Women's Health Initiative
2019 Annual Progress Report

Data as of: March 1, 2019

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1.   Overview

1.0   Background

Between 1993 and 1998, WHI investigators at 40 Clinical Centers recruited 161,808 women into the program; 68,132 were randomized into one or more arms of the clinical trial component (CT) and 93,676 were enrolled into the observational study (OS) (Figure 1). During 2004-2005, the close-out period for the original program, 115,407 women consented to five additional years of follow-up, representing 78.3% of the 147,300 participants who were alive in active follow-up at that time. At the end of the first extension period in 2010, participants were offered the opportunity to continue and 88.6% of the 105,584 eligible women agreed (n=93,567).
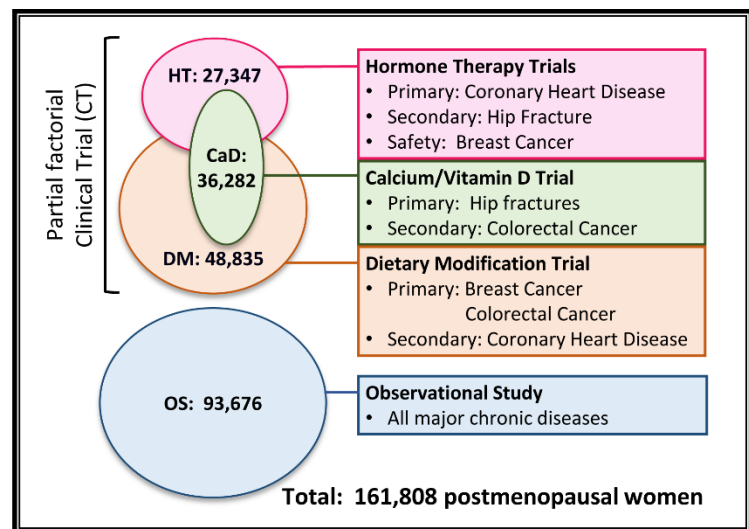
Figure 1. Original design of the WHI clinical trials and observational study, its components and outcomes.

1.1   The 2010-2020 Extension Study

The follow-up protocol for 2015-2020 is essentially unchanged from the protocol for the previous 5 years (2010-2015). All participants are contacted annually, primarily by mail, for health and selected exposure updates. For reports of designated health events, the effort to obtain documentation has been reduced to a subset. Continuing in 2015-2020, cardiovascular events and hip fractures are only documented in a subset of participants referred to as the Medical Records Cohort (MRC). The MRC is comprised of former hormone trial (HT) participants and all African American and Hispanic participants, regardless of their previous enrollment status (Figure 2). In this subset, we stopped documentation for atrial fibrillation in May 2017 and for hospitalizations that were not tied to an outcome of interest in 2018. Active outcome data collection for the remaining participants (the Self-Report Cohort or SRC) is limited to self-report with the exception of cancer, for which NCI is supporting the documentation and coding of all incident primary cancers. In addition to these cohorts, there are several active ancillary studies that are augmenting the endpoints documentation.
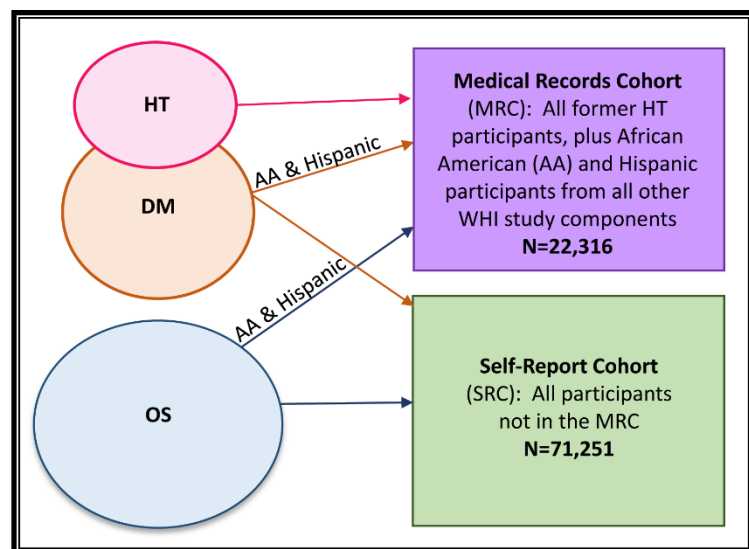
Figure 2. 2010–2020 Extension Study design reflecting differing levels of outcomes ascertainment: MRC and SRC.

The Clinical Coordinating Center (CCC) conducts annual mailings of follow-up questionnaires to all eligible participants. The Regional Centers (RC) and their collaborating centers contact non-responders, collect and submit medical records for all of the designated outcomes to the CCC, and participate in a range of scientific endeavors. The CCC fulfills the RC role for two former Field Centers (Seattle and LaJolla). As of March 1, 2019, 67,140 women remain in active follow-up (Table 1.4), 69% of whom are 80 or older. Table 1.5 shows how the characteristics of the currently active participants compare to those originally recruited.

As the size of the cohort decreases, we have reconfigured the infrastructure to maximize efficiency. Several Field Centers have closed, and their participants are now being followed at the Regional Centers. This includes the closure of the Pittsburgh Field Center (participants now followed at the Columbus Regional Center), and the Gainesville Field Center (participants now followed at the Wake Forest Regional Center).

1.2   Progress on primary study objectives

This report provides an update on study status through March 1, 2019. Though follow-up rates have remained excellent, there has been a gradual drop in initial and overall response rates in the last two years. In 2017, mailing response was 82.0% after 2 mailings, and the overall response was 88.5% including phone follow-up (Tables 1.6-1.7). Mailing response in 2018 was 80.3%, and was 80.5% when including phone follow-up. Participant age and health are beginning to erode response to our annual mailings. We have begun to explore alternate, complimentary approaches to collecting health data to facilitate as complete data collection as possible, including online forms for participant proxies and using administrative data to drive outcomes investigations.

For the designated WHI outcomes, annualized clinical event rates based on fully adjudicated outcomes through March 1, 2019 are presented by original study component, age and race (Sections 2-4). We present data for the MRC and SRC Supercohorts, including data for women who would have been in those groups had they participated in the 2010-2020 Extension Study. Fully adjudicated events available through March 1, 2019 are provided for the MRC Supercohort. For the SRC Supercohort, fully adjudicated events are provided for the interval from enrollment to September 2010 or March 1, 2019 as appropriate. A large proportion of the cohort is deceased: 22.5% of Extension Study 2010-2020 participants had died as of March 1, 2019 (Table 2.1), up from 18.8% of the cohort last March. Cardiovascular disease is the most common cause of death over time, with an annualized rate of CVD death of 0.62% (Table 2.5).

Section 5 provides a current summary of the agreement rates between self-reported events and the centrally adjudicated events among MRC participants. In general, 50% to 70% of self-reported cardiovascular outcomes are confirmed as the reported diagnosis (Table 5.1). Often, however, a related diagnosis is found. For example, of the confirmed clinical myocardial infarctions, only 52% were based on a self-report of that condition, and the remainder were discovered when investigating a self-report of a different outcome (Table 5.3). Similarly, fewer than half of confirmed heart failure cases were found based on a self-report of that condition (Table 5.2).

The WHI Long Life Study (LLS) consisted of an in-person visit with 7,875 of the oldest women in the MRC (details in Section 6), during which a blood sample and physical frailty measures were collected. LLS participants were preferentially sampled based on availability of GWAS data, CVD biomarkers and older ages. Of the participants who were in the LLS, 75.5% (n=5947) continue to be actively followed (Table 6.2). Verified and self-reported outcomes are presented stratified by age at LLS study visit (Table 6.3) and race (Table 6.4). So far, 841 LLS participants have had verified cardiovascular outcomes, 542 have had a verified cancer, and 1,463 have died after the LLS visit. The most frequent self-reported outcomes after the visit are: macular degeneration (N=938), dementia or Alzheimer's disease (N=908), osteoarthritis (N=724) and COPD (N=660) (Table 6.5).

1.3   Engaging investigators

The WHI program leadership recognizes the importance of both drawing in new investigators to use the rich WHI resources, and also providing leadership and growth opportunities. Chairing WHI committees is one area where investigators who have participated in scientific endeavors with WHI can become engaged in the infrastructure that enables the science. In the last year, there are several new committee chairs, Marian Neuhouser (Fred Hutchinson Cancer Research Center) for the Ancillary Studies Committee, and Linda Van Horn (Northwestern University) for the Publications and Presentations Committee (Table 1.1), both of whom had previously served as the co-Chairs for those committees. Several more junior investigators have also newly become co-Chairs, who will assume the role of Chair when the term of the current chair ends. Kathleen Hayden (Associate Professor of Social Sciences and Health Policy at Wake Forest School of Medicine) is the new co-Chair for the P&P Committee, and Nora Franceschini (Associate Professor of Epidemiology at the University of North Carolina) is the new co-Chair for the ASC. The Steering Committee appointed a Mentorship Task Force to identify ways to better engage junior investigators in navigating WHI.

Section 7 addresses manuscripts published in the last year. A full listing and status of all proposed ancillary studies and manuscripts is available on the WHI website (www.whi.org). There are 3,325 manuscript proposals that have been approved and 1,859 manuscripts are published or in press (Table 7.2), which is 183 publications since last year's report. Investigators using WHI data continue to present high-quality science of broad interest, with publications in the last year in many high-impact journals such as *The Lancet, Nature Medicine, Journal of the American College of Cardiology, JAMA Internal Medicine, Nature Genetics, BMJ, JAMA Oncology, Nature Communications, JAMA Cardiology (2714, IF: 10.133), and more*. In addition to manuscripts addressing cardiovascular disease among WHI participants, there have been a substantial number in cancer, diabetes, genetics, and aging. A substantial number of these papers are related to consortia in which WHI participates, speaking to the collaborative nature of the WHI investigators and to the value of our data, even for rare exposures and endpoints.

The cohort continues to serve as the critical backbone for ancillary studies large and small. The COcoa Supplement and Multivitamin Outcomes Study (COSMOS) trial (PIs: JoAnn Manson and Howard Sesso) and the WHI Strong and Healthy (WHISH) trial (PIs: Marcia Stefanick, Charles Kooperberg, Andrea LaCroix) both successfully launched in 2015. COSMOS completed randomizations of 4,611 WHI participants (among a total of

21,444 trial participants, men and women) in early 2018. In addition, five ancillary studies to these trials are ongoing (COSMOS – Mind, COSMOS – Web, COSMOS – Eye, and WHISH 2 Prevent Heart Failure, and WHISHStar). The WHI Sleep HyPoxia and End Results (WHISPER) study began recruiting in 2017, towards a goal of recruiting 6,500 WHI participants, but success with their baseline measures has reduced their recruitment needs. COSMOS, WHISH, and the WHISH 2 Prevent Heart Failure are all funding adjudication of WHI endpoints among SRC participants in their studies, augmenting the outcomes data available for future analyses.

Various core studies have generated genetic data for over 30,000 WHI participants using a number of approaches (genome-wide association studies, exome sequencing, typing of ancestry informative markers, metabochip typing), along with CVD biomarker data. These data are shared through dbGaP and BIOLINCC, providing an opportunity for outside investigators to use these resources, independent of the WHI program. Whole genome sequencing for more than 11,000 WHI participants through the TopMED program has been completed, and those data will be broadly available through dbGaP.

1.4   Future Directions

The May 2019 WHI Investigator Meeting was held in Bethesda, MD, with Dr. David Goff as the keynote speaker. Dr. Goff presented the strategic priorities of the NHLBI. The WHI program is well-positioned to address many of these areas. The Big Goals of NHLBI are to:

- Address social determinants of cardiovascular health (CVH) and health inequities
- Enhance resilience
- Promote CVH and prevent CVD across the lifespan
- Eliminate hypertension-related CVD
- Reduce the burden of heart failure
- Prevent vascular dementia

The Steering Committee appointed a Data Collection Task Force, chaired by Andrea LaCroix and Marian Limacher. Over the course of the last year, the DCTF has worked towards changing and refining our surveys to better position WHI to address both the goals of NHLBI and the scientific issues that can be well studied in our aging cohort. In the coming year, we will deploy our new data collection tools.

We are also working towards more efficient and comprehensive data collection using administrative data to augment adjudication of self-reported outcomes. Using these approaches increased the array of outcomes that can be studied in our cohort without increasing participant burden. This also could enable us to study endpoints that may be quite unreliable by self-report, such as vascular dementia.

The WHI continues to be a rich resource for scientific discovery across the spectrum of disease and conditions that affect aging women. We continue to proactively identify ways to engage new investigators and support strong science.

Table 1.1
WHI Centers and Principal Investigators

Clinical Coordinating Center

Principal Investigator	Institution	Location
Garnet Anderson, PhD	Fred Hutchinson Cancer Research Center	Seattle, WA

Field Centers

Principal Investigator	Institution	Location
Rebecca Jackson, MD	Ohio State University	Columbus, OH
Lewis Kuller, MD DrPH	University of Pittsburgh	Pittsburgh, PA (FC closed Oct 2018)
Marian Limacher, MD	University of Florida	Gainesville, FL (FC closed Apr 2019)
JoAnn Manson, MD DrPH	Brigham and Women's Hospital	Boston, MA
Sally Shumaker, PhD	Wake Forest University	Winston-Salem/Greensboro, NC
Marcia Stefanick, PhD	Stanford University	Palo Alto, CA
Cynthia Thomson, PhD RD	University of Arizona	Tucson, AZ
Jean Wactawski-Wende, PhD	University at Buffalo	Buffalo, NY
Jennifer Robinson, MD MPH	University of Iowa	Iowa City/ Bettendorf, IA

Previous Field Center Principal Investigators

Principal Investigator	Institution	Location
Shirley Beresford, PhD	Fred Hutchinson Cancer Research Center	Seattle, WA
Robert Brunner, PhD	University of Nevada	Reno, NV
Robert Brzyski, MD	University of Texas	San Antonio, TX
Bette Caan, DrPH	Kaiser Foundation Research Institute	Oakland, CA
Rowan Chlebowski, MD PhD	University of California, Los Angeles	Torrance, CA
J. David Curb, MD	University of Hawaii	Honolulu, HI
Charles Eaton, MD	Memorial Hospital of Rhode Island	Pawtucket, RI
Gerardo Heiss, MD MPH	University of North Carolina, Chapel Hill	Chapel Hill, NC
Barbara Howard, PhD	MedStar Research Institute	Washington, D.C.
Allen Hubbell, MD	University of California, Irvine	Irvine, CA
Karen Johnson, MD MPH	University of Tennessee	Memphis, TN
Jane Kotchen, MD MPH	Medical College of Wisconsin	Milwaukee, WI
Andrea LaCroix, PhD	FHCRC for UCSD/La Jolla	Seattle, WA
Dorothy Lane, MD MPH	Research Foundation SUNY, Stony Brook	Stony Brook, NY
Norman Lasser, MD PhD	University of Medicine and Dentistry	Newark, NJ
Erin LeBlanc, MD	Oregon Health & Science University	Portland, OR
Cora Lewis, MD MSPH	University of Alabama at Birmingham	Birmingham, AL
Karen Margolis, MD	University of Minnesota	Minneapolis, MN
Lisa Martin, MD FACC	George Washington University	Washington, DC
Lauren Nathan, MD	University of California, Los Angeles	Los Angeles, CA
Mary-Jo O'Sullivan, MD	University of Miami	Miami, FL
Judith Ockene, PhD	University of Massachusetts	Worcester, MA
Larry Phillips, MD	Emory University	Atlanta, GA
Lynda Powell, PhD	Rush University Medical Center	Chicago, IL
Ross Prentice, PhD	Fred Hutchinson Cancer Research Center	Seattle, WA
Haleh Sangi-Haghpeykar, PhD	Baylor College of Medicine	Houston, TX

Table 1.1 (continued)
WHI Centers and Principal Investigators

Former Principal Investigators

Principal Investigator	Institution	Location
John Robbins, MD	University of California, Davis	Sacramento, CA
Gloria Sarto, MD	University of Wisconsin	Madison, WI
Michael Simon, MD	Wayne State University	Detroit, MI
Michael Thomas, MD	University of Cincinnati	Cincinnati, OH
Linda Van Horn, PhD RD	Northwestern University	Chicago/Evanston, IL
Mara Vitolins, PhD	Wake Forest University	Winston-Salem/Greensboro, NC
Robert Wallace, MD MSc	University of Iowa	Iowa City/Bettendorf, IA
Sylvia Wassertheil-Smoller, PhD	Albert Einstein College of Medicine	Bronx, NY

Current WHI Committee Chairs

Investigator	Institution	Committee
Marian Neuhouser, PhD	Fred Hutchinson Cancer Research Center	Ancillary Studies (ASC)
Marian Limacher, MD	University of Florida	Outcomes Adjudications (OAC)
Charles Kooperberg, PhD	Fred Hutchinson Cancer Research Center	Performance Monitoring (PMC)
Cynthia Thomson, PhD RD	University of Arizona	Publications and Presentations (P&P)
Linda Van Horn, PhD RD	Northwestern University	Publications and Presentations (P&P)
Rebecca Jackson, MD	Ohio State University	Scientific Resources Working Group
Garnet Anderson, PhD	Fred Hutchinson Cancer Research Center	Steering Committee (SC)

Table 1.2
Consent Status by Study Component and Arm

Data as of: March 1, 2019

	Enrolled in WHI	Eligible for extension 2005-2010[1]	Consented N	%
WHI Enrollment				
Hormone Therapy	27347	25194	20433	81.1
With Uterus	16608	15408	12788	83.0
E+P	8506	7878	6545	83.1
Placebo	8102	7530	6243	82.9
Without Uterus	10739	9786	7645	78.1
E-alone	5310	4851	3778	77.9
Placebo	5429	4935	3867	78.4
Dietary Modification	48835	45560	37858	83.1
Intervention	19541	18207	14769	81.1
Comparison	29294	27353	23089	84.4
Calcium and Vitamin D	36282	34447	29862	86.7
Active	18176	17280	15025	87.0
Placebo	18106	17167	14837	86.4
Clinical Trial Total	68132	63332	52176	82.4
Observational Study	93676	86744	63231	72.9
Total	161808	150076	115407	76.9

	Enrolled in extension 2005-2010	Eligible for extension 2010-2020[1]	Consented N	%
WHI Enrollment				
Hormone Therapy	20433	18794	15584	82.9
With Uterus	12788	11789	9891	83.9
E+P	6545	6048	5047	83.4
Placebo	6243	5741	4844	84.4
Without Uterus	7645	7005	5693	81.3
E-alone	3778	3479	2834	81.5
Placebo	3867	3526	2859	81.1
Dietary Modification	37858	35594	30690	86.2
Intervention	14769	13922	12014	86.3
Comparison	23089	21672	18676	86.2
Calcium and Vitamin D	29862	27975	24231	86.6
Active	15025	14083	12242	86.9
Placebo	14837	13892	11989	86.3
Clinical Trial Total	52176	48697	41499	85.2
Observational Study	63231	59009	52068	88.2
Total	115407	107706	93567	86.9

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[1] Eligibility defined as alive at the beginning of consent and willing to be contacted.

Table 1.3
Consent Status by <u>Age at Enrollment</u> and <u>Race/Ethnicity</u>

Data as of: March 1, 2019

	Clinical Trial				Observational Study			
	Enrolled in WHI	**Eligible for extension 2005-2010**[1]	**Consented**		**Enrolled in WHI**	**Eligible for extension 2005-2010**	**Consented**	
			N	**%**			**N**	**%**
WHI Enrollment								
Total	68132	63332	52176	82.4	93676	86744	63231	72.9
Age								
50-54	9188	8754	7237	82.7	12381	11969	8996	76.9
55-59	14661	13940	11724	84.1	17329	16565	12732	74.2
60-69	31389	29290	24528	83.7	41200	38502	28582	65.6
70-79	12894	11348	8687	76.6	22766	19708	12921	72.9
Race/Ethnicity								
American Indian/Alaska Native	292	260	185	71.2	421	372	217	58.3
Asian/Pacific Islander	1519	1414	1105	78.1	2671	2444	1291	52.8
Black/African American	6983	6423	4769	74.2	7635	6868	3585	52.2
Hispanic/Latina	2875	2686	1791	66.7	3609	3333	1598	47.9
White	55525	51682	43680	84.5	78016	72504	55767	76.9
Unknown	938	867	646	74.5	1324	1223	773	63.2

	Clinical Trial				Observational Study			
	Enrolled in extension 2005-2010	**Eligible for extension 2010-2020**[1]	**Consented**		**Enrolled in extension 2005-2010**	**Eligible for extension 2010-2020**[1]	**Consented**	
			N	**%**			**N**	**%**
WHI Enrollment								
Total	52176	48697	41499	85.2	63231	59009	52068	88.2
Age								
50-54	7237	7068	6249	88.4	8996	8802	8225	93.4
55-59	11724	11329	10055	88.8	12732	12400	11481	92.6
60-69	24528	22940	19642	85.6	28582	26820	23716	88.4
70-79	8687	7360	5553	75.4	12921	10987	8646	78.7
Race/Ethnicity								
American Indian/Alaska Native	185	174	147	84.5	217	204	171	83.8
Asian/Pacific Islander	1105	1050	845	80.5	1291	1224	1035	84.6
Black/African American	4769	4459	3420	76.7	3585	3358	2716	80.9
Hispanic/Latina	1791	1701	1226	72.1	1598	1527	1246	81.6
White	43680	40704	35363	86.9	55767	51969	46296	89.1
Unknown	646	609	498	81.8	773	727	604	83.1

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[1] Eligibility defined as alive at the beginning of consent and willing to be contacted.

Table 1.4
Counts of Participants with Active[1] Participation by <u>Current Age[2]</u>, <u>Race/Ethnicity</u> and <u>Cohort</u>

Data as of: March 1, 2019

	Clinical Trial (N=29,939)		Observational Study (N=37,201)		MRC Cohort[3] (N=15,565)		SRC Cohort[4] (N=51,575)		Total (N=67,140)	
	N	%	N	%	N	%	N	%	N	%
Age on 3/1/2019										
<75	1384	4.6	2342	6.3	1020	6.6	2706	5.2	3726	5.5
75-79	7669	25.6	9449	25.4	4085	26.2	13033	25.3	17118	25.5
80-84	9398	31.4	10690	28.7	4651	29.9	15437	29.9	20088	29.9
85-89	6957	23.2	8325	22.4	3401	21.9	11881	23.0	15282	22.8
90-94	3606	12.0	4998	13.4	1898	12.2	6706	13.0	8604	12.8
95+	925	3.1	1397	3.8	510	3.3	1812	3.5	2322	3.5
Race/Ethnicity										
American Indian/Alaska Native	108	0.4	127	0.3	40	0.3	195	0.4	235	0.4
Asian/Pacific Islander	674	2.3	796	2.1	177	1.1	1293	2.5	1470	2.2
Black/African American	2426	8.1	1942	5.2	4368	28.1	0	0.0	4368	6.5
Hispanic/Latina	954	3.2	968	2.6	1922	12.3	0	0.0	1922	2.9
White	25413	84.9	32954	88.6	8920	57.3	49447	95.9	58367	86.9
Unknown	364	1.2	414	1.1	138	0.9	640	1.2	778	1.2

Current Age[2] Distribution by <u>Race/Ethnicity</u> for Active[1] WHI Extension Study 2010-2020 Participants

Data as of: March 1, 2019

	Total (N = 67,140)		American Indian/ Alaskan Native (N = 235)		Asian/Pacific Islander (N = 1,470)		Black/African American (N = 4,368)		Hispanic/ Latina (N = 1,922)		White (N = 58,367)		Unknown (N = 778)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age on 3/1/2019														
<75	3726	5.5	22	9.4	146	9.9	405	9.3	211	11.0	2889	4.9	53	6.8
75-79	17118	25.5	74	31.5	398	27.1	1318	30.2	636	33.1	14506	24.9	186	23.9
80-84	20088	29.9	68	28.9	396	26.9	1327	30.4	565	29.4	17507	30.0	225	28.9
85-89	15282	22.8	42	17.9	325	22.1	845	19.3	331	17.2	13563	23.2	176	22.6
90-94	8604	12.8	22	9.4	160	10.9	383	8.8	153	8.0	7778	13.3	108	13.9
95+	2322	3.5	7	3.0	45	3.1	90	2.1	26	1.4	2124	3.6	30	3.9

[1] Active participation is defined as current (Form 33 within the last 15 months) or recent (Form 33 between 15 and 24 months ago) follow-up.

[2] Age on March 1, 2019

[3] The MRC Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS who consented to WHI Extension Study 2010-2020.

[4] The SRC Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study who consented to WHI Extension Study 2010-2020.

Table 1.5
Composition of WHI Cohort Over Time

Data as of: March 1, 2019

	Enrolled in WHI (N=161,808)		Active[1] Participation at End of Extension 1 (9/30/2010) (N=104,889)		Active[1] Participation as of 3/1/2019 (N=67,140)	
	N	%	N	%	N	%
Age[2]						
50-54	21569	13.3				
55-59	31990	19.8				
60-64	37210	23.0	1137	1.1		
65-69	35379	21.9	16490	15.7		
70-74	24906	15.4	25588	24.4	3726	5.5
75-79	10754	6.6	25353	24.2	17118	25.5
80-84			21808	20.8	20088	29.9
85-89			11636	11.1	15282	22.8
90-94			2839	2.7	8604	12.8
95+			38	<0.1	2322	3.5
Race/Ethnicity						
White	133541	82.5	90471	86.3	58367	86.9
Black/African American	14618	9.0	7485	7.1	4368	6.5
Hispanic/Latina	6484	4.0	3069	2.9	1922	2.9
American Indian/Alaska Native	713	0.4	366	0.3	235	0.4
Asian/Pacific Islander	4190	2.6	2216	2.1	1470	2.2
Unknown	2262	1.4	1282	1.2	778	1.2
Education[3]						
0-8 years	2665	1.7	869	0.8	388	0.6
Some high school	5979	3.7	2818	2.7	1305	2.0
High school diploma/GED	27624	17.2	16760	16.1	9662	14.5
School after high school	60909	37.9	38435	36.9	23708	35.5
College degree or higher	63415	39.5	45298	43.5	31638	47.4
Income						
< $10,000	6937	4.6	2870	2.9	1232	1.9
$10,000 – $19,999	18499	12.3	9543	9.6	4508	7.1
$20,000 – $34,999	36665	24.3	22385	22.6	12712	19.9
$35,000 – $49,999	30912	20.5	21008	21.2	13402	21.0
$50,000 – $74,999	29948	19.8	21611	21.8	15208	23.9
$75,000 +	27973	18.5	21565	21.8	16662	26.1
Study Component						
Clinical Trial	68132	42.1	47325	45.1	29939	44.6
Observational Study	93676	57.9	57564	54.9	37201	55.4

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[1] Active participation is defined as current (Form 33 within the last 15 months) or recent (Form 33 between 15 and 24 months ago) follow-up.
[2] Age at WHI Enrollment, End of Extension 1 (9/30/2010), and on 3/1/2019.
[3] Education and income reported at baseline.

Table 1.6
Response Rates to CCC Annual Mailings, Extension Study 2010-2020
Year 2017 by Cohort and Regional Center

Data as of: March 1, 2019

Cohort	Form[1]	1st Mailing Period			2nd Mailing Period					Cumulative Response
		Sent Mail 1	Response N	%	Past 2nd mailing period	Sent Mail 2	%	Response N	%	
Total	33	72688	53684	73.9	72688	16034	22.1	5932	37.0	82.0
	151	72083	52552	72.9	72083	16497	22.9	6231	37.8	81.5
	158	69154	50613	73.2	69154	13409	19.4	5146	38.4	80.6
Medical Record Cohort[2]	33	16802	11233	66.9	16802	4623	27.5	1528	33.1	75.9
	151	16636	10978	66.0	16636	4709	28.3	1587	33.7	75.5
	158	15909	10550	66.3	15909	3756	23.6	1277	34.0	74.3
Self Report Cohort[3]	33	55886	42451	76.0	55886	11411	20.4	4404	38.6	83.8
	151	55447	41574	75.0	55447	11788	21.3	4644	39.4	83.4
	158	53245	40063	75.2	53245	9653	18.1	3869	40.1	82.5
Regional Center										
Boston	33	8009	5791	72.3	8009	1712	21.4	638	37.3	80.3
	151	7918	5637	71.2	7918	1760	22.2	671	38.1	79.7
	158	7278	5230	71.9	7278	1324	18.2	491	37.1	78.6
Buffalo	33	11591	8383	72.3	11591	2853	24.6	1032	36.2	81.2
	151	11503	8223	71.5	11503	2918	25.4	1069	36.6	80.8
	158	10594	7598	71.7	10594	2277	21.5	829	36.4	79.5
Columbus	33	11619	8722	75.1	11619	2321	20.0	904	38.9	82.8
	151	11524	8544	74.1	11524	2397	20.8	956	39.9	82.4
	158	11433	8512	74.5	11433	2054	18.0	829	40.4	81.7
Gainesville	33	6544	4509	68.9	6544	1700	26.0	549	32.3	77.3
	151	6499	4414	67.9	6499	1743	26.8	567	32.5	76.6
	158	5861	3992	68.1	5861	1324	22.6	448	33.8	75.8
Iowa	33	6869	5394	78.5	6869	1322	19.2	529	40.0	86.2
	151	6816	5296	77.7	6816	1365	20.0	550	40.3	85.8
	158	6785	5277	77.8	6785	1186	17.5	492	41.5	85.0
Seattle	33	3341	2578	77.2	3341	644	19.3	238	37.0	84.3
	151	3301	2510	76.0	3301	667	20.2	259	38.8	83.9
	158	3294	2500	75.9	3294	557	16.9	225	40.4	82.7
Stanford	33	12291	9541	77.6	12291	2334	19.0	1016	43.5	85.9
	151	12179	9337	76.7	12179	2421	19.9	1073	44.3	85.5
	158	12164	9347	76.8	12164	2053	16.9	937	45.6	84.5
Tucson	33	4826	3323	68.9	4826	1361	28.2	425	31.2	77.7
	151	4797	3276	68.3	4797	1378	28.7	436	31.6	77.4
	158	4778	3265	68.3	4778	1203	25.2	381	31.7	76.3
Wake Forest	33	7598	5443	71.6	7598	1787	23.5	601	33.6	79.5
	151	7546	5315	70.4	7546	1848	24.5	650	35.2	79.0
	158	6967	4892	70.2	6967	1431	20.5	514	35.9	77.6

[1] Form 33 = Medical History Update; Form 151 = Activities of Daily Living; Form 158 = Supplemental Questionnaire 2017.

[2] The MRC Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS who consented to WHI Extension Study 2010-2020.

[3] The SRC Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study who consented to WHI Extension Study 2010-2020.

Table 1.6 (continued)
Response Rates to CCC Annual Mailings, Extension Study 2010-2020
Year 2018 by Cohort and Regional Center

Data as of: March 1, 2019

Cohort	Form[1]	1st Mailing Period			2nd Mailing Period					Cumulative Response
		Sent Mail 1	Response N	%	Past 2nd mailing period	Sent Mail 2		Response N	%	
Total	33	67985	49600	73.0	67582	15686	23.1	4977	31.7	80.3
	151	67980	49191	72.4	67577	16099	23.7	5211	32.4	80.0
	158	2503	1952	78.0	2503	0	0.0	0	0.0	78.0
	159	62459	45123	72.2	62056	14941	23.9	4828	32.3	80.0
Medical Record Cohort[2]	33	15584	10368	66.5	15453	4352	27.9	1200	27.6	74.2
	151	15583	10311	66.2	15452	4409	28.3	1239	28.1	74.1
	158	585	432	73.8	585	0	0.0	0	0.0	73.8
	159	14312	9414	65.8	14181	4134	28.9	1158	28.0	73.9
Self Report Cohort[3]	33	52401	39232	74.9	52129	11334	21.6	3777	33.3	82.1
	151	52397	38880	74.2	52125	11690	22.3	3972	34.0	81.8
	158	1918	1520	79.2	1918	0	0.0	0	0.0	79.2
	159	48147	35709	74.2	47875	10807	22.4	3670	34.0	81.8
Regional Center										
Boston	33	7353	5240	71.3	7295	1782	24.2	649	36.4	80.1
	151	7351	5173	70.4	7293	1846	25.1	683	37.0	79.7
	158	544	438	80.5	544	0	0.0	0	0.0	80.5
	159	6754	4776	70.7	6696	1709	25.3	606	35.5	79.7
Buffalo	33	10890	7662	70.4	10861	2891	26.5	1017	35.2	79.7
	151	10889	7604	69.8	10860	2951	27.1	1055	35.8	79.5
	158	804	643	80.0	804	0	0.0	0	0.0	80.0
	159	10015	6983	69.7	9986	2744	27.4	985	35.9	79.6
Columbus	33	10982	8143	74.1	10900	2306	21.0	710	30.8	80.6
	151	10980	8078	73.6	10898	2375	21.6	754	31.7	80.4
	158	19	16	84.2	19	0	0.0	0	0.0	84.2
	159	10072	7403	73.5	9990	2174	21.6	666	30.6	80.1
Gainesville	33	6158	4221	68.5	6125	1650	26.8	425	25.8	75.4
	151	6158	4197	68.2	6125	1674	27.2	432	25.8	75.2
	158	570	405	71.1	570	0	0.0	0	0.0	71.1
	159	5565	3773	67.8	5532	1547	27.8	416	26.9	75.3
Iowa	33	6465	5004	77.4	6424	1218	18.8	442	36.3	84.2
	151	6465	4968	76.8	6424	1257	19.4	458	36.4	83.9
	158	13	11	84.6	13	0	0.0	0	0.0	84.6
	159	5921	4540	76.7	5880	1164	19.7	429	36.9	83.9
Seattle	33	3118	2342	75.1	3091	657	21.1	211	32.1	81.9
	151	3118	2320	74.4	3091	683	21.9	223	32.7	81.6
	158	14	11	78.6	14	0	0.0	0	0.0	78.6
	159	2836	2113	74.5	2809	620	21.9	204	32.9	81.7
Stanford	33	11487	8916	77.6	11412	2166	18.9	710	32.8	83.8
	151	11487	8850	77.0	11412	2227	19.4	747	33.5	83.5
	158	28	26	92.9	28	0	0.0	0	0.0	92.9
	159	10712	8206	76.6	10637	2111	19.7	727	34.4	83.4

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[1] Form 33 = Medical History Update; Form 151 = Activities of Daily Living; Form 158 = Supplemental Questionnaire 2017; Form 159 = Supplemental Questionnaire 2018. Form 158 was collected on a small number of participants in 2018 rather than 2017. Only a single mailing was done for these participants.

[2] The MRC Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS who consented to WHI Extension Study 2010-2020.

[3] The SRC Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study who consented to WHI Extension Study 2010-2020.

Table 1.6 (continued)
Response Rates to CCC Annual Mailings, Extension Study 2010-2020
<u>Year 2018</u> by Cohort and Regional Center

Data as of: March 1, 2019

Regional Center	Form[1]	1st Mailing Period			2nd Mailing Period					Cumulative Response
		Sent Mail 1	Response N	%	Past 2nd mailing period	Sent Mail 2		Response N	%	
Tucson	33	4481	3090	69.0	4460	1250	27.9	329	26.3	76.3
	151	4481	3063	68.4	4460	1274	28.4	342	26.8	76.0
	158	4	3	75.0	4	0	0.0	0	0.0	75.0
	159	4106	2789	67.9	4085	1187	28.9	317	26.7	75.6
Wake Forest	33	7051	4982	70.7	7014	1766	25.0	484	27.4	77.5
	151	7051	4938	70.0	7014	1812	25.7	517	28.5	77.4
	158	507	399	78.7	507	0	0.0	0	0.0	78.7
	159	6478	4540	70.1	6441	1685	26.0	478	28.4	77.5

[1] Form 33 = Medical History Update; Form 151 = Activities of Daily Living; Form 158 = Supplemental Questionnaire 2017; Form 159 = Supplemental Questionnaire 2018. Form 158 was collected on a small number of participants in 2018 rather than 2017. Only a single mailing was done for these participants.

Table 1.7
Response Rates to Regional Center Follow-up and Cumulative Response
Extension Study 2010-2020, <u>Year 2017</u> by Cohort and Regional Center

Data as of: March 1, 2019

Cohort	Form[1]	Eligible for RC Follow-up N	Respondents N	Respondents %	Total Estimated Response Rate %
Total	33	16233	9265	57.1	88.5
	151	16728	3655	21.8	80.6
	158	16108	455	2.8	76.3
Medical Record Cohort[2]	33	5084	3105	61.1	86.0
	151	5226	1337	25.6	75.8
	158	5010	189	3.8	69.4
Self Report Cohort[3]	33	11149	6160	55.3	89.2
	151	11502	2318	20.2	82.1
	158	11098	266	2.4	78.5
Regional Center					
Boston	33	1849	969	52.4	87.3
	151	1911	141	7.4	76.7
	158	1826	5	0.3	74.1
Buffalo	33	2740	1453	53.0	87.4
	151	2817	1130	40.1	84.1
	158	2652	330	12.4	77.5
Columbus	33	2523	1515	60.0	88.8
	151	2602	143	5.5	77.4
	158	2594	78	3.0	76.6
Gainesville	33	1800	991	55.1	85.5
	151	1871	486	26.0	77.6
	158	1711	11	0.6	70.7
Iowa	33	1115	574	51.5	89.4
	151	1162	23	2.0	81.1
	158	1220	3	0.2	80.1
Seattle	33	716	446	62.3	90.2
	151	739	14	1.9	77.5
	158	714	5	0.7	77.4
Stanford	33	2407	1698	70.5	92.5
	151	2469	757	30.7	84.7
	158	2286	7	0.3	80.1
Tucson	33	1203	607	50.5	85.6
	151	1241	377	30.4	80.5
	158	1268	6	0.5	72.7
Wake Forest	33	1880	1012	53.8	86.8
	151	1916	584	30.5	80.9
	158	1837	10	0.5	73.0

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[1] Form 33 = Medical History Update; Form 151 = Activities of Daily Living; Form 158 = Supplemental Questionnaire 2017; Form 159 = Supplemental Questionnaire 2018.

[2] The MRC Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS who consented to WHI Extension Study 2010-2020.

[3] The SRC Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study who consented to WHI Extension Study 2010-2020.

Table 1.7 (continued)
Response Rates to Regional Center Follow-up and Cumulative Response
Extension Study 2010-2020, <u>Year 2018</u> by Cohort and Regional Center

Data as of: March 1, 2019

Cohort	Form[1]	Eligible for RC Follow-up N	Respondents N	%	Total Estimated Response Rate %
Total	33	17794	6153	34.6	80.5
	151	18235	2172	11.9	75.0
	158	601	1	0.2	76.5
	159	16904	366	2.2	72.6
Medical Record Cohort[2]	33	5463	1993	36.5	75.6
	151	5595	732	13.1	68.4
	158	167	1	0.6	72.3
	159	5212	152	2.9	65.0
Self Report Cohort[3]	33	12331	4160	33.7	82.1
	151	12640	1440	11.4	77.1
	158	434	0	0.0	77.8
	159	11692	214	1.8	75.0
Regional Center					
Boston	33	1943	648	33.4	80.4
	151	2005	12	0.6	72.2
	158	112	0	0.0	79.6
	159	1850	1	0.1	72.0
Buffalo	33	3033	1116	36.8	81.1
	151	3105	808	26.0	78.4
	158	181	1	0.6	78.2
	159	2893	322	11.1	74.6
Columbus	33	2702	1008	37.3	81.2
	151	2768	54	2.0	73.2
	158	3	0	0.0	84.2
	159	2572	33	1.3	72.8
Gainesville	33	1964	660	33.6	77.1
	151	2009	278	13.8	71.3
	158	181	0	0.0	69.1
	159	1837	6	0.3	67.4
Iowa	33	1164	216	18.6	80.3
	151	1207	5	0.4	77.0
	158	2	0	0.0	84.6
	159	1109	2	0.2	76.8
Seattle	33	866	412	47.6	83.5
	151	899	80	8.9	73.8
	158	3	0	0.0	78.6
	159	810	0	0.0	72.0
Stanford	33	2736	1059	38.7	83.5
	151	2787	506	18.2	79.0
	158	2	0	0.0	92.9
	159	2622	0	0.0	74.9

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[1] Form 33 = Medical History Update; Form 151 = Activities of Daily Living; Form 158 = Supplemental Questionnaire 2017; Form 159 = Supplemental Questionnaire 2018. Form 158 was collected on a small number of participants in 2018 rather than 2017. Only a single mailing was done for these participants.

[2] The MRC Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS who consented to WHI Extension Study 2010-2020.

[3] The SRC Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study who consented to WHI Extension Study 2010-2020.

Table 1.7 (continued)
Response Rates to Regional Center Follow-up and Cumulative Response
Extension Study 2010-2020, <u>Year 2018</u> by Cohort and Regional Center

Data as of: March 1, 2019

Cohort	Form[1]	Eligible for RC Follow-up N	Respondents N	%	Total Estimated Response Rate %
Tucson	33	1295	306	23.6	76.1
	151	1331	102	7.7	71.7
	158	2	0	0.0	60.0
	159	1243	0	0.0	69.3
Wake Forest	33	2091	728	34.8	78.4
	151	2124	327	15.4	73.2
	158	115	0	0.0	77.6
	159	1968	2	0.1	69.0

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[1] Form 33 = Medical History Update; Form 151 = Activities of Daily Living; Form 158 = Supplemental Questionnaire 2017; Form 159 = Supplemental Questionnaire 2018. Form 158 was collected on a small number of participants in 2018 rather than 2017. Only a single mailing was done for these participants.

Table 2.1
Participation and Vital Status: WHI Participants by Extension Study Participation and Cohort

Data as of: March 1, 2019
WHI Extension Study 2010-2020 Participants

Vital Status/Participation	MRC Cohort[1] (N = 22,316)		SRC Cohort[2] (N = 71,251)		Total Participants (N = 93,567)	
	N	%	N	%	N	%
Deceased	5006	22.4	16044	22.5	21050	22.5
Alive: Current Participation[3]	14855	66.6	50052	70.2	64907	69.4
Alive: Recent Participation[4]	710	3.2	1523	2.1	2233	2.4
Stopped Follow-Up[5]	774	3.5	1920	2.7	2694	2.9
Lost to Follow-Up[6]	971	4.4	1712	2.4	2683	2.9

Data as of: March 1, 2019; Status as of September 30, 2010
WHI Extension Study 2005-2010 Participants

Vital Status/Participation	MRC Super Cohort[7] (N = 29,368)		SRC Super Cohort[8] (N = 86,039)		Total Participants (N = 115,407)	
	N	%	N	%	N	%
Deceased	2360	8.0	6210	7.2	8570	7.4
Alive: Current Participation	25884	88.1	78195	90.9	104079	90.2
Alive: Recent Participation[4]	321	1.1	489	0.6	810	0.7
Alive: Past/Unknown Participation[9]	32	0.1	39	<0.1	71	0.1
Stopped Follow-Up[5]	459	1.6	794	0.9	1253	1.1
Lost to Follow-Up[6]	312	1.1	312	0.4	624	0.5

Data as of: March 1, 2019; Status as of April 8, 2005
WHI Participants

Vital Status/Participation	MRC Super Cohort[7] (N = 44,174)		SRC Super Cohort[8] (N = 117,634)		Total Participants (N = 161,808)	
	N	%	N	%	N	%
Deceased	2820	6.4	7232	6.1	10052	6.2
Alive: Current Participation[10]	38165	86.4	105585	89.8	143750	88.8
Alive: Recent Participation[11]	342	0.8	419	0.4	761	0.5
Alive: Past/Unknown Participation[12]	21	<0.1	41	<0.1	62	<0.1
Stopped Follow-Up[5]	1699	3.8	2757	2.3	4456	2.8
Lost to Follow-Up[6]	1127	2.6	1600	1.4	2727	1.7

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[1] The MRC Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS who consented to WHI Extension Study 2010-2020.

[2] The SRC Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study who consented to WHI Extension Study 2010-2020.

[3] Participants who have filled in a Form 33 within the last 15 months.

[4] Participants who last filled in a Form 33 between 15 and 24 months ago.

[5] Participants with codes 5 (no follow-up) or 8 (absolutely no follow-up) on Form 7 or 9.

[6] Participants not in any of the above categories.

[7] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.

[8] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.

[9] Participants without a Form 33 within the last 24 months, who have been located (as indicated on Form 23) within the last 6 months.

[10] CT participants who have filled in a Form 33 within the last 9 months; and OS participants who have filled in a Form 33 within the last 15 months.

[11] CT participants who last filled in a Form 33 between 9 and 18 months ago; and OS participants who last filled in a Form 33 between 15 and 24 months ago.

[12] CT participants without a Form 33 within the last 18 months, who have been located (as indicated on Form 23) within the last 6 months; and OS participants without a Form 33 within the last 24 months, who have been located (as indicated on Form 23) within the last 6 months.

Table 2.2
Proxy Follow-up Status[1]:
WHI Extension Study 2010-2020 Participants by <u>Cohort</u>, <u>Current Age</u>[2], and <u>Race/Ethnicity</u>

Data as of: March 1, 2019

	Total		Current Age[2]							
			69-79		80-84		85-89		≥90	
	N	%	N	%	N	%	N	%	N	%
MRC Cohort[3]	(N = 14679)		(N = 4219)		(N = 4651)		(N = 3401)		(N = 2408)	
Proxy follow-up	618	4.2	29	0.7	105	2.3	190	5.6	294	12.2
SRC Cohort[4]	(N = 48639)		(N = 12803)		(N = 15437)		(N = 11881)		(N = 8518)	
Proxy follow-up	1884	3.9	77	0.6	293	1.9	588	4.9	926	10.9
Total	(N = 63318)		(N = 17022)		(N = 20088)		(N = 15282)		(N = 10926)	
Proxy follow-up	2502	4.0	106	0.6	398	2.0	778	5.1	1220	11.2

	Race/Ethnicity											
	American Indian/ Alaskan Native		Asian/Pacific Islander		Black/African American		Hispanic/ Latina		White		Unknown	
	N	%	N	%	N	%	N	%	N	%	N	%
MRC Cohort[3]	(N = 40)		(N = 177)		(N = 4368)		(N = 1922)		(N = 8920)		(N = 138)	
Proxy follow-up	4	10.0	7	4.0	142	3.3	50	2.6	418	4.7	7	5.1
SRC Cohort[4]	(N = 195)		(N = 1293)		N/A		N/A		(N = 49447)		(N = 640)	
Proxy follow-up	7	3.6	41	3.2					1845	3.7	29	4.5
Total	(N = 235)		(N = 1470)		(N = 4368)		(N = 1922)		(N = 58367)		(N = 778)	
Proxy follow-up	11	4.7	48	3.3	142	3.3	50	2.6	2263	3.9	36	4.6

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[1] For participants alive as of March 1, 2019 and with current, recent or past/unknown participation.
[2] Age on March 1, 2019.
[3] The MRC Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS who consented to WHI Extension Study 2010-2020.
[4] The SRC Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study who consented to WHI Extension Study 2010-2020.

Table 2.3
Participation and Vital Status: <u>CT and OS Participants</u>

Data as of: March 1, 2019
<u>WHI Extension Study 2010-2020 Participants</u>

Vital Status/Participation	CT Participants (N = 41,499)		OS Participants (N = 52,068)	
	N	**%**	**N**	**%**
Deceased	9091	21.9	11959	23.0
Alive: Current Participation[1]	28875	69.6	36032	69.2
Alive: Recent Participation[2]	1064	2.6	1169	2.2
Stopped Follow-Up[3]	1197	2.9	1497	2.9
Lost to Follow-Up[4]	1272	3.1	1411	2.7

Data as of: March 1, 2019; Status as of September 30, 2010
<u>WHI Extension Study 2005-2010 Participants</u>

Vital Status/Participation	CT Participants (N = 52,176)		OS Participants (N = 63,231)	
	N	**%**	**N**	**%**
Deceased	3812	7.3	4758	7.5
Alive: Current Participation[1]	46883	89.9	57196	90.5
Alive: Recent Participation[2]	442	0.8	368	0.6
Alive: Past/Unknown Participation[5]	37	0.1	34	0.1
Stopped Follow-Up[3]	649	1.2	604	1.0
Lost to Follow-Up[4]	353	0.7	271	0.4

Data as of: March 1, 2019; Status as of April 8, 2005
<u>WHI Participants</u>

Vital Status/Participation	CT Participants (N = 68,132)		OS Participants (N =93,676)	
	N	**%**	**N**	**%**
Deceased	3701	5.4	6351	6.8
Alive: Current Participation[6]	61160	89.8	82590	88.2
Alive: Recent Participation[7]	339	0.5	422	0.5
Alive: Past/Unknown Participation[8]	10	<0.1	52	0.1
Stopped Follow-Up[3]	2194	3.2	2262	2.4
Lost to Follow-Up[4]	728	1.1	1999	2.1

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[1] Participants who have filled in a Form 33 within the last 15 months.

[2] Participants who last filled in a Form 33 between 15 and 24 months ago.

[3] Participants with codes 5 (no follow-up) or 8 (absolutely no follow-up) on Form 7 or 9.

[4] Participants not in any of the above categories.

[5] Participants without a Form 33 within the last 24 months, who have been located (as indicated on Form 23) within the last 6 months.

[6] CT participants who have filled in a Form 33 within the last 9 months; OS participants who have filled in a Form 33 within the last 15 months.

[7] CT participants who last filled in a Form 33 between 9 and 18 months ago; OS participants who last filled in a Form 33 between 15 and 24 months ago.

[8] CT participants without a Form 33 within the last 18 months, who have been located (as indicated on Form 23) within the last 6 months; OS participants without a Form 33 within the last 24 months, who have been located (as indicated on Form 23) within the last 6 months.

Table 2.4
Cause of Death[1] (Annualized Percentages): <u>MRC and SRC Super Cohort Participants</u>
Data as of: March 1, 2019; Events through March 1, 2019

	MRC Super Cohort[2]		SRC Super Cohort[3]	
Number of participants	44174		117634	
Mean follow-up (months)	221.9		225.0	
Total death	16349	(2.00%)	43973	(1.99%)
Adjudicated death	15974	(1.96%)	41567	(1.88%)
Centrally adjudicated death	7971	(0.98%)	7470	(0.34%)
Locally adjudicated death	679	(0.08%)	4681	(0.21%)
Identified by NDI search	7324	(0.90%)	29416	(1.33%)
Not yet adjudicated	356	(0.04%)	0	(0.00%)
Form 120 death[4]	19	(<0.01%)	2406	(0.11%)
Cardiovascular				
Atherosclerotic cardiac	2409	(0.29%)	5351	(0.24%)
Definite CHD deaths after 10/99	925	(0.11%)	1796	(0.08%)
Possible CHD deaths after 10/99	1484	(0.18%)	3519	(0.16%)
Cerebrovascular	1318	(0.16%)	3177	(0.14%)
Pulmonary embolism	98	(0.01%)	189	(0.01%)
Other cardiovascular	1629	(0.20%)	4567	(0.21%)
Unknown cardiovascular	45	(0.01%)	102	(<0.01%)
Total cardiovascular deaths	5499	(0.67%)	13386	(0.61%)
Cancer				
Breast cancer	421	(0.05%)	1382	(0.06%)
Ovarian cancer	213	(0.03%)	789	(0.04%)
Endometrial cancer	49	(0.01%)	202	(0.01%)
Colorectal cancer	378	(0.05%)	873	(0.04%)
Uterus cancer	49	(0.01%)	121	(0.01%)
Lung cancer	1042	(0.13%)	2432	(0.11%)
Pancreas cancer	385	(0.05%)	1016	(0.05%)
Lymphoma (NHL only)	179	(0.02%)	573	(0.03%)
Leukemia	157	(0.02%)	532	(0.02%)
Melanoma	46	(0.01%)	147	(0.01%)
Brain cancer	78	(0.01%)	323	(0.01%)
Multiple myeloma	152	(0.02%)	323	(0.01%)
Other cancer	793	(0.10%)	2145	(0.10%)
Unknown cancer site	163	(0.02%)	507	(0.02%)
Total cancer deaths	4105	(0.50%)	11365	(0.52%)
Accident/injury				
Homicide	16	(<0.01%)	20	(<0.01%)
Accident	359	(0.04%)	1074	(0.05%)
Suicide	18	(<0.01%)	66	(<0.01%)
Other injury	32	(<0.01%)	38	(<0.01%)
Total accident/injury deaths	425	(0.05%)	1198	(0.05%)
Other				
Alzheimer's disease	880	(0.11%)	2784	(0.13%)
COPD	624	(0.08%)	1726	(0.08%)
Pneumonia	432	(0.05%)	1084	(0.05%)
Pulmonary fibrosis	168	(0.02%)	432	(0.02%)
Renal failure	375	(0.05%)	598	(0.03%)
Sepsis	449	(0.05%)	909	(0.04%)
Dementia, other than Alzheimer's	939	(0.11%)	2808	(0.13%)
Amyotrophic lateral sclerosis	49	(0.01%)	215	(0.01%)
Parkinson's	178	(0.02%)	592	(0.03%)
Hepatic cirrhosis	96	(0.01%)	197	(0.01%)
Other known cause	1618	(0.20%)	4759	(0.22%)
Unknown cause	156	(0.02%)	1920	(0.09%)
Total other cause deaths	5964	(0.73%)	18024	(0.82%)

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[1] Includes deaths for non-Extension Study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.
[2] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.
[3] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.
[4] Includes SRC Cohort participants and discovered deaths among non-Extension Study 2010-2020 participants that occurred during Extension Study 2010-2020.

Table 2.5
Cause of Death[1] (Annualized Percentages): <u>CT and OS Participants</u>
Data as of: March 1, 2019; Events through March 1, 2019

	CT	OS	Total
Number of participants	68132	93676	161808
Mean follow-up (months)	228.8	220.8	224.1
Total death	24121 (1.86%)	36201 (2.10%)	60322 (2.00%)
Adjudicated death	23101 (1.78%)	34440 (2.00%)	57541 (1.90%)
Centrally adjudicated death	10366 (0.80%)	5075 (0.29%)	15441 (0.51%)
Locally adjudicated death (final)	1 (<0.01%)	5359 (0.31%)	5360 (0.18%)
Identified by NDI search	12734 (0.98%)	24006 (1.39%)	36740 (1.22%)
Not yet adjudicated	307 (0.02%)	49 (<0.01%)	356 (0.01%)
Form 120 death[2]	713 (0.05%)	1712 (0.10%)	2425 (0.08%)
Cardiovascular			
Atherosclerotic cardiac	3207 (0.25%)	4553 (0.26%)	7760 (0.26%)
Definite CHD deaths after 10/99	1250 (0.10%)	1471 (0.09%)	2721 (0.09%)
Possible CHD deaths after 10/99	1948 (0.15%)	3055 (0.18%)	5003 (0.17%)
Cerebrovascular	1787 (0.14%)	2708 (0.16%)	4495 (0.15%)
Pulmonary embolism	139 (0.01%)	148 (0.01%)	287 (0.01%)
Other cardiovascular	2442 (0.19%)	3754 (0.22%)	6196 (0.21%)
Unknown cardiovascular	40 (<0.01%)	107 (0.01%)	147 (<0.01%)
Total cardiovascular deaths	7615 (0.59%)	11270 (0.65%)	18885 (0.62%)
Cancer			
Breast cancer	572 (0.04%)	1231 (0.07%)	1803 (0.06%)
Ovarian cancer	382 (0.03%)	620 (0.04%)	1002 (0.03%)
Endometrial cancer	109 (0.01%)	142 (0.01%)	251 (0.01%)
Colorectal cancer	534 (0.04%)	717 (0.04%)	1251 (0.04%)
Uterus cancer	74 (0.01%)	96 (0.01%)	170 (0.01%)
Lung cancer	1513 (0.12%)	1961 (0.11%)	3474 (0.11%)
Pancreas cancer	590 (0.05%)	811 (0.05%)	1401 (0.05%)
Lymphoma (NHL only)	297 (0.02%)	455 (0.03%)	752 (0.02%)
Leukemia	291 (0.02%)	398 (0.02%)	689 (0.02%)
Melanoma	87 (0.01%)	106 (0.01%)	193 (0.01%)
Brain cancer	178 (0.01%)	223 (0.01%)	401 (0.01%)
Multiple myeloma	208 (0.02%)	267 (0.02%)	475 (0.02%)
Other cancer	1217 (0.09%)	1721 (0.10%)	2938 (0.10%)
Unknown cancer site	271 (0.02%)	399 (0.02%)	670 (0.02%)
Total cancer deaths	6323 (0.49%)	9147 (0.53%)	15470 (0.51%)
Accident/injury			
Homicide	14 (<0.01%)	22 (<0.01%)	36 (<0.01%)
Accident	572 (0.04%)	861 (0.05%)	1433 (0.05%)
Suicide	29 (<0.01%)	55 (<0.01%)	84 (<0.01%)
Other injury	36 (<0.01%)	34 (<0.01%)	70 (<0.01%)
Total accident/injury deaths	651 (0.05%)	972 (0.06%)	1623 (0.05%)
Other			
Alzheimer's disease	1383 (0.11%)	2281 (0.13%)	3664 (0.12%)
COPD	972 (0.07%)	1378 (0.08%)	2350 (0.08%)
Pneumonia	629 (0.05%)	887 (0.05%)	1516 (0.05%)
Pulmonary fibrosis	269 (0.02%)	331 (0.02%)	600 (0.02%)
Renal failure	408 (0.03%)	565 (0.03%)	973 (0.03%)
Sepsis	581 (0.04%)	777 (0.05%)	1358 (0.04%)
Dementia, other than Alzheimer's	1428 (0.11%)	2319 (0.13%)	3747 (0.12%)
Amyotrophic lateral sclerosis	105 (0.01%)	159 (0.01%)	264 (0.01%)
Parkinson's	301 (0.02%)	469 (0.03%)	770 (0.03%)
Hepatic cirrhosis	131 (0.01%)	162 (0.01%)	293 (0.01%)
Other known cause	2358 (0.18%)	4019 (0.23%)	6377 (0.21%)
Unknown cause	660 (0.05%)	1416 (0.08%)	2076 (0.07%)
Total other cause deaths	9225 (0.71%)	14763 (0.86%)	23988 (0.79%)

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[1] Includes deaths for non-Extension study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.
[2] Includes SRC Cohort participants and discovered deaths among non-Extension Study 2010-2020 participants that occurred during Extension Study 2010-2020.

Table 2.6
Cause of Death *Excluding Post Consent Discovered Deaths* **(Annualized Percentages):** **CT and OS Participants**

Data as of: March 1, 2019; Events through March 1, 2019

	CT		OS		Total	
Number of participants	68132		93676		161808	
Mean follow-up (months)	197.3		182.9		189.0	
Death	16604	(1.48%)	23068	(1.62%)	39672	(1.56%)
Adjudicated death	15604	(1.39%)	21332	(1.49%)	36936	(1.45%)
Centrally adjudicated death	10249	(0.92%)	4958	(0.35%)	15207	(0.60%)
Locally adjudicated death (final)	1	(<0.01%)	5283	(0.37%)	5284	(0.21%)
Identified by NDI search	5354	(0.48%)	11091	(0.78%)	16445	(0.65%)
Not yet adjudicated	307	(0.03%)	49	(<0.01%)	356	(0.01%)
Form 120 death[1]	693	(0.06%)	1687	(0.12%)	2380	(0.09%)
Cardiovascular						
Atherosclerotic cardiac	2249	(0.20%)	2812	(0.20%)	5061	(0.20%)
Definite CHD deaths after 10/99	1060	(0.09%)	1187	(0.08%)	2247	(0.09%)
Possible CHD deaths after 10/99	1180	(0.11%)	1598	(0.11%)	2778	(0.11%)
Cerebrovascular	1235	(0.11%)	1713	(0.12%)	2948	(0.12%)
Pulmonary embolism	121	(0.01%)	124	(0.01%)	245	(0.01%)
Other cardiovascular	1558	(0.14%)	2304	(0.16%)	3862	(0.15%)
Unknown cardiovascular	37	(<0.01%)	106	(0.01%)	143	(0.01%)
Total cardiovascular deaths	5200	(0.46%)	7059	(0.49%)	12259	(0.48%)
Cancer						
Breast cancer	432	(0.04%)	954	(0.07%)	1386	(0.05%)
Ovarian cancer	315	(0.03%)	498	(0.03%)	813	(0.03%)
Endometrial cancer	92	(0.01%)	112	(0.01%)	204	(0.01%)
Colorectal cancer	422	(0.04%)	544	(0.04%)	966	(0.04%)
Uterus cancer	54	(<0.01%)	64	(<0.01%)	118	(<0.01%)
Lung cancer	1206	(0.11%)	1502	(0.11%)	2708	(0.11%)
Pancreas cancer	487	(0.04%)	606	(0.04%)	1093	(0.04%)
Lymphoma (NHL only)	241	(0.02%)	350	(0.02%)	591	(0.02%)
Leukemia	240	(0.02%)	303	(0.02%)	543	(0.02%)
Melanoma	74	(0.01%)	89	(0.01%)	163	(0.01%)
Brain cancer	151	(0.01%)	169	(0.01%)	320	(0.01%)
Multiple myeloma	169	(0.02%)	217	(0.02%)	386	(0.02%)
Other cancer	973	(0.09%)	1351	(0.09%)	2324	(0.09%)
Unknown cancer site	206	(0.02%)	285	(0.02%)	491	(0.02%)
Total cancer deaths	5062	(0.45%)	7044	(0.49%)	12106	(0.48%)
Accident/injury						
Homicide	14	(<0.01%)	19	(<0.01%)	33	(<0.01%)
Accident	410	(0.04%)	546	(0.04%)	956	(0.04%)
Suicide	28	(<0.01%)	46	(<0.01%)	74	(<0.01%)
Other injury	36	(<0.01%)	32	(<0.01%)	68	(<0.01%)
Total accident/injury deaths	488	(0.04%)	643	(0.05%)	1131	(0.04%)
Other						
Alzheimer's disease	615	(0.05%)	851	(0.06%)	1466	(0.06%)
COPD	661	(0.06%)	858	(0.06%)	1519	(0.06%)
Pneumonia	471	(0.04%)	565	(0.04%)	1036	(0.04%)
Pulmonary fibrosis	211	(0.02%)	243	(0.02%)	454	(0.02%)
Renal failure	276	(0.02%)	341	(0.02%)	617	(0.02%)
Sepsis	412	(0.04%)	477	(0.03%)	889	(0.03%)
Dementia, other than Alzheimer's	593	(0.05%)	790	(0.06%)	1383	(0.05%)
Amyotrophic lateral sclerosis	87	(0.01%)	116	(0.01%)	203	(0.01%)
Parkinson's	152	(0.01%)	219	(0.02%)	371	(0.01%)
Hepatic cirrhosis	101	(0.01%)	112	(0.01%)	213	(0.01%)
Other known cause	1385	(0.12%)	2395	(0.17%)	3780	(0.15%)
Unknown cause	583	(0.05%)	1306	(0.09%)	1889	(0.07%)
Total other cause deaths	5547	(0.50%)	8273	(0.58%)	13820	(0.54%)

[1] Includes SRC Cohort participants.

Table 3.1
Verified Outcomes (Annualized Percentages) by <u>Age at Enrollment</u> for <u>MRC Super Cohort Participants</u>[1]

Data as of: March 1, 2019; Events through March 1, 2019

Outcomes	Total	Age at Enrollment			
		50-54	55-59	60-69	70-79
Number randomized	44174	6788	9352	19418	8616
Mean follow-up (months)	177.3	189.1	190.0	178.4	151.5
Cardiovascular					
CHD[2]	3547 (0.54%)	241 (0.23%)	441 (0.30%)	1676 (0.58%)	1189 (1.09%)
CHD death[3]	1556 (0.24%)	63 (0.06%)	142 (0.10%)	679 (0.24%)	672 (0.62%)
Clinical MI	2427 (0.37%)	188 (0.18%)	339 (0.23%)	1190 (0.41%)	710 (0.65%)
Angina[4]	1625 (0.47%)	114 (0.20%)	226 (0.30%)	785 (0.52%)	500 (0.76%)
CABG/PTCA	3016 (0.46%)	246 (0.23%)	501 (0.34%)	1545 (0.54%)	724 (0.67%)
Carotid artery disease	521 (0.08%)	25 (0.02%)	82 (0.06%)	285 (0.10%)	129 (0.12%)
Congestive heart failure, WHI[4]	1246 (0.36%)	84 (0.15%)	145 (0.19%)	531 (0.35%)	486 (0.74%)
Heart failure, UNC[5]	2911 (0.45%)	184 (0.17%)	318 (0.22%)	1377 (0.48%)	1032 (0.97%)
Stroke	2839 (0.44%)	184 (0.17%)	346 (0.23%)	1379 (0.48%)	930 (0.85%)
PVD	674 (0.10%)	44 (0.04%)	102 (0.07%)	349 (0.12%)	179 (0.16%)
DVT	1111 (0.17%)	95 (0.09%)	192 (0.13%)	538 (0.19%)	286 (0.26%)
Pulmonary embolism	896 (0.14%)	86 (0.08%)	158 (0.11%)	440 (0.15%)	212 (0.19%)
DVT/PE	1601 (0.25%)	134 (0.13%)	278 (0.19%)	789 (0.27%)	400 (0.37%)
Coronary disease[6]	7459 (1.14%)	564 (0.53%)	1043 (0.70%)	3538 (1.23%)	2314 (2.13%)
Aortic aneurysm[7]	62 (0.04%)	4 (0.01%)	8 (0.02%)	39 (0.06%)	11 (0.06%)
Valvular heart disease[7]	448 (0.29%)	27 (0.10%)	64 (0.17%)	250 (0.37%)	107 (0.59%)
Total cardiovascular disease[8]	10355 (1.59%)	755 (0.71%)	1453 (0.98%)	4924 (1.71%)	3223 (2.96%)
Cancer					
Breast cancer	2918 (0.45%)	438 (0.41%)	666 (0.45%)	1323 (0.46%)	491 (0.45%)
Invasive breast cancer	2393 (0.37%)	339 (0.32%)	545 (0.37%)	1077 (0.37%)	432 (0.40%)
In-situ breast cancer	580 (0.09%)	105 (0.10%)	132 (0.09%)	276 (0.10%)	67 (0.06%)
Ovarian cancer	273 (0.04%)	26 (0.02%)	56 (0.04%)	139 (0.05%)	52 (0.05%)
Endometrial cancer[9]	330 (0.09%)	53 (0.09%)	85 (0.10%)	142 (0.09%)	50 (0.08%)
Colorectal cancer	930 (0.14%)	85 (0.08%)	148 (0.10%)	456 (0.16%)	241 (0.22%)
Other cancer[10]	4134 (0.63%)	394 (0.37%)	733 (0.50%)	2039 (0.71%)	968 (0.89%)
Total cancer	7968 (1.22%)	928 (0.87%)	1585 (1.07%)	3782 (1.31%)	1673 (1.54%)
Fractures					
Hip fracture	1531 (0.23%)	52 (0.05%)	134 (0.09%)	679 (0.24%)	666 (0.61%)
Deaths					
Cardiovascular deaths	3450 (0.53%)	139 (0.13%)	317 (0.21%)	1495 (0.52%)	1499 (1.38%)
Cancer deaths	3064 (0.47%)	245 (0.23%)	467 (0.32%)	1515 (0.52%)	837 (0.77%)
Other known cause	3221 (0.49%)	154 (0.14%)	323 (0.22%)	1505 (0.52%)	1239 (1.14%)
Unknown cause	95 (0.01%)	6 (0.01%)	13 (0.01%)	52 (0.02%)	24 (0.02%)
Not yet adjudicated	356 (0.05%)	21 (0.02%)	50 (0.03%)	187 (0.06%)	98 (0.09%)
Total death[11]	16349 (2.00%)	875 (0.63%)	1857 (1.00%)	7481 (2.09%)	6136 (4.54%)

[1] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.

[2] "CHD" includes clinical MI, evolving Q-wave MI, and CHD death; Q-wave MI is not collected in the WHI Extension Studies 2005-2020.

[3] "CHD death" includes definite and possible CHD death.

[4] Angina and CHF are not verified outcomes in the WHI Extension Studies 2005-2020. Reported statistics represent experience during the original program.

[5] Definite or possible decompensated heart failure adjudicated by UNC.

[6] "Coronary disease" includes clinical MI, evolving Q-wave MI, possible evolving Q-wave MI, CHD death, angina, congestive heart failure, UNC heart failure, and CABG/PTCA; Q-wave MI, angina, and congestive heart failure are not collected in the WHI Extension Studies 2005-2020.

[7] Aortic aneurysm and valvular heart disease are new adjudicated outcomes during the WHI Extension Study 2010-2020.

[8] Total CVD does not include aortic aneurysm or valvular heart disease.

[9] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.

[10] Only one report of "other cancer" is counted per woman; however, the first of each type is adjudicated. Excludes non-melanoma skin cancer.

[11] Includes deaths for non-Extension study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.

Table 3.2
Verified Outcomes (Annualized Percentages) by <u>Race/Ethnicity</u> for <u>MRC Super Cohort Participants</u>[1]

Data as of: March 1, 2019; Events through March 1, 2019

Outcomes	American Indian/ Alaskan Native	Asian/Pacific Islander	Black/African American	Hispanic/ Latina	White	Unknown
Number randomized	130	527	14618	6484	22030	385
Mean follow-up (months)	169.0	171.4	162.8	153.8	193.9	178.0
Cardiovascular						
CHD[2]	11 (0.60%)	29 (0.39%)	1010 (0.51%)	230 (0.28%)	2234 (0.63%)	33 (0.58%)
CHD death[3]	7 (0.38%)	10 (0.13%)	527 (0.27%)	80 (0.10%)	921 (0.26%)	11 (0.19%)
Clinical MI	6 (0.33%)	23 (0.31%)	617 (0.31%)	176 (0.21%)	1579 (0.44%)	26 (0.46%)
Angina[4]	7 (0.69%)	14 (0.34%)	548 (0.48%)	160 (0.33%)	884 (0.49%)	12 (0.40%)
CABG/PTCA	10 (0.55%)	23 (0.31%)	754 (0.38%)	272 (0.33%)	1927 (0.54%)	30 (0.53%)
Carotid artery disease	1 (0.05%)	4 (0.05%)	98 (0.05%)	22 (0.03%)	393 (0.11%)	3 (0.05%)
Congestive heart failure, WHI[4]	3 (0.30%)	9 (0.22%)	477 (0.42%)	91 (0.19%)	655 (0.36%)	11 (0.37%)
Heart failure, UNC[5]	10 (0.55%)	22 (0.29%)	801 (0.41%)	158 (0.19%)	1897 (0.54%)	23 (0.41%)
Stroke	13 (0.71%)	24 (0.32%)	873 (0.44%)	202 (0.24%)	1701 (0.48%)	26 (0.46%)
PVD	3 (0.16%)	8 (0.11%)	240 (0.12%)	27 (0.03%)	392 (0.11%)	4 (0.07%)
DVT	5 (0.27%)	4 (0.05%)	215 (0.11%)	37 (0.04%)	844 (0.24%)	6 (0.11%)
Pulmonary embolism	4 (0.22%)	2 (0.03%)	194 (0.10%)	22 (0.03%)	663 (0.19%)	11 (0.19%)
DVT/PE	8 (0.44%)	4 (0.05%)	331 (0.17%)	51 (0.06%)	1193 (0.34%)	14 (0.25%)
Coronary disease[6]	24 (1.31%)	61 (0.81%)	2209 (1.11%)	568 (0.68%)	4533 (1.27%)	64 (1.12%)
Aortic aneurysm[7]	0 (0.00%)	1 (0.06%)	18 (0.04%)	3 (0.02%)	40 (0.04%)	0 (0.00%)
Valvular heart disease[7]	1 (0.25%)	3 (0.18%)	57 (0.14%)	35 (0.20%)	347 (0.39%)	5 (0.37%)
Total cardiovascular disease[8]	33 (1.80%)	88 (1.17%)	3122 (1.57%)	781 (0.94%)	6248 (1.75%)	83 (1.45%)
Cancer						
Breast cancer	8 (0.44%)	36 (0.48%)	930 (0.47%)	309 (0.37%)	1611 (0.45%)	24 (0.42%)
Invasive breast cancer	7 (0.38%)	28 (0.37%)	749 (0.38%)	252 (0.30%)	1336 (0.38%)	21 (0.37%)
In situ breast cancer	1 (0.05%)	9 (0.12%)	203 (0.10%)	63 (0.08%)	299 (0.08%)	5 (0.09%)
Ovarian cancer	1 (0.05%)	3 (0.04%)	72 (0.04%)	37 (0.04%)	155 (0.04%)	5 (0.09%)
Endometrial cancer[9]	1 (0.13%)	2 (0.04%)	90 (0.10%)	29 (0.06%)	206 (0.09%)	2 (0.06%)
Colorectal cancer	1 (0.05%)	17 (0.23%)	291 (0.15%)	78 (0.09%)	534 (0.15%)	9 (0.16%)
Other cancer[10]	13 (0.71%)	49 (0.65%)	1040 (0.52%)	347 (0.42%)	2646 (0.74%)	39 (0.68%)
Total cancer	23 (1.26%)	101 (1.34%)	2257 (1.14%)	748 (0.90%)	4764 (1.34%)	75 (1.31%)
Fractures						
Hip fracture	7 (0.38%)	11 (0.15%)	140 (0.07%)	70 (0.08%)	1291 (0.36%)	12 (0.21%)
Deaths						
Cardiovascular deaths	13 (0.71%)	19 (0.25%)	1093 (0.55%)	196 (0.24%)	2109 (0.59%)	20 (0.35%)
Cancer deaths	10 (0.55%)	38 (0.50%)	899 (0.45%)	274 (0.33%)	1816 (0.51%)	27 (0.47%)
Other known cause	14 (0.76%)	29 (0.39%)	798 (0.40%)	236 (0.28%)	2121 (0.60%)	23 (0.40%)
Unknown cause	0 (0.00%)	3 (0.04%)	28 (0.01%)	16 (0.02%)	44 (0.01%)	4 (0.07%)
Not yet adjudicated	0 (0.00%)	5 (0.07%)	78 (0.04%)	26 (0.03%)	242 (0.07%)	5 (0.09%)
Total death[11]	50 (2.10%)	174 (1.78%)	5259 (1.98%)	1596 (1.30%)	9133 (2.24%)	137 (1.93%)

[1] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.
[2] "CHD" includes clinical MI, evolving Q-wave MI, and CHD death; Q-wave MI is not collected in the WHI Extension Studies 2005-2020.
[3] "CHD death" includes definite and possible CHD death.
[4] Angina and CHF are not verified outcomes in the WHI Extension Studies 2005-2020. Reported statistics represent experience during the original program.
[5] Definite or possible decompensated heart failure adjudicated by UNC.
[6] "Coronary disease" includes clinical MI, evolving Q-wave MI, possible evolving Q-wave MI, CHD death, angina, congestive heart failure, UNC heart failure, and CABG/PTCA; Q-wave MI, angina and congestive heart failure are not collected in the WHI Extension Studies 2005-2020.
[7] Aortic aneurysm and valvular heart disease are new adjudicated outcomes during the WHI Extension Study 2010-2020.
[8] Total CVD does not include aortic aneurysm or valvular heart disease.
[9] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.
[10] Only one report of "other cancer" is counted per woman; however, the first of each type is adjudicated. Excludes non-melanoma skin cancer.
[11] Includes deaths for non-Extension study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.

Table 3.3
Verified Outcomes (Annualized Percentages)[1] by <u>Age at Diagnosis</u> for <u>MRC Super Cohort Participants</u>[2]

Data as of: March 1, 2019; Events between January 1, 2000 and December 31, 2017

Outcomes	Age at Diagnosis							
	50-59	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-103**
Number of participants[3]	8898	18159	24973	29115	27359	19340	10156	3679
Mean follow-up (months)	32.0	39.0	44.4	46.2	45.3	43.8	39.4	34.6
Cancer								
Breast cancer	95 (0.40%)	269 (0.46%)	427 (0.46%)	598 (0.53%)	503 (0.49%)	326 (0.46%)	117 (0.35%)	32 (0.30%)
Invasive breast cancer	73 (0.31%)	211 (0.36%)	314 (0.34%)	500 (0.45%)	424 (0.41%)	284 (0.40%)	112 (0.34%)	32 (0.30%)
In situ breast cancer	22 (0.09%)	62 (0.11%)	114 (0.12%)	113 (0.10%)	94 (0.09%)	53 (0.08%)	9 (0.03%)	1 (0.01%)
Ovarian cancer	5 (0.02%)	15 (0.03%)	43 (0.05%)	52 (0.05%)	50 (0.05%)	42 (0.06%)	14 (0.04%)	8 (0.08%)
Endometrial cancer[4]	3 (0.01%)	33 (0.06%)	69 (0.07%)	74 (0.07%)	49 (0.05%)	30 (0.04%)	16 (0.05%)	4 (0.04%)
Colorectal cancer	10 (0.04%)	57 (0.10%)	117 (0.13%)	156 (0.14%)	168 (0.16%)	105 (0.15%)	68 (0.20%)	34 (0.32%)
Leukemia	1 (<0.01%)	13 (0.02%)	25 (0.03%)	52 (0.05%)	42 (0.04%)	52 (0.07%)	25 (0.07%)	13 (0.12%)
Lung cancer	18 (0.08%)	67 (0.11%)	123 (0.13%)	218 (0.19%)	249 (0.24%)	171 (0.24%)	83 (0.25%)	35 (0.33%)
Non-Hodgkin's lymphoma	3 (0.01%)	14 (0.02%)	43 (0.05%)	79 (0.07%)	79 (0.08%)	72 (0.10%)	42 (0.13%)	14 (0.13%)
Melanoma of the skin	10 (0.04%)	30 (0.05%)	43 (0.05%)	64 (0.06%)	72 (0.07%)	50 (0.07%)	37 (0.11%)	9 (0.08%)
Pancreas cancer	5 (0.02%)	10 (0.02%)	35 (0.04%)	58 (0.05%)	63 (0.06%)	58 (0.08%)	42 (0.13%)	16 (0.15%)
Total cancer	167 (0.70%)	595 (1.01%)	1058 (1.14%)	1521 (1.36%)	1464 (1.42%)	1031 (1.46%)	494 (1.48%)	179 (1.69%)
Cardiovascular								
CHD[5]	35 (0.15%)	132 (0.22%)	329 (0.36%)	514 (0.46%)	657 (0.64%)	643 (0.91%)	454 (1.36%)	256 (2.41%)
Clinical MI	25 (0.11%)	98 (0.17%)	249 (0.27%)	396 (0.35%)	473 (0.46%)	429 (0.61%)	254 (0.76%)	101 (0.95%)
CABG/PTCA	48 (0.20%)	180 (0.31%)	418 (0.45%)	577 (0.51%)	616 (0.60%)	436 (0.62%)	147 (0.44%)	28 (0.26%)
Stroke	26 (0.11%)	101 (0.17%)	214 (0.23%)	407 (0.36%)	549 (0.53%)	605 (0.86%)	367 (1.10%)	177 (1.67%)
Total cardiovascular[6]	157 (0.66%)	497 (0.84%)	1046 (1.13%)	1565 (1.40%)	1860 (1.80%)	1694 (2.40%)	985 (2.95%)	517 (4.87%)
Deaths								
Total death[7]	88 (0.37%)	372 (0.63%)	907 (0.98%)	1729 (1.54%)	2728 (2.64%)	3434 (4.86%)	3366 (10.10%)	2548 (24.01%)

[1] Annualized percentages calculated as the number with an event in the age interval divided by the total person years of all participants with time in the interval.
[2] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.
[3] Number of participants with any follow-up time in the age interval.
[4] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.
[5] "CHD" includes clinical MI, evolving Q-wave MI, and CHD death; Q-wave MI is not collected in the OS or in in the WHI Extension Study 2005-2010.
[6] Total cardiovascular disease includes CHD, angina, CABG/PTCA, carotid artery disease, WHI CHF, UNC HF, stroke, PVD and CVD death. Angina and WHI CHF are not verified outcomes in the WHI Extension Studies 2005-2020.
[7] Includes deaths for non-Extension study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.

Table 3.4
Verified Outcomes (Annualized Percentages) by <u>Age at Enrollment</u> for <u>SRC Super Cohort Participants</u>[1]
Data as of: March 1, 2019; Events through September 30, 2010 and March 1, 2019

		Age at Enrollment			
	Total	**50-54**	**55-59**	**60-69**	**70-79**
Outcomes through Extension Study 2005-2010					
Number randomized	117634	14781	22638	53171	27044
Mean follow-up (months)	142.7	154.9	151.9	142.9	128.1
Cardiovascular[2]					
CHD[3]	5434 (0.39%)	201 (0.11%)	489 (0.17%)	2362 (0.37%)	2382 (0.83%)
CHD death[4]	1891 (0.14%)	49 (0.03%)	104 (0.04%)	693 (0.11%)	1045 (0.36%)
Clinical MI	4044 (0.29%)	159 (0.08%)	398 (0.14%)	1834 (0.29%)	1653 (0.57%)
Angina[5]	3623 (0.38%)	139 (0.11%)	423 (0.22%)	1749 (0.41%)	1312 (0.63%)
CABG/PTCA	6113 (0.44%)	241 (0.13%)	711 (0.25%)	3161 (0.50%)	2000 (0.69%)
Carotid artery disease	1111 (0.08%)	48 (0.03%)	117 (0.04%)	520 (0.08%)	426 (0.15%)
Congestive heart failure, WHI[5]	2797 (0.29%)	78 (0.06%)	201 (0.11%)	1096 (0.26%)	1422 (0.68%)
Stroke	4255 (0.30%)	124 (0.06%)	319 (0.11%)	1856 (0.29%)	1956 (0.68%)
PVD	984 (0.07%)	24 (0.01%)	88 (0.03%)	460 (0.07%)	412 (0.14%)
Coronary disease[6]	11771 (0.84%)	455 (0.24%)	1244 (0.43%)	5456 (0.86%)	4616 (1.60%)
Total cardiovascular disease	16773 (1.20%)	626 (0.33%)	1662 (0.58%)	7667 (1.21%)	6818 (2.36%)
Fractures[2]					
Hip fracture	2955 (0.21%)	63 (0.03%)	186 (0.06%)	1108 (0.18%)	1598 (0.55%)
Outcomes through Extension Study 2010-2020					
Number randomized	117634	14781	22638	53171	27044
Mean follow-up (months)	193.4	221.4	216.1	194.9	156.0
Cancer					
Breast cancer	10445 (0.55%)	1379 (0.51%)	2230 (0.55%)	4853 (0.56%)	1983 (0.56%)
Invasive breast cancer	8738 (0.46%)	1103 (0.40%)	1856 (0.46%)	4079 (0.47%)	1700 (0.48%)
In situ breast cancer	1859 (0.10%)	300 (0.11%)	405 (0.10%)	849 (0.10%)	305 (0.09%)
Ovarian cancer	1001 (0.05%)	121 (0.04%)	192 (0.05%)	475 (0.05%)	213 (0.06%)
Endometrial cancer[7]	1488 (0.13%)	166 (0.10%)	334 (0.13%)	689 (0.14%)	299 (0.15%)
Colorectal cancer	2382 (0.13%)	136 (0.05%)	310 (0.08%)	1185 (0.14%)	751 (0.21%)
Other cancer[8]	13262 (0.70%)	1252 (0.46%)	2260 (0.55%)	6502 (0.75%)	3248 (0.92%)
Total cancer	26121 (1.38%)	2807 (1.03%)	4884 (1.20%)	12443 (1.44%)	5987 (1.70%)
Deaths					
Cardiovascular deaths	8809 (0.46%)	181 (0.07%)	521 (0.13%)	3544 (0.41%)	4563 (1.30%)
Cancer deaths	9042 (0.48%)	575 (0.21%)	1224 (0.30%)	4441 (0.51%)	2802 (0.80%)
Other known cause	9841 (0.52%)	297 (0.11%)	788 (0.19%)	4419 (0.51%)	4337 (1.23%)
Unknown cause	1794 (0.09%)	63 (0.02%)	188 (0.05%)	938 (0.11%)	605 (0.17%)
Total death[9]	43973 (1.99%)	1501 (0.48%)	3656 (0.79%)	19211 (1.92%)	19605 (4.61%)

[1] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.
[2] Cardiovascular diseases and hip fracture are not adjudicated for SRC Super Cohort participants during the WHI Extension Study 2010-2020. Reported statistics represent experience during the original program and the Extension Study 2005-2010.
[3] "CHD" includes clinical MI, evolving Q-wave MI, and CHD death; Q-wave MI is not collected in the WHI Extension Study 2005-2010.
[4] "CHD death" includes definite and possible CHD death.
[5] Angina and CHF are not verified outcomes in the WHI Extension Study 2005-2010. Reported statistics represent experience during the original program.
[6] "Coronary disease" includes clinical MI, evolving Q-wave MI, possible evolving Q-wave MI, CHD death, angina, congestive heart failure, and CABG/PTCA; Q-wave MI, angina, and congestive heart failure were not collected in the WHI Extension Study 2005-2010.
[7] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.
[8] Only one report of "other cancer" is counted per woman; however, the first of each type is adjudicated. Excludes non-melanoma skin cancer.
[9] Includes deaths for non-Extension study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.

Table 3.5
Verified Outcomes (Annualized Percentages) by <u>Race/Ethnicity</u> for <u>SRC Super Cohort Participants</u>[1]
Data as of: March 1, 2019; Events through September 30, 2010 and March 1, 2019

	Race/Ethnicity			
	American Indian/ Alaskan Native	Asian/Pacific Islander	White	Unknown
Outcomes through Extension Study 2005-2010				
Number randomized	583	3663	111511	1877
Mean follow-up (months)	125.1	127.8	143.5	131.0
Cardiovascular[2]				
CHD[3]	26 (0.43%)	87 (0.22%)	5240 (0.39%)	81 (0.40%)
CHD death[4]	13 (0.21%)	30 (0.08%)	1813 (0.14%)	35 (0.17%)
Clinical MI	16 (0.26%)	66 (0.17%)	3906 (0.29%)	56 (0.27%)
Angina[5]	23 (0.52%)	56 (0.20%)	3492 (0.39%)	52 (0.36%)
CABG/PTCA	30 (0.49%)	77 (0.20%)	5922 (0.44%)	84 (0.41%)
Carotid artery disease	7 (0.12%)	10 (0.03%)	1074 (0.08%)	20 (0.10%)
Congestive heart failure, WHI[5]	18 (0.41%)	30 (0.11%)	2702 (0.30%)	47 (0.32%)
Stroke	17 (0.28%)	101 (0.26%)	4061 (0.30%)	76 (0.37%)
PVD	6 (0.10%)	8 (0.02%)	951 (0.07%)	19 (0.09%)
Coronary disease[6]	67 (1.10%)	178 (0.46%)	11356 (0.85%)	170 (0.83%)
Total cardiovascular disease	89 (1.46%)	291 (0.75%)	16129 (1.21%)	264 (1.29%)
Fractures[2]				
Hip fracture	7 (0.12%)	29 (0.07%)	2892 (0.22%)	27 (0.13%)
Outcomes through Extension Study 2010-2020				
Number randomized	583	3663	111511	1877
Mean follow-up (months)	161.3	166.3	194.8	170.6
Cancer				
Breast cancer	32 (0.41%)	245 (0.48%)	10042 (0.55%)	126 (0.47%)
Invasive breast cancer	27 (0.34%)	203 (0.40%)	8404 (0.46%)	104 (0.39%)
In situ breast cancer	6 (0.08%)	45 (0.09%)	1784 (0.10%)	24 (0.09%)
Ovarian cancer	2 (0.03%)	14 (0.03%)	975 (0.05%)	10 (0.04%)
Endometrial cancer[7]	1 (0.03%)	23 (0.07%)	1439 (0.13%)	25 (0.16%)
Colorectal cancer	10 (0.13%)	44 (0.09%)	2294 (0.13%)	34 (0.13%)
Other cancer[8]	42 (0.54%)	220 (0.43%)	12823 (0.71%)	177 (0.66%)
Total cancer	83 (1.06%)	505 (0.99%)	25196 (1.39%)	337 (1.26%)
Deaths				
Cardiovascular deaths	36 (0.46%)	149 (0.29%)	8491 (0.47%)	133 (0.50%)
Cancer deaths	29 (0.37%)	164 (0.32%)	8726 (0.48%)	123 (0.46%)
Other known cause	52 (0.66%)	132 (0.26%)	9538 (0.53%)	119 (0.45%)
Unknown cause	4 (0.05%)	19 (0.04%)	1752 (0.10%)	19 (0.07%)
Total death[9]	220 (2.13%)	971 (1.39%)	42074 (2.01%)	708 (2.06%)

[1] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.

[2] Cardiovascular diseases and hip fracture are not adjudicated for SRC Super Cohort participants during the WHI Extension Study 2010-2020. Reported statistics represent experience during the original program and the Extension Study 2005-2010.

[3] "CHD" includes clinical MI, evolving Q-wave MI, and CHD death; Q-wave MI is not collected in the WHI Extension Study 2005-2010.

[4] "CHD death" includes definite and possible CHD death.

[5] Angina and CHF are not verified outcomes in the WHI Extension Study 2005-2010. Reported statistics represent experience during the original program.

[6] "Coronary disease" includes clinical MI, evolving Q-wave MI, possible evolving Q-wave MI, CHD death, angina, congestive heart failure, and CABG/PTCA; Q-wave MI, angina and congestive heart failure were not collected in the WHI Extension Study 2005-2010.

[7] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.

[8] Only one report of "other cancer" is counted per woman; however, the first of each type is adjudicated. Excludes non-melanoma skin cancer.

[9] Includes deaths for non-Extension study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.

Table 3.6
Verified Primary and Other Cancers (Annualized Percentages): <u>MRC and SRC Super Cohort Participants</u>

Data as of: March 1, 2019; Events through March 1, 2019

	MRC Super Cohort[1]	SRC Super Cohort[2]
Number of participants	44174	117634
Mean follow-up (months)	177.3	193.4
Overall cancer	7968 (1.22%)	26121 (1.38%)
Primary cancer		
Breast cancer	2918 (0.45%)	10445 (0.55%)
Invasive breast cancer	2393 (0.37%)	8738 (0.46%)
In situ breast cancer	580 (0.09%)	1859 (0.10%)
Ovarian cancer	273 (0.04%)	1001 (0.05%)
Endometrial cancer[3]	330 (0.09%)	1488 (0.13%)
Colorectal cancer	930 (0.14%)	2382 (0.13%)
Other cancer		
Accessory sinus	2 (<0.01%)	12 (<0.01%)
Adrenal gland	4 (<0.01%)	12 (<0.01%)
Anus	28 (<0.01%)	92 (<0.01%)
Appendix	12 (<0.01%)	30 (<0.01%)
Base of tongue	8 (<0.01%)	24 (<0.01%)
Biliary tract, parts of (other/unspecified)	57 (0.01%)	138 (0.01%)
Bladder	245 (0.04%)	769 (0.04%)
Bones/joints/articular cartilage (limbs)	2 (<0.01%)	11 (<0.01%)
Bones/joints/articular cartilage (other)	9 (<0.01%)	19 (<0.01%)
Brain	68 (0.01%)	303 (0.02%)
Cervix	44 (0.01%)	88 (<0.01%)
Central Nervous System (excludes brain)	1 (<0.01%)	4 (<0.01%)
Connective/subcutaneous/soft tissues	43 (0.01%)	147 (0.01%)
Endocrine glands, related structures	0 (0.00%)	4 (<0.01%)
Esophagus	47 (0.01%)	134 (0.01%)
Eye and adnexa	24 (<0.01%)	59 (<0.01%)
Floor of mouth	7 (<0.01%)	10 (<0.01%)
Gallbladder	44 (0.01%)	99 (0.01%)
Genital organs	77 (0.01%)	283 (0.01%)
Gum	6 (<0.01%)	40 (<0.01%)
Heart	4 (<0.01%)	32 (<0.01%)
Kidney	201 (0.03%)	545 (0.03%)
Larynx	21 (<0.01%)	33 (<0.01%)
Leukemia	251 (0.04%)	874 (0.05%)
Liver	98 (0.02%)	227 (0.01%)
Lung	1122 (0.17%)	2985 (0.16%)
Lymph nodes	1 (<0.01%)	2 (<0.01%)
Lymphoma, Hodgkins	22 (<0.01%)	54 (<0.01%)
Lymphoma, non-Hodgkins	383 (0.06%)	1426 (0.08%)
Melanoma of the skin	368 (0.06%)	2177 (0.11%)
Meninges	2 (<0.01%)	5 (<0.01%)
Multiple myeloma	201 (0.03%)	434 (0.02%)
Mycosis fungoides	7 (<0.01%)	20 (<0.01%)
Nasal cavity mid ear	2 (<0.01%)	18 (<0.01%)
Oral (mouth)	7 (<0.01%)	32 (<0.01%)
Other digestive cancer	9 (<0.01%)	43 (<0.01%)
Other lip	7 (<0.01%)	6 (<0.01%)
Palate	7 (<0.01%)	25 (<0.01%)

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[1] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.
[2] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.
[3] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial and uterine cancer.

Table 3.6 (continued)
Verified Primary and Other Cancers (Annualized Percentages): <ins>MRC and SRC Super Cohort Participants</ins>

Data as of: March 1, 2019; Events through March 1, 2019

	MRC Super Cohort[1]	SRC Super Cohort[2]
Number of participants	44174	117634
Mean follow-up (months)	177.3	193.4
Pancreas	327 (0.05%)	929 (0.05%)
Parotid gland (Stensen's duct)	14 (<0.01%)	47 (<0.01%)
Peripheral nerves and autonomic nervous	0 (0.00%)	2 (<0.01%)
Peritoneum	53 (0.01%)	172 (0.01%)
Pharynx	11 (<0.01%)	18 (<0.01%)
Pyriform sinus	0 (0.00%)	2 (<0.01%)
Renal pelvis	35 (0.01%)	90 (<0.01%)
Respiratory system, intrathoracic, other	0 (0.00%)	3 (<0.01%)
Salivary glands, major (other/unspecified)	3 (<0.01%)	15 (<0.01%)
Small intestine	40 (0.01%)	118 (0.01%)
Stomach	99 (0.02%)	209 (0.01%)
Thymus	3 (<0.01%)	10 (<0.01%)
Thyroid	103 (0.02%)	395 (0.02%)
Tongue, part of (other/unspecified)	15 (<0.01%)	70 (<0.01%)
Tonsil	2 (<0.01%)	18 (<0.01%)
Trachea	1 (<0.01%)	0 (0.00%)
Ureter	19 (<0.01%)	65 (<0.01%)
Urinary organs (other/unspecified)	9 (<0.01%)	25 (<0.01%)
Uterus, not otherwise specified[3]	31 (0.01%)	95 (0.01%)
Other/unknown site of cancer	137 (0.02%)	430 (0.02%)
Other/unknown cancers reported on death form	92 (0.01%)	342 (0.02%)

[1] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.

[2] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.

[3] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial and uterine cancer.

Table 3.7
Verified Outcomes (Annualized Percentages)[1] by Age at Diagnosis for CT and OS Participants

Data as of: March 1, 2019; Events Between January 1, 2000 and December 31, 2017 or January 1, 2000 and September 30, 2010

	Age at Diagnosis							
	50-59	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85-89**	**90-103**
Cancer and Death Outcomes Between 1/1/2000 and 12/31/2017								
Number of participants[2]	28496	62321	91039	113119	112141	81916	44409	16370
Mean follow-up (months)	30.9	39.5	45.3	47.2	45.9	44.4	39.6	34.8
Breast cancer	359 (0.49%)	1072 (0.52%)	1908 (0.56%)	2532 (0.57%)	2467 (0.57%)	1519 (0.50%)	603 (0.41%)	151 (0.32%)
Invasive breast cancer	281 (0.38%)	862 (0.42%)	1513 (0.44%)	2101 (0.47%)	2092 (0.49%)	1310 (0.43%)	562 (0.38%)	146 (0.31%)
In situ breast cancer	80 (0.11%)	222 (0.11%)	412 (0.12%)	478 (0.11%)	433 (0.10%)	249 (0.08%)	56 (0.04%)	8 (0.02%)
Ovarian cancer	26 (0.04%)	78 (0.04%)	183 (0.05%)	246 (0.06%)	222 (0.05%)	163 (0.05%)	96 (0.07%)	27 (0.06%)
Endometrial cancer[3]	32 (0.08%)	144 (0.12%)	293 (0.14%)	362 (0.14%)	325 (0.13%)	203 (0.12%)	74 (0.09%)	23 (0.08%)
Colorectal cancer	35 (0.05%)	156 (0.08%)	337 (0.10%)	536 (0.12%)	614 (0.14%)	520 (0.17%)	322 (0.22%)	120 (0.25%)
Leukemia	6 (0.01%)	47 (0.02%)	137 (0.04%)	199 (0.04%)	232 (0.05%)	207 (0.07%)	131 (0.09%)	58 (0.12%)
Lung cancer	33 (0.04%)	177 (0.09%)	402 (0.12%)	757 (0.17%)	913 (0.21%)	723 (0.24%)	366 (0.25%)	134 (0.28%)
Non-Hodgkin's lymphoma	18 (0.02%)	76 (0.04%)	201 (0.06%)	353 (0.08%)	385 (0.09%)	309 (0.10%)	204 (0.14%)	62 (0.13%)
Melanoma of the skin	49 (0.07%)	164 (0.08%)	321 (0.09%)	496 (0.11%)	555 (0.13%)	360 (0.12%)	204 (0.14%)	52 (0.11%)
Pancreas cancer	10 (0.01%)	44 (0.02%)	103 (0.03%)	193 (0.04%)	263 (0.06%)	279 (0.09%)	171 (0.12%)	64 (0.13%)
Total cancer	644 (0.88%)	2184 (1.06%)	4248 (1.24%)	6255 (1.41%)	6500 (1.51%)	4717 (1.56%)	2345 (1.60%)	745 (1.57%)
Total death[4]	221 (0.30%)	999 (0.49%)	2449 (0.71%)	5279 (1.19%)	9206 (2.14%)	12832 (4.23%)	13873 (9.46%)	10663 (22.44%)
Cardiovascular Outcomes Between 1/1/2000 and 9/30/2010								
Number of participants[2]	22435	50703	75664	80683	65949	40706	15580	2664
Mean follow-up (months)	31.1	41.6	41.9	40.6	40.8	38.3	31.0	17.6
CHD[5]	35 (0.06%)	131 (0.07%)	307 (0.12%)	396 (0.14%)	458 (0.20%)	379 (0.29%)	166 (0.41%)	28 (0.72%)
Clinical MI	25 (0.04%)	97 (0.06%)	231 (0.09%)	298 (0.11%)	326 (0.15%)	248 (0.19%)	95 (0.24%)	11 (0.28%)
CABG/PTCA	48 (0.08%)	178 (0.10%)	395 (0.15%)	479 (0.18%)	465 (0.21%)	288 (0.22%)	58 (0.14%)	0 (0.00%)
Stroke	26 (0.04%)	100 (0.06%)	191 (0.07%)	303 (0.11%)	364 (0.16%)	315 (0.24%)	124 (0.31%)	22 (0.56%)
Total cardiovascular[6]	157 (0.27%)	493 (0.28%)	980 (0.37%)	1253 (0.46%)	1342 (0.60%)	999 (0.77%)	344 (0.86%)	58 (1.48%)

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[1] Annualized percentages calculated as the number with an event in the age interval divided by the total person years of all participants with time in the interval.

[2] Number of participants with any follow-up time in the age interval.

[3] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.

[4] Includes deaths for non-Extension study participants after the main WHI study close-out. Annualized rates incorporate additional follow-up from the NDI search.

[5] "CHD" includes clinical MI, evolving Q-wave MI, and CHD death; Q-wave MI is not collected in the OS or in the WHI Extension Study 2005-2010.

[6] Total cardiovascular disease includes CHD, angina, CABG/PTCA, carotid artery disease, CHF, stroke, PVD and CVD death. Angina and CHF are not verified outcomes in the WHI Extension Study 2005-2010.

Table 3.8
Verified Primary and Other Cancers (Annualized Percentages): <u>CT and OS Participants</u>

Data as of: March 1, 2019; Events through March 1, 2019

	CT	OS	Total
Number of participants	68132	93676	161808
Mean follow-up (months)	197.3	182.9	189.0
Overall cancer	14600 (1.30%)	19489 (1.36%)	34089 (1.34%)
Primary cancer			
Breast cancer	5572 (0.50%)	7791 (0.55%)	13363 (0.52%)
Invasive breast cancer	4603 (0.41%)	6528 (0.46%)	11131 (0.44%)
In situ breast cancer	1068 (0.10%)	1371 (0.10%)	2439 (0.10%)
Ovarian cancer	510 (0.05%)	764 (0.05%)	1274 (0.05%)
Endometrial cancer[1]	769 (0.12%)	1049 (0.12%)	1818 (0.12%)
Colorectal cancer	1517 (0.14%)	1795 (0.13%)	3312 (0.13%)
Other cancer			
Accessory sinus	5 (<0.01%)	9 (<0.01%)	14 (<0.01%)
Adrenal gland	6 (<0.01%)	10 (<0.01%)	16 (<0.01%)
Anus	51 (<0.01%)	69 (<0.01%)	120 (<0.01%)
Appendix	20 (<0.01%)	22 (<0.01%)	42 (<0.01%)
Base of tongue	15 (<0.01%)	17 (<0.01%)	32 (<0.01%)
Biliary tract, parts of (other/unspecified)	98 (0.01%)	97 (0.01%)	195 (0.01%)
Bladder	462 (0.04%)	552 (0.04%)	1014 (0.04%)
Bones/joints/articular cartilage (limbs)	6 (<0.01%)	7 (<0.01%)	13 (<0.01%)
Bones/joints/articular cartilage (other)	14 (<0.01%)	14 (<0.01%)	28 (<0.01%)
Brain	166 (0.01%)	205 (0.01%)	371 (0.01%)
Cervix	65 (0.01%)	67 (<0.01%)	132 (0.01%)
Central Nervous System (excludes brain)	1 (<0.01%)	4 (<0.01%)	5 (<0.01%)
Connective/subcutaneous/soft tissues	87 (0.01%)	103 (0.01%)	190 (0.01%)
Endocrine glands, related structures	1 (<0.01%)	3 (<0.01%)	4 (<0.01%)
Esophagus	81 (0.01%)	100 (0.01%)	181 (0.01%)
Eye and adnexa	48 (<0.01%)	35 (<0.01%)	83 (<0.01%)
Floor of mouth	10 (<0.01%)	7 (<0.01%)	17 (<0.01%)
Gallbladder	81 (0.01%)	62 (<0.01%)	143 (0.01%)
Genital organs	152 (0.01%)	208 (0.01%)	360 (0.01%)
Gum	20 (<0.01%)	26 (<0.01%)	46 (<0.01%)
Heart	9 (<0.01%)	27 (<0.01%)	36 (<0.01%)
Kidney	354 (0.03%)	392 (0.03%)	746 (0.03%)
Larynx	28 (<0.01%)	26 (<0.01%)	54 (<0.01%)
Leukemia	488 (0.04%)	637 (0.04%)	1125 (0.04%)
Liver	134 (0.01%)	191 (0.01%)	325 (0.01%)
Lung	1776 (0.16%)	2331 (0.16%)	4107 (0.16%)
Lymph nodes	2 (<0.01%)	1 (<0.01%)	3 (<0.01%)
Lymphoma, Hodgkins	27 (<0.01%)	49 (<0.01%)	76 (<0.01%)
Lymphoma, non-Hodgkins	757 (0.07%)	1052 (0.07%)	1809 (0.07%)
Melanoma of the skin	1096 (0.10%)	1449 (0.10%)	2545 (0.10%)
Meninges	3 (<0.01%)	4 (<0.01%)	7 (<0.01%)
Multiple myeloma	282 (0.03%)	353 (0.02%)	635 (0.02%)
Mycosis fungoides	10 (<0.01%)	17 (<0.01%)	27 (<0.01%)
Nasal cavity mid ear	7 (<0.01%)	13 (<0.01%)	20 (<0.01%)
Oral (mouth)	21 (<0.01%)	18 (<0.01%)	39 (<0.01%)
Other digestive cancer	25 (<0.01%)	27 (<0.01%)	52 (<0.01%)
Other lip	7 (<0.01%)	6 (<0.01%)	13 (<0.01%)
Palate	13 (<0.01%)	19 (<0.01%)	32 (<0.01%)

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[1] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial and uterine cancer.

Table 3.8 (continued)
Verified Primary and Other Cancers (Annualized Percentages): <u>MRC and SRC Super Cohort Participants</u>

Data as of: March 1, 2019; Events through March 1, 2019

	CT	OS	Total
Number of participants	68132	93676	161808
Mean follow-up (months)	197.3	182.9	189.0
Pancreas	552 (0.05%)	704 (0.05%)	1256 (0.05%)
Parotid gland (Stensen's duct)	25 (<0.01%)	36 (<0.01%)	61 (<0.01%)
Peripheral nerves and autonomic nervous	1 (<0.01%)	1 (<0.01%)	2 (<0.01%)
Peritoneum	93 (0.01%)	132 (0.01%)	225 (0.01%)
Pharynx	13 (<0.01%)	16 (<0.01%)	29 (<0.01%)
Pyriform sinus	0 (0.00%)	2 (<0.01%)	2 (<0.01%)
Renal pelvis	57 (0.01%)	68 (<0.01%)	125 (<0.01%)
Respiratory system, intrathoracic, other	1 (<0.01%)	2 (<0.01%)	3 (<0.01%)
Salivary glands, major (other/unspecified)	5 (<0.01%)	13 (<0.01%)	18 (<0.01%)
Small intestine	53 (<0.01%)	105 (0.01%)	158 (0.01%)
Stomach	131 (0.01%)	177 (0.01%)	308 (0.01%)
Thymus	7 (<0.01%)	6 (<0.01%)	13 (<0.01%)
Thyroid	212 (0.02%)	286 (0.02%)	498 (0.02%)
Tongue, part of (other/unspecified)	40 (<0.01%)	45 (<0.01%)	85 (<0.01%)
Tonsil	8 (<0.01%)	12 (<0.01%)	20 (<0.01%)
Trachea	0 (0.00%)	1 (<0.01%)	1 (<0.01%)
Ureter	41 (<0.01%)	43 (<0.01%)	84 (<0.01%)
Urinary organs (other/unspecified)	14 (<0.01%)	20 (<0.01%)	34 (<0.01%)
Uterus, not otherwise specified[1]	57 (0.01%)	69 (0.01%)	126 (0.01%)
Other/unknown site of cancer	250 (0.02%)	317 (0.02%)	567 (0.02%)
Other/unknown cancers reported on death form	142 (0.01%)	292 (0.02%)	434 (0.02%)

[1] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial and uterine cancer.

Table 3.9
Verified Primary and Other Cancers (Annualized Percentages) by <u>Race/Ethnicity</u> for <u>CT and OS Participants</u>

Data as of: March 1, 2019; Events through March 1, 2019

	Race/Ethnicity					
	American Indian/Alaskan Native	Asian/Pacific Islander	Black/African American	Hispanic/ Latina	White	Unknown
Number of participants	713	4190	14618	6484	133541	2262
Mean follow-up (months)	162.7	166.9	162.8	153.8	194.7	171.8
Overall cancer	106 (1.10%)	606 (1.04%)	2257 (1.14%)	748 (0.90%)	29960 (1.38%)	412 (1.27%)
Primary cancer						
Breast cancer	40 (0.41%)	281 (0.48%)	930 (0.47%)	309 (0.37%)	11653 (0.54%)	150 (0.46%)
Invasive breast cancer	34 (0.35%)	231 (0.40%)	749 (0.38%)	252 (0.30%)	9740 (0.45%)	125 (0.39%)
In situ breast cancer	7 (0.07%)	54 (0.09%)	203 (0.10%)	63 (0.08%)	2083 (0.10%)	29 (0.09%)
Ovarian cancer	3 (0.03%)	17 (0.03%)	72 (0.04%)	37 (0.04%)	1130 (0.05%)	15 (0.05%)
Endometrial cancer[1]	2 (0.04%)	25 (0.07%)	90 (0.10%)	29 (0.06%)	1645 (0.13%)	27 (0.14%)
Colorectal cancer	11 (0.11%)	61 (0.10%)	291 (0.15%)	78 (0.09%)	2828 (0.13%)	43 (0.13%)
Other cancer						
Accessory sinus	0 (0.00%)	0 (0.00%)	1 (<0.01%)	0 (0.00%)	13 (<0.01%)	0 (0.00%)
Adrenal gland	0 (0.00%)	0 (0.00%)	2 (<0.01%)	1 (<0.01%)	13 (<0.01%)	0 (0.00%)
Anus	1 (0.01%)	2 (<0.01%)	8 (<0.01%)	6 (0.01%)	102 (<0.01%)	1 (<0.01%)
Appendix	0 (0.00%)	0 (0.00%)	4 (<0.01%)	3 (<0.01%)	34 (<0.01%)	1 (<0.01%)
Base of Tongue	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (<0.01%)	31 (<0.01%)	0 (0.00%)
Biliary tract, parts of (other/unspecified)	2 (0.02%)	2 (<0.01%)	12 (0.01%)	12 (0.01%)	165 (0.01%)	2 (0.01%)
Bladder	2 (0.02%)	10 (0.02%)	57 (0.03%)	14 (0.02%)	923 (0.04%)	8 (0.02%)
Bones/joints/articular cartilage (limbs)	0 (0.00%)	1 (<0.01%)	0 (0.00%)	0 (0.00%)	11 (<0.01%)	1 (<0.01%)
Bones/joints/articular cartilage (other)	0 (0.00%)	0 (0.00%)	2 (<0.01%)	1 (<0.01%)	24 (<0.01%)	1 (<0.01%)
Brain	1 (0.01%)	3 (0.01%)	13 (0.01%)	5 (0.01%)	347 (0.02%)	2 (0.01%)
Cervix	0 (0.00%)	2 (<0.01%)	20 (0.01%)	5 (0.01%)	102 (<0.01%)	3 (0.01%)
Central Nervous System (excludes brain)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	5 (<0.01%)	0 (0.00%)
Connective/subcutaneous/soft tissues	0 (0.00%)	5 (0.01%)	8 (<0.01%)	4 (<0.01%)	172 (0.01%)	1 (<0.01%)
Endocrine glands, related structures	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	4 (<0.01%)	0 (0.00%)
Esophagus	1 (0.01%)	0 (0.00%)	9 (<0.01%)	2 (<0.01%)	166 (0.01%)	3 (0.01%)
Eye and adnexa	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (<0.01%)	79 (<0.01%)	1 (<0.01%)
Floor of mouth	0 (0.00%)	1 (<0.01%)	2 (<0.01%)	0 (0.00%)	13 (<0.01%)	1 (<0.01%)
Gallbladder	0 (0.00%)	1 (<0.01%)	12 (0.01%)	8 (0.01%)	122 (0.01%)	0 (0.00%)
Genital organs	0 (0.00%)	4 (0.01%)	17 (0.01%)	13 (0.02%)	322 (0.01%)	4 (0.01%)
Gum	0 (0.00%)	1 (<0.01%)	1 (<0.01%)	1 (<0.01%)	43 (<0.01%)	0 (0.00%)
Heart	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	36 (<0.01%)	0 (0.00%)
Kidney	7 (0.07%)	15 (0.03%)	59 (0.03%)	21 (0.03%)	633 (0.03%)	11 (0.03%)

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[1] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial and uterine cancer.

Table 3.9 (continued)
Verified Primary and Other Cancers (Annualized Percentages) by Race/Ethnicity: CT and OS Participants

Data as of: March 1, 2019; Events through March 1, 2019

	Race/Ethnicity					
	American Indian/Alaskan Native	Asian/Pacific Islander	Black/African American	Hispanic/ Latina	White	Unknown
Number of participants	713	4190	14618	6484	133541	2262
Mean follow-up (months)	162.7	166.9	162.8	153.8	194.7	171.8
Larynx	0 (0.00%)	0 (0.00%)	6 (<0.01%)	0 (0.00%)	48 (<0.01%)	0 (0.00%)
Leukemia	0 (0.00%)	17 (0.03%)	63 (0.03%)	15 (0.02%)	1020 (0.05%)	10 (0.03%)
Liver	3 (0.03%)	16 (0.03%)	26 (0.01%)	20 (0.02%)	255 (0.01%)	5 (0.02%)
Lung	16 (0.17%)	59 (0.10%)	268 (0.14%)	62 (0.07%)	3642 (0.17%)	60 (0.19%)
Lymph nodes	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (<0.01%)	0 (0.00%)
Lymphoma, Hodgkins	0 (0.00%)	1 (<0.01%)	4 (<0.01%)	5 (0.01%)	65 (<0.01%)	1 (<0.01%)
Lymphoma, non-Hodgkins	5 (0.05%)	32 (0.05%)	70 (0.04%)	48 (0.06%)	1629 (0.08%)	25 (0.08%)
Melanoma of the skin	4 (0.04%)	7 (0.01%)	8 (<0.01%)	15 (0.02%)	2491 (0.11%)	20 (0.06%)
Meninges	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	6 (<0.01%)	1 (<0.01%)
Multiple myeloma	3 (0.03%)	1 (<0.01%)	86 (0.04%)	19 (0.02%)	519 (0.02%)	7 (0.02%)
Mycosis fungoides	0 (0.00%)	0 (0.00%)	3 (<0.01%)	0 (0.00%)	24 (<0.01%)	0 (0.00%)
Nasal cavity mid ear	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	20 (<0.01%)	0 (0.00%)
Oral (mouth)	0 (0.00%)	0 (0.00%)	2 (<0.01%)	1 (<0.01%)	36 (<0.01%)	0 (0.00%)
Other digestive cancer	0 (0.00%)	0 (0.00%)	2 (<0.01%)	0 (0.00%)	50 (<0.01%)	0 (0.00%)
Other lip	0 (0.00%)	0 (0.00%)	1 (<0.01%)	0 (0.00%)	12 (<0.01%)	0 (0.00%)
Palate	0 (0.00%)	1 (<0.01%)	1 (<0.01%)	0 (0.00%)	30 (<0.01%)	0 (0.00%)
Pancreas	4 (0.04%)	36 (0.06%)	103 (0.05%)	31 (0.04%)	1064 (0.05%)	18 (0.06%)
Parotid gland (Stensen's duct)	0 (0.00%)	2 (<0.01%)	7 (<0.01%)	1 (<0.01%)	51 (<0.01%)	0 (0.00%)
Peripheral nerves and autonomic nervous system	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	2 (<0.01%)	0 (0.00%)
Peritoneum	1 (0.01%)	3 (0.01%)	14 (0.01%)	7 (0.01%)	197 (0.01%)	3 (0.01%)
Pharynx	0 (0.00%)	0 (0.00%)	3 (<0.01%)	0 (0.00%)	26 (<0.01%)	0 (0.00%)
Pyriform sinus	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	2 (<0.01%)	0 (0.00%)
Renal Pelvis	1 (0.01%)	2 (<0.01%)	9 (<0.01%)	1 (<0.01%)	110 (0.01%)	2 (0.01%)
Respiratory system, intrathoracic, other	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (<0.01%)	0 (0.00%)
Salivary glands, major (other/ unspecified)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	18 (<0.01%)	0 (0.00%)
Small intestine	0 (0.00%)	3 (0.01%)	13 (0.01%)	6 (0.01%)	135 (0.01%)	1 (<0.01%)
Stomach	1 (0.01%)	17 (0.03%)	44 (0.02%)	8 (0.01%)	233 (0.01%)	5 (0.02%)
Thymus	0 (0.00%)	1 (<0.01%)	0 (0.00%)	0 (0.00%)	12 (<0.01%)	0 (0.00%)
Thyroid	1 (0.01%)	10 (0.02%)	35 (0.02%)	10 (0.01%)	435 (0.02%)	7 (0.02%)
Tongue, part of (other/unspecified)	0 (0.00%)	2 (<0.01%)	2 (<0.01%)	0 (0.00%)	79 (<0.01%)	2 (0.01%)

Table 3.9 (continued)
Verified Primary and Other Cancers (Annualized Percentages) by <u>Race/Ethnicity</u>: <u>CT and OS Participants</u>

Data as of: March 1, 2019; Events through March 1, 2019

	Race/Ethnicity					
	American Indian/Alaskan Native	Asian/Pacific Islander	Black/African American	Hispanic/ Latina	White	Unknown
Number of participants	713	4190	14618	6484	133541	2262
Mean follow-up (months)	162.7	166.9	162.8	153.8	194.7	171.8
Tonsil	0 (0.00%)	0 (0.00%)	1 (<0.01%)	0 (0.00%)	19 (<0.01%)	0 (0.00%)
Trachea	0 (0.00%)	0 (0.00%)	1 (<0.01%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureter	1 (0.01%)	3 (0.01%)	1 (<0.01%)	1 (<0.01%)	77 (<0.01%)	1 (<0.01%)
Urinary organs (other/unspecified)	1 (0.01%)	1 (<0.01%)	4 (<0.01%)	1 (<0.01%)	27 (<0.01%)	0 (0.00%)
Uterus, not otherwise specified[1]	0 (0.00%)	3 (0.01%)	13 (0.01%)	4 (0.01%)	102 (0.01%)	4 (0.02%)
Other/unknown site of cancer	2 (0.02%)	10 (0.02%)	37 (0.02%)	13 (0.02%)	497 (0.02%)	8 (0.02%)
Other/unknown cancers reported on death form	3 (0.03%)	9 (0.02%)	38 (0.02%)	12 (0.01%)	365 (0.02%)	7 (0.02%)

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[1] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial and uterine cancer.

Table 4.1
Counts (Annualized Percentages) of Participants with Self-Reported Outcomes by <u>Age at Enrollment</u> and <u>Race/Ethnicity</u> for <u>MRC Super Cohort Participants</u>[1] Who Did Not Report a Prevalent Condition at Baseline

Data as of: March 1, 2019; Events through March 1, 2019

Outcome	Total	Age at Enrollment			
		50-54	55-59	60-69	70-79
Number of participants	44174	6788	9352	19418	8616
Mean follow-up (months)	177.0	188.8	189.7	178.2	151.3
Angina (hospitalized)[2]	3352 (0.54%)	422 (0.41%)	616 (0.43%)	1614 (0.59%)	700 (0.70%)
Diabetes (treated)	7768 (1.27%)	1369 (1.34%)	1773 (1.27%)	3504 (1.30%)	1122 (1.10%)
Hysterectomy	1880 (0.50%)	300 (0.52%)	471 (0.53%)	842 (0.51%)	267 (0.44%)
Osteoarthritis[3]	13521 (3.33%)	2319 (2.91%)	3130 (3.09%)	5922 (3.47%)	2150 (3.90%)
Intestinal polyps	10634 (1.76%)	1745 (1.70%)	2519 (1.80%)	4843 (1.82%)	1527 (1.59%)
Lupus	804 (0.12%)	129 (0.12%)	179 (0.12%)	368 (0.13%)	128 (0.12%)
Hypertension treated w/pills	16376 (3.71%)	2676 (3.26%)	3646 (3.43%)	7175 (3.84%)	2879 (4.41%)
COPD[4]	2430 (0.83%)	340 (0.70%)	567 (0.86%)	1214 (0.95%)	309 (0.66%)
Macular degeneration[5]	4779 (1.05%)	400 (0.52%)	809 (0.77%)	2399 (1.20%)	1171 (1.62%)
Dementia[5]	4305 (0.94%)	247 (0.32%)	522 (0.50%)	2175 (1.09%)	1361 (1.89%)
Parkinson's disease[5]	592 (0.13%)	60 (0.08%)	116 (0.11%)	307 (0.15%)	109 (0.15%)

Outcomes	Race/Ethnicity					
	American Indian/ Alaskan Native	Asian/Pacific Islander	Black/African American	Hispanic/ Latina	White	Unknown
Number of participants	130	527	14618	6484	22030	385
Mean follow-up (months)	169.0	171.4	162.3	153.4	193.9	177.9
Angina (hospitalized)[2]	16 (0.95%)	22 (0.31%)	1033 (0.56%)	343 (0.43%)	1901 (0.56%)	37 (0.68%)
Diabetes (treated)	25 (1.53%)	92 (1.30%)	2895 (1.63%)	1123 (1.44%)	3558 (1.04%)	75 (1.41%)
Hysterectomy	4 (0.54%)	12 (0.23%)	440 (0.50%)	281 (0.61%)	1126 (0.49%)	17 (0.48%)
Osteoarthritis[3]	48 (3.84%)	175 (3.24%)	4039 (3.44%)	2033 (3.67%)	7099 (3.18%)	127 (3.40%)
Intestinal polyps	33 (1.94%)	109 (1.61%)	3536 (1.93%)	1309 (1.67%)	5561 (1.68%)	86 (1.65%)
Lupus	3 (0.16%)	6 (0.08%)	290 (0.15%)	131 (0.16%)	370 (0.10%)	4 (0.07%)
Hypertension treated w/pills	58 (4.37%)	190 (3.57%)	4402 (4.38%)	2347 (3.72%)	9244 (3.47%)	135 (3.42%)
COPD[4]	10 (1.32%)	13 (0.36%)	616 (0.64%)	224 (0.50%)	1549 (1.07%)	18 (0.72%)
Macular degeneration[5]	15 (1.12%)	41 (0.81%)	881 (0.59%)	490 (0.74%)	3312 (1.44%)	40 (1.01%)
Dementia[5]	12 (0.89%)	38 (0.76%)	1047 (0.71%)	443 (0.67%)	2737 (1.19%)	28 (0.71%)
Parkinson's disease[5]	2 (0.15%)	8 (0.16%)	147 (0.10%)	62 (0.09%)	368 (0.16%)	5 (0.13%)

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[1] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.
[2] During WHI Extension Study 2005-2010, the outcome was angina with hospitalization for a heart condition that may or may not have been related to the angina.
[3] This outcome has not been self-reported on all versions of Form 33 during WHI follow-up. The annualized percentages are corrected for the different amounts of follow-up.
[4] Data only collected during the WHI Extension Study 2010-2020.
[5] Data only collected during the WHI Extension Studies 2005-2020.

Table 4.2
Counts (Annualized Percentages) of Participants with Self-Reported Outcomes by <u>Age at Enrollment</u> and <u>Race/Ethnicity </u>for <u>SRC Super Cohort Participants</u>[1] Who Did Not Report a Prevalent Condition at Baseline

Data as of: March 1, 2019; Events through March 1, 2019

Outcome	Total	Age at Enrollment			
		50-54	**55-59**	**60-69**	**70-79**
Number of participants	117634	14781	22638	53171	27044
Mean follow-up (months)	193.1	221.2	215.9	194.7	155.6
DVT	4123 (0.23%)	360 (0.14%)	650 (0.16%)	2056 (0.25%)	1057 (0.32%)
Pulmonary embolism[2]	2560 (0.14%)	229 (0.08%)	449 (0.11%)	1304 (0.15%)	578 (0.17%)
Angina (hospitalized)[3]	8658 (0.48%)	751 (0.28%)	1464 (0.37%)	4344 (0.53%)	2099 (0.65%)
Diabetes (treated)	16173 (0.88%)	2194 (0.82%)	3401 (0.85%)	7638 (0.91%)	2940 (0.87%)
Hysterectomy	6878 (0.61%)	1071 (0.63%)	1674 (0.64%)	3139 (0.62%)	994 (0.50%)
Osteoarthritis[4]	37408 (3.33%)	5754 (2.89%)	8439 (3.11%)	16792 (3.46%)	6423 (3.81%)
Intestinal polyps	29966 (1.73%)	4608 (1.77%)	6976 (1.82%)	13631 (1.75%)	4751 (1.56%)
Lupus	1923 (0.10%)	248 (0.09%)	398 (0.10%)	891 (0.10%)	386 (0.11%)
Hypertension treated w/pills	44936 (3.19%)	5700 (2.46%)	9176 (2.80%)	20800 (3.34%)	9260 (4.07%)
COPD[5]	7100 (0.90%)	832 (0.76%)	1495 (0.91%)	3753 (1.05%)	1020 (0.69%)
Macular degeneration[6]	16789 (1.30%)	1200 (0.66%)	2474 (0.91%)	8621 (1.47%)	4494 (1.90%)
Dementia[6]	12157 (0.94%)	505 (0.28%)	1284 (0.47%)	6328 (1.08%)	4040 (1.71%)
Parkinson's disease[6]	2156 (0.17%)	153 (0.08%)	377 (0.14%)	1208 (0.21%)	418 (0.18%)

Outcomes	Race/Ethnicity			
	American Indian/ Alaskan Native	**Asian/Pacific Islander**	**White**	**Unknown**
Number of participants	583	3663	111511	1877
Mean follow-up (months)	160.9	165.6	194.6	170.2
DVT	11 (0.15%)	36 (0.07%)	4022 (0.23%)	54 (0.21%)
Pulmonary embolism[2]	9 (0.12%)	20 (0.04%)	2506 (0.14%)	25 (0.09%)
Angina (hospitalized)[3]	43 (0.61%)	133 (0.27%)	8363 (0.48%)	119 (0.47%)
Diabetes (treated)	107 (1.52%)	542 (1.12%)	15233 (0.86%)	291 (1.14%)
Hysterectomy	17 (0.45%)	123 (0.37%)	6647 (0.62%)	91 (0.58%)
Osteoarthritis[4]	150 (3.46%)	1161 (3.20%)	35511 (3.33%)	586 (3.56%)
Intestinal polyps	126 (1.76%)	763 (1.67%)	28650 (1.73%)	427 (1.77%)
Lupus	16 (0.21%)	41 (0.08%)	1834 (0.10%)	32 (0.12%)
Hypertension treated w/pills	187 (3.66%)	1194 (3.35%)	42885 (3.18%)	670 (3.54%)
COPD[5]	32 (0.85%)	100 (0.39%)	6878 (0.92%)	90 (0.72%)
Macular degeneration[6]	51 (0.83%)	252 (0.62%)	16296 (1.33%)	190 (0.96%)
Dementia[6]	47 (0.76%)	215 (0.53%)	11722 (0.96%)	173 (0.87%)
Parkinson's disease[6]	7 (0.11%)	33 (0.08%)	2081 (0.17%)	35 (0.18%)

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[1] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.
[2] During the main WHI Study and the WHI Extension Study 2005-2010, pulmonary embolism includes only inpatient self-reports. During WHI Extension Study 2010-2020, pulmonary embolism includes both inpatient and outpatient self-reports.
[3] During WHI Extension Study 2005-2010, the outcome was angina with hospitalization for a heart condition that may or may not have been related to the angina.
[4] This outcome has not been self-reported on all versions of Form 33 during WHI follow-up. The annualized percentages are corrected for the different amounts of follow-up.
[5] Data only collected during the WHI Extension Study 2010-2020.
[6] Data only collected during the WHI Extension Studies 2005-2020.

Table 4.3
Counts (Annualized Percentages) of Participants with Self-Reported Outcomes by Age at Enrollment and Race/Ethnicity for CT Participants Who Did Not Report a Prevalent Condition at Baseline

Data as of: March 1, 2019; Events through March 1, 2019

Outcome	Total	Age at Enrollment			
		50-54	55-59	60-69	70-79
Number randomized	68132	9188	14661	31389	12894
Mean follow-up (months)	197.2	217.1	213.5	197.6	163.7
Hospitalizations					
Ever	51423 (4.59%)	5775 (3.47%)	10172 (3.90%)	24669 (4.77%)	10807 (6.14%)
Two or more	39037 (3.49%)	3925 (2.36%)	7326 (2.81%)	19184 (3.71%)	8602 (4.89%)
Other					
DVT	2805 (0.26%)	235 (0.14%)	507 (0.20%)	1401 (0.28%)	662 (0.39%)
Pulmonary embolism[1]	1683 (0.15%)	155 (0.09%)	317 (0.12%)	872 (0.17%)	339 (0.19%)
Angina (hospitalized)[2]	5630 (0.53%)	572 (0.35%)	1039 (0.41%)	2845 (0.58%)	1174 (0.72%)
Diabetes (treated)	11578 (1.08%)	1756 (1.08%)	2650 (1.05%)	5455 (1.10%)	1717 (1.02%)
Gallbladder disease[3,4]	5248 (1.15%)	746 (1.07%)	1195 (1.15%)	2463 (1.21%)	844 (1.05%)
Hysterectomy	3727 (0.56%)	570 (0.59%)	964 (0.59%)	1720 (0.57%)	473 (0.48%)
Glaucoma[4]	7565 (1.78%)	744 (1.19%)	1457 (1.53%)	3662 (1.92%)	1702 (2.24%)
Osteoporosis[4]	14697 (3.53%)	1451 (2.32%)	2635 (2.80%)	7142 (3.83%)	3469 (4.72%)
Osteoarthritis[5]	23157 (3.32%)	3707 (2.96%)	5612 (3.11%)	10487 (3.46%)	3351 (3.81%)
Rheumatoid arthritis[4]	4010 (0.76%)	538 (0.70%)	866 (0.74%)	1822 (0.77%)	784 (0.84%)
Intestinal polyps	18262 (1.75%)	2830 (1.76%)	4493 (1.81%)	8514 (1.79%)	2425 (1.56%)
Lupus	1155 (0.10%)	157 (0.09%)	272 (0.10%)	545 (0.11%)	181 (0.10%)
Kidney stones[4,5]	1877 (0.50%)	241 (0.46%)	379 (0.47%)	898 (0.53%)	359 (0.51%)
Cataracts[4,5]	21571 (6.44%)	1468 (2.79%)	3731 (4.62%)	11650 (7.63%)	4722 (9.66%)
Hypertension treated w/pills	27366 (3.40%)	3802 (2.80%)	6191 (3.08%)	12762 (3.56%)	4611 (4.19%)
COPD[6]	4370 (0.95%)	520 (0.77%)	1009 (0.95%)	2316 (1.10%)	525 (0.74%)
Macular degeneration[7]	9386 (1.29%)	675 (0.62%)	1554 (0.91%)	4954 (1.47%)	2203 (1.99%)
Dementia[7]	7350 (1.01%)	350 (0.32%)	889 (0.52%)	3876 (1.15%)	2235 (2.02%)
Parkinson's disease[7]	1144 (0.16%)	90 (0.08%)	244 (0.14%)	625 (0.19%)	185 (0.17%)

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[1] During the main WHI Study and the WHI Extension Study 2005-2010, pulmonary embolism includes only inpatient self-reports. During WHI Extension Study 2010-2020, pulmonary embolism includes both inpatient and outpatient self-reports.

[2] During WHI Extension Study 2005-2010, the outcome was angina with hospitalization for a heart condition that may or may not have been related to the angina.

[3] "Gallbladder disease" includes self-reports of both hospitalized and non-hospitalized events.

[4] Data not collected for the WHI Extension Studies 2005-2020.

[5] These outcomes have not been self-reported on all versions of Form 33 during WHI follow-up. The annualized percentages are corrected for the different amounts of follow-up.

[6] Data only collected during the WHI Extension Study 2010-2020.

[7] Data only collected during the WHI Extension Studies 2005-2020.

Table 4.3 (continued)
Counts (Annualized Percentages) of Participants with Self-Reported Outcomes by <u>Age at Enrollment</u> and <u>Race/Ethnicity</u> for <u>CT Participants</u> Who Did Not Report a Prevalent Condition at Baseline

Data as of: March 1, 2019; Events through March 1, 2019

Outcomes	American Indian/ Alaskan Native	Asian/Pacific Islander	Black/African American	Hispanic/ Latina	White	Unknown
Number randomized	292	1519	6983	2875	55525	938
Mean follow-up (months)	176.0	188.3	179.4	167.7	201.6	181.5
Hospitalizations						
Ever	204 (4.76%)	896 (3.76%)	4885 (4.68%)	1666 (4.15%)	43110 (4.62%)	662 (4.67%)
Two or more	157 (3.67%)	558 (2.34%)	3495 (3.35%)	1060 (2.64%)	33302 (3.57%)	465 (3.28%)
Other						
DVT	10 (0.24%)	20 (0.08%)	291 (0.29%)	62 (0.16%)	2397 (0.26%)	25 (0.18%)
Pulmonary embolism[1]	7 (0.16%)	9 (0.04%)	162 (0.16%)	24 (0.06%)	1465 (0.16%)	16 (0.11%)
Angina (hospitalized)[2]	25 (0.64%)	61 (0.27%)	584 (0.60%)	182 (0.47%)	4702 (0.52%)	76 (0.56%)
Diabetes (treated)	53 (1.35%)	301 (1.33%)	1592 (1.70%)	586 (1.55%)	8874 (0.98%)	172 (1.28%)
Gallbladder disease[3,4]	22 (1.31%)	86 (0.81%)	420 (0.85%)	243 (1.45%)	4403 (1.18%)	74 (1.20%)
Hysterectomy	9 (0.48%)	53 (0.34%)	260 (0.57%)	133 (0.58%)	3236 (0.57%)	36 (0.43%)
Glaucoma[4]	40 (2.23%)	153 (1.68%)	1005 (2.38%)	338 (1.91%)	5930 (1.70%)	99 (1.80%)
Osteoporosis[4]	66 (3.67%)	389 (4.32%)	909 (2.08%)	639 (3.75%)	12485 (3.67%)	209 (3.82%)
Osteoarthritis[5]	100 (3.82%)	538 (3.09%)	2125 (3.36%)	997 (3.61%)	19074 (3.31%)	323 (3.57%)
Rheumatoid arthritis[4]	32 (1.55%)	74 (0.66%)	682 (1.33%)	357 (1.70%)	2788 (0.65%)	77 (1.13%)
Intestinal polyps	82 (2.07%)	373 (1.71%)	1912 (1.97%)	641 (1.67%)	15012 (1.73%)	242 (1.85%)
Lupus	8 (0.19%)	19 (0.08%)	146 (0.14%)	57 (0.14%)	910 (0.10%)	15 (0.11%)
Kidney stones[4,5]	15 (0.98%)	47 (0.58%)	190 (0.50%)	100 (0.64%)	1501 (0.49%)	24 (0.48%)
Cataracts[4,5]	92 (6.45%)	428 (5.88%)	2002 (5.76%)	828 (5.57%)	17928 (6.59%)	293 (6.55%)
Hypertension treated w/pills	107 (3.71%)	569 (3.45%)	2288 (4.28%)	1153 (3.80%)	22917 (3.31%)	332 (3.39%)
COPD[6]	20 (1.09%)	51 (0.48%)	335 (0.72%)	116 (0.59%)	3797 (1.01%)	51 (0.81%)
Macular degeneration[7]	33 (1.07%)	130 (0.80%)	472 (0.67%)	235 (0.83%)	8427 (1.40%)	89 (0.90%)
Dementia[7]	26 (0.85%)	112 (0.69%)	596 (0.85%)	244 (0.86%)	6295 (1.05%)	77 (0.78%)
Parkinson's disease[7]	3 (0.10%)	22 (0.14%)	68 (0.10%)	31 (0.11%)	1003 (0.17%)	17 (0.17%)

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[1] During the main WHI Study and the WHI Extension Study 2005-2010, pulmonary embolism includes only inpatient self-reports. During WHI Extension Study 2010-2020, pulmonary embolism includes both inpatient and outpatient self-reports.
[2] During WHI Extension Study 2005-2010, the outcome was angina with hospitalization for a heart condition that may or may not have been related to the angina.
[3] "Gallbladder disease" includes self-reports of both hospitalized and non-hospitalized events.
[4] Data not collected for the WHI Extension Studies 2005-2020.
[5] These outcomes have not been self-reported on all versions of Form 33 during WHI follow-up. The annualized percentages are corrected for the different amounts of follow-up.
[6] Data only collected during the WHI Extension Study 2010-2020.
[7] Data only collected during the WHI Extension Studies 2005-2020.

Table 4.4
Counts (Annualized Percentages) of Participants with Self-Reported Outcomes by <u>Age at Enrollment</u> and <u>Race/Ethnicity</u> for <u>OS Participants</u> Who Did Not Report a Prevalent Condition at Baseline

Data as of: March 1, 2019; Events through March 1, 2019

Outcome	Total	Age at Enrollment			
		50-54	55-59	60-69	70-79
Number enrolled	93676	12381	17329	41200	22766
Mean follow-up (months)	182.6	206.5	203.9	184.7	149.4
Hospitalizations					
Ever	66426 (4.66%)	7185 (3.37%)	11278 (3.83%)	30309 (4.78%)	17654 (6.23%)
Two or more	48535 (3.41%)	4744 (2.23%)	7887 (2.68%)	22675 (3.58%)	13229 (4.67%)
Other					
DVT	2991 (0.22%)	284 (0.14%)	458 (0.16%)	1442 (0.24%)	807 (0.30%)
Pulmonary embolism[1]	1829 (0.13%)	186 (0.09%)	322 (0.11%)	888 (0.14%)	433 (0.15%)
Angina (hospitalized)[2]	6380 (0.47%)	601 (0.29%)	1041 (0.37%)	3113 (0.52%)	1625 (0.62%)
Diabetes (treated)	12363 (0.89%)	1807 (0.87%)	2524 (0.88%)	5687 (0.93%)	2345 (0.86%)
Gallbladder disease[3,4]	5673 (0.95%)	834 (0.96%)	1148 (0.98%)	2543 (0.99%)	1148 (0.85%)
Hysterectomy	5031 (0.35%)	801 (0.38%)	1181 (0.40%)	2261 (0.36%)	788 (0.28%)
Glaucoma[4]	8483 (1.87%)	845 (1.33%)	1372 (1.59%)	3899 (1.99%)	2367 (2.19%)
Osteoporosis[4]	20720 (4.75%)	2100 (3.35%)	3378 (4.00%)	9524 (5.07%)	5718 (5.63%)
Osteoarthritis[5]	27772 (3.31%)	4366 (2.83%)	5957 (3.08%)	12227 (3.44%)	5222 (3.83%)
Rheumatoid arthritis[4]	4588 (0.68%)	636 (0.67%)	883 (0.68%)	1888 (0.65%)	1181 (0.76%)
Intestinal polyps	22338 (1.73%)	3523 (1.74%)	5002 (1.81%)	9960 (1.75%)	3853 (1.57%)
Lupus	1572 (0.11%)	220 (0.10%)	305 (0.10%)	714 (0.11%)	333 (0.12%)
Kidney stones[4,5]	2317 (0.57%)	292 (0.55%)	433 (0.59%)	994 (0.57%)	598 (0.60%)
Cataracts[4,5]	27103 (7.93%)	1726 (3.21%)	4088 (5.63%)	14045 (9.25%)	7244 (11.34%)
Hypertension treated w/pills	33946 (3.24%)	4574 (2.56%)	6631 (2.84%)	15213 (3.37%)	7528 (4.11%)
COPD[6]	5160 (0.83%)	652 (0.71%)	1053 (0.84%)	2651 (0.97%)	804 (0.65%)
Macular degeneration[7]	12182 (1.19%)	925 (0.61%)	1729 (0.83%)	6066 (1.34%)	3462 (1.74%)
Dementia[7]	9112 (0.89%)	402 (0.26%)	917 (0.44%)	4627 (1.03%)	3166 (1.60%)
Parkinson's disease[7]	1604 (0.16%)	123 (0.08%)	249 (0.12%)	890 (0.20%)	342 (0.17%)

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[1] During the main WHI Study and the WHI Extension Study 2005-2010, pulmonary embolism includes only inpatient self-reports. During WHI Extension Study 2010-2020, pulmonary embolism includes both inpatient and outpatient self-reports.

[2] During WHI Extension Study 2005-2010, the outcome was angina with hospitalization for a heart condition that may or may not have been related to the angina.

[3] "Gallbladder disease" includes self-reports of both hospitalized and non-hospitalized events.

[4] Data not collected for the WHI Extension Studies 2005-2020.

[5] These outcomes have not been self-reported on all versions of Form 33. The annualized percentages are corrected for the different amounts of follow-up.

[6] Data only collected during the WHI Extension Study 2010-2020.

[7] Data only collected during the WHI Extension Studies 2005-2020.

Table 4.4 (continued)
Counts (Annualized Percentages) of Participants with Self-Reported Outcomes by <u>Age at Enrollment</u> and <u>Race/Ethnicity</u> for <u>OS Participants</u> Who Did Not Report a Prevalent Condition at Baseline

Data as of: March 1, 2019; Events through March 1, 2019

Outcomes	American Indian/ Alaskan Native	Asian/Pacific Islander	Black/African American	Hispanic/ Latina	White	Unknown
Number enrolled	421	2671	7635	3609	78016	1324
Mean follow-up (months)	153.0	153.8	146.6	142.0	189.4	164.4
Hospitalizations						
Ever	280 (5.22%)	1235 (3.61%)	4654 (4.99%)	1790 (4.19%)	57616 (4.68%)	851 (4.69%)
Two or more	202 (3.76%)	700 (2.04%)	3001 (3.22%)	1072 (2.51%)	42951 (3.49%)	609 (3.36%)
Other						
DVT	9 (0.18%)	24 (0.07%)	219 (0.24%)	59 (0.14%)	2640 (0.22%)	40 (0.23%)
Pulmonary embolism[1]	6 (0.11%)	14 (0.04%)	116 (0.13%)	23 (0.05%)	1654 (0.14%)	16 (0.09%)
Angina (hospitalized)[2]	34 (0.70%)	94 (0.28%)	449 (0.52%)	161 (0.40%)	5562 (0.47%)	80 (0.46%)
Diabetes (treated)	79 (1.66%)	333 (1.02%)	1303 (1.56%)	537 (1.33%)	9917 (0.82%)	194 (1.11%)
Gallbladder disease[3,4]	31 (1.32%)	81 (0.46%)	374 (0.78%)	231 (1.19%)	4879 (0.98%)	77 (0.95%)
Hysterectomy	12 (0.22%)	82 (0.24%)	180 (0.19%)	148 (0.35%)	4537 (0.37%)	72 (0.40%)
Glaucoma[4]	45 (2.31%)	253 (1.85%)	991 (2.72%)	309 (1.79%)	6763 (1.78%)	122 (1.89%)
Osteoporosis[4]	90 (4.59%)	626 (4.78%)	1073 (2.84%)	737 (4.41%)	17871 (4.95%)	323 (5.25%)
Osteoarthritis[5]	98 (3.28%)	798 (3.28%)	1914 (3.51%)	1036 (3.71%)	23536 (3.27%)	390 (3.48%)
Rheumatoid arthritis[4]	38 (1.39%)	98 (0.53%)	662 (1.34%)	383 (1.66%)	3320 (0.59%)	87 (0.96%)
Intestinal polyps	77 (1.58%)	499 (1.63%)	1624 (1.90%)	668 (1.67%)	19199 (1.72%)	271 (1.67%)
Lupus	11 (0.21%)	28 (0.08%)	144 (0.16%)	74 (0.17%)	1294 (0.11%)	21 (0.12%)
Kidney stones[4,5]	17 (0.96%)	40 (0.32%)	263 (0.77%)	125 (0.80%)	1828 (0.55%)	44 (0.76%)
Cataracts[4,5]	102 (6.76%)	683 (6.71%)	1937 (6.61%)	894 (6.21%)	23094 (8.18%)	393 (8.19%)
Hypertension treated w/pills	138 (3.88%)	815 (3.32%)	2114 (4.49%)	1194 (3.65%)	29212 (3.16%)	473 (3.61%)
COPD[6]	22 (0.82%)	62 (0.33%)	281 (0.56%)	108 (0.43%)	4630 (0.89%)	57 (0.66%)
Macular degeneration[7]	33 (0.74%)	163 (0.56%)	409 (0.52%)	255 (0.66%)	11181 (1.31%)	141 (1.01%)
Dementia[7]	33 (0.74%)	141 (0.48%)	451 (0.57%)	199 (0.52%)	8164 (0.96%)	124 (0.89%)
Parkinson's disease[7]	6 (0.14%)	19 (0.07%)	79 (0.10%)	31 (0.08%)	1446 (0.17%)	23 (0.17%)

[1] During the main WHI Study and the WHI Extension Study 2005-2010, pulmonary embolism includes only inpatient self-reports. During WHI Extension Study 2010-2020, pulmonary embolism includes both inpatient and outpatient self-reports.
[2] During WHI Extension Study 2005-2010, the outcome was angina with hospitalization for a heart condition that may or may not have been related to the angina.
[3] "Gallbladder disease" includes self-reports of both hospitalized and non-hospitalized events.
[4] Data not collected for the WHI Extension Studies 2005-2020.
[5] These outcomes have not been self-reported on all versions of Form 33. The annualized percentages are corrected for the different amounts of follow-up.
[6] Data only collected during the WHI Extension Study 2010-2020.
[7] Data only collected during the WHI Extension Studies 2005-2020.

Table 4.5
Self Reported Fractures (Annualized Percentages): <u>MRC and SRC Super Cohort Participants</u>

Data as of: March 1, 2019; Events through March 1, 2019

	MRC Super Cohort[1]	SRC Super Cohort[2]
Number of participants	44174	117634
Mean follow-up (months)	177.3	193.4
Elbow	650 (0.10%)	2268 (0.12%)
Foot	1936 (0.30%)	7131 (0.38%)
Hand	611 (0.09%)	1965 (0.10%)
Hip	1719 (0.26%)	6210 (0.33%)
Knee	1054 (0.16%)	3139 (0.17%)
Lower arm	3148 (0.48%)	10261 (0.54%)
Lower leg	2375 (0.36%)	7510 (0.40%)
Pelvis	775 (0.12%)	3480 (0.18%)
Tailbone	284 (0.04%)	1155 (0.06%)
Upper arm	1899 (0.29%)	6106 (0.32%)
Upper leg	679 (0.10%)	2718 (0.14%)
Spine	1920 (0.29%)	8121 (0.43%)
Other	6838 (1.05%)	23892 (1.26%)
Any fracture	15137 (2.32%)	50596 (2.67%)

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[1] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.
[2] The SRC Super Cohort includes all White, American Indian/Alaskan Native, Asian/Pacific Islander, and Unknown Race/Ethnicity participants from the Dietary Modification Trial (not also in the Hormone Trial) and the Observational Study.

Table 4.6
Self Reported Fractures (Annualized Percentages): <u>CT and OS Participants</u>

Data as of: March 1, 2019; Events through March 1, 2019

	CT		OS		Total	
Number of participants	68132		93676		161808	
Mean follow-up (months)	197.3		182.9		189.0	
Elbow	1247	(0.11%)	1671	(0.12%)	2918	(0.11%)
Foot	3963	(0.35%)	5104	(0.36%)	9067	(0.36%)
Hand	1190	(0.11%)	1386	(0.10%)	2576	(0.10%)
Hip	3346	(0.30%)	4583	(0.32%)	7929	(0.31%)
Knee	1793	(0.16%)	2400	(0.17%)	4193	(0.16%)
Lower arm	5890	(0.53%)	7519	(0.53%)	13409	(0.53%)
Lower leg	4425	(0.40%)	5460	(0.38%)	9885	(0.39%)
Pelvis	1685	(0.15%)	2570	(0.18%)	4255	(0.17%)
Tailbone	589	(0.05%)	850	(0.06%)	1439	(0.06%)
Upper arm	3617	(0.32%)	4388	(0.31%)	8005	(0.31%)
Upper leg	1431	(0.13%)	1966	(0.14%)	3397	(0.13%)
Spine	4162	(0.37%)	5879	(0.41%)	10041	(0.39%)
Other	12983	(1.16%)	17747	(1.24%)	30730	(1.21%)
Any fracture	28212	(2.52%)	37521	(2.63%)	65733	(2.58%)

Table 5.1
Agreement of the Central Adjudications with Self-Reports for Outcomes Reported in Extension Study 2010-2020

Data as of: March 1, 2019

	Participants with a self-report[1]	Closed		Confirmed		Denied – related outcome found[2]		Denied – unrelated outcome found		Denied – no outcome found	
		N	%	N	(%)[3]	N	(%)[3]	N	(%)[3]	N	(%)[3]
Cardiovascular											
Clinical MI	667	565	85%	375	(66%)	89	(16%)	13	(2%)	88	(16%)
CABG	220	187	85%	134	(72%)	29	(16%)	0	(0%)	24	(13%)
PTCA	689	617	90%	426	(69%)	76	(12%)	2	(<1%)	113	(18%)
Carotid artery disease	191	172	90%	101	(59%)	38	(22%)	0	(0%)	33	(19%)
Stroke	1330	1137	85%	778	(68%)	133	(12%)	23	(2%)	203	(18%)
PVD	347	262	76%	113	(43%)	59	(23%)	4	(2%)	86	(33%)
DVT	728	608	84%	342	(56%)	103	(17%)	7	(1%)	156	(26%)
Pulmonary embolism	372	334	90%	285	(85%)	18	(5%)	7	(2%)	24	(7%)
Valvular heart disease	435	377	87%	263	(70%)	70	(19%)	0	(0%)	44	(12%)
Cancers											
Breast cancer	3186	3001	94%	2931	(98%)	6	(<1%)	1	(<1%)	63	(2%)
Ovarian cancer	372	342	92%	222	(65%)	76	(22%)	0	(0%)	44	(13%)
Endometrial cancer	502	476	95%	364	(76%)	87	(18%)	1	(<1%)	24	(5%)
Cervical cancer	73	68	93%	17	(25%)	17	(25%)	1	(1%)	33	(49%)
Colorectal cancer	920	830	90%	690	(83%)	69	(8%)	4	(<1%)	67	(8%)
Bladder/urinary tract cancer	388	354	91%	303	(86%)	23	(6%)	0	(0%)	28	(8%)
Brain cancer	170	127	75%	46	(36%)	14	(11%)	8	(6%)	59	(46%)
Esophagus cancer	71	64	90%	39	(61%)	9	(14%)	1	(2%)	15	(23%)
Gallbladder/bile duct cancer	88	81	92%	33	(41%)	33	(41%)	1	(1%)	14	(17%)
Kidney cancer	328	296	90%	178	(60%)	61	(21%)	2	(1%)	55	(19%)
Leukemia	340	304	89%	236	(78%)	23	(8%)	1	(<1%)	44	(14%)
Liver cancer	312	243	78%	52	(21%)	47	(19%)	11	(5%)	133	(55%)
Lung cancer	1313	1150	88%	961	(84%)	55	(5%)	4	(<1%)	130	(11%)
Hodgkin's lymphoma	57	46	81%	9	(20%)	26	(57%)	0	(0%)	11	(24%)
Non-Hodgkin's lymphoma	437	394	90%	339	(86%)	30	(8%)	0	(0%)	25	(6%)
Melanoma	1596	1236	77%	955	(77%)	43	(3%)	2	(<1%)	236	(19%)
Multiple myeloma	197	177	90%	151	(85%)	8	(5%)	5	(3%)	13	(7%)
Pancreas cancer	415	369	89%	305	(83%)	27	(7%)	4	(1%)	33	(9%)
Stomach cancer	150	130	87%	53	(41%)	37	(28%)	0	(0%)	40	(31%)

[1] Excludes duplicates and prior conditions.
[2] All cardiovascular outcomes are considered related, all cancers are considered related and all fractures are considered related.
[3] Percentages between parentheses are relative to "closed."

Table 5.1 (continued)
Agreement of the Central Adjudications with Self-Reports for Outcomes Reported in Extension Study 2010-2020

Data as of: March 1, 2019

	Participants with a self-report[1]	Closed		Confirmed		Denied – related outcome found[2]		Denied – unrelated outcome found		Denied – no outcome found	
		N	%	N	(%)[3]	N	(%)[3]	N	(%)[3]	N	(%)[3]
Thyroid cancer	164	151	92%	119	(79%)	5	(3%)	0	(0%)	27	(18%)
Other genital organ cancer[4]	129	111	86%	14	(13%)	77	(69%)	0	(0%)	20	(18%)
Other cancer[5]	991	757	76%	349	(46%)	174	(23%)	10	(1%)	224	(30%)
Fractures											
Hip fracture	719	602	84%	515	(86%)	0	(0%)	10	(2%)	77	(13%)
Upper leg fracture[6]	351	299	85%	0	(0%)	131	(44%)	22	(7%)	146	(49%)

[1] Excludes duplicates and prior conditions.
[2] All cardiovascular outcomes are considered related, all cancers are considered related and all fractures are considered related.
[3] Percentages between parentheses are relative to "closed."
[4] Does not include cancer of the ovary, endometrium, or cervix.
[5] Any cancer other than those listed above, excluding non-melanoma skin cancer.
[6] Upper leg fractures are only investigated for possible occurrence of hip fracture.

Table 5.2
Agreement of the UNC Heart Failure (HF) Adjudications with Self-Reports among <u>MRC Super Cohort Participants</u>[1]

Data as of: March 1, 2019

	Potential Case[2]	Case Eligible for UNC[3]		Case Processed by UNC[3]		Case Confirmed[4]		Case Denied		Case Unclassifiable	
		N	%	N	(%)[5]	N	(%)[6]	N	(%)[6]	N	(%)[6]
Overall	8332	8250	99%	7517	(91%)	6107	(81%)	984	(13%)	425	(6%)
By Self Report											
Self-reported HF	4075	4032	99%	3321	(82%)	2912	(88%)	321	(10%)	88	(3%)
No HF self-report	4257	4218	99%	4196	(99%)	3195	(76%)	663	(16%)	337	(8%)

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[1] The MRC Super Cohort includes all WHI Hormone Trial participants and all Black/African American and Hispanic/Latina participants from the CT and OS.
[2] Includes all self-reported or discovered heart failure cases and a portion of self reported angina or other heart condition cases with 2 or more essential documents among MRC Super Cohort participants.
[3] Cases are eligible if they self-reported HF, or if not, were forwarded by another outcomes committee for possible HF; cases are sent to and processed by UNC when all required records have been received.
[4] Diagnosis was either definite or probable decompensated heart failure, or chronic stable heart failure.
[5] Percentages are relative to "Case Eligible for UNC".
[6] Percentages are relative to "Case Processed by UNC".

Table 5.3
Source of Outcomes Confirmed by Central Adjudication for Self-Reported Outcomes in Extension Study 2010-2020

Data as of: March 1, 2019

	Centrally confirmed N	Reason for central investigation					
		Self-report same outcome		Self-report related outcome[1]		Self-report unrelated outcome[2]	
		N	%	N	%	N	%
Cardiovascular							
Clinical MI	725	374	52%	208	29%	143	20%
CABG	150	134	89%	13	9%	3	2%
PTCA	477	427	90%	39	8%	11	2%
Carotid artery disease	92	78	85%	8	9%	6	7%
Stroke	878	781	89%	16	2%	81	9%
PVD	171	114	67%	47	27%	10	6%
DVT	463	350	76%	54	12%	59	13%
Pulmonary embolism	372	283	76%	43	12%	46	12%
Valvular heart disease	448	264	59%	120	27%	64	14%
Cancers							
Breast cancer	2963	2932	99%	20	1%	11	<1%
Ovarian cancer	238	222	93%	12	5%	4	2%
Endometrial cancer	399	364	91%	31	8%	4	1%
Cervical cancer	24	17	71%	6	25%	1	4%
Colorectal cancer	727	693	95%	23	3%	11	2%
Bladder/urinary tract cancer[3]	391	304	78%	82	21%	5	1%
Brain cancer	46	46	100%	0	0%	0	0%
Esophagus cancer	41	40	98%	1	2%	0	0%
Gallbladder/bile duct cancer	73	33	45%	40	55%	0	0%
Kidney cancer	190	181	95%	5	3%	4	2%
Leukemia	284	236	83%	38	13%	10	4%
Liver cancer	65	53	82%	10	15%	2	3%
Lung cancer	1020	964	95%	35	3%	21	2%
Hodgkin's lymphoma	12	9	75%	3	25%	0	0%
Non-Hodgkin's lymphoma	471	339	72%	127	27%	5	1%
Melanoma	971	958	99%	12	1%	1	<1%
Multiple myeloma	174	151	87%	21	12%	2	1%
Pancreas cancer	319	306	96%	9	3%	4	1%
Stomach cancer	70	53	76%	13	19%	4	6%
Thyroid cancer	120	119	99%	1	1%	0	0%
Other genital organ cancer[4]	129	14	11%	115	89%	0	0%
Fractures							
Hip fracture	648	513	79%	118	18%	17	3%

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[1] All cardiovascular outcomes are considered related, all cancers are considered related and all fractures are considered related.
[2] Includes self-report of hospitalizations.
[3] Cancers of the urinary tract include renal pelvis, ureter and urinary organs (NOS).
[4] Does not include cancers of the ovary, endometrium or cervix; includes cancers of the vulva, vagina, uterus (NOS) and genital organs (NOS).

Table 6.1
Consent Status and Participant Characteristics for <u>Long Life Study Participants</u>[1]

Data as of: March 1, 2019

	N	Mean (SD) or (%)
Number eligible	14081	
Phase 1: Age 72-79	9930	(70.5%)
Phase 2: Age 63-72	2651	(18.8%)
Phase 3: Age 64-98	1500	(10.7%)
Consented[2]	9246	(65.7%)
Completed visit 2012-2013[3]	7875	(85.2%)
Blood draw[4]	7475	(94.9%)
Age at visit	7875	79.2 (6.8)
63-69	724	(9.2%)
70-79	3050	(38.7%)
80-89	3689	(46.8%)
≥90	412	(5.2%)
Race/ethnicity		
White	3910	(49.7%)
Black	2651	(33.7%)
Hispanic	1314	(16.7%)
Education		
0-8 years	112	(1.4%)
Some high school	286	(3.7%)
High school diploma/GED	1288	(16.5%)
School after high school	3041	(38.9%)
College degree or higher	3099	(39.6%)
Body-mass Index (BMI), kg/m^2	7775	28.2 (5.9)
Underweight (< 18.5)	112	(1.4%)
Normal (18.5 - 24.9)	2378	(30.6%)
Overweight (25.0 - 29.9)	2799	(36.0%)
Obesity I (30.0 - 34.9)	1505	(19.4%)
Obesity II (35.0 - 39.9)	633	(8.1%)
Extreme Obesity III (>= 40)	348	(4.5%)
Systolic blood pressure, mmHg	7864	125.9 (14.6)
<=120	2962	(37.7%)
120 - 140	3796	(48.3%)
>140	1106	(14.1%)
Diastolic blood pressure, mmHg	7862	72.6 (8.9)
<80	6073	(77.2%)
80-89	1535	(19.5%)
≥90	254	(3.2%)
Grip strength, kg	7274	17.8 (7.0)
Repeated chair stands, #stands/sec	6949	0.35 (0.13)
Walking pace, m/sec	6911	0.65 (0.29)
Look AHEAD SPPB[5]	7022	1.3 (0.5)
EPESE SPPB[6]	7102	7.9 (2.7)

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[1] Long Life Study participants are a subset of the Medical Records Cohort.
[2] Percentage is relative to number eligible.
[3] Percentage is relative to consented.
[4] Percentage is relative to completed visit.
[5] The Look AHEAD Short Physical Performance Battery (SPPB) ranges from 0 to 3, with higher scores indicating better physical performance.
[6] The Established Populations for the Epidemiologic Studies of the Eldery (EPESE) Short Physical Performance Battery (SPPB) ranges from 0 to 12, with higher scores indicating better physical performance.

Table 6.2
Participation and Vital Status: <u>Long Life Study (LLS) Participants</u>

Data as of: March 1, 2019

Vital Status/Participation	LLS Participants (N=7875)	
	N	**%**
Deceased	1463	18.6
Alive: Current Participation[1]	5694	72.3
Alive: Recent Participation[2]	253	3.2
Stopped Follow-Up[3]	215	2.7
Lost to Follow-Up[4]	250	3.2

[1] Participants who have filled in a Form 33 within the last 15 months.
[2] Participants who last filled in a Form 33 between 15 and 24 months ago.
[3] Participants with codes 5 (no follow-up) or 8 (absolutely no follow-up) on Form 7 or 9.
[4] Participants not in any of the above categories.

Table 6.3
Verified Outcomes (Annualized Percentages)
After Long Life Study (LLS) Blood Draw by Age at Visit for LLS Participants

Data as of: March 1, 2019; Events through March 1, 2019

Outcomes	Total	Age at Visit			
		63-69	70-79	80-89	≥ 90
Number enrolled	7875	723	3052	3688	412
Mean follow-up (months) after LLS visit	63.1	66.8	66.5	60.7	53.1
Cardiovascular					
CHD[1]	341 (0.82%)	12 (0.30%)	76 (0.45%)	217 (1.16%)	36 (1.97%)
CHD death[2]	192 (0.46%)	4 (0.10%)	32 (0.19%)	126 (0.68%)	30 (1.64%)
Clinical MI	228 (0.55%)	10 (0.25%)	56 (0.33%)	144 (0.77%)	18 (0.99%)
CABG/PTCA	163 (0.39%)	11 (0.27%)	56 (0.33%)	91 (0.49%)	5 (0.27%)
Carotid artery disease	22 (0.05%)	1 (0.02%)	8 (0.05%)	12 (0.06%)	1 (0.05%)
Heart failure, UNC[3]	370 (0.89%)	9 (0.22%)	83 (0.49%)	243 (1.30%)	35 (1.92%)
Stroke	319 (0.77%)	11 (0.27%)	88 (0.52%)	190 (1.02%)	30 (1.64%)
PVD	52 (0.13%)	1 (0.02%)	10 (0.06%)	37 (0.20%)	4 (0.22%)
DVT	158 (0.38%)	8 (0.20%)	56 (0.33%)	84 (0.45%)	10 (0.55%)
Pulmonary embolism	123 (0.30%)	6 (0.15%)	46 (0.27%)	65 (0.35%)	6 (0.33%)
Coronary disease[4]	547 (1.32%)	21 (0.52%)	133 (0.79%)	344 (1.84%)	49 (2.69%)
DVT/PE	228 (0.55%)	12 (0.30%)	86 (0.51%)	118 (0.63%)	12 (0.66%)
Aortic aneurysm	15 (0.04%)	1 (0.02%)	4 (0.02%)	9 (0.05%)	1 (0.05%)
Valvular heart disease	137 (0.33%)	2 (0.05%)	26 (0.15%)	94 (0.50%)	15 (0.82%)
Total cardiovascular disease[5]	841 (2.03%)	30 (0.75%)	215 (1.27%)	512 (2.74%)	84 (4.60%)
Cancer					
Breast cancer	160 (0.39%)	15 (0.37%)	85 (0.50%)	58 (0.31%)	2 (0.11%)
Invasive breast cancer	141 (0.34%)	10 (0.25%)	75 (0.44%)	53 (0.28%)	3 (0.16%)
In situ breast cancer	24 (0.06%)	6 (0.15%)	13 (0.08%)	5 (0.03%)	0 (0.00%)
Ovarian cancer	21 (0.05%)	0 (0.00%)	9 (0.05%)	10 (0.05%)	2 (0.11%)
Endometrial cancer[6]	13 (0.03%)	0 (0.00%)	5 (0.03%)	8 (0.04%)	0 (0.00%)
Colorectal cancer	63 (0.15%)	2 (0.05%)	17 (0.10%)	42 (0.23%)	2 (0.11%)
Other cancer[7]	359 (0.87%)	17 (0.42%)	122 (0.72%)	203 (1.09%)	17 (0.93%)
Total cancer	542 (1.31%)	34 (0.85%)	212 (1.25%)	277 (1.48%)	19 (1.04%)
Fractures					
Hip fracture	226 (0.55%)	2 (0.05%)	31 (0.18%)	161 (0.86%)	32 (1.75%)
Deaths					
Cardiovascular deaths	513 (1.23%)	10 (0.25%)	81 (0.48%)	332 (1.78%)	90 (4.93%)
Cancer deaths	287 (0.69%)	9 (0.22%)	76 (0.45%)	183 (0.98%)	19 (1.04%)
Other known cause	492 (1.19%)	7 (0.17%)	73 (0.43%)	337 (1.81%)	75 (4.11%)
Unknown cause	22 (0.05%)	2 (0.05%)	2 (0.01%)	15 (0.08%)	3 (0.16%)
Not yet adjudicated	149 (0.36%)	6 (0.15%)	29 (0.17%)	105 (0.56%)	9 (0.49%)
Total death	1463 (3.53%)	34 (0.85%)	261 (1.54%)	972 (5.21%)	196 (10.74%)

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[1] CHD includes clinical MI and CHD death.
[2] CHD death includes definite and possible CHD death.
[3] Definite or possible decompensated heart failure adjudicated by UNC.
[4] Coronary disease includes clinical MI, CHD death, UNC heart failure and CABG/PTCA.
[5] Total CVD does not include aortic aneurysm or valvular heart disease.
[6] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.
[7] Only one report of "other cancer" is counted per woman; however, the first of each type is adjudicated. Excludes non-melanoma skin cancer.

Table 6.4
Verified Outcomes (Annualized Percentages)
After Long Life Study (LLS) Blood Draw by Race/Ethnicity for LLS Participants

Data as of: March 1, 2019; Events through March 1, 2019

Outcomes	Race/Ethnicity		
	Black/African American	Hispanic/Latina	White
Number enrolled	2651	1314	3910
Mean follow-up (months) after LLS visit	63.9	66.9	61.3
Cardiovascular			
CHD[1]	77 (0.55%)	35 (0.48%)	229 (1.15%)
CHD death[2]	39 (0.28%)	12 (0.16%)	141 (0.71%)
Clinical MI	50 (0.35%)	28 (0.38%)	150 (0.75%)
CABG/PTCA	41 (0.29%)	17 (0.23%)	105 (0.53%)
Carotid artery disease	8 (0.06%)	0 (0.00%)	14 (0.07%)
Heart failure, UNC[3]	93 (0.66%)	27 (0.37%)	250 (1.25%)
Stroke	96 (0.68%)	36 (0.49%)	187 (0.94%)
PVD	16 (0.11%)	3 (0.04%)	33 (0.17%)
DVT	60 (0.42%)	15 (0.20%)	83 (0.42%)
Pulmonary embolism	51 (0.36%)	9 (0.12%)	63 (0.32%)
Coronary disease[4]	131 (0.93%)	49 (0.67%)	367 (1.84%)
DVT/PE	92 (0.65%)	22 (0.30%)	114 (0.57%)
Aortic aneurysm	7 (0.05%)	0 (0.00%)	8 (0.04%)
Valvular heart disease	11 (0.08%)	15 (0.20%)	111 (0.56%)
Total cardiovascular disease[5]	221 (1.56%)	83 (1.13%)	537 (2.69%)
Cancer			
Breast cancer	62 (0.44%)	27 (0.37%)	71 (0.36%)
Invasive breast cancer	52 (0.37%)	25 (0.34%)	64 (0.32%)
In situ breast cancer	13 (0.09%)	3 (0.04%)	8 (0.04%)
Ovarian cancer	4 (0.03%)	4 (0.05%)	13 (0.07%)
Endometrial cancer[6]	3 (0.02%)	2 (0.03%)	8 (0.04%)
Colorectal cancer	13 (0.09%)	6 (0.08%)	44 (0.22%)
Other cancer[7]	103 (0.73%)	48 (0.65%)	208 (1.04%)
Total cancer	170 (1.20%)	80 (1.09%)	292 (1.46%)
Fractures			
Hip fracture	20 (0.14%)	12 (0.16%)	194 (0.97%)
Deaths			
Cardiovascular deaths	116 (0.82%)	35 (0.48%)	362 (1.81%)
Cancer deaths	80 (0.57%)	29 (0.40%)	178 (0.89%)
Other known cause	89 (0.63%)	39 (0.53%)	364 (1.82%)
Unknown cause	8 (0.06%)	2 (0.03%)	12 (0.06%)
Not yet adjudicated	27 (0.19%)	17 (0.23%)	105 (0.53%)
Total death	320 (2.27%)	122 (1.66%)	1021 (5.11%)

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[1] CHD includes clinical MI and CHD death.
[2] CHD death includes definite and possible CHD death.
[3] Definite or possible decompensated heart failure adjudicated by UNC
[4] Coronary disease includes clinical MI, CHD death, UNC heart failure and CABG/PTCA.
[5] Total CVD does not include aortic aneurysm or valvular heart disease.
[6] Only women without a baseline hysterectomy are used to compute the annual rates of endometrial cancer.
[7] Only one report of "other cancer" is counted per woman; however, the first of each type is adjudicated. Excludes non-melanoma skin cancer.

Table 6.5
Self-Reported Outcomes (Annualized Percentages) After Long Life Study (LLS) Blood Draw
by Age at Visit and Race/Ethnicity for LLS Participants Who Did Not Report a Prevalent Condition at Baseline

Data as of: March 1, 2019; Events through March 1, 2019

Outcome	Total	Age at Visit			
		63-69	70-79	80-89	≥ 90
Number enrolled	7875	723	3052	3688	412
Mean follow-up (months) after LLS visit	63.1	66.8	66.5	60.7	53.1
Angina (hospitalized)	384 (0.93%)	28 (0.70%)	123 (0.73%)	214 (1.15%)	19 (1.04%)
Diabetes (treated)	545 (1.32%)	50 (1.24%)	243 (1.44%)	233 (1.25%)	19 (1.04%)
Hysterectomy	81 (0.20%)	11 (0.27%)	46 (0.27%)	24 (0.13%)	0 (0.00%)
Osteoarthritis	724 (1.75%)	71 (1.77%)	320 (1.89%)	296 (1.59%)	37 (2.03%)
Intestinal polyps	426 (1.03%)	76 (1.89%)	240 (1.42%)	107 (0.57%)	3 (0.16%)
Lupus	35 (0.08%)	3 (0.07%)	19 (0.11%)	12 (0.06%)	1 (0.05%)
Pills for hypertension	506 (1.22%)	61 (1.52%)	200 (1.18%)	223 (1.20%)	22 (1.21%)
COPD	660 (1.59%)	50 (1.24%)	245 (1.45%)	342 (1.83%)	23 (1.26%)
Macular degeneration	938 (2.26%)	41 (1.02%)	278 (1.64%)	553 (2.96%)	66 (3.62%)
Dementia	908 (2.19%)	27 (0.67%)	207 (1.22%)	583 (3.13%)	91 (4.99%)
Parkinson's disease	90 (0.22%)	7 (0.17%)	36 (0.21%)	43 (0.23%)	4 (0.22%)

| Outcome	Race/Ethnicity		
	Black/African American	Hispanic/Latina	White
Number enrolled	2651	1314	3910
Mean follow-up (months) after LLS visit	63.9	66.9	61.3
Angina (hospitalized)	131 (0.93%)	48 (0.65%)	205 (1.03%)
Diabetes (treated)	201 (1.42%)	86 (1.17%)	258 (1.29%)
Hysterectomy	28 (0.20%)	17 (0.23%)	36 (0.18%)
Osteoarthritis	256 (1.81%)	113 (1.54%)	355 (1.78%)
Intestinal polyps	179 (1.27%)	105 (1.43%)	142 (0.71%)
Lupus	10 (0.07%)	8 (0.11%)	17 (0.09%)
Pills for hypertension	114 (0.81%)	108 (1.47%)	284 (1.42%)
COPD	212 (1.50%)	97 (1.32%)	351 (1.76%)
Macular degeneration	221 (1.56%)	134 (1.83%)	583 (2.92%)
Dementia	207 (1.47%)	111 (1.51%)	590 (2.95%)
Parkinson's disease	30 (0.21%)	15 (0.20%)	45 (0.23%)

Table 7.1
Number of Falls per Participant During Extension Study 2010-2020 by <u>Visit Year</u>

Data as of: March 1, 2019; Events between September 30, 2010 and March 1, 2019

Number of falls	Extension Study 2010-2020 Visit Year																	
	1		2		3		4		5		6		7		8		9	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
None	48766	64.8	55018	66.2	53014	65.7	49993	65.0	47879	64.3	44167	64.5	41722	63.6	39801	63.4	14892	61.9
1	15716	20.9	16361	19.7	15923	19.7	15550	20.2	15216	20.4	13841	20.2	13500	20.6	13068	20.8	5157	21.4
2	7124	9.5	7511	9.0	7495	9.3	7234	9.4	7089	9.5	6349	9.3	6308	9.6	5974	9.5	2401	10.0
≥3	3667	4.9	4235	5.1	4288	5.3	4156	5.4	4260	5.7	4084	6.0	4090	6.2	3948	6.3	1618	6.7

Figure 7.1
Percent of Participants with Falls During Extension Study 2010-2020
by <u>Visit Year</u> and <u>Age at the Start of Extension Study 2010-2020</u>

Data as of: March 1, 2019; Events between September 30, 2010 and March 1, 2019
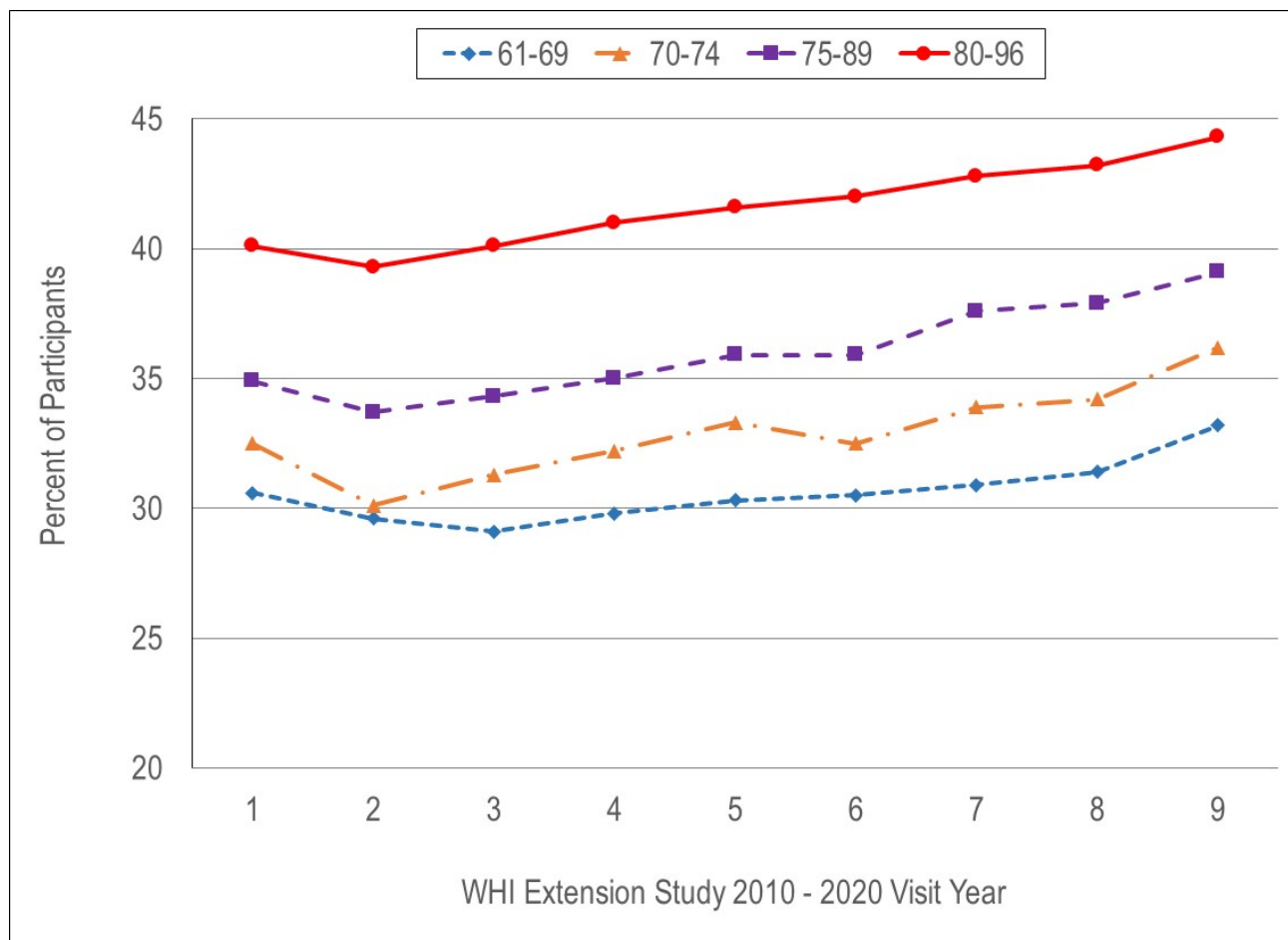
Figure 7.2
Unadjusted Percent of Participants with Falls During Extension Study 2010-2020 by <u>Visit Year</u> and <u>Race/Ethnicity</u>[1]

Data as of: March 1, 2019; Events between September 30, 2010 and March 1, 2019

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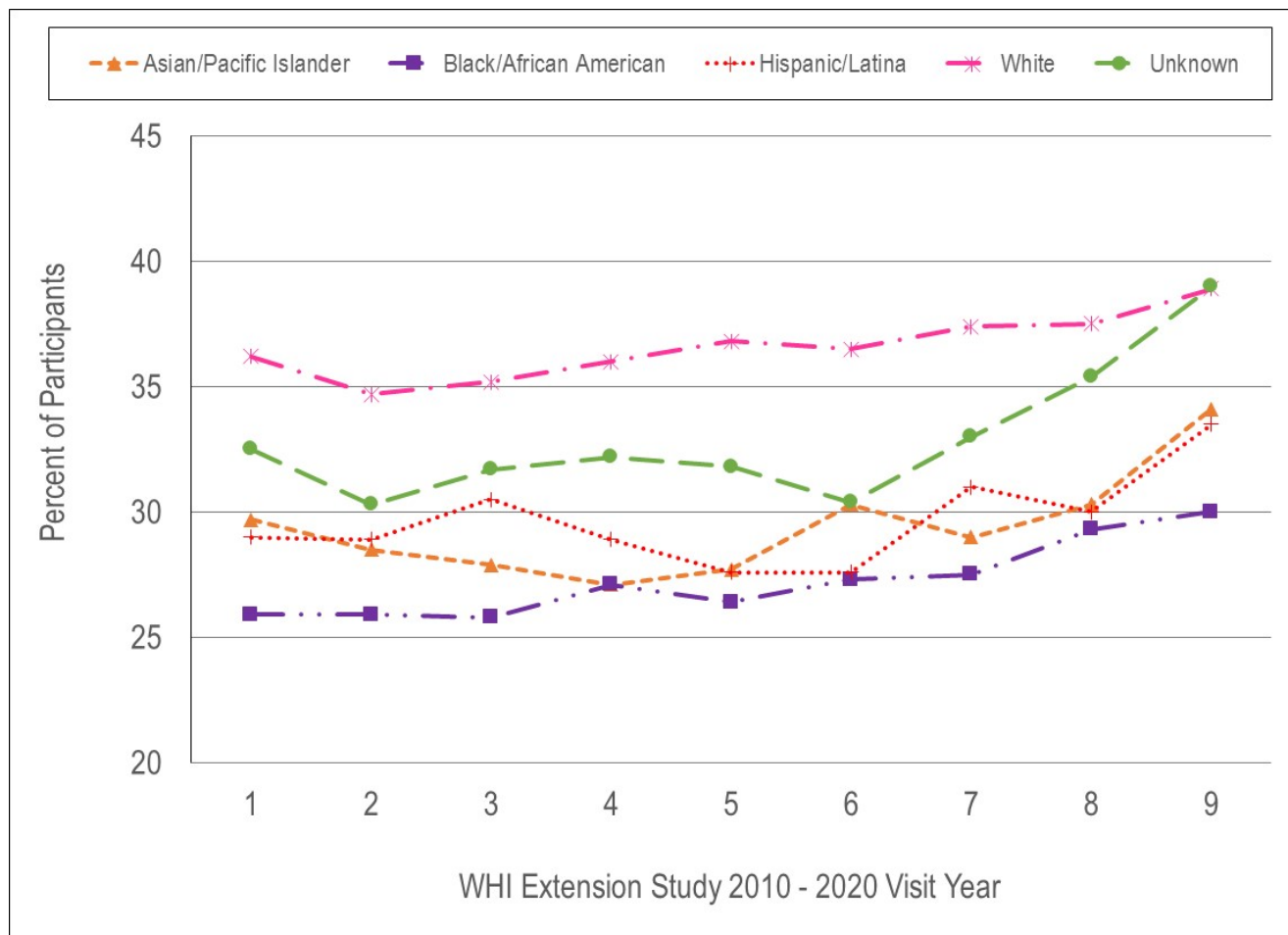
[1] Due to small numbers and unstable rates, data for American Indian/Alaskan Native participants are not displayed.

Table 8.1
WHI Manuscript Stages

Stage #	Definition	Number
12*	Published	1845
11	In press / accepted by journal	14
10	Submitted to journal	25
9	Final manuscript approved by P&P Committee	202
8	Final manuscript submitted to P&P Committee	42
7	Draft manuscript	24
6	Analysis completed	42
5	Analysis in progress	57
4	Analysis proposed	7
2 & 3	Approved proposal	1064
Total		**3325**

*Only Stage 12 papers published between April 2018 and March 2019 are included in Table 8.2

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
380	Biomarkers, menopausal hormone therapy and risk of venous thrombosis: The Women's Health Initiative	Cushman, Larson, Rosendaal, Heckbert, Curb, Phillips, Baird, Eaton, Stafford	CT	Res Pract Thromb Haemost. 2018 Apr 17;2(2):310-319. doi: 10.1002/rth2.12100. eCollection 2018 Apr	W6
487	Body composition and physical function in the Women's Health Initiative Observational Study	Bea, Going, Wertheim, Bassford, LaCroix, Wright, Nicholas, Heymsfield, Chen	OS	Prev Med Rep. 2018 May 9;11:15-22. doi: 10.1016/j.pmedr.2018.05.007 . eCollection 2018 Sep.	AS153
681	Bone turnover markers are not associated with hip fracture risk: a case-control study in the Women's Health Initiative	Crandall, Vasan, LaCroix, LeBoff, Cauley, Robbins, Jackson, Bauer	OS	J Bone Miner Res. 2018 Jul;33(7):1199-1208. doi: 10.1002/jbmr.3471. Epub 2018 Jun 19.	AS181
920	Coffee and tea consumption in relation to risk of rheumatoid arthritis in the Women's Health Initiative Observational Cohort	Lamichhane, Collins, Constantinescu, Walitt, Pettinger, Parks, Howard	OS	J Clin Rheumatol. 2018 Apr 19. doi: 10.1097/RHU.000000000000 0788. [Epub ahead of print]	OS
925	Changes in overall diet quality in relation to survival in postmenopausal women with breast cancer: results from the Women's Health Initiative	Sun, Bao, Liu, Caan, Lane, Millen, Simon, Thomson, Tinker, Van Horn, Vitolins, Snetselaar	Gen	J Acad Nutr Diet. 2018 Oct;118(10):1855-1863.e6. doi: 10.1016/j.jand.2018.03.017. Epub 2018 May 30.	
1048	Vitamin D with calcium supplementation and risk of atrial fibrillation in postmenopausal women	Boursiquot, Larson, Shalash, Vitolins, Soliman, Perez	CT	Am Heart J. 2019 Mar;209:68-78. doi: 10.1016/j.ahj.2018.12.006. Epub 2018 Dec 13.	W35
1174	Genome-wide association study and meta-analysis identify loci associated with ventricular and supraventricular ectopy	Napier, Franceschini, Gondalia, Stewart, Mendez Giraldez, Sitlani, Seyerle, Highland, Li, Wilhelmsen, Yan, Duan, Roach, Yao, Guo, Taylor, et al.	Gen	Sci Rep. 2018 Apr 4;8(1):5675. doi: 10.1038/s41598-018-23843-z.	AS264, M5
1246	Discovery, fine-mapping, and conditional analyses of genetic variants associated with C-reactive protein in multiethnic populations using the Metabochip in the Population Architecture using Genomics and Epidemiology (PAGE) study	Kocarnik, Richard, Graff, Haessler, Bien (Rosse), Carlson, Carty, Reiner, Avery, Ballantyne, LaCroix, Kooperberg, Ambite, Cheng, Hindorff, Peters, et al.	Gen	Hum Mol Genet. 2018 Aug 15;27(16):2940-2953. doi: 10.1093/hmg/ddy211.	M6

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
1312	Association of 25-hydroxyvitamin D levels and cutaneous melanoma: a nested case-control study of the Women's Health Initiative Observation Study	Kwon, Gamba, Stefanick, Swetter, Li, Zhang Shi, Clarke, Feldman, Millen, Messina, Shikany, Manson, Chlebowski, Tang	CT	J Am Acad Dermatol. 2018 Jul;79(1):145-147. doi: 10.1016/j.jaad.2017.05.037	AS346
1318	Comparison of cardiovascular risk factors for coronary heart disease and stroke type in women	Leening, Cook, Franco, Manson, Lakshminarayan, LaMonte, Leira, Robinson, Ridker, Paynter	OS	J Am Heart Assoc. 2018 Oct 2;7(19):e007514. doi: 10.1161/JAHA.117.007514.	BAA22
1393	Changes in physical and mental health are associated with cardiovascular disease incidence in postmenopausal women	Saquib, Brunner, Desai, Kroenke, Martin, Daviglus, Allen, Robinson, Tindle, Stefanick	OS	Age Ageing. 2019 Feb 11. doi: 10.1093/ageing/afy213. [Epub ahead of print]	
1427	Perceived social support and the risk of cardiovascular disease and all-cause mortality in the Women's Health Initiative Observational Study	Freeborne, Simmens, Manson, Howard, Wiley Cene, Allison, Corbie-Smith, Bell, Denburg, Martin	OS	Menopause. 2019 Feb 19. doi: 10.1097/GME.0000000000001297. [Epub ahead of print]	
1752	Chocolate intake and heart disease and stroke in the Women's Health Initiative: a prospective analysis	Greenberg, Manson, Neuhouser, Tinker, Eaton, Johnson, Shikany	OS	Am J Clin Nutr. 2018 Jul 1;108(1):41-48. doi: 10.1093/ajcn/nqy073.	
1835	Association between physical health and cardiovascular diseases: Effect modification by chronic conditions	Saquib, Brunner, Desai, Allison, Garcia, Stefanick	Gen	SAGE Open Med. 2018 Jul 11;6:2050312118785335. doi: 10.1177/2050312118785335. eCollection 2018.	
2013	Effects of reproductive period duration and number of pregnancies on midlife ECG indices: a secondary analysis from the Womens Health Initiative Clinical Trial	Parikh, Kapphahn, Hedlin, Olgin, Allison, Magnani, Ryckman, Waring, Perez, Howard	CT	BMJ Open. 2018 Aug 17;8(8):e019129. doi: 10.1136/bmjopen-2017-019129.	
2016	Common coding variants in SCN10A are associated with the Nav1.8 late current and cardiac conduction	Brody, Macri, Ellinor, Sotoodehnia	Gen	Circ Genom Precis Med. 2018 May;11(5):e001663. doi: 10.1161/CIRCGEN.116.001663.	M24

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
2070	Variability in sleep disturbance, physical activity, & quality of life according to level of depressive symptoms in women with type 2 diabetes	Danhauer, Brenes, Levine, Young, Tindle, Addington, Wallace, Naughton, Garcia, Safford, Kim, LeBlanc, Snively, Snetselaar, Shumaker	Gen	Diabet Med. 2018 Dec 15. doi: 10.1111/dme.13878. [Epub ahead of print]	
2097	Rural-urban residence and stage at breast cancer diagnosis among postmenopausal women: The Women's Health Initiative	Sealy-Jefferson, Roseland, Cote, Lehman, Whitsel, Mustafaa, Booza, Simon	Gen	J Womens Health (Larchmt). 2018 Sep 19. doi: 10.1089/jwh.2017.6884. [Epub ahead of print]	AS464
2100	Risk factors for 5-year prospective height loss among postmenopausal women	Mai, Marshall, Hovey, Sperrazza, Wactawski-Wende	Gen	Menopause. 2018 Aug;25(8):883-889. doi: 10.1097/GME.0000000000001108.	AS98
2101	Physical activity modifies genetic susceptibility to obesity in postmenopausal women	Ochs-Balcom, Preus, Nie, Wactawski-Wende, Agyemang, Neuhouser, Tinker, Zheng, Kazlauskaite, Qi, Sucheston	Gen	Menopause. 2018 Oct;25(10):1131-1137. doi: 10.1097/GME.0000000000001134. Epub 2018 May 14.	M13, W63
2109	Meta-analysis of up to 622,409 individuals identifies 40 novel smoking behaviour associated genetic loci	Erzurumluoglu, Liu, Jackson, Barnes, Datta, Melbourne, Young, Batini, Surendran, Jiang, Chen, David, Eaton, Haessler, Gong, Kooperberg, et al.	Gen	Mol Psychiatry. 2019 Jan 7. doi: 10.1038/s41380-018-0313-0. [Epub ahead of print]	AS224, BAA14, BAA18, M13, M24
2120	Psychological traits, heart rate variability, and risk of coronary heart disease in healthy aging women - The Women's Health Initiative	Salmoirago-Blotcher, Hovey, Andrews, Allison, Brunner, Denburg, Eaton, Garcia, Sealy-Jefferson, Zaslavsky, Kang, Lopez, Post, Tindle, Wassertheil-Smoller	OS	Psychosom Med. 2019 Jan 24. doi: 10.1097/PSY.0000000000000672. [Epub ahead of print]	
2141	The genetic underpinnings of variation in ages at menarche and natural menopause among women from the multi-ethnic population architecture using genomics and epidemiology (PAGE) study: A trans-ethnic meta-analysis	Fernández-Rhodes, Malinowski, Wang, Tao, Pankratz, Jeff, Yoneyama, Carty, Setiawan, Le Marchand, Haiman, Corbett, Heiss, Peters, Kooperberg, Franceschini, et al.	Gen	PLoS One. 2018 Jul 25;13(7):e0200486. doi: 10.1371/journal.pone.0200486. eCollection 2018.	M6
2185	An analysis of the effect of statins on the risk of non-Hodgkin's lymphoma in the Women's Health Initiative cohort	Desai, Wallace, Anderson, Howard, Wu, Safford, Martin, Schlecht, Liu, Cirillo, Jay, Manson, Simon	Gen	Cancer Med. 2018 May;7(5):2121-2130. doi: 10.1002/cam4.1368. Epub 2018 Apr 2.	

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
2297	Genetic susceptibility markers for a breast-colorectal cancer phenotype: exploratory results from genome-wide association studies	Pande, Joon, Brewster, Chen, Hopper, Eng, Shete, Casey, Schumacher, Lin, Harrison, White, Ahsan, Andrulis, Whittemore, John, et al.	Gen	PLoS One. 2018 Apr 26;13(4):e0196245. doi: 10.1371/journal.pone.0196245. eCollection 2018.	AS224
2300	Trans-ethnic kidney function association study reveals putative causal genes and effects on kidney-specific disease aetiologies	Morris, Le, Wu, Akbarov, van der Most, Hemani, Smith, Mahajan, Gaulton, Nadkarni, Haessler, Kooperberg, Franceschini	Gen	Nat Commun. 2019 Jan 3;10(1):29. doi: 10.1038/s41467-018-07867-7.	AS224, BAA14, M13, M24
2313	Occupational physical activity and coronary heart disease in Women's Health Initiative observational study	Wang, De Roos, Fujishiro, Allison, Wallace, Seguin, Nassir, Michael	OS	J Gerontol A Biol Sci Med Sci. 2018 Dec 24. doi: 10.1093/gerona/gly288. [Epub ahead of print]	
2371	Physical activity and incidence of heart failure in postmenopausal women	LaMonte, Manson, Chomistek, Larson, Lewis, Bea, Johnson, Li, Klein, LaCroix, Stefanick, Wactawski-Wende, Eaton	Gen	JACC Heart Fail. 2018 Dec;6(12):983-995. doi: 10.1016/j.jchf.2018.06.020. Epub 2018 Sep 5.	AS510
2380	Risk factor burden, heart failure, and survival in women of different ethnic groups: insights from the Women's Health Initiative	Breathett, Leng, Foraker, Abraham, Coker, Whitfield, Shumaker, Manson, Eaton, Howard, Ijioma, Cene, Martin, Johnson, Klein	Gen	Circ Heart Fail. 2018 May;11(5):e004642. doi: 10.1161/CIRCHEARTFAILURE.117.004642.	
2392	Estrogen-alone therapy and invasive breast cancer incidence by dose, formulation, and route of delivery: findings from the WHI observational study	Shufelt, Bairey Merz, Pettinger, Choi, Chlebowski, Crandall, Liu, Lane, Prentice, Manson	OS	Menopause. 2018 Sep;25(9):985-991. doi: 10.1097/GME.0000000000001115. Epub 2018 May 7.	
2410	Strategies for imputing missing covariates in accelerated failure time models.	Qi, Wang, Chen, Siddique, Robbins, He	OS	Stat Med. 2018 Oct 30;37(24):3417-3436. doi: 10.1002/sim.7809. Epub 2018 Jun 25.	
2436	Evaluation of the pooled cohort risk equations for cardiovascular risk prediction in a multiethnic cohort from the Women's Health Initiative	Mora, Wenger, Cook, Liu, Howard, Limacher, Liu, Margolis, Martin, Paynter, Ridker, Robinson, Rossouw, Safford, Manson	Gen	JAMA Intern Med. 2018 Sep 1;178(9):1231-1240. doi: 10.1001/jamainternmed.2018.2875. Epub 2018 Jul 23.	

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
2462	Associations of biomarker-calibrated intake of total sugars with the risk of type 2 diabetes and cardiovascular disease in the Women's Health Initiative Observational Study	Tasevska, Pettinger, Kipnis, Midthune, Tinker, Potischman, Neuhouser, Beasley, Van Horn, Howard, Liu, Manson, Shikany, Thomson, Prentice	OS	Am J Epidemiol. 2018 Oct 1;187(10):2126-2135. doi: 10.1093/aje/kwy115. 2018 Jun 4.	AS498, M12
2482	Breastfeeding history and risk of stroke among parous postmenopausal women in the Women's Health Initiative	Jacobson, Hade, Collins, Margolis, Waring, Van Horn, Silver, Sattari, Bird, Kimminau, Wambach, Stefanick	OS	J Am Heart Assoc. 2018 Sep 4;7(17):e008739. doi: 10.1161/JAHA.118.008739.	
2489	Bone health and survival in women with multiple myeloma	Rosko, Hade, Li, Ing, Jackson, Paskett, Naughton	Gen	Clin Lymphoma Myeloma Leuk. 2018 Sep;18(9):597-602.e1. doi: 10.1016/j.clml.2018.06.002. Epub 2018 Jun 8.	
2519	Generalization and fine mapping of red blood cell trait genetic associations to multi-ethnic populations: The PAGE Study	Hodonsky, Schurmann, Schick, Kocarnik, Tao, van Rooij, Wassel, Buyske, Fornage, Hindorff, Floyd, Ganesh, Lin, North, Reiner, Loos, et al.	Gen	Am J Hematol. 2018 Jun 15. doi: 10.1002/ajh.25161. [Epub ahead of print]	M6
2529	Common and rare coding genetic variation underlying the electrocardiographic PR interval	Lin, Van Setten, Smith, Bihlmeyer, Warren, Brody, Radmanesh, Hall, Grarup, Muller-Nurasyid, Haessler, Perez, Kooperberg	OS	Circ Genom Precis Med. 2018 May;11(5):e002037. doi: 10.1161/CIRCGEN.117.002037.	AS224, BAA14, BAA18, M13, M24
2564	Influence of smoking, body mass index, and other factors on the preventive effect of nonsteroidal anti-inflammatory drugs on colorectal cancer risk	Wang, Chan, Slattery, Chang-Claude, Potter, Gallinger, Caan, Lampe, Newcomb, Zubair, Hsu, Schoen, Hoffmeister, Brenner, Le Marchand, Peters, et al.	Gen	Cancer Res. 2018 Aug 15;78(16):4790-4799. doi: 10.1158/0008-5472.CAN-18-0326. Epub 2018 Jun 19.	AS224
2566	Mendelian randomization analysis of C-reactive protein on colorectal cancer risk	Wang, Dai, Albanes, Arndt, Berndt, Bezieau, Brenner, Buchanan, Gong, Caan, Hsu, Lampe, Newcomb, Potter, Peters, White, et al.	Gen	Int J Epidemiol. 2018 Nov 21. doi: 10.1093/ije/dyy244. [Epub ahead of print]	AS224
2580	Agnostic pathway/gene set analysis of genome-wide association data identifies associations for pancreatic cancer	Walsh, Zhang, Hyland, Yang, Mocci, Zhang, Childs, Collins, Wang, Arslan, Kooperberg, White, Thornquist, Peters	Gen	J Natl Cancer Inst. 2018 Dec 12. doi: 10.1093/jnci/djy155. [Epub ahead of print]	M4

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
2656	A comparison of US and Canadian osteoporosis screening and treatment strategies in postmenopausal women	Crandall, Larson, Manson, Cauley, LaCroix, Wactawski-Wende, Datta, Sattari, Schousboe, Leslie, Ensrud	Gen	J Bone Miner Res. 2018 Dec 7. doi: 10.1002/jbmr.3636. [Epub ahead of print]	
2664	Analgesic use and ovarian cancer risk: an analysis in the Ovarian Cancer Cohort Consortium	Trabert, Poole, White, Visvanathan, Tworoger, Wentzensen, Anderson, Brasky, Mackenzie	OS	J Natl Cancer Inst. 2018 May 31. doi: 10.1093/jnci/djy100. [Epub ahead of print]	
2673	Hypertension treatment and control and risk of falls in older women	Margolis, Buchner, LaMonte, Zhang, Di, Rillamas-Sun, Hunt, Ikramuddin, Li, Marshall, Rosenberg, Stefanick, Wallace, LaCroix	Gen	J Am Geriatr Soc. 2019 Jan 7. doi: 10.1111/jgs.15732. [Epub ahead of print]	AS286, W64
2674	Menopausal hormone therapy and the incidence of carpal tunnel syndrome in postmenopausal women: findings from the Women's Health Initiative	Al-Rousan, Sparks, Pettinger, Chlebowski, Manson, Kaunitz, Wallace	CT	PLoS One. 2018 Dec 4;13(12):e0207509. doi: 10.1371/journal.pone.0207509. eCollection 2018.	W35
2690	Association of urinary levels of 6-sulfatoxymelatonin (aMT6s) with prevalent and incident hypertension	Perez-Caraballo, Ma, Ockene, Reeves, Balasubramanian, Stanczyk, Allison, Chen, Wang, Manson, Sturgeon	OS	Chronobiol Int. 2018 Aug;35(8):1115-1121. doi: 10.1080/07420528.2018.1461109. Epub 2018 May 11.	AS275
2701	Mendelian randomization study of age at menarche and age at menopause and the risk of colorectal cancer	Neumeyer, Banbury, Arndt, Berndt, Bezieau, Bien (Rosse), Buchanan, Butterbach, Caan, Campbell, Casey, Chan, Hoffmeister, Peters, Newcomb, Chang-Claude, et al.	Gen	Br J Cancer. 2018 Jun;118(12):1639-1647. doi: 10.1038/s41416-018-0108-8. Epub 2018 May 24.	AS224
2714	Association of APOL1 with heart failure with preserved ejection fraction in postmenopausal African-American women	Franceschini, Kopp, Barac, Martin, Li, Qian, Reiner, Pollak, Wallace, Rosamond, Winkler	Gen	JAMA Cardiol. 2018 Aug 1;3(8):712-720. doi: 10.1001/jamacardio.2018.1827.	AS476
2716	Hot deck multiple imputation for handling missing accelerometer data	Butera, Li, Evenson, Di, Buchner, LaMonte, Herring	OS	Stat Biosci (2018). https://doi.org/10.1007/s12561-018-9225-4	AS286
2750	Predicting fracture risk in younger postmenopausal women: comparison of the Garvan and FRAX risk calculators in the Women's Health Initiative Study	Crandall, Larson, LaCroix, Cauley, LeBoff, Li, LeBlanc, Edwards, Manson, Ensrud	Gen	J Gen Intern Med. 2018 Oct 17. doi: 10.1007/s11606-018-4696-z. [Epub ahead of print]	

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
2762	Estrogen metabolism in menopausal hormone users in the Women's Health Initiative Observational Study: does it differ between estrogen plus progestin and estrogen alone?	Falk, Manson, Anderson, Barnabei, Brinton, Rohan, Cauley, Chen, Coburn, Pfeiffer, Reding, Sarto, Wentzensen, Chlebowski, Xu, Trabert, et al.	OS	Int J Cancer. 2019 Feb 15;144(4):730-740. doi: 10.1002/ijc.31851. Epub 2018 Nov 1.	AS297
2781	Dietary long-chain n-3 fatty acid intake and arthritis risk in the Women's Health Initiative	Krok-Schoen, Brasky, Hunt, Rohan, Baker, Li, Carbone, Mackey, Snetselaar, Lustberg, Neuhouser	Gen	J Acad Nutr Diet. 2018 Nov;118(11):2057-2069. doi: 10.1016/j.jand.2018.04.005. Epub 2018 Jun 18.	
2784	Is there a spillover effect of targeted dietary change on untargeted health behaviors? Evidence from a dietary modification trial	Sarma, Moyer, Messina, Laroche, Snetselaar, Van Horn, Lane	CT	Health Educ Behav. 2019 Feb 27:1090198119831756. doi: 10.1177/1090198119831756. [Epub ahead of print]	
2799	Racial differences in the effects of hormone therapy on incident open-angle glaucoma in a randomized trial	Vajaranant, Ray, Pasquale, Mares, Ritch, Gower, Haan, Jackson, Maki	CT	Am J Ophthalmol. 2018 Aug 3. pii: S0002-9394(18)30428-8. doi: 10.1016/j.ajo.2018.07.035.	W35
2821	Anti-hypertensive medication use, soluble receptor for glycation end products and risk of pancreatic cancer in the Women's Health Initiative Study	Wang, White, Hoogeveen, Chen, Whitsel, Richardson, Virani, Garcia, El-Serag, Jiao	Gen	J Clin Med. 2018 Aug 2;7(8). pii: E197. doi: 10.3390/jcm7080197.	AS362
2848	Women's occupational patterns and later life physical functioning	Palumbo, Cannuscio, De Roos, Robinson, Mossey, Wallace, Garcia, Shadyab, Sealy-Jefferson, Michael	OS	J Aging Health. 2019 Jan 30:898264319826797. doi: 10.1177/0898264319826797. [Epub ahead of print]	
2851	Blood pressure variability and brain morphology in elderly women without cardiovascular disease	Haring, Liu, Salmoirago-Blotcher, Hayden, Sarto, Rossouw, Kuller, Rapp, Wassertheil-Smoller	CT	Neurology. 2019 Mar 19;92(12):e1284-e1297. doi: 10.1212/WNL.0000000000 07135. Epub 2019 Feb 27.	AS39
2852	Racial/Ethnic differences in 25-hydroxy vitamin d and parathyroid hormone levels and cardiovascular disease risk among postmenopausal women	Zhang, Tu, Manson, Tinker, Liu, Cauley, Qi, Mouton, Martin, Hou, Song	OS	J Am Heart Assoc. 2019 Feb 19;8(4):e011021. doi: 10.1161/JAHA.118.011021.	AS325

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
2866	Weight loss and breast cancer incidence in postmenopausal women	Chlebowski, Luo, Anderson, Barrington, Reding, Simon, Manson, Rohan, Wactawski-Wende, Lane, Strickler, Mossavar-Rahmani, Freudenheim, Saquib, Stefanick	OS	Cancer. 2018 Oct 8. doi: 10.1002/cncr.31687. [Epub ahead of print]	
2876	Association between intake of red and processed meat and survival in patients with colorectal cancer in a pooled analysis	Carr, Banbury, Berndt, Campbell, Chang-Claude, Hayes, Howard, Jansen, Jacobs, Lane, Nishihara, Ogino, Phipps, Slattery, Stefanick, Wallace, et al.	Gen	Clin Gastroenterol Hepatol. 2018 Nov 23. pii: S1542-3565(18)31279-5. doi: 10.1016/j.cgh.2018.11.036. [Epub ahead of print]	AS224
2882	Smoking cessation, weight gain, and risk of stroke among postmenopausal women	Dinh, Schrader, Svennson, Margolis, Silver, Luo	Gen	Prev Med. 2018 Oct 22. pii: S0091-7435(18)30337-2. doi: 10.1016/j.ypmed.2018.10.018. [Epub ahead of print	
2889	Urinary phthalate biomarker concentrations and postmenopausal breast cancer risk	Reeves, Diaz-Santana, Manson, Hankinson, Zoeller, Bigelow, Sturgeon, Spiegelman, Tinker, Luo, Chen, Meliker, Bonner, Cote, Cheng, Calafat, et al.	Gen	J Natl Cancer Inst. 2019 Jan 10. doi: 10.1093/jnci/djz002. [Epub ahead of print]	AS458
2890	Urinary concentrations of phthalate biomarkers and weight change among postmenopausal women: a prospective cohort study	Diaz-Santana, Hankinson, Bigelow, Sturgeon, Tinker, Manson, Ye, Calafat, Meliker, Reeves	Gen	Environ Health. 2019 Mar 12;18(1):20. doi: 10.1186/s12940-019-0458-6	AS458
2897	Antidepressant use and risk of colorectal cancer in The Women's Health Initiative	Kiridly-Calderbank, Sturgeon, Kroenke, Reeves	Gen	Cancer Epidemiol Biomarkers Prev. 2018 Aug;27(8):892-898. doi: 10.1158/1055-9965.EPI-17-1035. Epub 2018 May 22.	
2903	Pooled analysis of nine cohorts reveals breast cancer risk factors by tumor molecular subtype	Gaudet, Gierach, Carter, Luo, Milne, Weiderpass, Giles, Tamimi, Eliassen, Rosner, Wolk, Adami, Margolis, Gapstur, Garcia-Closas, Brinton, et al.	OS	Cancer Res. 2018 Oct 15;78(20):6011-6021. doi: 10.1158/0008-5472.CAN-18-0502. Epub 2018 Sep 5.	

Table 8.2
Publications April 2018 - March 2019

MS#	Title	Authors	Focus	Reference	Study #
2926	A prospective targeted serum metabolomics study of pancreatic cancer in postmenopausal women	Jiao, Maity, Coarfa, Rajapakshe, Chen, Jin, Putluri, Tinker, Mo, Chen, Sen, Sangi-Haghpeykar, El-Serag, Putluri	Gen	Cancer Prev Res (Phila). 2019 Feb 5. pii: canprevres.0201.2018. doi: 10.1158/1940-6207.CAPR-18-0201. [Epub ahead of print]	AS536
2940	Recommendation to use exact P-values in biomarker discovery research in place of approximate P-values	Buas, Li, Anderson, Pepe	OS	Cancer Epidemiol. 2018 Aug 9;56:83-89. doi: 10.1016/j.canep.2018.07.014.	BAA5
2944	27-hydroxycholesterol, an endogenous SERM, and risk of fracture in postmenopausal women: A nested case-cohort study in the Women's Health Initiative	Chang, Feldman, Stefanick, McDonnell, Thompson, McDonald, Lee	CT	J Bone Miner Res. 2018 Aug 23. doi: 10.1002/jbmr.3576	AS537
2979	Association of sickle cell trait with ischemic stroke among African Americans: a meta-analysis	Hyacinth, Carty, Seals, Irvin, Naik, Burke, Zakai, Wilson, Franceschini, Winkler	Gen	JAMA Neurol. 2018 Apr 23. doi: 10.1001/jamaneurol.2018.0571. [Epub ahead of print]	M24, M5
2989	Association of periodontal disease and edentulism with hypertension risk in postmenopausal women	Gordon, LaMonte, Zhao, Genco, Hovey, Mouton, Wactawski-Wende	OS	Am J Hypertens. 2019 Jan 15;32(2):193-201. doi: 10.1093/ajh/hpy164.	
2995	Characteristics of self-reported sleep and the risk of falls and fractures: The Women's Health Initiative (WHI)	Cauley, Hovey, Stone, Andrews, Barbour, Hale, Jackson, Johnson, LeBlanc, Li, Zaslavsky, Ochs-Balcom, Wactawski-Wende, Crandall	Gen	J Bone Miner Res. 2018 Nov 21. doi: 10.1002/jbmr.3619. [Epub ahead of print]	
3020	Identification of nine new susceptibility loci for endometrial cancer	O'Mara, Glubb, Amant, Annibali, Ashton, Attia, Auer, Beckmann, Black, Bolla, Chen, Nassir, Sarto	OS	Nat Commun. 2018 Aug 9;9(1):3166. doi: 10.1038/s41467-018-05427-7	AS224, AS264, BAA18, M13, W63, W64
3034	Fatty acid biomarkers of dairy fat consumption and incidence of type 2 diabetes: a pooled analysis of prospective cohort studies	Imamura, Fretts, Marklund, Ardisson Korat, Yang, Lankinen, Qureshi, Helmer, Chen, Wong, Tintle, Harris, Robinson	CT	PLoS Med. 2018 Oct 10;15(10):e1002670. doi: 10.1371/journal.pmed.1002670. eCollection 2018 Oct.	BAA19

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3050	Change in longitudinal trends in sleep quality and duration following breast cancer diagnosis: results from the Women's Health Initiative	Hery, Naughton, Pennell, Foraker, Young, Hale, Cespedes, Pan, Crane, Danhauer, Paskett	Gen	NPJ Breast Cancer. 2018 Jun 29;4:15. doi: 10.1038/s41523-018-0065-7. eCollection 2018.	AS370
3056	Serum nitrogen and carbon stable isotope ratios meet biomarker criteria for fish and animal protein intake in a controlled feeding study of a Women's Health Initiative cohort	Yun, Lampe, Tinker, Neuhouser, Beresford, Niles, Mossavar-Rahmani, Snetselaar, Van Horn, Prentice, O'Brien	Gen	J Nutr. 2018 Dec 1;148(12):1931-1937. doi: 10.1093/jn/nxy168.	AS423
3063	Association of clinical measures of periodontal disease with blood pressure and hypertension among postmenopausal women	Gordon, LaMonte, Genco, Zhao, Cimato, Hovey, Wactawski-Wende	OS	J Periodontol. 2018 Oct;89(10):1193-1202. doi: 10.1002/JPER.17-0562. Epub 2018 Aug 15.	AS382, AS98
3066	Financial burden among older, long-term cancer survivors: Results from the LILAC study	Hastert, Young, Pennell, Padamsee, Zafar, DeGraffinreid, Naughton, Simon, Paskett	Gen	Cancer Med. 2018 Sep;7(9):4261-4272. doi: 10.1002/cam4.1671. Epub 2018 Jul 17.	AS370
3093	DNA methylation signatures of depressive symptoms in middle-aged and elderly persons: meta-analysis of multi-ethnic epigenome-wide studies	Gondalia, Hou, Baccarelli, Whitsel, Manson, LaCroix, Dunn	CT	JAMA Psychiatry. 2018 Sep 1;75(9):949-959. doi: 10.1001/jamapsychiatry.2018.1725.	AS315
3111	Genetic variant predictors of gene expression provide new insight into risk of colorectal cancer	Bien (Rosse), Su, Conti, Harrison, Qu, Guo, Lu, Albanes, Auer, Banbury, Caan, Carlson, Connolly, Huyghe, Li, Newcomb, et al.	Gen	Hum Genet. 2019 Feb 28. doi: 10.1007/s00439-019-01989-8. [Epub ahead of print]	AS224
3116	C-reactive protein concentration and risk of selected obesity-related cancers in the Women's Health Initiative	Brasky, Kabat, Ho, Thomson, Nicholson, Barrington, Bittoni, Wassertheil-Smoller, Rohan	Gen	Cancer Causes Control. 2018 Sep;29(9):855-862. doi: 10.1007/s10552-018-1061-9. Epub 2018 Jul 25.	
3141	Leptin gene variants and colorectal cancer risk: sex-specific associations	Chun, Kocarnik, Hardikar, Robinson, Berndt, Chan, Figueiredo, Lindor, Song, Schoen, Hayes, Potter, Nassir, Bezieau, Le Marchand, Slattery, et al.	Gen	PLoS One. 2018 Oct 31;13(10):e0206519. doi: 10.1371/journal.pone.0206519. eCollection 2018.	AS224

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MS#	Title	Authors	Focus	Reference	Study #
3144	Generalizing polygenic risk scores from Europeans to Hispanics/Latinos	Grinde, Qi, Thornton, Liu, Shadyab, Chan, Reiner, Sofer	Gen	Genet Epidemiol. 2018 Oct 15. doi: 10.1002/gepi.22166. [Epub ahead of print]	M5, W68
3178	Fear of recurrence among older breast, ovarian, endometrial, and colorectal cancer survivors: findings from the WHI LILAC study	Krok-Schoen, Naughton, Bernardo, Young, Paskett	Gen	Psychooncology. 2018 Jul;27(7):1810-1815. doi: 10.1002/pon.4731. Epub 2018 May 16.	AS370
3180	Application of blood concentration biomarkers in nutritional epidemiology: example of carotenoid and tocopherol intake in relation to chronic disease risk	Prentice, Pettinger, Neuhouser, Tinker, Huang, Zheng, Manson, Mossavar-Rahmani, Anderson, Lampe	Gen	Am J Clin Nutr. 2019 Mar 27. pii: nqy360. doi: 10.1093/ajcn/nqy360. [Epub ahead of print]	AS498
3192	Circulating vitamin D and colorectal cancer risk: An international pooling project of 17 cohorts	McCullough, Zoltick, Weinstein, Fedirko, Wang, Cook, Eliassen, Zeleniuch-Jacquotte, Agnoli, Albanes, Barnett, Buring, Campbell, Clendenen, Freedman, Neuhouser, et al.	Gen	J Natl Cancer Inst. 2018 Jun 14. doi: 10.1093/jnci/djy087. [Epub ahead of print]	
3193	An epigenetic biomarker of aging for lifespan and healthspan	Levine, Lu, Quach, Chen, Assimes, Bandinelli, Hou, Baccarelli, Stewart, Li, Whitsel, Wilson, Reiner, Aviv, Lohman, Liu, et al.	Gen	Aging (Albany NY). 2018 Apr 18;10(4):573-591. doi: 10.18632/aging.101414	BAA23
3194	Parental longevity predicts healthy ageing among women	Shadyab, Manson, Li, Gass, Brunner, Naughton, Cannell, Howard, LaCroix	Gen	Age Ageing. 2018 Aug 15. doi: 10.1093/ageing/afy125.	
3204	Relation of pregnancy loss to risk of cardiovascular disease in parous postmenopausal women (from the Women's Health Initiative)	Hall, Nah, Vittinghoff, Parker, Manson, Howard, Sarto, Gass, Sealy-Jefferson, Salmoirago-Blotcher, Stefanick, Shadyab, Van Horn, Park, Parikh	Gen	Am J Cardiol. 2019 Feb 22. pii: S0002-9149(19)30217-6. doi: 10.1016/j.amjcard.2019.02.012. [Epub ahead of print]	W1, W54, W58
3229	Habitual sleep quality, plasma metabolites and risk of coronary heart disease in post-menopausal women	Huang, Zeleznik, Poole, Clish, Deik, Scott, Vetter, Schernhammer, Brunner, Hale, Manson, Hu, Redline, Tworoger, Rexrode	Gen	Int J Epidemiol. 2018 Oct 26. doi: 10.1093/ije/dyy234. [Epub ahead of print]	BAA24

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3235	A transcriptome-wide association study of 229,000 women identifies new candidate susceptibility genes for breast cancer	Wu, Shi, Long, Guo, Michailidou, Beesley, Bolla, Shu, Lu, Auer, Prentice	Gen	Nat Genet. 2018 Jul;50(7):968-978. doi: 10.1038/s41588-018-0132-x. Epub 2018 Jun 18.	W63
3250	Risk prediction for estrogen receptor-specific breast cancers in two large prospective cohorts	Li, Anderson, Muller, Gunter, Dossus, Prentice, Thomson, Ferrari	Gen	Breast Cancer Res. 2018 Dec 3;20(1):147. doi: 10.1186/s13058-018-1073-0.	
3252	Substantial differences in the subgingival microbiome measured by 16S metagenomics according to periodontitis status in older women	LaMonte, Genco, Zheng, Andrews, Leys, Griffen, Hovey, Li, Sun, Buck, Millen, Falkner, Wactawski-Wende	OS	Dent J (Basel). 2018 Oct 19;6(4). pii: E58. doi: 10.3390/dj6040058.	AS15, AS98
3258	Using high-dimensional machine learning methods to estimate an anatomical risk factor for Alzheimer's disease across imaging databases	Casanova, Barnard, Guassoin, Saldana, Hayden, Manson, Wallace, Rapp, Resnick, Espeland, Chen	CT	Neuroimage. 2018 Aug 18. pii: S1053-8119(18)30738-9. doi: 10.1016/j.neuroimage.2018.08.040	AS183
3265	Stratified probabilistic bias analysis for BMI-related exposure misclassification in postmenopausal women	Banack, Stokes, Fox, Hovey, Cespedes, LeBlanc, Bird, Caan, Kroenke, Allison, Going, Snetselaar, Cheng, Chlebowski, Stefanick, LaMonte, et al.	Gen	Epidemiology. 2018 Sep;29(5):604-613. doi: 10.1097/EDE.0000000000000863. Epub 2018 Jun 1.	AS15, AS382, AS98
3273	Prediagnostic circulating markers of inflammation and risk of oesophageal adenocarcinoma: a study within the National Cancer Institute Cohort Consortium	Cook, Barnett, Bock, Cross, Goodman, Goodman, Haiman, Khaw, McCullough, Newton, Kroenke, Simon, Campbell	Gen	Gut. 2018 Aug 18. pii: gutjnl-2018-316678. doi: 10.1136/gutjnl-2018-316678. [Epub ahead of print]	AS482
3274	Comparison of methods that use whole genome data to estimate the heritability and genetic architecture of complex traits	Evans, Tahmasbi, Vrieze, Abecasis, Das, Gazal, Bjelland, De Candia, Goddard, Neale, Yang, Visscher, Keller	Gen	Nat Genet. 2018 May;50(5):737-745. doi: 10.1038/s41588-018-0108-x. Epub 2018 Apr 26.	AS224
3276	Persistent vasomotor symptoms and breast cancer in the Women's Health Initiative	Chlebowski, Mortimer, Crandall, Pan, Manson, Nelson, Johnson, Vitolins, Lane, Wactawski-Wende, Kwan, Stefanick	Gen	Menopause. 2018 Dec 28. doi: 10.1097/GME.0000000000001283. [Epub ahead of print]	

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MS#	Title	Authors	Focus	Reference	Study #
3296	A large-scale exome array analysis of venous thromboembolism	Lindstrom, Brody, Turman, Germain, Bartz, Smith, Chen, Puurunen, Chasman, Haessler, Jackson, Reiner, Kooperberg	Gen	Genet Epidemiol. 2019 Jan 19. doi: 10.1002/gepi.22187. [Epub ahead of print]	AS224, M13, M24, W63, W66
3301	Associations of sedentary time and diabetes in 6166 older women: the Objective Physical Activity and Cardiovascular Health study	Bellettiere, Healy, LaMonte, Kerr, Evenson, Rillamas-Sun, Di, Buchner, Hovell, LaCroix	Gen	J Gerontol A Biol Sci Med Sci. 2018 May 3. doi: 10.1093/gerona/gly101. [Epub ahead of print]	AS286
3302	Sedentary behavior and cardiovascular disease in older women: The Objective Physical Activity and Cardiovascular Health (OPACH) Study	Bellettiere, LaMonte, Evenson, Rillamas-Sun, Kerr, Lee, Di, Rosenberg, Stefanick, Buchner, Hovell, LaCroix	Gen	Circulation. 2019 Feb 19;139(8):1036-1046. doi: 10.1161/CIRCULATIONAH A.118.035312.	AS286
3311	Accelerometer-based predictive models of fall risk in older women: a pilot study	Hua, Quicksall, Di, Motl, LaCroix, Schatz, Li	Gen	npj Digital Medicine (2018) 1:25; doi:10.1038/s41746-018-0033-5	AS286
3319	No association between circulating concentrations of vitamin D and risk of lung cancer: An analysis in 20 prospective studies in the Lung Cancer Cohort Consortium (LC3)	Muller, Albanes, Johansson, Hodge, Fanidi, Albanes, Mai, Shu, Weinstein, Larose, Prentice, Pettinger, Thomson	Gen	Ann Oncol. 2018 Jun 1;29(6):1468-1475. doi: 10.1093/annonc/mdy104. Epub 2018 Apr 2.	AS509
3322	The association of sleep duration and quality with all-cause and cause-specific mortality in the Women's Health Initiative	Kabat, Xue, Kamensky, Zaslavsky, Stone, Johnson, Wassertheil-Smoller, Shadyab, Luo, Hale, Qi, Cauley, Brunner, Manson, Rohan	Gen	Sleep Med. 2018 Oct;50:48-54. doi: 10.1016/j.sleep.2018.05.015. Epub 2018 Jun 2.	
3326	Serological response to Helicobacter pylori proteins associate with risk of colorectal cancer among diverse populations in the United States	Butt, Varga, Blot, Teras, Visvanathan, Le Marchand, Haiman, Chen, Bao, Sesso, Wassertheil-Smoller, Ho, Tinker, Potter, Epplein	OS	Gastroenterology. 2019 Jan;156(1):175-186.e2. doi: 10.1053/j.gastro.2018.09.054. Epub 2018 Oct 6.	AS455
3334	Association of physical activity with late-life mobility limitation among women with total joint replacement for knee or hip osteoarthritis	Shadyab, Eaton, Li, LaCroix	Gen	J Rheumatol. 2018 Aug;45(8):1180-1187. doi: 10.3899/jrheum.171136. Epub 2018 Jun 1.	W35

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MS#	Title	Authors	Focus	Reference	Study #
3338	Interaction of body mass index and or waist-to-hip ratio and sun exposure associated with non-melanoma skin cancer: A prospective study from the Women's Health Initiative	Chan, Noguti, Pak, Qi, Caan, Going, Han, Chlebowski, Lee	OS	Cancer. 2018 Dec 11. doi: 10.1002/cncr.31810. [Epub ahead of print]	
3342	Prospective associations of C-reactive protein (CRP) levels and CRP genetic risk scores with risk of total knee and hip replacement for osteoarthritis in a diverse cohort	Shadyab, Terkeltaub, Kooperberg, Reiner, Eaton, Jackson, Krok-Schoen, Salem, LaCroix	Gen	Osteoarthritis Cartilage. 2018 Aug;26(8):1038-1044. doi: 10.1016/j.joca.2018.05.002. Epub 2018 May 22.	AS224, AS264, BAA3, M13, M5, W35, W63
3343	Association between sarcopenic obesity and falls in a multiethnic cohort of postmenopausal women	Follis, Cook, Bea, Going, Laddu-Patel, Cauley, Shadyab, Stefanick, Chen	Gen	J Am Geriatr Soc. 2018 Dec;66(12):2314-2320. doi: 10.1111/jgs.15613. Epub 2018 Oct 30.	
3363	Somatic mutations precede acute myeloid leukemia years before diagnosis	Desai, Mencia-Trinchant, Savenkov, Simon, Cheang, Lee, Samuel, Ritchie, Guzman, Ballman, Roboz, Hassane	Gen	Nat Med. 2018 Jul;24(7):1015-1023. doi: 10.1038/s41591-018-0081-z. Epub 2018 Jul 9.	AS545
3366	Circulating androgens and postmenopausal ovarian cancer risk in the Women's Health Initiative Observational Study	Trabert, Michels, Anderson, Brinton, Falk, Geczik, Harris, Pan, Pfeiffer, Qi, Rohan, Wentzensen, Xu	OS	Int J Cancer. 2019 Jan 26. doi: 10.1002/ijc.32157. [Epub ahead of print]	AS297
3368	Association of low-fat dietary pattern with breast cancer overall survival: a secondary analysis of the Women's Health Initiative Randomized Clinical Trial	Chlebowski, Aragaki, Anderson, Simon, Manson, Neuhouser, Pan, Stefanick, Rohan, Lane, Qi, Snetselaar, Prentice	CT	JAMA Oncol. 2018 Oct 1;4(10):e181212. doi: 10.1001/jamaoncol.2018.1212. Epub 2018 Oct 11.	
3373	Artificially sweetened beverages and stroke, coronary heart disease, and all-cause mortality in the Women's Health Initiative	Mossavar-Rahmani, Kamensky, Manson, Silver, Rapp, Haring, Beresford, Snetselaar, Wassertheil-Smoller	WHIMS	Stroke. 2019 Mar;50(3):555-562. doi: 10.1161/STROKEAHA.118.023100.	AS233, AS244, AS262, AS39
3390	Physical activity and weight gain after smoking cessation in postmenopausal women	Luo, Manson, Hendryx, Shadyab, Johnson, Dinh, Going, Chlebowski, Stefanick, Margolis	Gen	Menopause. 2018 Jul 9. doi: 10.1097/GME.0000000000001168. [Epub ahead of print]	

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MS#	Title	Authors	Focus	Reference	Study #
3405	Association of body fat and risk of breast cancer in postmenopausal women with normal body mass index: a secondary analysis of a randomized clinical trial and observational study	Iyengar, Arthur, Manson, Chlebowski, Kroenke, Peterson, Cheng, Feliciano, Lane, Luo, Nassir, Pan, Wassertheil-Smoller, Kamensky, Rohan, Dannenberg, et al.	Gen	JAMA Oncol. 2018 Dec 6. doi: 10.1001/jamaoncol.2018.5327. [Epub ahead of print]	
3410	A mixed-effects model for powerful association tests in integrative functional genomics	Su, Di, Bien (Rosse), Huang, Dong, Abecasis, Berndt, Bezieau, Brenner, Caan, Connolly, Curtis, Harrison, Huyghe, Newcomb, Potter, et al.	Gen	Am J Hum Genet. 2018 May 3;102(5):904-919. doi: 10.1016/j.ajhg.2018.03.019.	AS224
3411	Trajectories of relative performance with 2 measures of global cognitive function	Espeland, Chen, Weitlauf, Hayden, Rapp, Resnick, Garcia, Cannell, Baker, Sachs, Tindle, Wallace, Casanova	WHIMS	J Am Geriatr Soc. 2018 Aug;66(8):1575-1580. doi: 10.1111/jgs.15431. Epub 2018 Jul 4.	AS39
3412	Circulating cotinine concentrations and lung cancer risk in the Lung Cancer Cohort Consortium (LC3)	Larose, Guida, Fanidi, Langhammer, Kveem, Stevens, Jacobs, Smith-Warner, Giovannucci, Albanes, Prentice, Pettinger, Thomson, Brennan, Johansson	Gen	Int J Epidemiol. 2018 Dec 1;47(6):1760-1771. doi: 10.1093/ije/dyy100. Epub 2018 Jun 12.	AS509
3424	Rare loss of function variants in candidate genes and risk of colorectal cancer	Rosenthal, Shirts, Amendola, Horike-Pyne, Robertson, Hisama, Bennett, Dorschner, Nickerson, Stanaway, Nassir, Vickers, Li, Grady, Peters, Jarvik, et al.	Gen	Hum Genet. 2018 Oct;137(10):795-806. doi: 10.1007/s00439-018-1938-4. Epub 2018 Sep 28.	AS224, M24
3426	Association of fried food consumption with all cause, cardiovascular, and cancer mortality: prospecive cohort study	Sun, Liu, Snetselaar, Robinson, Wallace, Peterson, Bao	Gen	BMJ. 2019 Jan 23;364:k5420. doi: 10.1136/bmj.k5420.	
3430	Prediagnostic plasma branched chain amino acids and the risk of amyotrophic lateral sclerosis	Bjornevik, O'Reilly, Berry, Clish, Kato, Kolonel, Le Marchand, McCullough, Paganoni, Schwarzschild, Talbott, Wallace, Zhang, Manson, Ascherio	Gen	Neurology. 2018 Nov 14. pii: 10.1212/WNL.0000000000006669. doi: 10.1212/WNL.0000000000006669. [Epub ahead of print]	AS402
3435	Adiposity at different periods of life and risk of adult glioma in a cohort of postmenopausal women	Kabat, Rohan	Gen	Cancer Epidemiol. 2018 Jun;54:71-74. doi: 10.1016/j.canep.2018.03.008. Epub 2018 Apr 11.	

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3447	Adiposity, history of diabetes, and risk of pancreatic cancer in postmenopausal women	Arthur, Kim, Ho, Chlebowski, Pan, Rohan, Kabat	Gen	Ann Epidemiol. 2019 Jan;29:23-29.e1. doi: 10.1016/j.annepidem.2018.09.005. Epub 2018 Sep 22.	W54, W58, W66
3454	Two high-risk susceptibility loci at 6p25.3 and 14q32.13 for Waldenström macroglobulinemia	McMaster, Berndt, Zhang, Slager, Li, Vajdic, Smedby, Yan, Birmann, Brown, North, Tinker, Jackson	Gen	Nat Commun. 2018 Oct 10;9(1):4182. doi: 10.1038/s41467-018-06541-2.	AS301
3470	Predictors of urinary phthalate biomarker concentrations in postmenopausal women	Reeves, Diaz-Santana, Manson, Hankinson, Zoeller, Bigelow, Hou, Wactawski-Wende, Liu, Tinker, Calafat	Gen	Environ Res. 2018 Oct 30;169:122-130. doi: 10.1016/j.envres.2018.10.024. [Epub ahead of print]	AS458
3474	A healthy lifestyle index in relation to risk of endometrial and ovarian cancer among women in the Women's Health Initiative study	Arthur, Brasky, Crane, Felix, Kaunitz, Shadyab, Qi, Wassertheil-Smoller, Rohan	Gen	Am J Epidemiol. 2018 Nov 8. doi: 10.1093/aje/kwy249. [Epub ahead of print]	
3475	An empirical dietary inflammatory pattern score is associated with circulating inflammatory biomarkers in a multi-ethnic population of postmenopausal women in the United States	Tabung, Giovannucci, Giulianini, Liang, Chandler, Balasubramanian, Manson, Cespedes, Hayden, Van Horn, Rexrode	Gen	J Nutr. 2018 Apr 20. doi: 10.1093/jn/nxy031. [Epub ahead of print]	BAA24
3481	Lipoprotein(a) and cardiovascular risk prediction among women	Cook, Mora, Ridker	OS	J Am Coll Cardiol. 2018 Jul 17;72(3):287-296. doi: 10.1016/j.jacc.2018.04.060. Epub 2018 Jul 9.	BAA22
3483	Associations of obesity and circulating insulin and glucose with breast cancer risk: a Mendelian randomization analysis	Shu, Wu, Khankari, Shu, Wang, Michailidou, Bolla, Wang, Dennis, Milne, Anton-Culver, Auer, Prentice	Gen	Int J Epidemiol. 2018 Oct 1. doi: 10.1093/ije/dyy201. [Epub ahead of print]	W63
3484	Is high vitamin B12 status a cause of lung cancer?	Fanidi, Carreras-Torres, Larose, Yuan, Stevens, Weinstein, Albanes, Prentice, Pettinger, Cai, Brennan	Gen	Int J Cancer. 2018 Nov 29. doi: 10.1002/ijc.32033. [Epub ahead of print]	AS294
3485	Anatomy of the mediterranean diet and mortality among older women with frailty	Zaslavsky, Zelber-Sagi, Shikany, Orchard, Wallace, Snetselaar, Tinker	OS	J Nutr Gerontol Geriatr. 2018 Aug 17:1-13. doi: 10.1080/21551197.2018.1496217. [Epub ahead of print]	

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MS#	Title	Authors	Focus	Reference	Study #
3489	Accuracy of self-reported weight in the Women's Health Initiative	Luo, Thomson, Hendryx, Tinker, Manson, Li, Nelson, Vitolins, Seguin, Eaton, Wactawski-Wende, Margolis	Gen	Public Health Nutr. 2018 Nov 19:1-10. doi: 10.1017/S1368980018003002. [Epub ahead of print]	
3497	Combining a food frequency questionnaire with 24-hour recalls to increase the precision of estimating usual dietary intakes – evidence from the Validation Studies Pooling Project	Freedman, Midthune, Arab, Prentice, Subar, Willett, Neuhouser, Tinker, Kipnis	CT	Am J Epidemiol. 2018 Oct 1;187(10):2227-2232. doi: 10.1093/aje/kwy126. Epub 2018 Jun 18.	AS289
3501	Multi-ancestry genome-wide association study of lipid levels incorporating gene-alcohol interactions	de Vries, Brown, Bentley, Sung, Winkler, Ntalla, Schwander, Kraja, Guo, Franceschini, Eaton, Kooperberg, Reiner, Robinson, North	Gen	Am J Epidemiol. 2019 Jan 29. doi: 10.1093/aje/kwz005. [Epub ahead of print]	M13, M5, W63
3502	Multi-ancestry genome-wide gene-smoking interaction study of 387,272 individuals identifies new loci associated with serum lipids	Bentley, Sung, Brown, Winkler, Kraja, Ntalla, Schwander, Chasman, Lim, Deng, Liu, Eaton, Kooperberg, Lewis, North, Robinson, et al.	Gen	Nat Genet. 2019 Apr;51(4):636-648. doi: 10.1038/s41588-019-0378-y. Epub 2019 Mar 29.	M13, M5, W63
3503	Circulating high sensitivity C reactive protein concentrations and risk of lung cancer: nested case-control study within Lung Cancer Cohort Consortium.	Muller, Larose, Hodge, Guida, Langhammer, Grankvist, Meyer, Cai, Arslan, Zeleniuch-Jacquotte, Prentice, Thomson, Pettinger, Johansson	Gen	BMJ. 2019 Jan 3;364:k4981. doi: 10.1136/bmj.k4981.	AS509
3504	Personality traits and diabetes incidence among postmenopausal women	Luo, Manson, Weitlauf, Shadyab, Rapp, Garcia, Jonasson, Tindle, Nassir, Wactawski-Wende, Hendryx	Gen	Menopause. 2019 Jan 21. doi: 10.1097/GME.0000000000001296. [Epub ahead of print]	
3506	Novel genetic associations for blood pressure identified via gene-alcohol interaction in up to 570K individuals across multiple ancestries	Feitosa, Kraja, Chasman, Sung, Winkler, Ntalla, Guo, Franceschini, Cheng, Sim, Eaton, Howard, Lewis, Liu, Tang, Kooperberg, et al.	Gen	PLoS One. 2018 Jun 18;13(6):e0198166. doi: 10.1371/journal.pone.0198166. eCollection 2018.	M13, M5, W63
3519	Metabolic syndrome and risk of endometrial cancer in postmenopausal women: a prospective study	Arthur, Kabat, Kim, Wild, Shadyab, Wactawski-Wende, Ho, Reeves, Kuller, Luo, Beebe-Dimmer, Simon, Strickler, Wassertheil-Smoller, Rohan	Gen	Cancer Causes Control. 2019 Feb 20. doi: 10.1007/s10552-019-01139-5. [Epub ahead of print]	

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MS#	Title	Authors	Focus	Reference	Study #
3534	Cohort profile: the Buffalo OsteoPerio microbiome prospective cohort study	Banack, Genco, LaMonte, Millen, Buck, Sun, Andrews, Hovey, Tsompana, McSkimming, Zhao, Wactawski-Wende	N/A	BMJ Open. 2018 Dec 4;8(12):e024263. doi: 10.1136/bmjopen-2018-024263.	AS15, AS98
3539	Nutritional status, body mass index, and the risk of falls in community-dwelling older adults: a systematic review and meta-analysis	Trevisan, Crippa, Welmer, Sergi, Maggi, Manzato, Bea, Cauley, Decullier, Hirani, LaMonte, Lewis, Schott, Orsini	OS	J Am Med Dir Assoc. 2018 Dec 13. pii: S1525-8610(18)30607-8. doi: 10.1016/j.jamda.2018.10.027. [Epub ahead of print]	
3552	Association of light physical activity measured by accelerometry and incidence of coronary heart disease and cardiovascular disease in older women	LaCroix, Bellettiere, Rillamas-Sun, Di, Evenson, Lewis, Buchner, Stefanick, Lee, Rosenberg, LaMonte	Gen	JAMA Netw Open. 2019 Mar 1;2(3):e190419. doi: 10.1001/jamanetworkopen.2019.0419.	AS286, W64
3557	Antibody responses to Streptococcus gallolyticus subspecies gallolyticus proteins in a large prospective colorectal cancer cohort consortium	Butt, Blot, Teras, Visvanathan, Le Marchand, Haiman, Chen, Bao, Sesso, Wassertheil-Smoller, Ho, Tinker, Epplein	OS	Cancer Epidemiol Biomarkers Prev. 2018 Oct;27(10):1186-1194. doi: 10.1158/1055-9965.EPI-18-0249. Epub 2018 Jul 23.	AS455
3575	Racial and ethnic differences in anthropometric measures as risk factors for diabetes	Luo, Hendryx, Laddu-Patel, Phillips, Chlebowski, LeBlanc, Allison, Nelson, Li, Rosal, Stefanick, Manson	Gen	Diabetes Care. 2018 Oct 23. pii: dc181413. doi: 10.2337/dc18-1413. [Epub ahead of print]	
3580	Association studies of up to 1.2 million individuals yield new insights into the genetic etiology of tobacco and alcohol use	Liu, Jiang, Wedow, Li, Haessler, Chen, Kooperberg, Peters, Reiner	Gen	Nat Genet. 2019 Feb;51(2):237-244. doi: 10.1038/s41588-018-0307-5. Epub 2019 Jan 14.	AS224, AS264, BAA3, M13, W63, W66
3595	Polygenic risk scores for prediction of breat cancer and breast cancer subtypes	Mavaddat, Michailidou, Dennis, Lush, Fachal, Lee, Tyrer, Chen, Wang, Bolla, Auer, Chlebowski, Prentice, Purrington	Gen	Am J Hum Genet. 2019 Jan 3;104(1):21-34. doi: 10.1016/j.ajhg.2018.11.002. Epub 2018 Dec 13.	W63
3601	Discovery of common and rare genetic risk variants for colorectal cancer	Huyghe, Bien (Rosse), Harrison, Kang, Chen, Schmit, Conti, Qu, Jeon, Edlund, Caan, Connolly, Curtis, Gong, Jackson, Kooperberg, et al.	Gen	Nat Genet. 2019 Jan;51(1):76-87. doi: 10.1038/s41588-018-0286-6. Epub 2018 Dec 3.	AS224

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MS#	Title	Authors	Focus	Reference	Study #
3602	Multi-ancestry study of blood lipid levels identifies four loci interacting with physical activity	Kilpeläinen, Bentley, Noordam, Sung, Schwander, Winkler, Jakupovic, Chasman, Manning, Ntalla, Kooperberg, North, Franceschini	Gen	Nat Commun. 2019 Jan 22;10(1):376. doi: 10.1038/s41467-018-08008-w.	M13, M5, W63
3645	Epigenetic clock for skin and blood cells applied to Hutchinson Gilford Progeria Syndrome and ex vivo studies	Horvath, Oshima, Martin, Lu, Quach, Cohen, Felton, Matsuyama, Lowe, Kabacik, Reiner, Whitsel	Gen	Aging (Albany NY). 2018 Jul 26;10(7):1758-1775. doi: 10.18632/aging.101508.	AS315, BAA23
3651	Pre-diagnostic plasma metabolomics and the risk of amyotrophic lateral sclerosis	Bjornevik, Zhang, O'Reilly, Berry, Clish, Kato, Kelly, Kolonel, Liang, Le Marchand, McCullough, Paganoni, Schwarzschild, Shadyab, Wactawski-Wende, Wang, et al.	Gen	Neurology. 2019 Mar 29. pii: 10.1212/WNL.0000000000 07401. doi: 10.1212/WNL.0000000000 07401. [Epub ahead of print]	AS402
3661	Whole genome sequence association with E-selectin levels reveals loss-of-function variant in African Americans	Polfus, Raffield, Wheeler, Tracy, Lange, Lettre, Miller, Correa, Bowler, Bis, Salimi, Jenny, Pankratz, Wang, Preuss, Zhou, et al.	Gen	Hum Mol Genet. 2018 Oct 10. doi: 10.1093/hmg/ddy360. [Epub ahead of print]	AS564
3666	Genome-wide significance thresholds for admixture mapping studies	Grinde, Brown, Reiner, Thornton, Browning	Gen	Am J Hum Genet. 2019 Feb 4. pii: S0002-9297(19)30008-4. doi: 10.1016/j.ajhg.2019.01.008. [Epub ahead of print]	M5
3668	DNA methylation GrimAge strongly predicts lifespan and healthspan	Lu, Quach, Wilson, Reiner, Aviv, Raj, Hou, Baccarelli, Li, Stewart, Whitsel, Assimes, Ferrucci, Horvath	Gen	Aging (Albany NY). 2019 Jan 21;11(2):303-327. doi: 10.18632/aging.101684.	AS315, BAA23
3674	Efficient variant set mixed model association tests for continuous and binary traits in large-scale whole genome sequencing studies	Chen, Huffman, Brody, Wang, Lee, Li, Gogarten, Sofer, Bielak, Bis, Kooperberg, Reiner, Lin	Gen	Am J Hum Genet. 2019 Feb 7;104(2):260-274. doi: 10.1016/j.ajhg.2018.12.012. Epub 2019 Jan 10.	AS564
3703	Multiancestry genome-wide association study of 520,000 subjects identifies 32 loci associated with stroke and stroke subtypes	Malik, Chauhan, Traylor, Sargurupremraj, Okada, Mishra, Rutten-Jacobs, Giese, van der Laan, Gretarsdottir, Carty, Haessler, Kooperberg, Reiner, Rexrode, Wassertheil-Smoller, et al.		Nat Genet. 2018 Apr;50(4):524-537. doi: 10.1038/s41588-018-0058-3. Epub 2018 Mar 12	M5, W63, W68

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3708	Risk thresholds for alcohol consumption: combined analysis of individual-participant data for 599 912 current drinkers in 83 prospective studies	Wood, Kaptoge, Butterworth, Willeit, Warnakula, Bolton, Paige, Paul, Burgess, Astle	OS	Lancet. 2018 Apr 14;391(10129):1513-1523. doi: 10.1016/S0140-6736(18)30134-X	AS126
3719	Leveraging linkage evidence to identify low-frequency and rare variants on 16p13 associated with blood pressure using TOPMed whole genome sequencing data	He, Li, Kelly, Liang, Cade, Assimes, Becker, Beitelshees, Bress, Chang, Franceschini, Haessler, Martin, Reiner, Snively, Kooperberg, et al.	Gen	Hum Genet. 2019 Feb;138(2):199-210. doi: 10.1007/s00439-019-01975-0. Epub 2019 Jan 22.	AS564
3733	The role of epigenetic aging in education and racial/ethnic mortality disparities among older U.S. women	Liu, Chen, Assimes, Ferrucci, Horvath, Levine	Gen	Psychoneuroendocrinology. 2019 Feb 6;104:18-24. doi: 10.1016/j.psyneuen.2019.01.028. [Epub ahead of print]	BAA23