Nov;2005 119(11):1288. [PubMed: 16271917]2005

Rolka DB, Fagot-Campagna A, Narayan KM. Aspirin use among adults with diabetes: estimates from the Third National Health and Nutrition Examination Survey. Diabetes Care 2001;24(2):197–201. [PubMed: 11213865]2001

Shahar E, Folsom AR, Romm FJ, Bisgard KM, Metcalf PA, Crum L, McGovern PG, Hutchinson RG, Heiss G. Patterns of aspirin use in middle-aged adults: The atherosclerosis risk in communities (ARIC) study. Am Heart J May;1996 131(5):915–922. [PubMed: 8615310]1996

Weisman SM, Graham D. Evaluation of the benefits and risks of low-dose aspirin in the secondary prevention of cardiovascular and cerebrovascular events. Arch Intern Med 2002;162:2197–2202. [PubMed: 12390062]2002

Wilson PWF, D'Agostino RB, Levy D, Belanger AM, Silbershatz H, Kannel WB. Prediction of Coronary Heart Disease Using Risk Factor Categories. Circulation 1998;97(18):1837–1847. [PubMed: 9603539]1998

Wolf PA, D'Agostino RB, Belanger AJ, Kannel WB. Probability of stroke: a risk profile from the Framingham Study. Stroke 1991;22(3):312–318. [PubMed: 2003301]1991

Table 1

Distribution of Risk Factors by Prophylactic Aspirin Use

	taking aspirin for prophylaxis			
	sample szie	taking aspirin		P value
		No.	%	
all	16908	5331	31.5	
Region				0.0696
Other regions	7968	2457	30.8	
Stroke Belt	8928	2869	32.1	
Race				<0.0001
White	9755	3383	34.7	
Black	7148	1947	27.2	
Gender				<0.0001
Male	7366	2727	37.0	
Female	9539	2604	27.3	
Age group				<0.0001
45-54	1908	324	17.0	
55-64	7104	2090	29.4	
65-74	5416	1999	36.9	
75-84	2214	829	37.4	
85+	257	88	34.2	
Income				<0.0001
<$20K	2883	804	27.9	
$20K-$34K	4005	1199	29.9	
$35K-74K	5252	1695	32.3	
$75+	2747	997	36.3	
Years of education				<0.0001
< high school	1952	569	29.1	
high school	4315	1297	30.1	
Some College	4569	1363	29.8	
College+	6060	2100	34.7	
Perceived health				0.5163
Excellent	3142	955	30.4	
Very good	5579	1764	31.6	
Good	5739	1842	32.1	
Fair	2045	638	31.2	
Poor	369	122	33.1	
hypertension				<0.0001
No	7731	1954	25.3	
Yes	9081	3347	36.9	
Diabetes				<0.0001
No	13226	3949	29.9	
Yes	3064	1230	40.1	
Dyslipidemia				<0.0001
No	7446	1908	25.6	
Yes	8826	3273	37.1	
Smoke status				<0.0001
Never	7852	2360	30.1	
Past	6640	2341	35.3	
Current	2349	609	25.9	
Alcohol use				<0.0001
Never	5024	1476	29.4	
Past	2843	857	30.1	
Current	9041	2998	33.2	
FraminghamCardiacRiskScore				<0.0001
<Q1	4030	987	24.5	
Q1-Median	4029	1301	32.3	
Median-Q3	4029	1421	35.3	
Q3 or higher	4030	1418	35.2	

		taking aspirin for prophylaxis		
	sample szie	taking aspirin		P value
		No.	%	
FraminghamStrokeRiskScore				<0.0001
<Q1	2461	450	18.3	
Q1-Median	2462	724	29.4	
Median-Q3	2463	858	34.8	
Q3 or higher	2461	955	38.8	

These cross-sectional associations are described in a national cohort (with oversampling of the southeastern "stroke belt") of African American and white participants evaluated between January 2003 and August 2006.

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Table 2

Multivariable Models Predicting Prophylactic Aspirin Use

	DF (16885 cases)				DF+SES (14858 cases)				DF+SES+CD+RF (14007 cases)			
	OR	95% CI		P value	OR	95% CI		P value	OR	95% CI		P value
Region												
Other regions vs Stroke Belt	0.94	0.88	1.00	0.0536	0.90	0.84	0.97	0.0054	0.93	0.86	1.00	0.0476
Race												
Black vs White	0.75	0.70	0.80	<.0001	0.82	0.76	0.88	<.0001	0.71	0.65	0.77	<.0001
Gender												
Female vs Male	0.67	0.63	0.72	<.0001	0.71	0.66	0.77	<.0001	0.75	0.69	0.81	<.0001
Age group												
55-64 vs 45-54	1.96	1.72	2.23	0.1732	2.01	1.75	2.31	0.0128	1.81	1.57	2.09	0.0098
65-74 vs 45-54	2.74	2.40	3.13	<.0001	2.97	2.58	3.43	<.0001	2.53	2.18	2.94	<.0001
75-84 vs 45-54	2.78	2.40	3.22	<.0001	3.11	2.64	3.66	<.0001	2.63	2.21	3.12	<.0001
85+ vs 45-54	2.50	1.88	3.33	0.0729	2.95	2.15	4.05	0.0186	2.85	2.04	3.99	0.0069
Income												
$20K-$34K vs <$20K					1.02	0.91	1.14	0.0004	1.04	0.93	1.17	0.0005
$35K-74K vs <$20K					1.15	1.03	1.29	0.7166	1.18	1.05	1.34	0.8087
$75+ vs <$20K					1.44	1.26	1.66	<.0001	1.53	1.32	1.78	<.0001
Years of education												
high school vs < high school					1.01	0.88	1.15	0.5552	1.02	0.88	1.17	0.2592
Some College vs <high school					0.99	0.86	1.13	0.2337	1.04	0.90	1.20	0.6220
College+ vs< high school					1.11	0.97	1.28	0.0111	1.19	1.02	1.37	0.0011
Perceived health												
Fair vs Excellent									1.10	0.95	1.27	0.4037
Good vs Excellent									1.06	0.95	1.19	0.8014
Poor vs Excellent									1.09	0.83	1.44	0.7126
Very good vs Excellent									1.00	0.90	1.12	0.2661
Hypertension												
Yes vs No									1.72	1.59	1.86	<.0001
Diabetes												
Yes vs No									1.52	1.38	1.67	<.0001
Dislipidemia												
Yes vs No									1.49	1.38	1.61	<.0001
Smoke status												
Past vs Never									1.08	1.00	1.18	0.0003
Current vs Never									0.86	0.77	0.98	0.0014
Alcohol use												
Past vs Never									0.98	0.87	1.11	0.1329
Current vs Never									1.13	1.03	1.25	0.0011

DF= demographic factors; SES = socioeconomic status; CD = cardiac disease, RF = risk factor

These cross-sectional associations are described in a national cohort (with oversampling of the southeastern “stroke belt”) of African American and white participants evaluated between January 2003 and August 2006.

Table 3

Dose of aspirin taken for prophylaxis

		# of taking	Dose (percent)		P value
			80-175mg	325mg or more	
Total		5242	75.0	25.0	
Region	Other regions	2416	74.8	25.2	0.7885
	Stroke Belt	2821	75.1	24.9	
Race	White	3347	77.3	22.7	<0.0001
	Black	1894	70.9	29.1	
Gender	Male	2682	71.1	28.9	<0.0001
	Female	2560	79.1	20.9	
Age Group	45-54	322	74.2	25.8	0.0665
	55-64	2052	73.5	26.5	
	65-74	1976	77.1	22.9	
	75-84	807	74.6	25.4	
	85+	84	69.1	31.0	
Income	<$20K	788	68.8	31.2	<0.0001
	$20K-$34K	1175	75.0	25.0	
	$35K-74K	1683	75.0	25.0	
	$75+	983	78.2	21.8	
Years of Education	LT HS	551	67.7	32.3	<0.0001
	HS	1265	74.6	25.5	
	Some College	1349	74.2	25.8	
	College+	2075	77.7	22.3	
Perceived Health	Excellent	944	77.9	22.1	0.0074
	Very good	1736	76.3	23.7	
	Good	1814	73.6	26.4	
	Fair	621	72.5	27.5	
	Poor	117	66.7	33.3	
Hypertension	No	1921	76.2	23.8	0.1231
	Yes	3291	74.3	25.7	
Diabetes	No	3893	75.8	24.3	0.0150
	Yes	1201	72.3	27.7	
Dyslipidemia	No	1884	75.0	25.0	0.8538
	Yes	3217	74.8	25.2	
Smoking Status	Never	2329	78.2	21.8	<0.0001
	Past	2292	74.0	26.1	
	Current	600	66.2	33.8	
Alcohol Use	Never	1447	76.0	24.1	0.0046
	Past	837	70.5	29.5	
	Current	2958	75.8	24.2	
Framingham Coronary Risk Score	<Q1	977	80.5	19.6	<0.0001
	Q1-Median	1288	78.3	21.7	
	Median-Q3	1400	75.4	24.6	
	Q3 or higher	1377	67.3	32.8	
Framingham Stroke Risk Function	<Q1	446	80.3	19.7	0.6046
	Q1-Median	714	80.4	19.6	
	Median-Q3	849	78.2	21.8	
	Q3 or higher	927	78.3	21.7	

These cross-sectional associations are described in a national cohort (with oversampling of the southeastern "stroke belt") of African American and white participants evaluated between January 2003 and August 2006.

Table 4

Joint use of aspirin and Non-steroidal agents

		Sample size	Pattern used (percent)				P value
			Neither	Aspirin alone	NSAIDS alone	Both	
Total		16858	58.8	27.1	9.7	4.4	
Region	Other regions	7950	59.9	26.8	9.2	4.0	0.0041
	Stroke Belt	8896	57.8	27.3	10.1	4.8	
Race	White	9726	54.6	29.2	10.7	5.4	<0.0001
	Black	7127	64.5	24.2	8.3	3.1	
Gender	Male	7347	56.3	32.9	6.7	4.1	<0.0001
	Female	9508	60.7	22.6	11.9	4.7	
Age Group	45-54	1902	71.5	14.7	11.5	2.3	<0.0001
	55-64	7089	59.4	24.8	11.1	4.6	
	65-74	5403	54.8	32.0	8.3	4.9	
	75-84	2199	55.2	32.5	7.4	5.0	
	85+	256	61.3	32.0	4.3	2.3	
Income	<$20K	2872	61.7	23.9	10.4	4.0	<0.0001
	$20K-$34K	3994	61.0	25.5	9.1	4.4	
	$35K-74K	5242	57.9	28.0	9.8	4.3	
	$75+	2739	54.1	31.0	9.5	5.3	
Years of Education	<high school	1942	62.4	25.1	8.4	4.1	<0.0001
	high school	4302	60.2	26.0	9.7	4.1	
	Some College	4554	59.6	25.3	10.6	4.5	
	College+	6048	56.0	29.8	9.4	4.8	
Perceived Health	Excellent	3138	62.3	26.7	7.3	3.7	<0.0001
	Very good	5569	59.7	27.7	8.6	3.9	
	Good	5720	57.4	27.2	10.5	5.0	
	Fair	2032	56.2	25.8	12.6	5.4	
	Poor	365	50.1	27.4	17.0	5.5	
Hypertension	No	7716	64.9	22.2	9.8	3.1	<0.0001
	Yes	9046	53.6	31.3	9.6	5.5	
Diabetes	No	13189	60.1	25.6	10.00	4.3	<0.0001
	Yes	3055	51.9	35.0	7.99	5.1	
Dyslipidemia	No	7425	64.3	22.2	10.03	3.5	<0.0001
	Yes	8803	53.7	31.7	9.25	5.4	
Smoking Status	Never	7837	60.9	25.8	9.02	4.3	<0.0001
	Past	6614	54.6	30.2	10.1	5.1	
	Current	2340	63.4	22.6	10.7	3.3	
Alcohol Use	Never	5014	61.9	25.4	8.7	4.0	<0.0001
	Past	2833	59.9	26.3	10.0	3.8	
	Current	9011	56.7	28.3	10.1	4.9	
Framingham Coronary Risk Score	<Q1	4022	63.7	20.4	11.8	4.1	<0.0001
	Q1-Median	4019	57.3	27.2	10.4	5.2	
	Median-Q3	4015	56.0	30.7	8.7	4.6	
	Q3 or higher	4016	57.1	31.2	7.7	4.0	
Famingham Stroke Risk Score	<Q1	2454	68.5	15.0	13.2	3.3	<0.0001
	Q1-Median	2456	60.6	25.2	10.0	4.2	
	Median-Q3	2455	54.5	29.3	10.6	5.6	
	Q3 or higher	2449	53.3	33.1	7.9	5.7	

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