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Low-dose aspirin for primary prevention of cardiovascular disease: Trends in use patterns among African American adults in Minnesota, 2015–2019

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ABSTRACT

Cardiovascular disease (CVD) disproportionately affects African Americans. Aspirin has long been recommended to reduce cardiovascular events. However, national guideline changes in 2016 limited the aspirin recommended population and several clinical trials questioning the utility of primary prevention aspirin were published in 2018. In light of the recent guidelines and study findings, we investigated primary prevention aspirin use among urban African American adults. Using three cross-sectional surveys, we collected data from self-identified African Americans with no CVD in 2015, 2017 and 2019, querying information on CVD risk factors, health behaviors and beliefs, and aspirin use. Poisson regression modeling was used to estimate age- and risk-factor adjusted aspirin prevalence, trends and associations. A total of 1491 African Americans adults, ages 45–79, were included in this analysis; 61% were women. There was no change in age- and risk factor-adjusted aspirin use over the 3 surveys for women (37%, 34% and 35% respectively) or men (27%, 25%, 30% respectively). However, fewer participants believed aspirin was helpful in 2019 compared to 2015—75% versus 84% ($p < 0.001$). Aspirin discussions with a health care practitioner were highly associated with aspirin use (adjusted RR 2.97, 95% CI 2.49–3.54) and aspirin use was 2.56 times higher (adjusted RR 95% CI 2.17–3.03) in respondents who agreed that people close to them thought they should take aspirin compared with those who disagreed or did not know. Despite major changes in national guidelines, overall primary prevention aspirin use did not significantly change in these African American samples from 2015 to 2019.

1. Introduction

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in the United States (Virani et al., 2020). Aspirin has long been recommended as a clinical and public health strategy to reduce the risk of a CV event. In the past several years, however, recommendations and messaging around the safety and appropriateness of taking aspirin to prevent an initial CV event—primary prevention—have changed. The 2016 United States Preventive Services Task Force (USPSTF) recommendations limited primary prevention aspirin use to those 50–69 years with ≥10% CVD risk over 10 years, narrowing the eligible population compared with the 2009 USPSTF recommendations (Bibbins-Domingo, 2016). Then in 2018, 3 large clinical trials were published highlighting the balance between CVD risk reduction and increased bleeding risk of low-dose aspirin (ASCEND Study Collaborative Group, 2018; Gaziano et al., 2018; McNeil et al., 2018). After the publication of these newer data, the 2019 American College of Cardiology/American Heart Association (ACC/AHA) guideline on the primary prevention of CVD recommended infrequent primary prevention aspirin use as one of its ten take home messages. Notably, the guideline still allowed limited aspirin use for those 40–70 years old when CVD risk outweighed bleeding risk (Arnett et al., 2019).

African Americans are disproportionately impacted by CVD compared with white adults.[1] In Minnesota, heart disease mortality in
African American adults is approximately double the morality rate for whites ages 35–64 (Heart Disease - Minnesota Department of Health, 2020 https://www.health.state.mn.us). Appropriate implementation of preventive therapies is particularly important in this population and needs to be better understood. Previous analysis showed little change in preventive aspirin use in a primarily white population after the 2009 USPSTF guidelines were published (Van't Hof et al., 2017). Data on aspirin use among African Americans are conflicting and outdated (Fernandez-Jimenez et al., 2019; Sanchez et al., 2011). With changing information on aspirin's utility for primary prevention, this study sought to evaluate aspirin use among African American adults without CVD
from 2015 to 2019.

2. Methods

2.1. Study population

Three surveys were conducted in the Minneapolis-Saint Paul metropolitan area in 2015, 2017 and 2019 representing 3 unique convenience samples. Community health workers recruited Minnesota residents 45–79 years old identifying as persons of color. In 2015, women ages 55–79 were recruited reflecting the 2009 USPSTF recommendations for primary prevention aspirin use. In subsequent surveys, the age range for women was 45–79 years. Recruitment sites included health and community fairs, churches, gyms, senior housing and community centers. All individuals gave verbal consent and were offered a $10 gift card for participation. The University of Minnesota IRB evaluated and approved this study.

A total of 2417 individuals were enrolled. For this analysis, we included 1491 participants who identified as Black or African American, did not have a history of CVD (self-reported history of heart attack, stroke or peripheral artery disease, or a revascularization procedure for the coronary, carotid or limb arteries), and had complete information (Fig. 1).

2.2. Data collection and study variables

Trained community health workers administered a 10-min, in- person survey. Survey questions addressed participant demographics, self-reported CVD history and risk factors, aspirin use, and aspirin- related discussions with their primary care practitioner. Additional questions examined health beliefs regarding prevention, aspirin use and social norms (Table A.1). These nine questions were formulated based on the theory of planned behavior (Ajzen, 1991) and have been used in prior studies to evaluate behaviors related to CVD risk factors and aspirin use (Norman et al., 1999; Plotnikoff et al., 2013; Van't Hof et al., 2019).

Aspirin use was defined as daily or every other day use for the purpose of preventing a heart attack or stroke. CVD risk factors included diabetes mellitus, current smoking, hypertension and hyperlipidemia. Relative contraindications to aspirin included self-reported history of gastrointestinal bleeding or ulcer, aspirin allergy or other antithrombotic medication use. Aspirin-related health beliefs and social norms were evaluated using a 4-point Likert scale (strongly agree, agree, disagree, and strongly disagree; 'don't know' responses were also recorded) that was collapsed into a 3 factorial variable (agree, disagree, don't know) and a 2 factorial variable (agree, disagree/don't know) for multivariable analyses. Ten-year CVD risk was estimated using a published formula based on self-reported CVD risk factors (Duval et al., 2020). Duval et al. calculated 10-year CVD risk using the ACC/AHA pooled cohort equation. Then using regression models they estimated the 10-year CVD risk using self-reported CVD risk factors, allowing risk estimation even when blood pressure and laboratory values are unavailable. The CVD risk estimates may be limited in this African American sample, since the formula used by Duval et al. to develop the 10-year CVD risk estimates was based on data from predominantly white participants.

2.3. Statistical analysis

Descriptive analyses report categorical data as n (%) and continuous

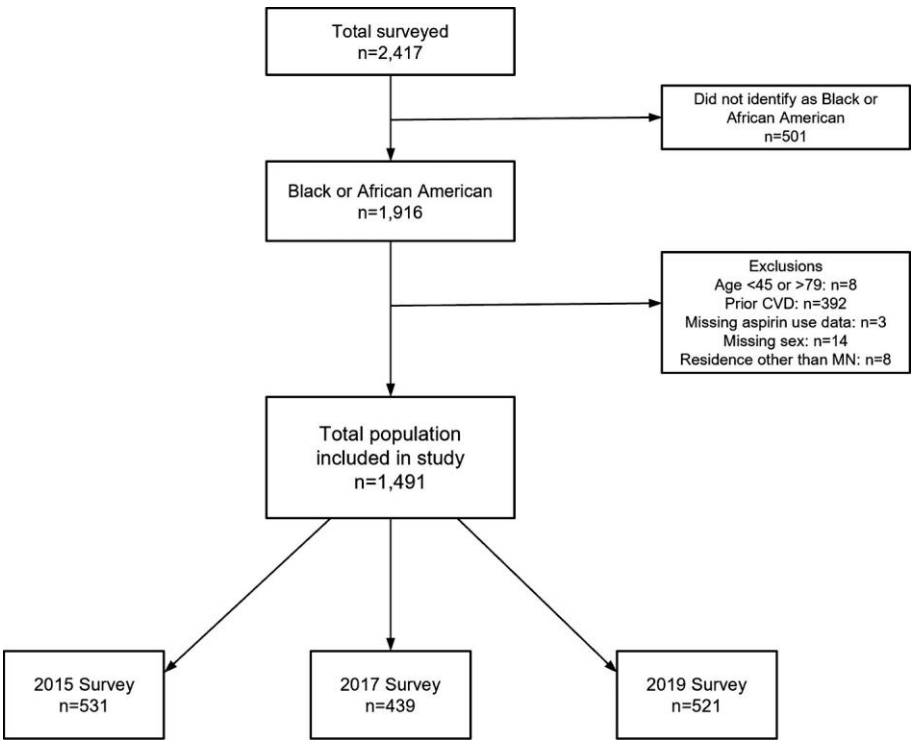

Fig. 1. Participant inclusions and exclusions. CVD indicates cardiovascular disease; MN, Minnesota.

Abbreviations: USPSTF, United States preventive services task force; AHA, American heart association; ACC, American college of cardiology; FRS, Framingham risk score; MESA, Multi-ethnic study of atherosclerosis; SCCS, Southern community cohort study; REGARDS, REasons for geographic and racial differences in stroke.

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data as median (interquartile range). Aspirin use prevalence was stratified by sex, age group and CVD risk factors. Poisson regression with robust error variance estimation was used to evaluate trends in aspirin use stratified by sex and adjusted for age and CVD risk factors. Trends in aspirin use were also assessed in subgroups for age, number of CVD risk factors and estimated 10-year CVD risk. Trends in health behavior beliefs and social norms were evaluated over the three surveys, adjusting for age, sex and CVD risk factors. Data from all three surveys were combined and Poisson regression with robust error variance was used to examine unadjusted and multivariable adjusted associations between aspirin use and age, sex, CVD risk factors, health behavior beliefs, and social norms for the entire sample. Covariates in the fully adjusted models included age, sex, CVD risk factors, and survey year. We chose Poisson regression to estimate relative risk because aspirin use was common in the study (>10%) and thus more appropriate than estimating relative risk by the odds ratio from logistic regression (Zou, 2004). All analyses were performed using Stata version 16 (Stata Corp, College Station, Texas, USA).

3. Results

A total of 1491 participants without CVD history were evaluated across 3 surveys (Fig. 1)—531 from Survey 1 (S1, 2015), 439 from Survey 2 (S2, 2017) and 521 from Survey 3 (S3, 2019). Table 1 describes participant demographics, CVD risk factors and estimated 10-year risk score by survey and stratified by sex. Median (IQR) age for women was 63 years (58–68), 60 years (51–68) and 61 years (54–68) and for men was 57 years (51–63), 58 years (52–63) and 58 years (53–66) in S1, S2, and S3 respectively. CVD risk factors were common overall; smoking prevalence was particularly high among men across surveys (38%, 30%, 30%). Nearly half of all participants had a conversation about aspirin with their healthcare practitioner in the two years prior to each survey. Influenza vaccination, an example of preventive behavior, was reasonably common, reported by 56–66% of participants (Table 1).

3.1. Aspirin use trends

After adjustment for age and CVD risk factors, aspirin use was unchanged over the three surveys (Table 2) both for women—37%, 34%, and 35% in S1, S2, S3 respectively (p for trend = 0.79); and men—27%, 25%, 30% in S1, S2, S3 respectively (p for trend = 0.62). Aspirin use was more common in older age groups (Fig. 2a and b). There appears to be a difference in aspirin use by age group, but this interaction was not significant for women (p = 0.54) or men (p = 0.76). When evaluated by number of CVD risk factors, age-adjusted aspirin use in women decreased from 22% in 2015 to 10% in 2019 in the lowest risk group

Table 2
Age adjusted regular aspirin use trend by estimated CVD risk score, stratified by sex.

	2015	2017	2019	p for trend
	Adjusted aspirin use (95% CI)	Adjusted aspirin use (95% CI)	Adjusted aspirin use (95% CI)	
Women				
Total	37%(32–42)	34%(32–37)	35%(30–39)	0.79
Estimated 10-year risk				
<10%	26%(20– 32)	20%(16–23)	23%(18–28)	0.86
≥10%	54%(46–63)	54%(49–59)	54%(46–62)	0.96
50–69 years 65) with ≥10%	53%(42–	51%(44–58)	49%(38–59)	0.59
Men				
Total	27%(23– 32)	25%(21–28)	30%(24–36)	0.62
Estimated 10-year risk				
<10%	16%(9–23)	15%(10– 20)	15%(7–23)	0.85
≥10%	32%(26–39)	36%(31–41)	36%(28–43)	0.99
50–69 years with ≥10%	30%(22–37)	32%(26–37)	32%(23–41)	0.85

Total aspirin use is adjusted for age, hypertension, hyperlipidemia, smoking and diabetes.
Data are presented as weighted means and 95% confidence intervals.
CVD indicates cardiovascular disease.

Table 1

		273	258	291	148	342	179
Age (years) Age groups		63 (58–68)	57 (51–63) 45	60 (51–68) 60	58 (52–63) 25	61 (54–68) 41	58 (53–66)
	45–49	NA[a]	(17%)	(21%)	(17%)	(12%)	23 (13%)
	50–59	89 (33%)	115 (45%)	81 (28%)	64 (43%)	102 (30%)	72 (40%)
	60–69	133 (49%)	77 (30%)	101 (35%)	41 (28%)	136 (40%)	59 (33%)
	70–79	51 (19%)	21 (8%)	49 (17%)	18 (12%)	63 (18%)	25 (14%)
Marital status	Married	71 (26%)	77 (30%)	79 (27%)	54 (36%)	110 (32%)	80 (45%)
	Single	86 (32%)	108 (42%)	112 (38%)	47 (32%)	125 (37%)	65 (36%)
	Separated/divorced	70 (26%)	52 (20%)	62 (21%)	43 (29%)	66 (19%)	31 (17%)
	Widowed	45 (17%)	16 (6%)	35 (12%)	4 (3%)	38 (11%)	3 (2%)
Education	<High school graduate	30 (11%)	33 (13%)	19 (7%)	15 (10%)	26 (7%)	18 (10%)
	High school graduate	75 (28%)	86 (33%)	62 (21%)	22 (15%)	77 (23%)	43 (24%)
	Some college	95 (34%)	83 (32%)	115 (40%)	76 (51%)	144 (42%)	82 (46%)
	College degree/graduate school	72 (26%)	54 (21%)	95 (33%)	35 (24%)	95 (28%)	36 (20%)
CVD risk factors	Current smoker	45 (16%)	99 (38%)	51 (18%)	44 (30%)	69 (20%)	53 (30%)
	Hypertension	184 (67%)	161 (62%)	190 (65%)	78 (53%)	223 (65%)	103 (58%)
	Hyperlipidemia	125 (46%)	104 (40%)	118 (41%)	44 (30%)	149 (44%)	73 (41%)

	Diabetes	72 (26%)	61 (24%)	90 (31%)	35 (24%)	101 (30%)	55 (31%)
Estimated 10-year CVD risk		8% (4–15)	13% (8–19)	6% (2–14)	12% (8–20)	7% (3–15)	14% (8–25)
Aspirin contraindications	Other antithrombotic use	9 (3%)	19 (7%)	14 (5%)	6 (4%)	17 (5%)	13 (7%)
	GI bleed or ulcer	23 (8%)	24 (9%)	18 (6%)	8 (5%)	21 (6%)	16 (9%)
	Aspirin allergy	24 (9%)	12 (5%)	10 (3%)	5 (3%)	23 (7%)	6 (3%)
Received flu vaccine		173 (63%)	157 (61%)	193 (66%)	85 (57%)	206 (60%)	100 (56%)
Doctor started conversation about aspirin		110 (40%)	88 (34%)	117 (40%)	55 (37%)	140 (41%)	63 (35%)
Patient asked doctor		55 (20%)	59 (23%)	60 (21%)	31 (21%)	89 (26%)	50 (28%)
Any aspirin discussion with doctor		127 (47%)	107 (41%)	137 (47%)	66 (45%)	173 (51%)	80 (45%)
Total number		Survey 1, 2015		Survey 2, 2017		Survey 3, 2019	
		Women	Men	Women	Men	Women	Men

Participant demographics, CVD risk factors, and health behaviors by survey, stratified by sex.

Data are presented as n(%) for categorical variables and median (interquartile range) for age and estimated 10-year risk.

CVD indicates cardiovascular disease; IQR, interquartile range; GI, gastrointestinal. [a] In the 2015 survey the eligible age range for women was 55–79.

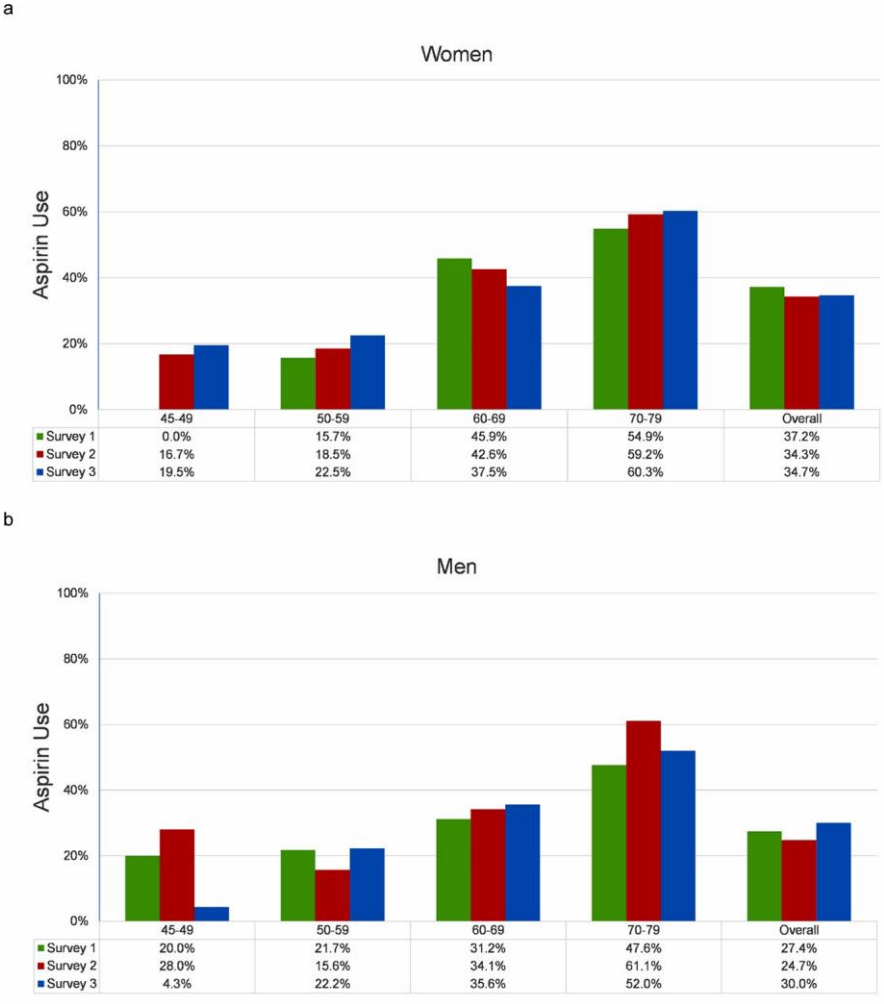

Fig. 2. Prevalence of aspirin use by (a) women and (b) men in each survey, stratified by age group. The overall aspirin prevalence is adjusted for age and cardiovascular risk factors. There was no significant change in aspirin use over time for any age or sex subgroup.

(Fig. A.1). However, there was no statistical difference in aspirin trend by number of risk factors (p = 0.52). Aspirin use by men with 3–4 risk factors decreased from 54% in 2015 to 47% in 2019 and there was a small increase over time in the lower risk groups (Fig. A.1) but the differences in aspirin use trends were not significant by number of risk factors for men either (p =0.61). There was also no change in aspirin use when evaluated by estimated 10-year CVD risk score (Table 2).

3.2. Health beliefs and social norms

Over 95% of participants across all three surveys agreed that their actions could positively impact their health and that preventing a heart attack or stroke was important to them (Table 3). Most people also agreed that they trust their doctor's decision about treatments (>82%) and that aspirin can help prevent a heart attack or stroke (>75%). However, fewer people agreed with those two statements over the course of the surveys. In 2019, 75% of respondents agreed that preventive aspirin was helpful compared to 86% in

2017 and 84% in 2015 (p for trend <0.001). In contrast, only one third of participants in each survey thought their chances of a heart attack or stroke were high. Fewer participants agreed that people close to them thought they should take aspirin over the 3 surveys (Table 3).

3.3. Associations with aspirin use

After multivariable adjustment, aspirin use was more common with increasing age and number of risk factors (Table 4). Prevalence of aspirin use was higher in men compared with women in the unadjusted analysis (unadjusted RR 0.78, 95% CI 0.67–0.91), but there was no significant difference after adjusting for age and number of CVD risk factors. Using the estimated 10-year CVD risk score, those with a risk ≥10% had a prevalence of aspirin use double that of participants with <10% risk (adjusted RR 2.12, 95% CI 1.80–2.49). This association was attenuated when limited to the age range recommended by the 2016 USPSTF recommendations (adjusted RR 1.77, 95% CI 1.47–2.14). Aspirin use was strongly associated with having a discussion with a healthcare practitioner (adjusted RR 3.37, 95% CI 2.76–4.12). Several health beliefs were also strongly associated with aspirin use (Table A.2). Participants had a higher prevalence of aspirin use if they agreed with statements about the usefulness, safety or ease of preventive aspirin. Those who agreed that people similar to them took aspirin or that people close to them thought they should use aspirin also used aspirin more commonly (Fig. 3, [adjusted RR 1.80, 95% CI 1.52–2.14 and adjusted RR 2.56, 95% CI 2.17–3.03 respectively]) compared with those who answered disagree or don't know.

4. Discussion

This study demonstrated no significant change in primary prevention aspirin use in three samples of African American adults from 2015 to 2019 despite major updates in clinical trial evidence and national guidelines limiting the aspirin eligible population. Although aspirin use did not change, fewer people in the 2019 survey thought aspirin was beneficial for CVD prevention. Discussing aspirin with a healthcare practitioner was strongly associated with aspirin use, but aspirin use was also more likely if it was perceived to be socially acceptable. Thus, interventions targeting primary prevention aspirin use may need to include both clinical and community components to be effective.

Clinical guidelines can impact general treatment practices when accompanied by quality improvement initiatives to implement appropriate, guideline-based care. Eagle et al. demonstrated the effectiveness of this approach in their Guidelines Applied in Practice project which

Table 3
Health belief responses by survey.

	2015	2017	2019	p for trend[a]
a. Actions affect health	530	438	521	
Agree	518 (98%)	426 (97%)	515 (99%)	0.14
Disagree	9(2%)	7(2%)	6(1%)	
Don't know	3(1%)	5(1%)	0(0%)	
b. Trust in doctor	530	436	521	
Agree	469 (88%)	388 (89%)	429 (82%)	<0.01
Disagree	58(11%)	42 (10%)	90(17%)	
Don't know	3(1%)	6(1%)	2(<1%)	
c. Aspirin prevents heart attack or stroke	528	437	520	
Agree	446 (84%)	374 (86%)	390 (75%)	<0.001
Disagree	46(9%)	27(6%)	77(15%)	
Don't know	36(7%)	36(8%)	53(10%)	
d. Preventing CVD is important	528	435	518	
Agree	523 (99%)	424 (97%)	515 (99%)	0.58
Disagree	4(1%)	6(1%)	2(<1%)	
Don't know	1(<1%)	5(1%)	1(<1%)	
e. Chances of heart attack or stroke are great	524	436	519	
Agree	186 (36%)	146 (33%)	183 (35%)	0.88
Disagree	281 (54%)	242 (56%)	254 (49%)	
Don't know	57(11%)	48 (11%)	82(16%)	
f. Similar people take aspirin for prevention	525	437	520	
Agree	291 (55%)	246 (56%)	285 (55%)	0.57
Disagree	96(18%)	81 (19%)	122 (23%)	
Don't know	138 (26%)	110 (25%)	113 (22%)	
g. People think you should take aspirin	527	438	521	
Agree	247 (47%)	206 (47%)	201 (39%)	0.01
Disagree	196 (37%)	159 (36%)	246 (47%)	
Don't know	84(16%)	73 (17%)	74(14%)	
h. Aspirin is safe to use	524	438	521	
Agree	367 (70%)	337 (77%)	348 (67%)	0.50
Disagree	119 (23%)	63 (14%)	130 (25%)	
Don't know	38(7%)	38(9%)	43(8%)	
i. Aspirin is easy to take	529	437	520	
Agree	419 (79%)	358 (82%)	399 (77%)	0.48
Disagree	98(18%)	57 (13%)	106 (20%)	
Don't know	12(2%)	22(5%)	15(3%)	

[a] Trend analysis for change in agree responses over time with adjustment for age, sex, hypertension, hyperlipidemia, diabetes mellitus, and current smoking.

Table 4
Univariate and multivariable-adjusted associations of regular aspirin use with demographics and CVD risk factors.

	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
Age, per one year	1.05(1.04–1.06)	1.04(1.04–1.05)
Age group 45–49		
	Ref	Ref
50–59	1.09(0.77–1.54)	1.00(0.72–1.39)
60–69	2.16(1.57–2.98)	1.75(1.29–2.39)
70–79	3.15(2.29–4.34)	2.50(1.83–3.43)
Sex		
Women	Ref	Ref
Men	0.78(0.67–0.91)	0.92(0.80–1.07)
CVD risk factors 0		
	Ref	Ref
1	1.98(1.37–2.85)	1.80(1.26–2.58)
2	3.06(2.16–4.33)	2.51(1.78–3.55)
3–4	4.91(3.50–6.89)	4.11(2.94–5.76)
10-yr CVD risk, per 5% increase in risk[a]		1.17(1.15–1.20)

<10%	Ref	
≥10%		–2.14)
50–69 years with ≥10% risk	2.12(1.80 2.49)	
	1.77(1.47	[b]

Covariates for the multivariable adjusted model include age (continuous), sex, number of risk factors and survey year. Data for all 3 surveys were combined for this analysis.
CVD indicates cardiovascular disease. [a] When the 10-yr risk estimate is in the model, the only other covariate is an indicator for survey because age, sex and risk factors are incorporated in the risk estimate. [b] Compared with 50–69 years with <10% risk.

implemented a program to increase guideline-based care, including aspirin use, after acute myocardial infarction resulting in a 5% decrease in 1-year mortality (Eagle et al., 2005). When there is no implementation plan, there is often minimal uptake of the modified guidelines. This was demonstrated by Pokharel et al. who found no significant change in primary prevention statin use trends after the 2013 American College of Cardiology/American Heart Association (ACC/AHA) cholesterol guidelines were published even though the new guideline increased the statin eligible population by over 10 million people (Pokharel et al., 2017). Our study team also previously showed no change in primary prevention aspirin use for a large clinical population after the publication of the 2009 USPSTF aspirin recommendations that included stronger language supporting primary prevention aspirin use (Van't Hof et al., 2017).

The current study evaluated primary prevention aspirin use by African Americans in the setting of not one, but multiple guideline and clinical trial publications and significant negative media coverage. The 2016 USPSTF guideline limited the eligible age range and increased the CVD risk threshold for primary prevention aspirin use. Clinical trials showed increased mortality for older adults taking primary prevention aspirin (McNeil et al., 2018); a modest decrease in myocardial infarction in moderate risk individuals (Gaziano et al., 2018); and a decrease in CV events in participants with diabetes that was offset by a similar magnitude increase in adverse bleeding events (ASCEND Study Collaborative Group, 2018). Then the ACC/AHA published recommendations to use primary prevention aspirin infrequently because of lack of net benefit (Arnett et al., 2019). Despite all these updates, primary prevention aspirin use did not change in these samples of African American adults.

This study provides a contemporary assessment of primary prevention aspirin use in a community dwelling African American sample. Aspirin use was common in this study and higher in women compared with men, but this difference was not statistically significant when adjusted for age and number of CVD risk factors. Luepker et al. found a similar prevalence of primary prevention aspirin use among primarily white adults in the 2007–2009 Minnesota Heart Survey. As with our study, the highest use was in the oldest age groups—47% and 57% for women and men respectively in the 65–74 years age group (Luepker et al., 2015). Aspirin use by African Americans was lower in several other cohort studies. Primary prevention aspirin use was assessed by Framingham Risk Score (FRS) category in the Multi-Ethnic Study of Atherosclerosis (MESA) cohort at a follow up visit conducted in 2005–2007 (Sanchez et al., 2011). Within FRS categories of low (<6%), increased (6–9.9%), and high (≥10%) risk, aspirin use prevalence for Blacks was 19%, 27%, and 43% respectively. Aspirin use prevalence was higher in whites—29%, 41%, and 53% for the low, increased, and high risk categories respectively. The Southern Community Cohort Study (SCCS) enrolled participants over a similar time frame (2002–2009) and evaluated primary prevention aspirin use by the same FRS risk categories but found a lower aspirin use prevalence in both whites and Blacks (Fernandez-Jimenez et al., 2019). Whites used aspirin more commonly than Blacks in all risk categories—low (10% vs 6%), increased (16% vs 10%) and high (27% vs 18%). The lower prevalence of aspirin use in the SCCS compared with MESA may be the result of a younger population since they limited enrollment for those 45–79 years while MESA included participants in their 80s.

Our participant sample was limited to the Minneapolis-Saint Paul area, but the CVD risk profile was similar to other cohorts that included Black adults of similar age. The REasons for Geographic And Racial Differences in Stroke (REGARDS) study recruited community dwelling adults and oversampled for Blacks. In 2013, nearly 4000 Black adults completed in-person assessments for CVD risk factors. Average age was
63 years—slightly older than our study—and prevalence of hypertension (71% in women, 66% in men) and diabetes (26% in women and 28% in men) were similar to our sample (Howard et al., 2017). Dyslipidemia was lower in the REGARDS cohort (30% in women, 33% in men). At baseline, Blacks in the MESA cohort had a mean age of 61 years; 18% were current smokers; 17% had diabetes and 50% were taking antihypertensive medications (Sanchez et al., 2011). Current smoking was high in our study, particularly among men. National smoking prevalence among Blacks in the 2018 National Health Interview Survey was 18% although it was much higher in men compared with women and the Midwest region had the highest prevalence of smoking (Wang et al., 2018).

Primary prevention aspirin use is one example of a CVD prevention behavior that patients have some control over, as it is inexpensive and available over the counter. Aspirin use behavior may thus be more influenced by factors other than healthcare practitioners prescribing patterns. This study found that participants were more likely to use aspirin if they thought it was safe, easy and effective. While participant belief in aspirin effectiveness declined over the 3 surveys, it remained high (>75%). Despite this confidence, aspirin use was much lower (25%–37%) and did not change. This may be explained in part by the low perception of CVD risk in each sample (33–36%). Another important factor was aspirin perception within participants' social networks. Participants who thought people similar to them used aspirin or that people close to them thought they should use aspirin were much more likely to use it themselves (adjusted RR 1.80 and 2.56 respectively, Fig. 3). The

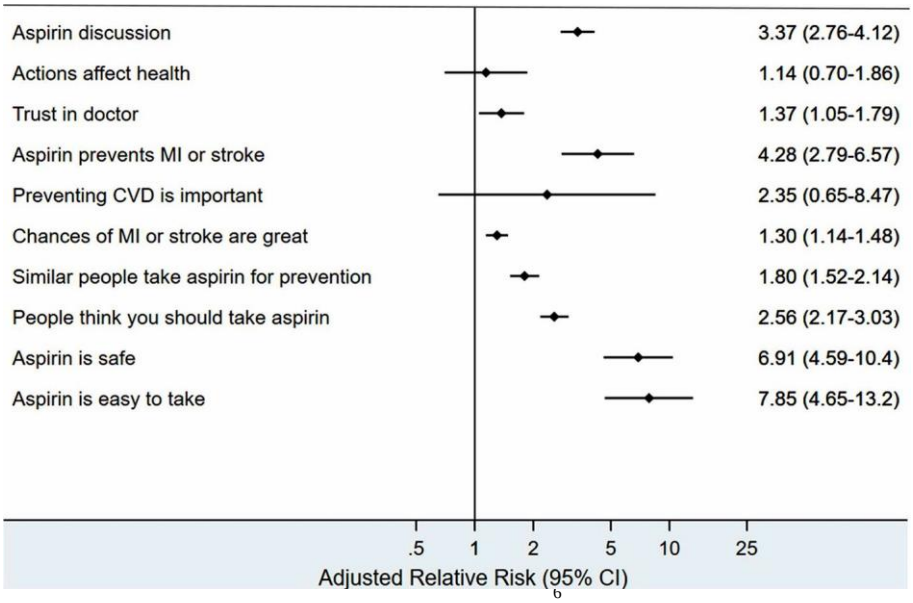

Fig. 3. Associations of primary prevention aspirin use with survey questions about prevention and social norms. Covariates in the adjusted model include age, sex, hypertension, hyperlipidemia, diabetes, smoking, and survey year. MI indicates myocardial infarction; CVD, cardiovascular disease.

healthcare system remains important for influencing aspirin use. Participants were over 3 times as likely to use aspirin if they had a conversation about it with their healthcare practitioner. These results suggest that efforts to implement guideline based preventive aspirin use should include both clinical and community based efforts in addition to patient education.

African American adults suffer worse cardiovascular outcomes compared with white adults. African American men and women have the highest incidence of myocardial infarction across all ages and mortality from heart disease is higher when compared with white adults (Virani et al., 2020). Cardiovascular events also occur at a younger average age for African Americans. Among all patients hospitalized for myocardial infarction in 2000–2014 within the Kaiser Permanente healthcare system, African Americans were 3–4 years younger than whites (Chi et al., 2020). Moreover, African American men <65 years old have double the risk of a fatal myocardial infarction compared to white men (Colantonio et al., 2017). CVD risk factor management is also worse in this population. Hypertension is less controlled (Johansen et al., 2015) and statin use is lower in African American adults compared with whites (Kramer et al., 2004). It is crucial that guideline directed therapies are implemented in a timely and comprehensive manner within this high-risk population.

This study has several limitations that must be acknowledged. Data were gathered from three convenience samples of African American adults resulting in differences in demographics and CVD risk factors across the surveys. We attempted to adjust for these differences in our regression analyses but some residual confounding likely remains. Although CVD risk factors were similar to other Black cohorts as mentioned above, this sampling method limits generalization. Participants were recruited at public events/locations including gyms and health fairs, so this study excludes homebound individuals and may include more health-focused individuals than the general public. CVD risk factors and aspirin use were self-reported, although there is evidence that self-reported aspirin use is accurate (Zantek et al., 2014). The CVD risk calculation used in this study was developed using data from primarily white participants. It has not been validated for other ethnicities.

5. Conclusions

This study provides contemporary data on primary prevention aspirin use in African Americans over a 5-year period. Despite major updates in clinical trial data and national guidelines narrowing aspirin use recommendations, aspirin use did not change over this time period. Aspirin use was positively associated with conversations between participants and health care practitioners as well as positive social norms regarding aspirin use. Efforts to implement guidelines for preventive behavior change like appropriate aspirin use should include both clinical and community based interventions.

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Appendix A. Supplementary data

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