American Journal of Preventive Cardiology 21 (2025) 100941

Contents lists available at ScienceDirect

American Journal of Preventive Cardiology

journal homepage: www.journals.elsevier.com/american-journal-of-preventive-cardiology

Population cessation of aspirin use for the prevention of cardiovascular disease

Stephanea Roeser [a,b,*], Sue Duval [c], Russell V. Luepker [b,c], Milton Eder [d], John R. Finnegan [b], Jeremy R. Van't Hof [c]

[a] New York City Department of Health and Mental Hygiene, 100134209 28th St, Long Island, NY 11101, USA
[b] Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, 1300 South Second Street, Suite 300, Minneapolis, MN 55454, USA
[c] Cardiovascular Division and Lillehei Heart Institute, University of Minnesota Medical School, 420 Delaware Street SE, MMC 508, Minneapolis, MN 55455. USA
[d] Department of Family Medicine and Community Health, University of Minnesota Medical School, 516 Delaware Street SE, Minneapolis, MN 55455, USA

ARTICLE INFO

Keywords:
Aspirin
Primary prevention
Guidelines
Media influences
Physician advice

ABSTRACT

Importance: Aspirin use for primary prevention of cardiovascular diseases (CVD) is widespread with over a third of the adult population using despite guidelines recommending against.
Objective: This population-based research documents rates of use and reasons for cessation from 2015 to 2020, a period when guidelines changed.
Design: Three cross-sectional telephone surveys were conducted during 2015, 2017, and 2019–20.
Setting: A population-based survey in the states of Iowa, Minnesota, North Dakota, South Dakota, and Wisconsin.
Participants: The surveys included non-institutionalized resident adults ages 55–79 for women and 45–79 for men with landline telephones.
Main Outcomes and Measures: The analysis included 8,197 participants, 4,161 women and 4,036 men after excluding those with a history of cardiovascular disease (secondary prevention). Aspirin use for primary prevention was stable for the first two survey years (39 % in 2015 and 41 % in 2017) but fell significantly to 34 % in the final survey (2019–2020). The most common reason for cessation was "doctor's advice" (38 % of quitters) followed by "heard negative news" with a significant increase from 2015 to 2020 (4 % to 29 % of quitters).
Conclusions and Relevance: Despite recent research findings and new guidelines, aspirin is still widely used for primary prevention of CVD in the general population. A combination of slow diffusion and implementation of guidelines, self-medication, and wide availability of low-cost aspirin underlies these trends. Physician advice is effective but more is needed. The influence of the popular media is also substantial. Appropriate implementation of aspirin guidelines requires additional clinician effort.
Trial Registration: Clinicaltrials.gov registered on December 1, 2014, NCT02607917

1. Introduction

Low dose aspirin for cardiovascular disease (CVD) prevention is widely used with over 30 % of the adult population reporting a daily aspirin [1,2]. Early clinical trials reported significant benefits [3,4] and guidelines recommended use for adults at increased risk of cardiovascular diseases [5,6]. However, more recent trials report fewer benefits and increased side effects [7–9]. These and other studies resulted in the United States Preventive Services Taskforce (USPSTF) downgrading recommendations for use in 2016 [10] and recommending against use for primary prevention of CVD in 2022 [11]. The new trials and guidelines resulted in considerable discussion about the dangers of aspirin in the popular media [12]. Subsequent professional debate is mixed, with support for targeted aspirin use and recognition of the dangers of quitting [13–17]. While the guidelines recommend

* Correspondence author at: Division of Epidemiology and Community Health School of Public Health, University of Minnesota, 1300 South Second Street, Suite 300, Minneapolis MN 55454, USA.
E-mail addresses: stephroes@gmail.com (S. Roeser), sueduval@umn.edu (S. Duval), luepk001@umn.edu (R.V. Luepker), meder@umn.edu (M. Eder), finne001@umn.edu (J.R. Finnegan), vanth008@umn.edu (J.R. Van't Hof).

https://doi.org/10.1016/j.ajpc.2025.100941
Received 18 December 2024; Received in revised form 28 January 2025; Accepted 7 February 2025
Available online 8 February 2025

discussion with a clinician before initiating aspirin use, widespread availability at minimal cost leads to self-prescribing.

In this research, we use population-based surveys before and after the new trials and guideline which recommended against use for CVD primary prevention. For those who quit, we evaluate rates and reasons for this behavior plus their risk factor status.

2. Methods

2.1. Study population

Three cross-sectional telephone surveys of non-institutionalized resident adults ages 55–79 for women and 45–79 for men from June-December 2015, June-December 2017, and October-March 2019–20 were conducted. The population resided in the five-state area of Iowa, Minnesota, North Dakota, South Dakota and Wisconsin.

2.2. Sampling frame

Lists of addresses with zip codes and associated landline telephone numbers were used to generate random samples within states proportional to population size. Selected households were sent a letter describing the study with an option to decline the survey. Only 4 % of the sampled population declined. The remaining households were called as many as 10 times to administer the survey. Only one randomly selected eligible respondent per household was allowed for age-targeted adults. The overall participation rate was 48 % accounting for refusals, address errors, business telephones and disconnected telephones.

2.3. Survey

Trained interviewers administered a 10-minute telephone survey including questions about aspirin use including reason for taking, time of initiation, frequency, discontinuation, history of CVD, cardiovascular risk factors, media exposure, doctor discussions about aspirin, health behaviors and demographic characteristics. The questionnaire is available as (Supplementary Table 1). Participants gave verbal consent for study participation in a protocol approved by the Institutional Review Board of the University of Minnesota. (1201M08921)

2.4. Validation

In a previously published study, using the same telephone survey, self-reported aspirin use was confirmed with blood levels of thromboxane B2 [18]. Sensitivity and specificity for reported aspirin use were each over 90 %.

The validity of the self-reported history of cardiovascular risk factors was also tested against measured values in a similar population sample, finding a high concordance between the interview responses and actual measures [19]. Increased risk was based on the criteria in the 2009 USPSTF guidelines [6].

2.4.1. Measures and definitions

Primary prevention aspirin candidate: No self-reported history of myocardial infarction, stroke, peripheral artery disease, or revascularization procedure.

Secondary prevention candidate: Self-reported history of myocardial infarction, stroke, peripheral artery disease, and/or revascularization procedure.

Regular aspirin use: Aspirin use every day or every other day to prevent a heart attack or stroke.

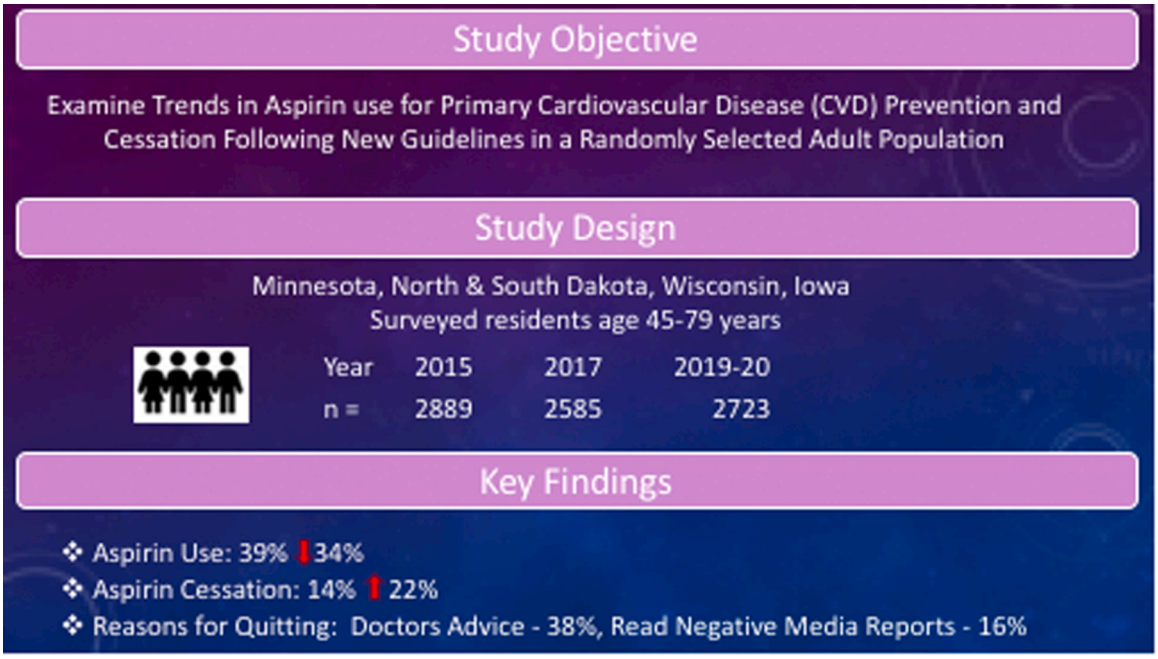
2.4.2. Statistical analysis

Data are presented as n (%) for categorical variables and mean (SD) for continuous variables. Analyses were performed in Stata version 16.1 (StataCorp. 2019. Stata Statistical Software: Release 16. College Station, TX: Stata Corp LLC.).

3. Results

The analysis included 8197 participants, of which 4161 were women and 4036 men (Table 1) after excluding those with a history of cardiovascular disease (secondary prevention). Demographic characteristics were like census data for these states and over time (Table 1).

History of hypertension, hyperlipidemia, diabetes, or current cigarette smoking was common (Table 1). Most participants reported having a regular healthcare provider (>90 %). Those who reported regular aspirin use took it specifically to prevent CVD (>90 %), took it daily (>95 %) and for a duration equal to or over five years (74 %).



Central Illustration

Table 1
Demographic and clinical characteristics of participants, by survey.

	Baseline	Year 2	Year 4
N	2889	2585	2723
Age, years	64.6 (8.2)	65.7 (8.0)	66.0 (7.9)
Women	1462 (51 %)	1327 (51 %)	1372 (50 %)
Risk factors			
Hypertension	1345 (47 %)	1260 (49 %)	1325 (49 %)
Hyperlipidemia	1273 (44 %)	1151 (45 %)	1189 (44 %)
Diabetes	379 (13 %)	398 (15 %)	438 (16 %)
Smoking			
Never	1602 (55 %)	1479 (57 %)	1605 (59 %)
Former	984 (34 %)	847 (33 %)	832 (31 %)
Current	303 (10 %)	259 (10 %)	286 (11 %)

Aspirin use for primary prevention was stable for the first two survey years (39 % in 2015 and 41 % in 2017) but fell significantly to 34 % in the final survey (2019–2020) (Table 2). This trend was paralleled by those who reported stopping aspirin during survey one (14 %) and survey two (15 %) with the number stopping in the final survey rising to 22 %.

Reasons for stopping aspirin use are shown in Table 3. The most common answer was "doctor's advice" particularly in the third survey. The second most common reason was "heard negative news". Another category "don't think it works" also rose in the final survey, which may reflect negative news reports [12]. Other stopping reasons reported were unchanged except "doesn't think at risk" and "forgot to take," which both declined. The survey also asked about news that was positive or negative for aspirin use for prevention. In the first two surveys, most reported the news was positive (63 %) and little was negative (4 %). But in the 2019–20 survey, 29 % reported hearing negative news, a clear shift. Conversations regarding aspirin also rose with more discussions initiated by the doctor than by the patient (21 % to 25 % to 27 % vs. 17 % to 19 % to 20 %) across all three surveys (Table 4).

4. Discussion

The widespread use of aspirin for the primary prevention of cardiovascular diseases (CVD) is well documented [1,2]. Early studies and subsequent guidelines encouraged aspirin use by those at increased CVD risk [5,6]. The widespread availability of inexpensive aspirin and commercial media campaigns led many clinicians to prescribe aspirin and self-medication by patients added to use [20].

But in 2016, the guidelines were changed by the USPSTF [10]. Adults aged 50–59 were recommended aspirin if they were at 10 % or greater 10-year CVD risk without bleeding potential at a grade of B. Adults aged 60–69 were recommended aspirin based on clinical judgement and 10 % or greater CVD 10-year risk (Grade C). Those 50 years or below and 70 years above were not recommended aspirin.

Further change came in 2018 with the release of results from three randomized trials initiating aspirin for primary prevention [7–9]. These trials were generally unfavorable to the use of aspirin for primary prevention emphasizing bleeding complications and increased cancer risk. There was extensive popular media coverage of these trials, emphasizing the dangers of regular aspirin use [12].

Table 2
Aspirin (ASA) status by survey.

	Baseline	Year 2	Year 4	*p*-value
N	2889	2585	2723	
Current regular ASA use	1138 (39 %)	1071 (41 %)	920 (34 %)	<0.001
No current regular ASA use	1751 (61 %)	1514 (59 %)	1803 (66 %)	<0.001
Never used ASA	1499 (86 %)	1289 (85 %)	1410 (78 %)	<0.001
Stopped using ASA	252 (14 %)	225 (15 %)	393 (22 %)	<0.001

Table 3
Reasons for stopping aspirin.

	Baseline	Year 2	Year 4	*p*-value[a]
Reason for stopping				
Doctor's advice	44 (18 %)	42 (20 %)	142 (38 %)	<0.001
Heard on news	14 (5.8 %)	6 (2.9 %)	59 (16 %)	<0.001
Bruising/bleeding	42 (18 %)	36 (17 %)	45 (12 %)	0.055
Doesn't think it works	8 (3.3 %)	14 (6.7 %)	29 (7.7 %)	0.026
Doesn't think at risk	28 (12 %)	17 (8.1 %)	20 (5.3 %)	0.004
Forgets to take	24 (10 %)	19 (9.1 %)	17 (4.5 %)	0.008
Doesn't like taking	15 (6.3 %)	15 (7.2 %)	16 (4.3 %)	0.27
Aspirin allergy	12 (5.0 %)	6 (2.9 %)	4 (1.1 %)	0.003
New meds	34 (14 %)	35 (17 %)	31 (8.2 %)	0.020
Heartburn	9 (3.8 %)	9 (4.3 %)	7 (1.9 %)	0.15
Health event	10 (4.2 %)	10 (4.8 %)	5 (1.3 %)	0.032
Cost	0	0	1 (0.27 %)	>0.99

[a] p-value for Year 4 vs. baseline
For those who gave two responses, 0.5 was assigned to each reason.

Table 4
Discussions regarding aspirin use for primary prevention, by survey.

	Baseline	Year 2	Year 4	*p*-value
Doctor-initiated	618 (21 %)	652 (25 %)	726 (27 %)	<0.001
Participant-initiated	482 (17 %)	497 (19 %)	541 (20 %)	0.0021
Either doctor- or participant-initiated	876 (30 %)	866 (34 %)	993 (36 %)	<0.001

In this study, which overlaps new guidelines (2016) and the new clinical trials (2018), rates of aspirin use for primary prevention are observed in the general population. Aspirin use was stable in the 2015 and 2017 surveys at 39 % and 41 %. But it fell significantly to 34 % in 2019–20. This decline was paralleled by increased reporting of quitting aspirin use. The reasons for quitting were attributed first to physician's advice although only about a third reported ever having this discussion. The next most common reason for cessation was negative reports on aspirin use in the media. Reports of negative media increased significantly in the 2019–20 survey.

Several conclusions can be inferred from these data on population use of this readily available and inexpensive medicine. First is the impact of professional guidelines. The USPSTF 2016 guidelines recommended reduction in use to limited age groups with B and C grade levels of support. These recommendations were aimed at professionals with little popular media coverage. The lack of changes in aspirin use in the 2017 survey one year after the 2016 USPSTF report suggests little impact of the guidelines in the year following the report. The decline in use observed in the 2019–20 survey suggests the combined effect of time plus the substantial popular media coverage of the new clinical trials in 2018. Nevertheless, 34 % of adults were still using aspirin despite the guidelines, and the professional debate continues about aspirin use [15–17,21]. That debate has centered on weaknesses in the 2018 trials [7–9] and the subsequent international polypill trial by Yusuf and others who found added benefit with the inclusion of aspirin [22].

An additional observation is that discontinuation of aspirin use is not the same as the initiation of aspirin [13]. Observational data from the national Swedish Registry finds that those who were taking aspirin and discontinue use have a 30 % increase in CVD events beginning almost immediately and continuing for several years [14]. The issue of discontinuation and its effects have not been well studied.

A limitation in the collection of data was the use of landline telephones for the surveys. Excluding individuals with cellular phones may have resulted in bias. Another limitation is the lack of more detailed information on reasons for quitting aspirin. Although there is comfort in the validity of the self-report of aspirin use and cardiovascular status questions, there is limited information on the reasons for starting or

quitting aspirin use. While there are substantial numbers of participants in each survey, analysis of the many reasons for quitting in subgroups by age, sex, education, income, geography and others lead to small numbers in each subgroup and difficulty in interpretation.

In conclusion, many adults continue to use aspirin, and many are frequently self-prescribing. Many, who quit, do so based on consultation with a clinician or are influenced by media reports. There are opportunities during routine clinical visits to explore the appropriateness of aspirin use and make recommendations.

CRediT authorship contribution statement

Stephanea Roeser: Writing – review & editing, Formal analysis, Conceptualization. **Sue Duval:** Writing – review & editing, Supervision, Software, Investigation, Data curation, Conceptualization. **Russell V. Luepker:** Writing – review & editing, Validation, Resources, Project administration, Methodology, Funding acquisition, Conceptualization. **Milton Eder:** Writing – review & editing, Methodology. **John R. Finnegan:** Writing – review & editing, Methodology. **Jeremy R. Van't Hof:** Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Role of the funder/sponsor

The funder had no role in the design and conduct of the study; collection, analysis and interpretation of the data; preparation, review, or approval of manuscript; and decision to submit the manuscript for publication.

Data sharing statement

Data described in the manuscript and analytic code will be made available upon request pending application and approval from manuscript authors.

Acknowledgments

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ajpc.2025.100941.

References

[1] O'Brien CW, Juraschek SP, Wee CC. Prevalence of aspirin use for primary prevention of cardiovascular disease in the United States: results from the 2017 National Health Interview Survey. Ann Intern Med 2019;171(8):596–8. https://doi.org/10.7326/M19-0953.

[2] Boakye E, Uddin SMI, Obisesan OH, Osei AD, Dzaye O, Sharma G, et al. Aspirin for cardiovascular disease prevention among adults in the United States: trends, prevalence, and participant characteristics associated with use. Am J Prev Cardiol 2021;8:100256. https://doi.org/10.1016/j.ajpc.2021.100256.

[3] Steering Committee of the Physicians' Health Study Research Group. Final report on the aspirin component of the ongoing Physicians' Health Study. N Engl J Med 1989;321(3):129–35. https://doi.org/10.1056/NEJM198907203210301.

[4] Ridker PM, Cook NR, Lee IM, Gordon D, Gaziano JM, Manson JE, et al. A randomized trial of low-dose aspirin in the primary prevention of cardiovascular disease in women. N Engl J Med 2005;352(13):1293–304. https://doi.org/10.1056/NEJMoa050613.

[5] U.S. Preventive Services Task Force. Aspirin for the primary prevention of cardiovascular events: recommendation and rationale. Ann Intern Med 2002;136(2):157–60. https://doi.org/10.7326/0003-4819-136-2-200201150-00015.

[6] U.S. Preventive Services Task Force. Aspirin for the prevention of cardiovascular disease: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med 2009;150(6):396–404. https://doi.org/10.7326/0003-4819-150-6-200903170-00008.

[7] Bowman L, Mafham M, Wallendszus K, Stevens W, Buck G, Barton J, et al. ASCEND Study Collaborative Group. Effects of aspirin for primary prevention in persons with diabetes mellitus. N Engl J Med 2018;379(16):1529–39. https://doi.org/10.1056/NEJMoa1804988.

[8] McNeil JJ, Woods RL, Nelson MR, Reid CM, Kirpach B, Wolfe R, et al. ASPREE Investigator Group. Effect of aspirin on disability-free survival in the healthy elderly. N Engl J Med 2018;379(16):1499–508. https://doi.org/10.1056/NEJMoa1800722.

[9] Gaziano JM, Brotons C, Coppolecchia R, Cricelli C, Darius H, Gorelick PB, et al. Use of aspirin to reduce risk of initial vascular events in patients at moderate risk of cardiovascular disease (ARRIVE): a randomised, double-blind, placebo-controlled trial. Lancet 2018;392(10152):1036–46. https://doi.org/10.1016/S0140-6736(18)31924-X.

[10] Bibbins-Domingo K, U.S. Preventive Services Task Force. Aspirin use for the primary prevention of cardiovascular disease and colorectal cancer: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med 2016;164(12):836–45. https://doi.org/10.7326/M16-0577.

[11] U.S. Preventive Services Task Force, Davidson KW, Barry MJ, Mangione CM, Cabana M, Chelmow D, Coker TR, et al. Aspirin use to prevent cardiovascular disease: U.S. Preventive Services Task Force Recommendation Statement. JAMA 2022;327(16):1577–84. https://doi.org/10.1001/jama.2022.4983.

[12] Southwell BG, Duval S, Luepker RV, Oldenburg N, Van't Hof J, Eder M, et al. News coverage about aspirin as a countervailing force against low-dose aspirin campaign promotion. Transl Behav Med 2021;11(10):1941–6. https://doi.org/10.1093/tbm/ibab065.

[13] Truong C. Update on acetylsalicylic acid for primary prevention of cardiovascular disease: not initiating is not the same thing as discontinuing. Can Fam Physician 2019;65(7):481–2.

[14] Sundström J, Hedberg J, Thuresson M, Aarskog P, Johannesen KM, Oldgren J. Low-dose aspirin discontinuation and risk of cardiovascular events: a Swedish nationwide, population-based cohort study. Circulation 2017;136(13):1183–92. https://doi.org/10.1161/CIRCULATIONAHA.117.028321.

[15] Patrono C. Low-dose aspirin for the prevention of atherosclerotic cardiovascular disease. Eur Heart J 2024;45(27):2362–76. https://doi.org/10.1093/eurheartj/ehae324.

[16] Wang M, Yu H, Li Z, Gong D, Liu X. Benefits and risks associated with low-dose aspirin use for the primary prevention of cardiovascular disease: a systematic review and meta-analysis of randomized control trials and trial sequential analysis. Am J Cardiovasc Drugs 2022;22(6):657–75. https://doi.org/10.1007/s40256-022-00537-6.

[17] Fras Z, Sahebkar A, Banach M. The use of aspirin in contemporary primary prevention of atherosclerotic cardiovascular diseases revisited: the increasing need and call for a personalized therapeutic approach. Am J Cardiovasc Drugs 2021;21(2):139–51. https://doi.org/10.1007/s40256-020-00424-y.

[18] Zantek ND, Luepker R, Duval S, Miller K, Oldenburg N, Hirsch AT. Confirmation of reported aspirin use in community studies: utility of serum thromboxane B2 measurement. Clin Appl Thromb Hemost 2014;20(4):385–92. https://doi.org/10.1177/1076029613486537.

[19] Duval S, Van't Hof JR, Steffen LM, Luepker R. Estimation of cardiovascular risk from self-reported knowledge of risk factors: insights from the Minnesota Heart Survey. Clin Epidemiol 2020;12:41–9. https://doi.org/10.2147/CLEP.S219708.

[20] Luepker RV, Oldenburg NC, Misialek JR, Van't Hof JR, Finnegan JR, Eder M, et al. Aspirin use and misuse for the primary prevention of cardiovascular diseases. Am J Prev Med 2021;60(4):513–9. https://doi.org/10.1016/j.amepre.2020.10.025.

[21] Aimo A, De Caterina R. Aspirin for primary cardiovascular prevention: why the wonder drug should not be precipitously dismissed. Pol Arch Intern Med 2020;130(2):121–9. https://doi.org/10.20452/pamw.15215.

[22] Yusuf S, Joseph P, Dans A, Gao P, Teo K, Xavier D, et al. Polypill with or without aspirin in persons without cardiovascular disease. N Engl J Med 2021;384(3):216–28. https://doi.org/10.1056/NEJMoa2028220.