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Prevalence of Aspirin Use for Primary Prevention of Cardiovascular Disease in the United States: Results From the 2017 National Health Interview Survey

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Background:

Physicians and medical professional societies have widely supported use of aspirin for primary prevention of cardiovascular disease (CVD) in persons who are at increased risk (1) (Table 1). Three randomized controlled trials published in 2018—ASCEND (A Study of Cardiovascular Events in Diabetes), ARRIVE (Aspirin to Reduce Risk of Initial Vascular Events), and ASPREE (Aspirin in Reducing Events in the Elderly)—sought to evaluate the benefits and risks of aspirin use for primary prevention of CVD in adults with diabetes, average-risk adults, and older adults, respectively (2–4). Collectively, these studies showed few benefits and consistent bleeding risks. ASCEND studied adults with diabetes and found fewer serious vascular events among those assigned aspirin but also an increase in major bleeding. Similarly, ARRIVE showed no difference in cardiovascular events between aspirin users and nonusers who were at average risk. Finally, ASPREE found increased overall mortality and unchanged cardiovascular mortality in older adults assigned aspirin. In light of these findings, in March 2019, the American Heart Association and American College of Cardiology (AHA/ACC) released updated guidelines, which now recommend against routine aspirin use in persons older than 70 years and those with increased bleeding risk (5). However, the extent to which these populations take aspirin for primary prevention in the United States is unknown.

Objective:

To characterize aspirin use for primary prevention of CVD among U.S. adults.

Reproducible Research Statement: *Study protocol and data set:* Publicly available at www.cdc.gov/nchs/nhis/index.htm. *Statistical code:* Available from Dr. Wee (cwee@bidmc.harvard.edu).

The institutional review board at Beth Israel Deaconess Medical Center deemed this study not to be human subjects research.

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Methods and Findings:

We used data from the Sample Adult component of the 2017 National Health Interview Survey (NHIS), a nationally representative in-person household survey of health and disability among U.S. adults. The final response rate was 53.0% (ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2017/srvydesc.pdf). Participants aged 40 years or older were asked the following questions about aspirin use: “Has a doctor or other health professional ever told you to take a low-dose aspirin each day to prevent or control heart disease?” “Are you now following this advice?” and “On your own, are you now taking a low-dose aspirin each day to prevent or control heart disease?” We classified participants who answered “yes” to either of the 2 latter questions as taking aspirin for CVD prevention. To focus on primary prevention, we excluded participants with a self-reported history of angina, coronary heart disease, myocardial infarction, or stroke. We conducted multivariable logistic regression to identify demographic and clinical factors associated with aspirin use.

Our sample included 14 328 adults. The mean age was 57.5 years; 54% were women, and 33% were nonwhite. Among adults aged 40 years or older without CVD, 23.4% (approximately 29 million persons) reported taking daily aspirin for prevention of CVD. Of these, 22.8% (6.6 million persons) did so without a physician’s recommendation. Nearly half of adults aged 70 years or older without CVD reported aspirin use (Table 2). After adjustment, older age, male sex, and cardiovascular risk factors (hypertension, hyperlipidemia, diabetes, and smoking) were statistically significantly associated with aspirin use. Of note, a history of peptic ulcer disease was not statistically significantly associated with lower aspirin use.

Discussion:

Nearly 30 million U.S. adults aged 40 years or older use aspirin to prevent CVD, including nearly half of older adults without self-reported CVD and a quarter of adults without CVD but with a history of peptic ulcer disease. Our findings have important implications in light of recent evidence and guidelines recommending against aspirin use for primary prevention of CVD in these 2 subgroups. Although prior AHA/ACC guidelines recommended aspirin only in persons without elevated bleeding risk, the 2019 guidelines now explicitly recommend against aspirin use in those older than 70 years (5). Our findings also suggest that a substantial portion of adults may be taking aspirin without their physician’s advice and potentially without their knowledge.

Our study had limitations. Aspirin use was based on self-reported data, and the term “low-dose” was not clearly defined, which may have led to misclassification. In addition, NHIS did not ask adults younger than 40 years about aspirin use, limiting the scope of our study. Finally, we were unable to calculate atherosclerotic CVD risk scores because blood pressure and cholesterol levels were not measured.

In summary, aspirin use in the United States is wide-spread among groups at risk for harm. In light of recent trials and guidelines, our findings show a tremendous need for health care

practitioners to inquire about ongoing aspirin use and to counsel patients about the balance of benefits and harms, especially among older adults and those with prior peptic ulcer disease.

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Table 1. Current and Recent Guideline and Consensus Documents on Aspirin Use for the Primary Prevention of CVD*

Guideline	Recommendations
2012 ACCP guidelines	Suggested for adults aged 50 y without symptomatic CVD (grade 2B)
2015 AHA/ADA scientific statement	Reasonable in adults with 10-y CVD risk 10% and without increased risk for bleeding (ACC/AHA class IIa, LOE B; ADA grade C) Reasonable in adults with DM at intermediate risk (10-y CVD risk of 5%–10%) (ACC/AHA class IIb, LOE C; ADA grade E)
2016 ADA guidelines	Consider in those with type 1 or 2 DM who are at increased CVD risk (10-y risk >10%) and are not at increased bleeding risk (grade C) Not recommended for adults with DM at low ASCVD risk (10-y risk <5%) (grade C) Clinical judgment required in patients with DM aged <50 y with other risk factors (e.g., 10-y risk of 5%–10%) (grade E)
2016 USPSTF recommendation statement	Initiate in adults aged 50–59 y with 10-y CVD risk 10% (grade B) Individual judgment required in adults aged 60–69 y with 10-y CVD risk 10% (grade C) No recommendation in adults aged <50 y (grade I)
2019 AHA/ACC guidelines	No recommendation in adults aged 70 y (grade I) May be considered in adults aged 40–70 y who are at higher ASCVD risk but not at increased bleeding risk (COR IIb, LOE A) Should not be used on a routine basis in adults aged >70 y (COR III, LOE B-R) Should not be used in adults of any age who are at increased risk for bleeding (COR III, LOE C-LD)

ACC = American College of Cardiology; ACCP = American College of Chest Physicians; ADA = American Diabetes Association; AHA = American Heart Association; ASCVD = atherosclerotic cardiovascular disease; COR = class of recommendation; CVD = cardiovascular disease; DM = diabetes mellitus; LOE = level of evidence; USPSTF = U.S. Preventive Services Task Force.

*From reference 1.

Table 2.

Aspirin Use Among Adults Aged 40 Years or Older Without CVD, by Demographic and Clinical Characteristics ($n = 14\,328$)*

Characteristic	Adults, <i>unweighted</i> n	Aspirin Use [†] , %	Estimated U.S. Population Using Aspirin (Millions) [†]	AOR for Aspirin Use (95% CI) [‡]
Age				
40–49 y	3552	7.0	2.57	1.00 (reference)
50–59 y	3873	18.4	6.73	2.51 (2.11–3.00)
60–69 y	3708	34.7	10.15	5.54 (4.58–6.70)
70–79 y	2136	44.6	6.50	7.67 (6.32–9.31)
80 y	1047	46.2	3.05	9.68 (7.61–12.31)
Sex				
Female	8136	21.8	14.54	1.00 (reference)
Male	6180	25.5	14.47	1.32 (1.18–1.48)
Race				
White	10 346	25.1	20.80	1.00 (reference)
Black	1471	23.7	3.20	0.97 (0.82–1.16)
Hispanic	1508	19.7	3.35	0.96 (0.78–1.17)
Asian	666	15.1	1.15	0.63 (0.46–0.88)
Other	300	21.2	0.50	0.74 (0.51–1.06)
Body mass index				
<18.5 kg/m ²	192	10.8	0.16	0.40 (0.24–0.68)
18.5–24.9 kg/m ²	4120	24.3	6.73	1.00 (reference)
25.0–29.9 kg/m ²	4993	24.5	10.79	1.22 (1.07–1.39)
30.0–34.9 kg/m ²	2690	26.9	6.39	1.30 (1.12–1.51)
35.0–35.9 kg/m ²	1086	26.3	2.48	1.16 (0.93–1.43)
40 kg/m ²	1235	23.7	2.58	1.21 (0.98–1.49)
History of peptic ulcer disease				
No	13 297	23.1	26.76	1.00 (reference)
Yes	1008	28.3	2.24	0.91 (0.75–1.11)
Hypertension				
No	8486	15.5	11.94	1.00 (reference)
Yes	5812	36.5	17.04	1.74 (1.56–1.94)

Characteristic	Adults, unweighted n	Aspirin Use [†] , %	Estimated U.S. Population Using Aspirin (Millions) [‡]	AOR for Aspirin Use (95% CI) [‡]
Hyperlipidemia				
No	8933	17.2	13.54	1.00 (reference)
Yes	5324	34.5	15.38	1.63 (1.47–1.81)
Diabetes				
No	12 629	20.6	22.54	1.00 (reference)
Yes	1680	46.5	6.45	2.07 (1.77–2.42)
Smoking status				
Never	8260	21.2	15.83	1.00 (reference)
Current	2058	22.4	3.63	1.28 (1.09–1.52)
Former	3935	29.3	9.47	1.13 (1.01–1.27)

AOR = adjusted odds ratio; CVD = cardiovascular disease.

* Analyses used sample weights and were conducted using survey proc commands (including PROC SURVEYLOGISTIC) in SAS, version 9.4 (SAS Institute), to account for the complex National Health Interview Survey sampling design and nonresponse and to generate U.S. population estimates.

[†] Weighted percentage of sample with each characteristic and associated population estimate taking aspirin for primary prevention.

[‡] Model adjusted for each characteristic in the table and for physician visit in the past year. Because of missing covariates, 13 995 adults were included in the adjusted model.