

Fifteen-Year Trends in Awareness of Heart Disease in Women Results of a 2012 American Heart Association National Survey

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Background—The purpose of this study was to evaluate trends in awareness of cardiovascular disease (CVD) risk among women between 1997 and 2012 by racial/ethnic and age groups, as well as knowledge of CVD symptoms and preventive behaviors/barriers.

Methods and Results—A study of awareness of CVD was conducted by the American Heart Association in 2012 among US women >25 years of age identified through random-digit dialing (n=1205) and Harris Poll Online (n=1227), similar to prior American Heart Association national surveys. Standardized questions on awareness were given to all women; additional questions about preventive behaviors/barriers were given online. Data were weighted, and results were compared with triennial surveys since 1997. Between 1997 and 2012, the rate of awareness of CVD as the leading cause of death nearly doubled (56% versus 30%; $P<0.001$). The rate of awareness among black and Hispanic women in 2012 (36% and 34%, respectively) was similar to that of white women in 1997 (33%). In 1997, women were more likely to cite cancer than CVD as the leading killer (35% versus 30%), but in 2012, the trend reversed (24% versus 56%). Awareness of atypical symptoms of CVD has improved since 1997 but remains low. The most common reasons why women took preventive action were to improve health and to feel better, not to live longer.

Conclusions—Awareness of CVD among women has improved in the past 15 years, but a significant racial/ethnic minority gap persists. Continued effort is needed to reach at-risk populations. These data should inform public health campaigns to focus on evidenced-based strategies to prevent CVD and to help target messages that resonate and motivate women to take action. (*Circulation*. 2013;127:00-00.)

Key Words: AHA Scientific Statements ■ awareness ■ cardiovascular diseases ■ prevention and control ■ risk factors

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In 1997, the American Heart Association (AHA) commissioned a national survey to assess the awareness and knowledge of heart disease risk among women on the basis of statistics that cardiovascular disease (CVD) was their number one killer and concerns that the perception about heart disease risk was not aligned with established risk among women. Results of the survey were presented in Washington, DC, against a backdrop of the Capital building and 500 000 red carnations, representing the number of women who died annually of CVD. In response to the national data showing that only 1 in 3 women correctly identified heart disease as their leading cause of death, the AHA launched a national campaign to raise awareness and to educate the public about the hazards of heart disease in women.¹ Subsequently, the AHA has conducted triennial surveys to monitor national trends in awareness of heart disease among women.²⁻⁵ Several other organizations have also promoted awareness of heart disease in women, including the National Heart, Lung, and Blood Institute Heart Truth campaign, initiated in 2001, and more recently the Department of Health and Human Services Office of Women's Health Make the Call, Don't Miss a Beat campaign, established in 2011 to raise awareness of heart disease symptoms in women and the need to call 9-1-1. The Red Dress has become the national symbol of the heart disease in women movement, and in 2003, the AHA named its national initiative Go Red for Women.

CVD, coronary heart disease in particular, remains the leading cause of death among women in the United States.⁶ During the decade after the initial launch of the AHA's national campaign in women, the rate of awareness of heart disease as the leading killer of women nearly doubled.^{1,5} During the same time frame, the death rate caused by CVD declined nearly 50% for both men and women.⁷ The purpose of this article, on the occasion of the 10-year anniversary of Go Red for Women, is to present the results of the 2012 survey and to compare those results with baseline data from 1997, along with other triennial surveys, to evaluate trends in awareness and to inform ongoing AHA, federal, and other initiatives aimed at reducing the burden of CVD among women.

Methods

Study Population and Survey Administration

We conducted a cross-sectional survey of 2432 women in the United States who were at least 25 years of age to assess their awareness, knowledge, and perceptions of CVD risk and prevention. The study was designed to result in a margin of error of $\approx 2.0\%$. Potential participants were identified through 2 independent mechanisms: random-digit dialing ($n=1205$) similar to previous surveys¹⁻⁵ and an online survey ($n=1227$) similar to an approach that began in 2009.⁵ All surveys were conducted between August 28 and October 5, 2012, by representatives of Harris Interactive, New York, NY (telephone interviews), or via an online survey conducted through Harris Poll Online, a multimillion-member panel of cooperative online respondents maintained by Harris Interactive. Both telephone and online surveys were administered in English. The telephone survey was ≈ 10 minutes long; the online survey took ≈ 20 minutes.

With the use of random-digit dialing, a total of 117 017 landline numbers were called. Of these, 27 685 (24%) were nonworking/disconnected, business/government, or computer tone numbers, and an additional 47 171 calls (40%) were unresolved because of the inability to talk directly with a person. Of the 42 161 calls successfully connected, a total of 20 298 were answered by individuals who declined to speak to an interviewer (48% refusal rate). An additional 2073 calls (5%) were not completed because of language barriers; 4879 (12%) said a respondent was not available; 1555 (4%) asked to be called back for an interview (10% of whom scheduled a specific call-back time); and 339 (1%) quit before qualification. Screening interviews were therefore completed in 13 017 calls, and 8586 of these calls (66%) were deemed not eligible to be included either because no woman ≥ 25 years of age was in the household or because the respondent refused to allow contact with a woman ≥ 25 years of age in the household. Of the remaining 4431 women who met the criteria for participation, 1205 (27%) completed the survey.

The online sample was obtained from Harris Poll Online. Harris Poll Online includes several million members recruited from a multitude of sources, including but not limited to coregistration offers on partners' Web sites, targeted e-mails sent by online partners to their audiences, graphical and text banner placement on partners' Web sites (including social media, news, search, and community portals), trade show presentations, targeted postal mail invitations, and telephone recruitment of targeted populations. Each recruitment source was vetted through a rigorous interviewing and testing process and then monitored for response quality on an ongoing basis. The database of respondent information was actively screened and updated along numerous demographic and psychographic variables to allow precision in the online sample we provide. The complete survey is available in the [online-only Data Supplement](#).

All telephone and online participants were asked standardized questions about demographic information. Questions about leading cause of death, warning signs of heart attack, and what to do first if experiencing warning signs of heart attack were unaided, similar to prior survey methodology.¹⁻⁵ If someone refused to answer or did not know an answer, the response was coded as "not sure" or "declined to answer." These percentages were not excluded from the analysis. In 2012, aided questions related to barriers to a healthy lifestyle and actions taken in the past year to prevent heart disease were asked only of online participants, and new aided questions about communication with healthcare providers about heart disease and issues of trust and cultural sensitivity were added to the online survey. In the online survey, respondents were not able to move to the next question before providing an answer to the current question.

Survey data were compared with results from similar surveys conducted in 1997, 2000, 2003, 2006, and 2009¹⁻⁵ to examine trends in awareness parameters. Characteristics of women surveyed by random-digital dialing were compared with those of women surveyed online. Data were weighted on the basis of age, race, education, income, and region to reflect the composition of the US population of women ≥ 25 years of age who speak English based on information from the

Table 1. Demographic Characteristics of the AHA Women's Tracking Survey Telephone Respondents

Characteristic	Overall		By Racial/Ethnic Group, 2012			
	1997 (n=1000)	2012 (n=1205)	White (n=651)	Black (n=205)	Hispanic (n=200)	Other (n=149)
			a	b	c	d
Age						
25–34 y	23	13*	11	12	22 ^{a,b}	19
35–44 y	24	20*	18	22	31 ^a	23
45–54 y	18	22*	22	27	22	19
55–64 y	13	19*	21 ^c	19 ^c	10	19
>65 y	21	24	28 ^{b,c,d}	18	14	17
Marital status						
Single, never married	16	12*	11	20 ^a	13	13
Married/cohabitating	59	64*	65 ^b	46	72 ^b	66
Separated/divorced	11	12	11	19 ^{a,c,d}	8	8
Widowed	12	12	12 ^c	12	6	13
Household income, \$						
<35 000	39	25*	22	39 ^{a,d}	34 ^{a,d}	18
35 000–49 999	16	11*	11	13	12	6
50,000–74 999	16	15	14	14	16	16
≥75 000	9	28*	31 ^{b,c}	17	21	34 ^{b,c}
Refused	20	21	22	17	17	26
Health insurance status						
Medicaid/Medicare/VA	NA	34	36 ^c	37 ^c	25	27
Private insurance/self-pay	NA	66	68 ^b	58	61	74 ^{b,c}
Some other type of insurance	NA	8	7	7	11	9
Uninsured	NA	9	9	8	14 ^d	3
Personal medical history						
Diabetes mellitus	NA	14	12	19 ^a	16	19
Heart attack	3	4	5	5	2	3
Stroke	2	4*	4	4	3	3
Family history of heart disease	NA	52	57 ^{a,b,c}	45	43	43
Weight ≥20 lb over ideal for your height and weight	NA	45	45 ^d	51 ^d	49 ^d	29
High blood pressure	NA	35	32	54 ^{a,c,d}	32	31
Have an inactive lifestyle	NA	32	30	36	42 ^{a,d}	28
Depression	NA	26	27	20	29	20
Smoking habit	NA	19	20 ^d	19 ^d	17 ^d	6

All values are weighted percentages.

Letters indicate significant differences in columns for racial/ethnic groups at $P<0.05$. AHA indicates American Heart Association; NA, data not asked in 1997; VA, Veterans Affairs.

*Significant differences between 1997 and 2012 survey responses at $P<0.05$.

US Census Bureau's March 2011 Current Population Survey overall and within ethnic strata. Propensity weighting was used for the online survey to adjust for the respondents' propensity to be online. Statistical significance was set at $P<0.05$. No adjustments were made for multiple pairwise comparisons.

Results

Characteristics of the Respondents

The demographic characteristics of telephone respondents are listed in Table 1 for 2012 overall compared with 1997 and by racial/ethnic group in 2012. Respondents in 2012 were significantly more likely to be in the age groups of 45 to 54 and 55 to 64 years, to be married/cohabitating, and to

have a household income of \$75 000 or more compared with 1997 respondents. In 2012, there were more white women than other racial/ethnic minorities who were ≥65 years old; Hispanic women were more likely to be in the youngest age strata compared with white and black women. Personal medical history of respondents revealed a high prevalence of CVD risk factors, consistent with other national data.

Online respondents were more likely than telephone respondents to be in the youngest age group of 25 to 34 years (18% versus 13%; $P=0.011$), to be separated/divorced (16% versus 12%; $P=0.033$), to be uninsured (14% versus 9%; $P=0.004$), to report being 20 lb overweight (52% versus 45%; $P=0.009$), and to have an inactive lifestyle (42% versus 32%; $P<0.0001$).

Table 2. (Unaided) Awareness of the Leading Cause of Death in 2012 Compared With 1997 Overall and by Racial/Ethnic Group

Response (Unaided)	Overall		Racial/Ethnic Group					
	Survey Year		White		Black		Hispanic	
	1997 (n=1000)	2012 (n=1205)	1997 (n=658)	2012 (n=651)	1997 (n=130)	2012 (n=205)	1997 (n=126)	2012 (n=200)
Leading cause of death								
Breast cancer	14	8*	14	5*	18	14	17	11
Cancer (general)	35	24*	33	20*	41	38	43	36
Heart disease/heart attack	30	56*	33	65*	15	36*	20	34*
Other	10	7*	8	5*	12	5*	9	14
Do not know/no answer	11	6*	12	5*	14	8	11	6

All values are weighted percentages for telephone results for comparability between the 1997 and 2012 surveys.

*Statistical significance between survey years within each racial/ethnic group at $P < 0.05$.

Awareness of and Perceptions Related to Heart Disease

Table 2 illustrates the difference in unaided awareness of the leading cause of death overall and by racial/ethnic group in 1997 and 2012 among telephone respondents. In contrast to 1997 when cancer was more frequently cited as the leading cause of death among women compared with heart disease (35% versus 30%), the trend reversed in 2012 (56% of respondents cited heart disease and 24% cited cancer as the leading cause of death). Overall, the rate of awareness that heart disease is the leading cause of death in women was significantly higher in 2012 compared with 1997 (56% versus 30%; $P < 0.001$) but was not different from 2009 (54%). The overall rate of awareness among online respondents was 63% in 2012, similar to that in 2009 (65%). In addition, 48% of women in 2012 considered themselves to be very well or well informed about heart disease in women compared with 34% in 1997 ($P < 0.001$).

The Figure illustrates trends in awareness of the leading cause of death among women in 6 triennial surveys according to racial/ethnic group among telephone respondents. A trend in greater awareness of heart disease as the leading cause of death across survey years from 1997 through 2006 when awareness reached a plateau overall was observed in all subgroups. The racial/ethnic minority gap in awareness noted in 1997 (33% white, 15% black, 20% Hispanic) persisted in all survey years, including the most recent (65% white, 36% black, 34% Hispanic). Levels of awareness were lower among

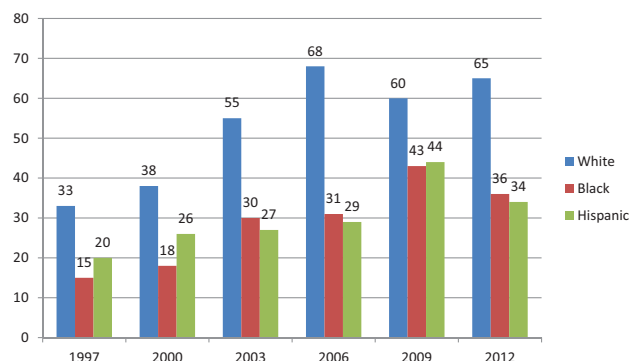


Figure. Trends in awareness that heart disease is the leading cause of death in women.

racial and ethnic minority women in 2012 compared with 2009. Among online respondents in 2012, the racial/ethnic disparity for awareness of heart disease as the leading killer of women was less pronounced (69% of white, 52% of black, 51% of Hispanic women).

Table 3 illustrates awareness according to age strata in 2012 compared with 1997 among telephone respondents. In contrast to 1997 when more women in the younger age strata (25–34 years) cited cancer as the leading cause of death compared with heart disease (38% versus 16%), in 2012, 44% of women in this age category correctly identified heart disease as the leading cause of death among women compared with 26% citing cancer. In both survey years, women in older age strata were more likely to cite heart disease as the leading killer compared with cancer.

Knowledge of Warning Signs of Heart Attack and Need to Call 9-1-1

Table 4 shows trends in women’s unaided awareness of the warning signs of a heart attack. Among 2012 telephone respondents, awareness of atypical signs of a heart attack such as nausea was greater in 2012 compared with 1997 (18% versus 10%; $P < 0.0001$). In contrast, chest pain was less frequently cited as a warning sign of a heart attack in 2012 versus 1997 (56% versus 67%; $P < 0.0001$). When asked what they would do first if they thought they were experiencing signs of a heart attack, 65% of women in 2012 reported that they would call 9-1-1 compared with 53% in 2009 (question not asked in 1997). When asked what they would do first if they thought someone else was experiencing signs of a heart attack, 81% of women reported that they would call 9-1-1 (Table 5). Trends were similar across racial and ethnic groups except that Hispanic women were significantly less likely to respond that they would take an aspirin first if they thought they were having a heart attack compared with white and black women (10% versus 22% and 18%, respectively). White women were more likely than black or Hispanic women to advise someone else to take an aspirin first (13% versus 11% versus 6% respectively).

Communication About Heart Disease

In 2012, 21% of women who were surveyed online (not asked by telephone in 2012) reported that their doctor had

Table 3. (Unaided) Awareness of the Leading Cause of Death in 2012 Compared With 1997 by Age

Response (Unaided)	Age 25–34 y		Age 35–44 y		Age 45–64 y		Age ≥65 y	
	1997 (n= 188)	2012 (n=104)	1997 (n= 294)	2012 (n=174)	1997 (n=308)	2012 (n=524)	1997 (n=195)	2012 (n=380)
Leading cause of death								
Breast cancer	19	11	17	9*	12	7*	9	6
Cancer (general)	38	26*	33	25	36	21*	34	26*
Heart disease/heart attack	16	44*	28	59*	38	62*	34	50*
Other	12	10	10	4*	7	5	9	9
Don't know/no answer	15	9	12	3*	7	5	14	9

All values are weighted percentages for telephone results for comparability between the 1997 and 2012 surveys.
 *Statistical significance between survey years within each age strata at $P<0.05$.

ever discussed their risk for heart disease when discussing their health; this was lower among Hispanics than whites or blacks (12% versus 22% and 22%, respectively) and lower for younger women compared with older age groups (6% for those 25–34 years of age compared with 16%, 23%, and 33% for those 35–44, 45–64, and ≥65 years of age, respectively). Similarly, women ≥65 years of age were more likely than all other age groups to report that their doctor discussed high blood pressure and cholesterol with them. Black women were more likely to report that their doctors had discussed high blood pressure with them compared with white and Hispanic women (54% versus 36% and 31%, respectively; $P<0.05$). Exercise, weight, and cholesterol management were the top 3 health issues that women report their doctors discussed with them when discussing their health (49%, 47%, and 45%, respectively).

Perceived Heart Disease Prevention Strategies, Reasons to Take Action, and Barriers to Take Action

Several traditional lifestyle actions (aided) to improve health in the past year were cited by a majority of female online respondents; however, unproven strategies (eg, aromatherapy) similar to prior surveys were also cited (Table 6). When asked what prompted them to take preventive action (aided), the majority of women reported wanting to improve their health and wanting to feel better as reasons to take action. Fewer than half of women cited wanting to live longer as a reason

Table 4. (Unaided) Awareness of Warning Signs of Heart Attack in 2012 Compared With 1997

Response (Unaided)	Survey Year	
	1997	2012
What warning signs would you associate with having a heart attack?		
Chest pain	67	56*
Fatigue	8	10
Nausea	10	18*
Pain that spreads to shoulders, neck, or arm	NA	60
Shortness of breath	33	38*
Tightness of the chest	15	17

All values are weighted percentages for telephone results for comparability between the 1997 and 2012 surveys.
 NA indicates response not surveyed in 1997.
 *Statistical significance between survey years at $P<0.05$.

to take preventive action with the exception of 2 subgroups: black women and women >65 years of age.

Table 7 shows barriers to prevention action as reported by online respondents. The most frequent response women gave when provided a list of 20 potential barriers they faced in taking preventive action was, “None of these; I lead a heart-healthy lifestyle” (35%). Nearly half of women ≥65 years of age (48%) gave this response. Of barriers reported, top barriers to leading a “heart-healthy” lifestyle were not having money or insurance coverage to do what needs to be done (16%), lack of confidence in ability to change behavior (14%), and not having time to care for oneself (13%). Women 25 to 34 years of age were more likely to report not having the time to take care of themselves as a barrier to preventive action than older women ($P<0.05$). More women 35 to 44 years of age reported that having family obligations and other people to take care of was a barrier preventing them from leading a heart-healthy lifestyle than women in older age groups (17% versus 10% and 5% for women in the age groups of 45–64 and ≥65 years, respectively; $P<0.05$).

Table 5. (Unaided) Responses to Signs of a Heart Attack in 2012 by Racial/Ethnic Group

Response (Unaided)	Overall, 2012	Racial/Ethnic Group		
		White (a)	Black (b)	Hispanic (c)
If you thought you were experiencing signs of a heart attack, what is the first thing you would do?				
Call 9-1-1	65	63	65	73
Take an aspirin	20	22 ^c	18 ^c	10
Go to the hospital	5	5	8	4
Call a family member	4	4	2	4
Call your doctor	2	1	1	5 ^a
If you thought someone else was experiencing signs of a heart attack, what is the first thing you would do?				
Call 9-1-1	81	80	78	87
Advise him/her to take an aspirin	11	13 ^{c,d}	11	6
Take him/her to the hospital	1	1	3	2
Tell him/her to call the doctor	1	—	—	2 ^a
Call his/her spouse or family member	—	...	—	...

All values are weighted percentages among telephone respondents.
 Letters denote significant differences in columns for racial/ethnic and age groups at $P<0.05$.
 Dash indicates small base sample <100; ..., empty cell

Table 6. (Aided) Preventive Actions Taken in the Past Year According to 2012 Online Respondents by Racial/Ethnic and Age Group

Response (Aided)	Racial/Ethnic Group					Age Group			
	Overall, 2012 (n=1227)	White (n=672) (a)	Black (n=202) (b)	Hispanic (n=200) (c)	Other (n=153) (d)	25–34 y (n=168) (e)	35–44 y (n=192) (f)	45–64 y (n=587) (g)	≥65 y (n=280) (h)
Preventive action taken									
Maintain a healthy blood pressure	78	80 ^c	74	71	75	60	65	86 ^{e,f}	90 ^{e,f}
See the doctor	78	79	79	70	79	71	58	82 ^{e,f}	93 ^{e,f,g}
Increase fiber intake	66	68	64	60	69	58	53	71 ^{e,f}	77 ^{e,f}
Eat foods containing antioxidants	66	68	65	59	69	54	55	72 ^{e,f}	76 ^{e,f}
Maintain a healthy cholesterol level	66	67	66	63	67	55	47	71 ^{e,f}	84 ^{e,f,g}
Get adequate sleep	61	63	55	58	56	62 ^f	40	63 ^f	74 ^{e,f,g}
Floss teeth regularly	60	58	62	68 ^a	67	58	54	65	60
Reduce sodium or salt in the diet	58	55	72 ^{a,c}	57	66	43	45	64 ^{e,f}	72 ^{e,f}
Reduce sugar intake	57	56	62	55	64	47	46	58 ^f	74 ^{e,f,g}
Eat foods or take supplements that contain fish oil/omega-3 fatty acids	57	58	53	51	61	43	40	64 ^{e,f}	70 ^{e,f}
Get regular physical exercise	53	53	60	51	55	58	53	52	52
Reduce dietary cholesterol intake	53	53	59 ^{a,d}	48	59	34	37	58 ^{e,f}	74 ^{e,f,g}
Pray or meditate	53	51	73 ^{a,c,d}	50	42	45	41	58 ^{e,f}	61 ^{e,f}
Take multivitamin with folic acid	53	54	49	48	52	54	42	53	62 ^f
Lose weight	49	47	63 ^{a,c}	51	47	46	43	51	56
Reduce stress	49	46	59 ^a	55	54	37	40	55 ^{e,f}	55 ^{e,f}
Reduce animal protein in the diet (eg, meat, whole milk, butter, and cream)	44	46	47	39	38	29	32	48 ^{e,f}	62 ^{e,f,g}
Take aspirin regularly	24	25	24	20	20	6	11	27 ^{e,f}	46 ^{e,f,g}
Eat plant stanols and sterols	20	20	14	26 ^b	19	22	14	21	22
Aromatherapy	14	13	16	15	10	13	11	17	10
Quit smoking	11	11	12	11	9	11	10	11	13
Reason to take preventive action									
I wanted to improve my health	64	64	63	68	59	57	52	70 ^{e,f}	70 ^{e,f}
I wanted to feel better	61	61	62	61	65	58	53	66 ^f	62
I wanted to live longer	45	44	52 ^d	48 ^d	32	32	38	46 ^e	59 ^{e,f,g}
I wanted to avoid taking medications	28	28	30	26	30	22	22	29	36 ^{e,f}
I did it for my family	25	25	23	26	26	23	29	23	28
My healthcare professional encouraged me to take action	23	21	32 ^a	24	21	9	14	28 ^{e,f}	33 ^{e,f}
A family member/relative developed heart disease, got sick, or died	14	12	18	20 ^{a,b}	19	10	15	15	16
I saw, heard, or read information related to heart disease	14	13	23 ^{a,c}	10	15	10	8	14	22 ^{e,f,g}
A family member or relative encouraged me to take action	11	11	9	9	21 ^{a,b,c}	17 ^f	5	12	12
I experienced symptoms that were related to heart disease	8	8	7	8	7	7	6	5	16 ^{e,f,g}
A friend encouraged me to take action	6	5	8	7	9	9	4	6	4
A friend developed heart disease, got sick, or died	5	4	6	8	4	4	2	5	7
I was encouraged to take action during an event or program at my place of worship (church, mosque, or temple)	3	2	7 ^{a,c,d}	2	—	6	2	2	1
I was encouraged to take action during an event or program at my community center	1	1	3	2	—	2	1	1	1

Values represent the weighted percent of women surveyed online who reported taking each preventive action to improve their health in the past year.

Letters denote significant differences in columns for racial/ethnic and age groups at $P < 0.05$.

Dash indicates small base sample < 100 .

Trust/Cultural Sensitivity

Black women were more likely than white and Hispanic women who completed the online survey to agree with the statement, “I trust my healthcare provider so much that I

always try to follow her/his advice” (87% versus 78% and 72%; $P < 0.05$). Compared with white and Hispanic women, black women were the most likely to report that they trusted their healthcare provider to put their medical needs above all

Table 7. (Aided) Barriers to Preventive Action According to Racial/Ethnic and Age Group

Response (Aided)	Overall, 2012 (n=1227)	Racial/Ethnic Group				Age Group			
		White (n=672) (a)	Black (n=202) (b)	Hispanic (n=200) (c)	Other (n=153) (d)	25–34 y (n=168) (e)	35–44 y (n=192) (f)	45–64 y (n=587) (g)	≥65 y (n=280) (h)
Barriers to prevention									
I do not have the money or insurance coverage to do what needs to be done	16	15	16	19	17	15 ^h	20 ^h	19 ^h	7
I am not confident that I can successfully change my behavior	14	13	15	15	15	11	10	17	14
I do not have the time to take care of myself	13	12	13	12	19	27 ^{g,h}	15 ^h	10 ^h	4
I am too stressed to do the things that need to be done	12	11	15	15	19 ^a	14 ^h	17 ^h	13 ^h	5
I don't know what I should do	11	11	8	14	7	11 ^h	15 ^h	11 ^h	5
I have family obligations and other people to take care of	11	10	10	14	15	12	17 ^{g,h}	10	5
I do not want to change my lifestyle	9	10 ^b	2	11 ^b	19 ^{a,b}	12	6	10	8
I do not perceive myself to be at risk for heart disease	9	10	6	7	10	14 ^f	4	8	10
I am too depressed to do the things that need to be done	8	8	6	6	14	6	12 ^h	11 ^h	3
There is too much confusion in the media about what to do	8	8	5	6	10	6	7	10	6
I am confused by what I am supposed to do to change my lifestyle	6	7	6	4	5	7	3	7	6
I feel the changes required are too complicated	5	5	2	7	5	3	5	7 ^h	3
I do not think changing my behavior will reduce my risk of developing heart disease	4	4	2	7	2	7	2	3	5
God or some higher power ultimately determines my health	4	5 ^c	6 ^c	1	1	1	2	6 ^a	6 ^a
My healthcare professional does not explain clearly what I should do	3	4	2	3	1	5	7 ^a	2	2
I am fearful of change	3	3	1	4	5	4	3	3	1
My healthcare professional does not think I need to worry about heart disease	3	3	1	5	4	5	3	2	2
I am too ill/old to make changes	2	2	2	2	2	—	2	2	3
My healthcare professional does not speak my language	1	1	3 ^a	...	—	3 ^a	—	—	1
My family/friends have told me that I do not need to change	—	—	—	—	...	—	...
Other	7	7	7	10	6	4	7	7	12 ^e
None of these; I lead a heart-healthy lifestyle	35	36	39	30	31	33	31	32	48 ^{e,f,g}

Values represent the weighted percent of women surveyed online.

Letters denote significant differences in columns for racial/ethnic and age groups at $P < 0.05$.

Dash indicates small base sample < 100 ; ..., empty cell.

other considerations when treating their medical problems and were least likely to agree that their healthcare provider does not care about them as a person. Hispanic women were less likely than white and black women to feel that their healthcare provider is sensitive to their culture when making recommendations about their health care (67% versus 76% versus 77%; $P < 0.05$).

Discussion

Between 1997 and 2012, awareness of heart disease as the leading cause of death in women has essentially doubled but remains suboptimal. However, the rate of awareness among women overall has not changed significantly in the past 6 years, and substantial heart disease awareness gaps persist among racial/ethnic minorities compared with white women. Although the level of awareness among black women has also doubled since 1997, their level of awareness in 2012 is similar to that of white women in 1997. These data suggest that future educational efforts should be targeted to racial

and ethnic minorities who have lower rates of awareness and higher rates of CVD mortality and risk factors. These data also suggest that perhaps the traditional outreach methods used by national organizations like the AHA might not be as effective as they could be in educating minority women. A component of awareness and adherence to medical guidelines is dictated by the perception of message priority among other priorities, sociodemographic variables, and trustworthiness and/or commonality between the messenger and the recipient. Furthermore, relatively few data exist on the effectiveness of favorable intervention strategies for chronic diseases such as CVD in different racial/ethnic minority groups.⁸

Insight into one potentially effective strategy for increasing awareness of heart disease among black women relates to our finding that they were more likely to report that they had been prompted to take preventive action at their place of worship and were more likely to report that God or a higher power determines their health. Although there have been longstanding efforts targeting places of worship as primary

partners in CVD education, the provision of the majority of such outreach has come from local/community organizations or minority medical organizations.⁹ Nationally organized and funded faith-based interventions will likely be necessary to provide sustainable awareness among racial/ethnic minorities.

Interestingly, these data indicate that black women reported higher levels of trust in their providers compared with white and Hispanic women and were more likely to report taking action on the advice of their healthcare provider. Provider mistrust as a barrier to provision of quality health care and a cause of racial/ethnic cardiovascular health disparities is often touted, but provider trust by black and Hispanic women may be influenced by many factors, including race/ethnicity of the provider-patient pair, perception of discrimination, socioeconomic status, age, and proximity of the provider and his/her facility to the patient's residence. It is important to note that trust in healthcare providers/systems for black and Hispanic women may be influenced by many factors that were not systematically explored in this study. Hispanic women in this study were more likely than white or black women to report that they felt their healthcare provider did not take their culture into account when making recommendations, suggesting that efforts to provide culturally sensitive care are important in this population.

The rate of awareness of heart disease as the leading cause of death was lower among younger women (25–34 years of age), who cited different barriers to prevention than older respondents (ie, time constraints, stress/depression, and lower perception of risk). They were also more likely than their older counterparts to state that their doctor did not talk to them about their heart disease risk. This may represent a missed opportunity, especially because women in the child-bearing years may present with novel risk factors for CVD (ie, preeclampsia, gestational diabetes mellitus) that can identify at-risk women earlier in their life course when lifestyle and other preventive efforts may be critical to implement.¹⁰ Recent nationally representative data have shown an increase in the prevalence of stroke and myocardial infarction among middle-aged women.^{10,11} This increase has occurred in parallel with steeper increases in obesity and abdominal obesity rates among young women compared with men.^{12–14} These findings suggest that future approaches to reduce heart disease risk in younger women should include strategies to overcome age-specific barriers to heart-healthy living and to improve adherence to evidence-based prevention guidelines by women that encourage assessment of pregnancy-related CVD risk and psychosocial factors.¹⁵

Over the past 15 years, there has been improvement in the recognition of atypical symptoms of heart attack, but overall, awareness remains quite low. Similarly, recognition of the need to call 9-1-1 first if heart attack signs occur has improved, but women are more likely to call emergency services on behalf of someone else compared with themselves. More data are needed to understand the barriers and psychosocial factors that women face to acting on the recognition that they might be having a heart attack if management of acute coronary syndromes in women is to be most effective.

Although this study supports that women are familiar with traditional methods to prevent CVD, there is still substantial misinformation on some strategies (eg, vitamin supplements)

that are not evidence based and are not recommended by the AHA.¹⁵ Overall, there was a substantial decrease in the proportion of women citing hormone therapy as a way to prevent heart disease since 1997 (47% of telephone respondents), consistent with the publication of AHA guidelines in 2004 suggesting that hormone therapy should not be used to prevent CVD and may be harmful.¹⁶ Given the widespread publicity surrounding the Women's Health Initiative results, the declining trend in the perception of hormone therapy as a CVD preventive strategy underscores the importance of the media in disseminating health information to women, a point that was underscored by a recent Institute of Medicine Committee on Women's Health Research.¹⁷ It should also be noted that self-reported depression was common (26%) among respondents, previously highlighted by the AHA as a potential barrier to adherence to guidelines for the prevention of CVD among women.^{15,16}

There are important limitations to this study that should be considered when the data are used to inform educational efforts. This was a study of English-speaking women who were willing to participate in a telephone or an online survey, so results may not be generalizable to all women. Similarities between these data and known population trends such as higher rates of hypertension among black compared with other women support the external validity of the results. There was no adjustment for multiple comparisons, and some of the significant findings could be attributable to chance. Random-digit dial survey methodology was used to allow comparisons across survey years; bias could have resulted from the increased number of households without landlines in 2012 compared with 1997 if characteristics of cell phone users differ from landline users, but we were not able to evaluate this.

Conclusions

Heart disease awareness among white, black, and Hispanic women has improved over the 15-year course of this study but remains suboptimal. Gaps in the awareness rates between women of the different racial/ethnic groups have remained relatively constant, suggesting that intensified efforts are needed. More data are needed in diverse racial/ethnic populations of women not highly represented in this study. Future CVD awareness and prevention efforts should focus on incorporating culturally relevant components into messaging and message delivery. An emphasis on how lifestyle and preventive strategies may improve health and energy and help women feel better may resonate with many segments of women more effectively than a focus on longevity. The women and heart disease movement can build on the gains in awareness that heart disease is the leading cause of death to encourage heart-healthy lifestyles as a leading strategy to feel better.

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This table represents the relationships of writing group members that may be perceived as actual or reasonably perceived conflicts of interest as reported on the Disclosure Questionnaire, which all members of the writing group are required to complete and submit. A relationship is considered to be "significant" if (a) the person receives \$10 000 or more during any 12-month period, or 5% or more of the person's gross income; or (b) the person owns 5% or more of the voting stock or share of the entity, or owns \$10 000 or more of the fair market value of the entity. A relationship is considered to be "modest" if it is less than "significant" under the preceding definition.

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*Modest.

†Significant.

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