

Supplementary Online Content

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eMethods.

eTable 1. Characteristics of Participants at Baseline With No Follow-up Questionnaire Data vs Those With Data

eTable 2. MET Values for the 7 Leisure Time Physical Activity Types

eTable 3. Spearman Rank Correlation Coefficients of Physical Activity Disciplines

eTable 4. E-values for Associations of Different Physical Activity Types With All-Cause, Cardiovascular and Cancer Mortality in NIH-AARP Diet and Health Study Participants (7.5 to <15 MET hrs/wk vs None)

eTable 5. Associations of Activity Types With All-Cause Mortality Following Sequential Adjustment for Covariates in NIH-AARP Diet and Health Study Participants

eTable 6. Categorical Associations of Leisure Time Physical Activity Types With All-Cause, Cardiovascular and Cancer Mortality in NIH-AARP Diet and Health Study Participants

eTable 7. Associations of Achieving 7.5 to <15 MET Hours per Week Through Each Activity Type With All-Cause Mortality by Average MET Hours per Week From Other Activities

eTable 8. Associations of Two Activity Types With All-Cause Mortality in NIH-AARP Diet and Health Study Participants

eTable 9. Associations of Each Activity With All-Cause, Cardiovascular and Cancer Mortality for NIH-AARP Diet and Health Study Participants (Any vs None)

eFigure 1. Participant Inclusion Flow Chart

eFigure 2. Log-Log Plots to Assess Proportional Hazards Assumption With All-Cause Mortality

eFigure 3. Associations of Activity Types With All-Cause Mortality by Subgroups

eReferences.

This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods.

Exposure assessment

The follow-up questionnaire asked respondents to self-report average time spent per week over the last year: i) jogging or running, ii) cycling (including riding a stationary bike), iii) swimming laps, iv) playing golf, v) playing tennis, squash, or racquetball, vi) other aerobic exercise (e.g., aerobic class, exercise machines, etc.), vii) walking for exercise. There were 10 possible response options (none, 5 min, 15 min, 30 min, 1 hour, 1 hour 30 min, 2–3 hours, 4–6 hours, 7–10 hours, more than 10 hours). MET values were assigned to each activity and multiplied by the reported durations to estimate average MET hours per week (Supplementary Table 2)¹. Where durations were a range of values, the midpoint duration of the range was assigned, where participants selected >10 hours, we assumed 12 hours of activity. Overall leisure time physical activity was calculated as the sum of the MET hours per week of the seven activities examined.

Respondents also self-reported: height, weight, smoking status (number of cigarettes per day current and historically), depression (diagnosed by doctor) and trouble with physical activity (none, slight, moderate, quite a bit, an enormous amount), and other forms and durations of physical activity in the follow-up questionnaire (light household chores, moderate to vigorous household chores, moderate outdoor chores, home repairs, caring for children, caring for another adult, and walking for other daily activities, weight training or lifting) and sedentary time (sitting watching television, video, or DVD, sitting or driving in a car, bus or train, other sitting (reading, knitting, using a computer)). Sex (male and female), race/ethnicity (American Indian or Alaskan Native, Asian, Hispanic, non-Hispanic Black, non-Hispanic White, Pacific Islander; categories defined by questionnaire), education level (<8 years, 8-11, completed high school, post-high school training excluding college, some college, college graduate, postgraduate) and alcohol consumption (g/day estimated based on beer, wine and liquor/mixed drink frequency and portion sizes over the last 12 months) were assessed using the baseline questionnaire. Doctor diagnosed history of diabetes, heart problems, stroke, emphysema, and cancer were determined using the self-reported combined responses to both the baseline and follow-up questionnaires (ever, never, or unknown). Co-morbidities for adjustments were chosen *a priori* based on the possibility that they may affect both physical activity levels at baseline and mortality risks²⁻⁴.

When BMI data were missing from the follow-up questionnaire, values were substituted from data collected at baseline (n=26,772). Where participants had answered at least three questions for the seven types of physical activities examined, missing answers for each respective activity were recoded to 0 (n=39,093), under the assumption that nonresponse indicated that they did not do that activity.

Adjustment covariates

Our primary analyses adjusted for age (continuous), sex (male, female), racial/ethnic group (Asian, Hispanic, non-Hispanic Black, non-Hispanic White, Pacific Islander or American Indian/Alaskan Native, and missing [1.0%]), education (less than 11 years, 12 years or completed high school, post-high school, some college, college and post graduate, and missing [2.2%]), smoking status (never, former light smoker (<20 cigarettes per day), former heavy smoker (20+ cigarettes per day), current light smoker (<20 cigarettes per day), current heavy smoker (20+ cigarettes per day), and missing [9.2%]), BMI (≤ 20 , 20.0-22.4, 22.5-24.9, 25.0-27.4, 27.5-29.9, 30.0-31.9, 32.0-33.9, and ≥ 34 kg/m²), alcohol consumption (non-drinker, <10, 10-19, 20+ g alcohol per day, and missing [0.4%]), marriage status (married or living as married, widowed/divorced/separated/never married, and missing [0.6%]), trouble with physical activity (none, slight amount, moderate amount, quite a bit, an enormous amount, and missing [7.2%]), history of stroke (yes, no, and missing [7.3%]), history of heart attack, angina, or coronary artery disease (yes, no, and missing [6.0%]), history of emphysema (yes, no, and missing [8.4%]), history of diabetes (yes, no, and missing [8.2%]), ever been diagnosed with cancer (yes, no, and missing [10.1%]), total MET hours per week from non-leisure time activities (light household chores, moderate to vigorous household chores, moderate outdoor chores, home repairs, caring for children, caring for another adult, and walking for other daily activities, fifths, missing [11.8%]), sedentary time (time spent watching television, sitting during travel, and other sitting, fifths, missing [16.3%]), weight lifting frequency (none, ≤ 1 , >1 hour/week, missing [1.8%]), and total MET hours from the other leisure time activities (running, cycling, swimming, aerobic exercise, racquet sports, golf, walking for exercise, excluding the activity of interest, in fifths assigned the median value, continuous).

E-values

E-values were used to assess the minimum strength of association that an unmeasured confounder would need with both exposure and outcome to explain away observed associations^{5, 6}. HRs were transformed using the formula:

$$RR \approx \frac{1 - 0.5\sqrt{HR}}{1 - 0.5\sqrt{1/HR}}$$

And the inverse of the RR was substituted into the equation⁶:

$$E - value = RR + \sqrt{RR \times (RR - 1)}$$

If the upper confidence interval crossed 0, the interval bound was = 1, else the upper CI was substituted into the E-value formula.

Subgroup analyses

Subgroup analyses for the associations of meeting the physical activity recommendations vs nonparticipants through each activity type and all-cause mortality risk were examined using the following categories: follow-up time (<5; 5+ years), age (<65, 65-69, 70-74, 75+ years), sex (male, female), BMI (<25, 25-29.9, 30+ kg/m²), education level (up to high school, high school-college, college graduate), self-reported racial group (Non-Hispanic Black, Non-Hispanic White), smoking (never, former, current), physical activity trouble (none, slight/moderate, quite a bit), history of diabetes (no, yes), history of heart problems (no, yes), history of cancer (no, yes), history of depression (no, yes), and average MET hours per week from the other six activities (< 7.5, 7.5+ MET hours/week). Heterogeneity in the associations for follow-up time was examined using in two different subgroups defined by follow-up period, using a χ^2 test for heterogeneity. Heterogeneity in the associations for the non-case dependent subgroups was assessed using a χ^2 interaction term.

eTable 1. Characteristics of Participants at Baseline With no Follow-up Questionnaire Data vs Those With Data

		Baseline cohort, no Follow-up questionnaire (N=253,035)	Baseline cohort, with Follow-up questionnaire (N=313,363)	Percentage difference
Age (SD)		62.4 (5.4)	62.0 (5.3)	-0.8
BMI (SD)		27.3 (5.3)	26.9 (4.9)	-1.4
Sex	Male	61.6	58.6	-3.0
	Female	38.4	41.4	3.0
Self-reported race and ethnicity, %	Non-Hispanic White	89.8	92.5	2.7
	Non-Hispanic Black	4.6	3.3	-1.3
	Hispanic	2.2	1.6	-0.5
	Asian	1.2	1.2	0.0
	Pacific Islander	0.1	0.1	0.0
	Native American/Alaskan	0.4	0.2	-0.1
	Missing	1.7	1.1	-0.7
Education, %	Up to 11 years	8.9	4.4	-4.5
	12 years or completed high school	22.4	17.5	-5.0
	Post high school	10.3	9.4	-0.9
	Some college	23.4	22.7	-0.8
	College graduate and postgraduate	31.2	43.7	12.6
	Missing	3.8	2.4	-1.4
Smoking, %	Never	30.5	38.1	7.5
	Former smoker <20 p/day	27.0	28.5	1.5
	Former smoker 20+ p/day	23.1	20.6	-2.5
	Current smoker <20 p/day	9.4	6.4	-3.0
	Current smoker 20+ p/day	5.6	3.1	-2.5
	Unknown	4.5	3.4	-1.1
Alcohol (g alc p/day), %	Non-drinker	27.9	21.6	-6.3
	< 10	45.8	49.8	4.1
	10-19	10.4	12.5	2.1
	20 +	15.5	15.6	0.1
	Unknown	0.5	0.4	-0.1
Marriage status, %	Married/living as married	67.2	70.2	3.0
	Not married/living as married	31.8	29.2	-2.5
	Unknown	1.1	0.6	-0.5
Ever had diabetes, %	No	88.1	92.8	4.7
	Yes	11.9	7.2	-4.7
Ever had heart disease, %	No	83.2	88.0	4.8
	Yes	16.9	12.0	-4.9
Ever had a stroke, %	No	96.8	98.5	1.6
	Yes	3.2	1.5	-1.6
Ever had emphysema, %	No	95.9	98.2	2.3
	Yes	4.1	1.8	-2.3
Ever had cancer, %	No	84.2	87.9	3.7
	Yes	10.4	7.8	-2.6
	Unknown	5.4	4.3	-1.1

Abbreviations: SD=standard deviation

eTable 2. MET Values for the 7 Leisure Time Physical Activity Types

Activity type	MET values
Running	7.0
Cycling	7.5
Swimming	8.3
Aerobic	7.3
Racquet sport	7.3
Golf	4.8
Walking for exercise	4.3

MET values based on the Compendium of Physical Activities¹

Abbreviations: MET= metabolic equivalent of task.

eTable 3. Spearman Rank Correlation Coefficients of Physical Activity Disciplines

	Running	Cycling	Swimming	Aerobic	Racquet sports	Golf	Walking for exercise
Running	1						
Cycling	0.11	1					
Swimming	0.07	0.13	1				
Aerobic	0.13	0.22	0.1	1			
Racquet sports	0.11	0.08	0.07	0.05	1		
Golf	0.05	0.07	0.05	0.03	0.09	1	
Walking for exercise	0.08	0.09	0.06	0.14	0.01	0.06	1

eTable 4. E-values for Associations of Different Physical Activity Types With All-Cause, Cardiovascular and Cancer Mortality in NIH-AARP Diet and Health Study Participants (7.5 to <15 MET hrs/wk vs None)

	E-values (interval bound)		
	All-cause mortality	Cardiovascular mortality	Cancer mortality
Running	1.49 (1.31)	1.31 (1.00)	1.59 (1.23)
Cycling	1.17 (1.08)	1.01 (1.00)	1.26 (1.13)
Swimming	1.23 (1.12)	1.11 (1.00)	1.26 (1.00)
Aerobic exercise	1.29 (1.22)	1.22 (1.00)	1.33 (1.18)
Racquet sports	1.51 (1.28)	1.80 (1.39)	1.11 (1.00)
Golf	1.27 (1.17)	1.33 (1.15)	1.04 (1.00)
Walking for exercise	1.33 (1.29)	1.39 (1.32)	1.18 (1.00)

E-values are calculated based on the results displayed in Table 2

eTable 5. Associations of Activity Types With All-Cause Mortality Following Sequential Adjustment for Covariates in NIH-AARP Diet and Health Study Participants

Model iteration	Running		Cycling		Swimming		Aerobic	
	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
1	0.66 (0.61, 0.72)	<0.0001	0.88 (0.86, 0.90)	<0.0001	0.86 (0.83, 0.90)	<0.0001	0.80 (0.78, 0.82)	<0.0001
2	0.68 (0.63, 0.74)	<0.0001	0.89 (0.87, 0.91)	<0.0001	0.87 (0.83, 0.90)	<0.0001	0.81 (0.79, 0.84)	<0.0001
3	0.68 (0.63, 0.74)	<0.0001	0.89 (0.87, 0.91)	<0.0001	0.86 (0.83, 0.90)	<0.0001	0.81 (0.79, 0.84)	<0.0001
4	0.70 (0.64, 0.76)	<0.0001	0.90 (0.88, 0.92)	<0.0001	0.88 (0.85, 0.91)	<0.0001	0.83 (0.81, 0.86)	<0.0001
5	0.74 (0.68, 0.80)	<0.0001	0.93 (0.91, 0.95)	<0.0001	0.90 (0.87, 0.93)	<0.0001	0.86 (0.84, 0.88)	<0.0001
6	0.80 (0.73, 0.87)	<0.0001	0.92 (0.90, 0.94)	<0.0001	0.91 (0.88, 0.94)	<0.0001	0.88 (0.85, 0.90)	<0.0001
7	0.84 (0.77, 0.92)	0.0001	0.96 (0.94, 0.98)	0.0004	0.94 (0.90, 0.97)	0.0002	0.92 (0.90, 0.95)	<0.0001
8	0.85 (0.78, 0.92)	0.0001	0.97 (0.95, 0.99)	0.008	0.95 (0.92, 0.98)	0.005	0.93 (0.90, 0.95)	<0.0001

HRs represent mortality risks for achieving 7.5-15 MET hrs/wk through each activity in comparison with those who did not participate in each activity.
 Model 1=adjusted for age (continuous), sex (male, female).
 Model 2 = Model 1 + adjusted for BMI (≤ 20 , 20.0-22.4, 22.5-24.9, 25.0-27.4, 27.5-29.9, 30.0-31.9, 32.0-33.9, and ≥ 34 kg/m²).
 Model 3 = Model 2 + adjusted for racial/ethnic group (non-Hispanic white, non-Hispanic black, Hispanic, Asian, Pacific Islander or American Indian/Alaskan Native, and missing [1.0%]).
 Model 4 = Model 3 + adjusted for education (less than 11 years, 12 years or completed high school, post-high school, some college, college and postgraduate, and missing [2.2%]), and marriage status (married or living as married, widowed/divorced/separated/never married, and missing [0.6%]).
 Model 5 = Model 4 + adjusted for smoking status (never, former light smoker (<20 cigarettes per day), former heavy smoker (20+ cigarettes per day), current light smoker (<20 cigarettes per day), current heavy smoker (20+ cigarettes per day), and missing [9.2%]), and alcohol consumption (non-drinker, <10, 10-19, 20+ g alcohol per day, and missing [0.4%]).
 Model 6 = Model 5 + adjusted for trouble with physical activity (none, slight amount, moderate amount, quite a bit, an enormous amount, and missing [7.2%]), history of stroke (yes, no, and missing [7.3%]), history of heart attack, angina, or coronary artery disease (yes, no, and missing [6.0%]), history of emphysema (yes, no, and missing [8.4%]), history of diabetes (yes, no, and missing [8.2%]), ever been diagnosed with cancer (yes, no, and missing [10.1%]).
 Model 7 = Model 6 + adjusted for total MET hours per week from non-leisure time activities (light household chores, moderate to vigorous household chores, moderate outdoor chores, home repairs, caring for children, caring for another adult, and walking for other daily activities, fifths, missing [11.8%]), sedentary time (fifths, missing [16.3%]), weight training frequency (none, ≤ 1 , >1 hour/week, missing [1.8%]).
 Model 8 = Model 7 + adjusted for total MET hours per week from other activities (running, cycling, swimming, aerobic exercise, racquet sports, golf, walking for exercise, excluding the activity of interest, fifths assigned the median value, continuous).
 Abbreviations: CI=confidence interval; HR=hazard ratio; MET= metabolic equivalent of task; NIH-AARP=National Institutes of Health-AARP.

eTable 5. Associations of Activity Types With All-Cause Mortality Following Sequential Adjustment for Covariates in NIH-AARP Diet and Health Study Participants (continued)

Model iteration	Racquet sports		Golf		Walking	
	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
1	0.68 (0.62, 0.76)	<0.0001	0.86 (0.83, 0.90)	<0.0001	0.80 (0.78, 0.81)	<0.0001
2	0.71 (0.63, 0.78)	<0.0001	0.88 (0.84, 0.91)	<0.0001	0.82 (0.80, 0.83)	<0.0001
3	0.71 (0.64, 0.79)	<0.0001	0.88 (0.84, 0.91)	<0.0001	0.82 (0.80, 0.83)	<0.0001
4	0.74 (0.66, 0.82)	<0.0001	0.89 (0.86, 0.93)	<0.0001	0.83 (0.81, 0.84)	<0.0001
5	0.77 (0.70, 0.86)	<0.0001	0.89 (0.86, 0.93)	<0.0001	0.87 (0.85, 0.89)	<0.0001
6	0.82 (0.74, 0.91)	0.0003	0.93 (0.89, 0.96)	0.0002	0.89 (0.87, 0.90)	<0.0001
7	0.83 (0.75, 0.92)	0.0005	0.93 (0.90, 0.97)	0.0004	0.91 (0.89, 0.93)	<0.0001
8	0.84 (0.75, 0.93)	0.001	0.93 (0.90, 0.97)	0.0005	0.91 (0.89, 0.93)	<0.0001

HRs represent mortality risks for achieving 7.5-15 MET hrs/wk through each activity in comparison with those who did not participate in each activity.

Model 1 = adjusted for age (continuous), sex (male, female).

Model 2 = Model 1 + adjusted for BMI (≤ 20 , 20.0-22.4, 22.5-24.9, 25.0-27.4, 27.5-29.9, 30.0-31.9, 32.0-33.9, and ≥ 34 kg/m²).

Model 3 = Model 2 + adjusted for racial/ethnic group (non-Hispanic white, non-Hispanic black, Hispanic, Asian, Pacific Islander or American Indian/Alaskan Native, and missing [1.0%]).

Model 4 = Model 3 + adjusted for education (less than 11 years, 12 years or completed high school, post-high school, some college, college and postgraduate, and missing [2.2%]), and marriage status (married or living as married, widowed/divorced/separated/never married, and missing [0.6%]).

Model 5 = Model 4 + adjusted for smoking status (never, former light smoker (<20 cigarettes per day), former heavy smoker (20+ cigarettes per day), current light smoker (<20 cigarettes per day), current heavy smoker (20+ cigarettes per day), and missing [9.2%]), and alcohol consumption (non-drinker, <10, 10-19, 20+ g alcohol per day, and missing [0.4%]).

Model 6 = Model 5 + adjusted for trouble with physical activity (none, slight amount, moderate amount, quite a bit, an enormous amount, and missing [7.2%]), history of stroke (yes, no, and missing [7.3%]), history of heart attack, angina, or coronary artery disease (yes, no, and missing [6.0%]), history of emphysema (yes, no, and missing [8.4%]), history of diabetes (yes, no, and missing [8.2%]), ever been diagnosed with cancer (yes, no, and missing [10.1%]).

Model 7 = Model 6 + adjusted for total MET hours per week from non-leisure time activities (light household chores, moderate to vigorous household chores, moderate outdoor chores, home repairs, caring for children, caring for another adult, and walking for other daily activities, fifths, missing [11.8%]), sedentary time (fifths, missing [16.3%]), weight training frequency (none, ≤ 1 , >1 hour/week, missing [1.8%]).

Model 8 = Model 7 + adjusted for total MET hours per week from other activities (running, cycling, swimming, aerobic exercise, racquet sports, golf, walking for exercise, excluding the activity of interest, fifths assigned the median value, continuous).

Abbreviations: CI=confidence interval; HR=hazard ratio; MET= metabolic equivalent of task; NIH-AARP=National Institutes of Health-AARP.

eTable 6. Categorical Associations of Leisure Time Physical Activity Types With All-Cause, Cardiovascular and Cancer Mortality in NIH-AARP Diet and Health Study Participants

		All-cause mortality	Cardiovascular mortality	Cancer mortality
	MET hrs/week	HR (95% CI)	HR (95% CI)	HR (95% CI)
Running	None	1 (ref)	1 (ref)	1 (ref)
	0.1-<7.5	0.92 (0.89, 0.95)	0.93 (0.88, 0.99)	0.90 (0.85, 0.95)
	7.5-<15	0.85 (0.78, 0.92)	0.92 (0.79, 1.07)	0.81 (0.69, 0.95)
	15-<22.5	0.80 (0.75, 0.87)	0.79 (0.69, 0.91)	0.83 (0.72, 0.94)
	22.5+	0.88 (0.82, 0.95)	0.93 (0.81, 1.06)	0.90 (0.79, 1.02)
Cycling	None	1 (ref)	1 (ref)	1 (ref)
	0.1-<7.5	0.94 (0.92, 0.96)	0.94 (0.90, 0.97)	0.92 (0.89, 0.96)
	7.5-<15	0.97 (0.95, 0.99)	0.99 (0.96, 1.03)	0.94 (0.90, 0.98)
	15-<22.5	0.93 (0.90, 0.96)	0.96 (0.91, 1.02)	0.86 (0.81, 0.92)
	22.5+	0.94 (0.90, 0.97)	0.96 (0.89, 1.02)	0.89 (0.83, 0.96)
Swimming	None	1 (ref)	1 (ref)	1 (ref)
	0.1-<7.5	0.90 (0.88, 0.93)	0.90 (0.86, 0.95)	0.94 (0.89, 0.99)
	7.5-<15	0.95 (0.92, 0.98)	0.99 (0.93, 1.05)	0.94 (0.88, 1.01)
	15-<22.5	0.94 (0.90, 0.99)	0.99 (0.91, 1.08)	0.91 (0.82, 1.00)
	22.5+	1.03 (0.98, 1.09)	1.09 (0.99, 1.20)	1.05 (0.94, 1.16)
Aerobic	None	1 (ref)	1 (ref)	1 (ref)
	0.1-<7.5	0.95 (0.93, 0.96)	0.95 (0.92, 0.98)	0.95 (0.92, 0.98)
	7.5-<15	0.92 (0.90, 0.95)	0.95 (0.90, 1.00)	0.91 (0.86, 0.96)
	15-<22.5	0.92 (0.90, 0.94)	0.89 (0.85, 0.93)	0.97 (0.93, 1.02)
	22.5+	0.98 (0.95, 1.01)	0.98 (0.93, 1.04)	1.00 (0.95, 1.06)
Racquet sport	None	1 (ref)	1 (ref)	1 (ref)
	0.1-<7.5	0.86 (0.81, 0.93)	0.77 (0.67, 0.87)	0.89 (0.78, 1.01)
	7.5-<15	0.84 (0.75, 0.93)	0.73 (0.59, 0.89)	1.01 (0.85, 1.21)
	15-<22.5	0.80 (0.74, 0.86)	0.87 (0.77, 0.98)	0.80 (0.70, 0.91)
	22.5+	0.80 (0.76, 0.84)	0.77 (0.70, 0.85)	0.91 (0.83, 0.99)
Golf	None	1 (ref)	1 (ref)	1 (ref)
	0.1-<7.5	0.88 (0.84, 0.91)	0.87 (0.81, 0.93)	0.93 (0.86, 1.00)
	7.5-<15	0.93 (0.90, 0.97)	0.91 (0.85, 0.97)	1.00 (0.93, 1.08)
	15-<22.5	-	-	-
	22.5+	0.87 (0.85, 0.88)	0.83 (0.80, 0.86)	0.95 (0.92, 0.99)
Walking for exercise	None	1 (ref)	1 (ref)	1 (ref)
	0.1-<7.5	0.97 (0.95, 0.98)	0.96 (0.94, 0.99)	0.96 (0.94, 0.99)
	7.5-<15	0.91 (0.89, 0.92)	0.89 (0.86, 0.91)	0.96 (0.93, 1.00)
	15-<22.5	0.90 (0.89, 0.92)	0.88 (0.85, 0.90)	0.96 (0.93, 0.99)
	22.5+	-	-	-

HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the activity of interest).

Abbreviations: CI=confidence interval; HR=hazard ratio; MET=metabolic equivalent of task; NIH-AARP=National Institutes of Health-AARP.

eTable 7. Associations of Achieving 7.5 to <15 MET Hours per Week Through Each Activity Type With All-Cause Mortality by Average MET Hours per Week From Other Activities

Activity type	MET hours/week from other leisure time activities ^a	Deaths	HR (95% CI)	P _{het}
Running	Low	46,614	0.68 (0.55, 0.84)	
	High	66,235	0.89 (0.81, 0.97)	0.03
Cycling	Low	46,279	0.92 (0.89, 0.96)	
	High	54,118	1.00 (0.97, 1.02)	0.002
Swimming	Low	46,724	0.90 (0.84, 0.97)	
	High	63,761	0.97 (0.93, 1.01)	0.09
Aerobic exercise	Low	45,593	0.85 (0.81, 0.90)	
	High	45,599	0.97 (0.94, 1.01)	0.0001
Racquet sports	Low	47,122	0.77 (0.61, 0.97)	
	High	67,984	0.87 (0.77, 0.98)	0.36
Golf	Low	47,514	0.89 (0.84, 0.95)	
	High	57,319	0.96 (0.92, 1.01)	0.07
Walking for exercise	Low	29,603	0.88 (0.86, 0.91)	
	High	18,228	0.96 (0.93, 0.99)	0.0001

^aLow=<7.5; high=7.5 + MET hours per week.
 HRs for the associations of achieving 7.5-<15 MET hours per week through each activity in comparison with those who did not participate in each activity with all-cause mortality, stratified by average MET hours per week from the other six activities. HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the activity of interest).
 Abbreviations: BMI=body mass index; CI=confidence interval; HR=hazard ratio; MET=metabolic equivalent of task.

eTable 8. Associations of Two Activity Types With All-Cause Mortality in NIH-AARP Diet and Health Study Participants

	Running			Cycling			Swimming		
	Deaths/total	HR (95% CI)	P	Deaths/total	HR (95% CI)	P	Deaths/total	HR (95% CI)	P
Running				625/1904	0.91(0.84,0.98)	0.02	252/773	0.90(0.80,1.02)	0.11
Cycling	625/1904	0.91(0.84,0.98)	0.02				958/2493	0.94(0.88,1.00)	0.06
Swimming	252/773	0.90(0.80,1.02)	0.11	958/2493	0.94(0.88,1.00)	0.06			
Aerobic	675/2178	0.86(0.80,0.93)	0.0001	3139/7712	0.94(0.91,0.98)	0.003	836/2310	0.86(0.80,0.92)	<0.0001
Racquet sport	102/314	0.88(0.72,1.06)	0.18	221/628	0.97(0.85,1.10)	0.61	101/307	0.88(0.72,1.06)	0.18
Golf	148/431	0.92(0.79,1.09)	0.34	498/1342	0.85(0.77,0.92)	0.0002	224/589	0.90(0.79,1.02)	0.10
Walking for exercise	1345/3993	0.90(0.85,0.95)	0.0002	6426/15663	0.91(0.88,0.94)	<0.0001	2432/6263	0.87(0.83,0.91)	<0.0001
<p>HRs represent mortality risks for those achieving 7.5-<15 MET hrs/wk through a combination of two activities in comparison with those who did not participate in either activity. HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the two activities of interest). Abbreviations: CI=confidence interval; HR=hazard ratio; MET= metabolic equivalent of task; NIH-AARP=National Institutes of Health-AARP.</p>									

eTable 8. Associations of Two Activity Types With All-Cause Mortality in NIH-AARP Diet and Health Study Participants (continued)

	Aerobic			Racquet sport		
	Deaths/total	HR (95% CI)	P	Deaths/total	HR (95% CI)	P
Running	675/2178	0.86(0.80,0.93)	0.0001	102/314	0.88(0.72,1.06)	0.18
Cycling	3139/7712	0.94(0.91,0.98)	0.003	221/628	0.97(0.85,1.10)	0.61
Swimming	836/2310	0.86(0.80,0.92)	<0.0001	101/307	0.88(0.72,1.06)	0.18
Aerobic				187/579	0.88(0.77,1.02)	0.09
Racquet sport	187/579	0.88(0.77,1.02)	0.09			
Golf	444/1219	0.88(0.80,0.97)	0.01	68/195	0.99(0.78,1.26)	0.95
Walking for exercise	6178/15431	0.89(0.86,0.91)	<0.0001	336/1021	0.81(0.73,0.90)	0.0001

HRs represent mortality risks for those achieving 7.5-<15 MET hrs/wk through a combination of two activities in comparison with those who did not participate in either activity. HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the two activities of interest).

Abbreviations: CI=confidence interval; HR=hazard ratio; MET= metabolic equivalent of task; NIH-AARP=National Institutes of Health-AARP.

eTable 8. Associations of Two Activity Types With All-Cause Mortality in NIH-AARP Diet and Health Study Participants (continued)

	Golf			Walking for exercise		
	Deaths/total	HR (95% CI)	P	Deaths/total	HR (95% CI)	P
Running	148/431	0.92(0.79,1.09)	0.34	1345/3993	0.90(0.85,0.95)	0.0002
Cycling	498/1342	0.85(0.77,0.92)	0.0002	6426/15663	0.91(0.88,0.94)	<0.0001
Swimming	224/589	0.90(0.79,1.02)	0.10	2432/6263	0.87(0.83,0.91)	<0.0001
Aerobic	444/1219	0.88(0.80,0.97)	0.007	6178/15431	0.89(0.86,0.91)	<0.0001
Racquet sport	68/195	0.99(0.78,1.26)	0.95	336/1021	0.81(0.73,0.90)	0.0001
Golf				1210/2983	0.87(0.82,0.92)	<0.0001
Walking for exercise	1210/2983	0.87(0.82,0.92)	<0.0001			

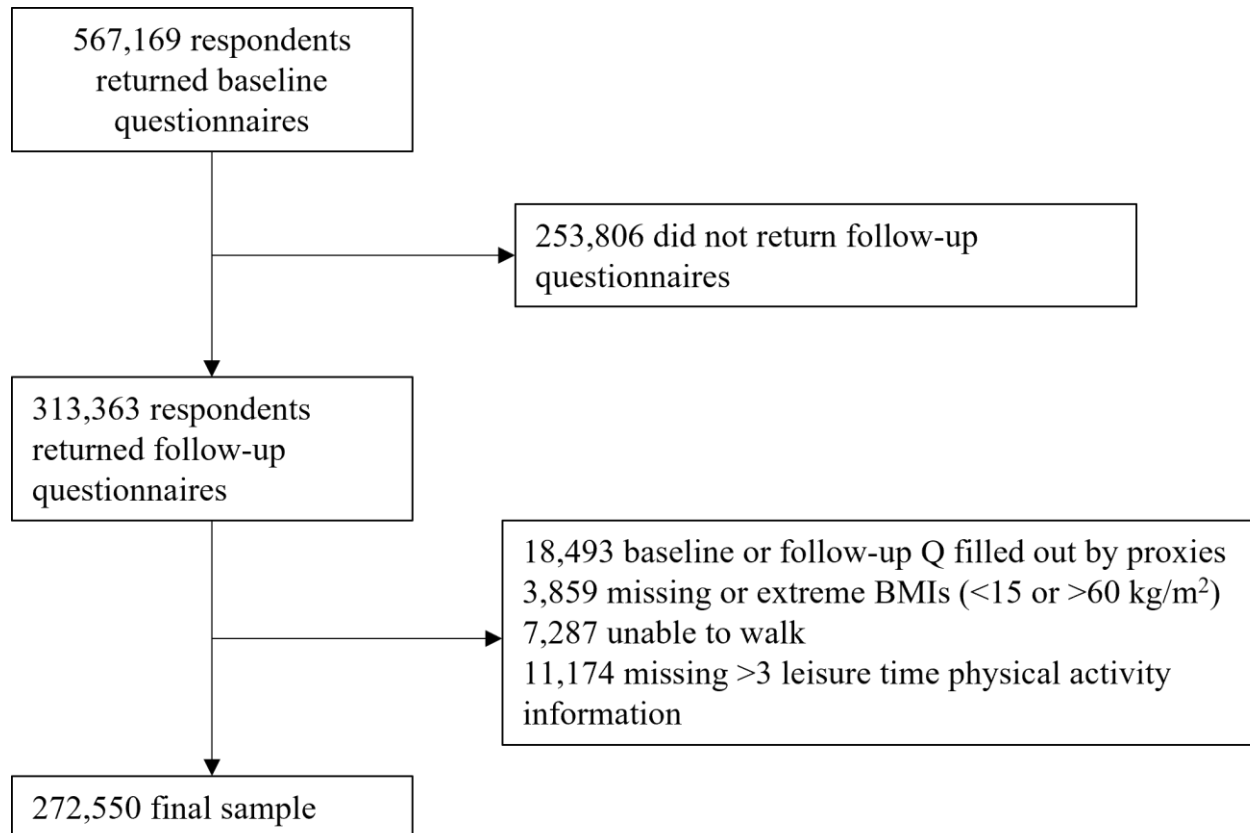
HRs represent mortality risks for those achieving 7.5-<15 MET hrs/wk through a combination of two activities in comparison with those who did not participate in either activity. HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the two activities of interest).

Abbreviations: CI=confidence interval; HR=hazard ratio; MET=metabolic equivalent of task; NIH-AARP=National Institutes of Health-AARP.

eTable 9. Associations of Each Activity With All-Cause, Cardiovascular and Cancer Mortality for NIH-AARP Diet and Health Study Participants (Any vs None)

		All-cause mortality			Cardiovascular mortality			Cancer mortality		
		Deaths	HR (95% CI)	P	Deaths	HR (95% CI)	P	Deaths	HR (95% CI)	P
Running	None	112,325	1 (ref)		36,457	1 (ref)		30,637	1 (ref)	
	Any	5,828	0.89 (0.87, 0.92)	<0.0001	1,843	0.91 (0.87, 0.96)	0.0003	1,729	0.88 (0.84, 0.93)	<0.0001
Cycling	None	91,052	1 (ref)		29,284	1 (ref)		25,099	1 (ref)	
	Any	27,101	0.95 (0.93, 0.96)	<0.0001	9,016	0.96 (0.94, 0.99)	0.002	7,267	0.92 (0.89, 0.94)	<0.0001
Swimming	None	107,366	1 (ref)		34,749	1 (ref)		29,313	1 (ref)	
	Any	10,787	0.94 (0.92, 0.95)	<0.0001	3,551	0.96 (0.93, 1.00)	0.03	3,053	0.95 (0.91, 0.98)	0.003
Aerobic exercise	None	86,023	1 (ref)		27,922	1 (ref)		23,422	1 (ref)	
	Any	32,130	0.94 (0.93, 0.95)	<0.0001	10,378	0.94 (0.92, 0.96)	<0.0001	8,944	0.95 (0.93, 0.98)	0.0009
Racquet sports	None	114,759	1 (ref)		37,274	1 (ref)		31,293	1 (ref)	
	Any	3,394	0.82 (0.79, 0.85)	<0.0001	1,026	0.79 (0.74, 0.84)	<0.0001	1,073	0.89 (0.84, 0.94)	0.0002
Golf	None	102,175	1 (ref)		33,283	1 (ref)		27,418	1 (ref)	
	Any	15,978	0.88 (0.86, 0.89)	<0.0001	5,017	0.84 (0.82, 0.87)	<0.0001	4,948	0.96 (0.93, 0.99)	0.007
Walking for exercise	None	28,506	1 (ref)		9,197	1 (ref)		7,736	1 (ref)	
	Any	89,647	0.94 (0.93, 0.95)	<0.0001	29,103	0.93 (0.90, 0.95)	<0.0001	24,630	0.96 (0.94, 0.99)	0.003
Test for heterogeneity				<0.0001			<0.0001			0.003

HRs represent mortality risks for participation in any amount of physical activity in comparison with who did not participate in the activity.
HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the activity of interest).
Heterogeneity between HRs for each activity type and mortality risk was assessed using the χ^2 test.
Abbreviations: CI=confidence interval; HR=hazard ratio; MET=metabolic equivalent of task; NIH-AARP=National Institutes of Health-AARP.



eFigure 1. Participant Inclusion Flow Chart

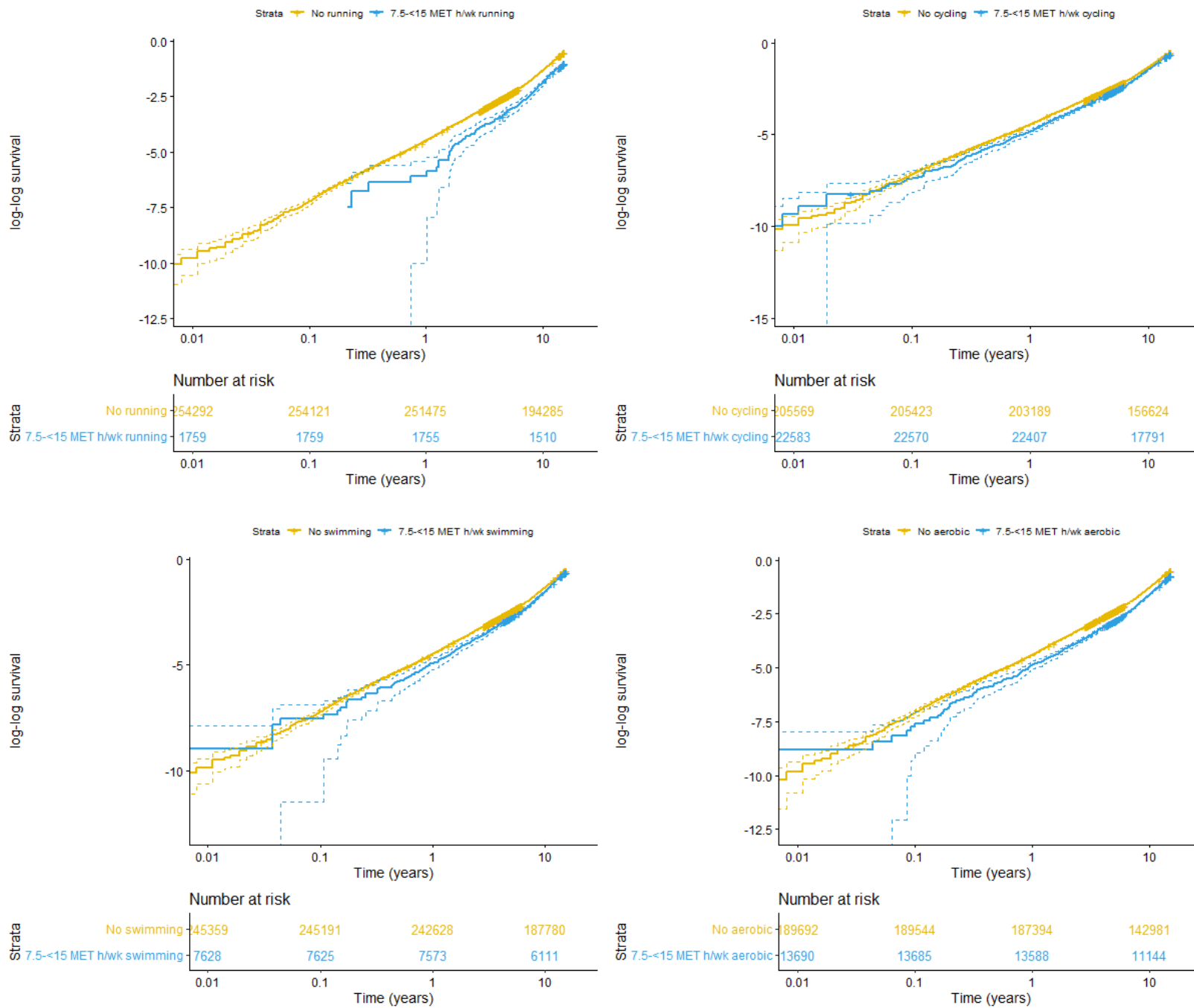
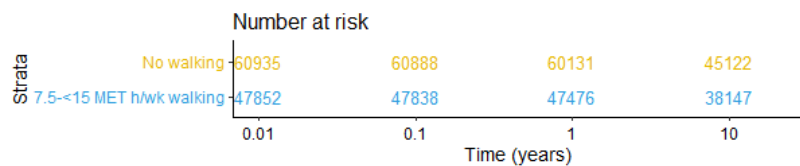
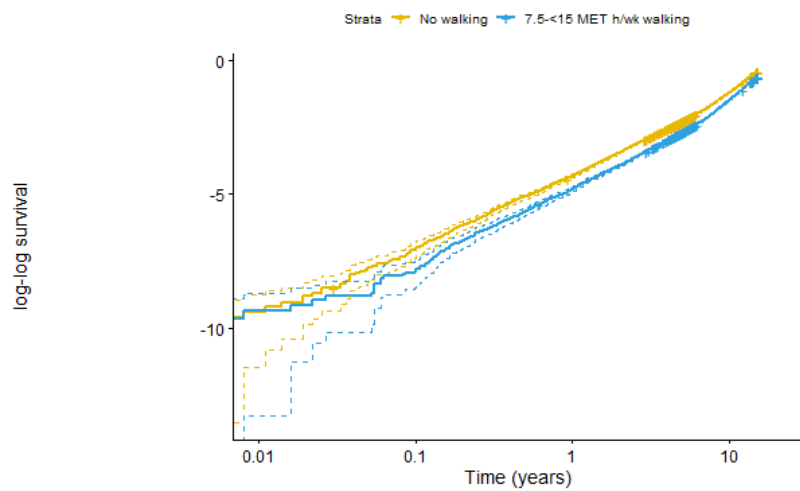
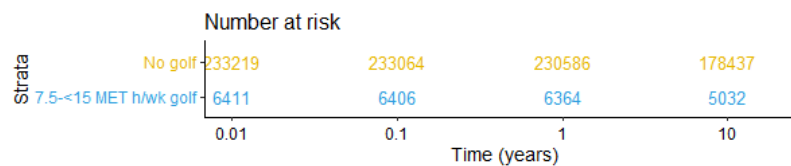
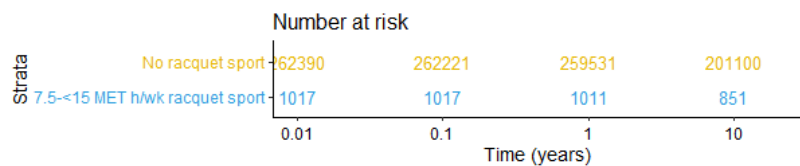
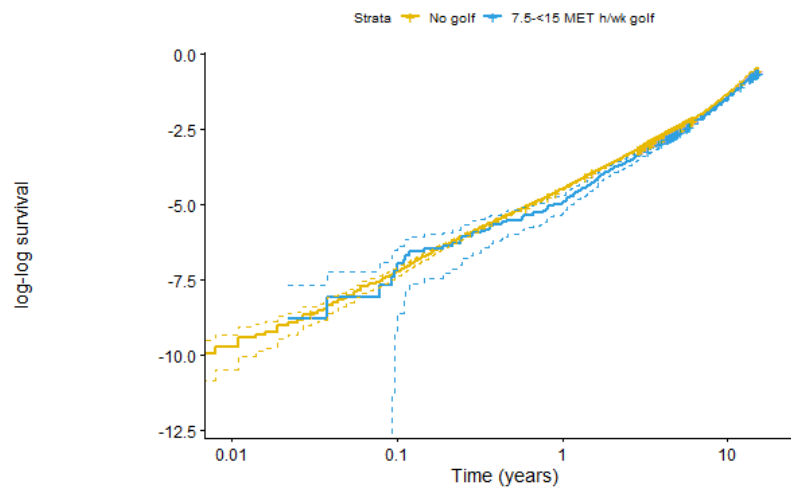
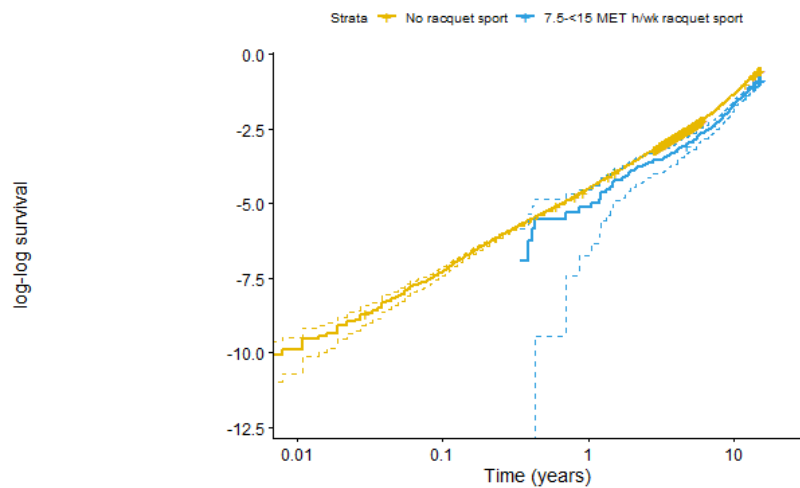
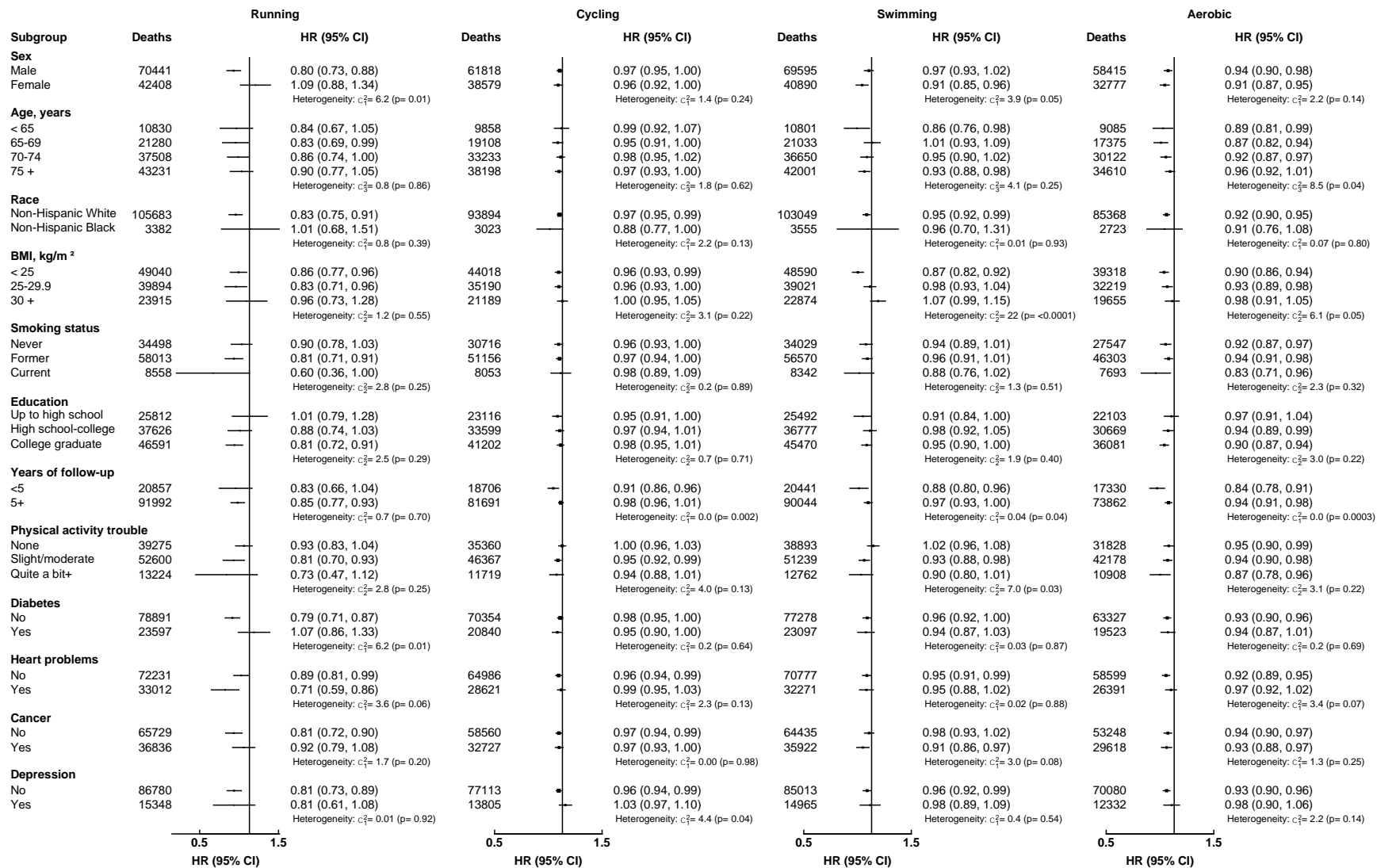


Figure 2. Log-Log Plots to Assess Proportional Hazards Assumption With All-Cause Mortality



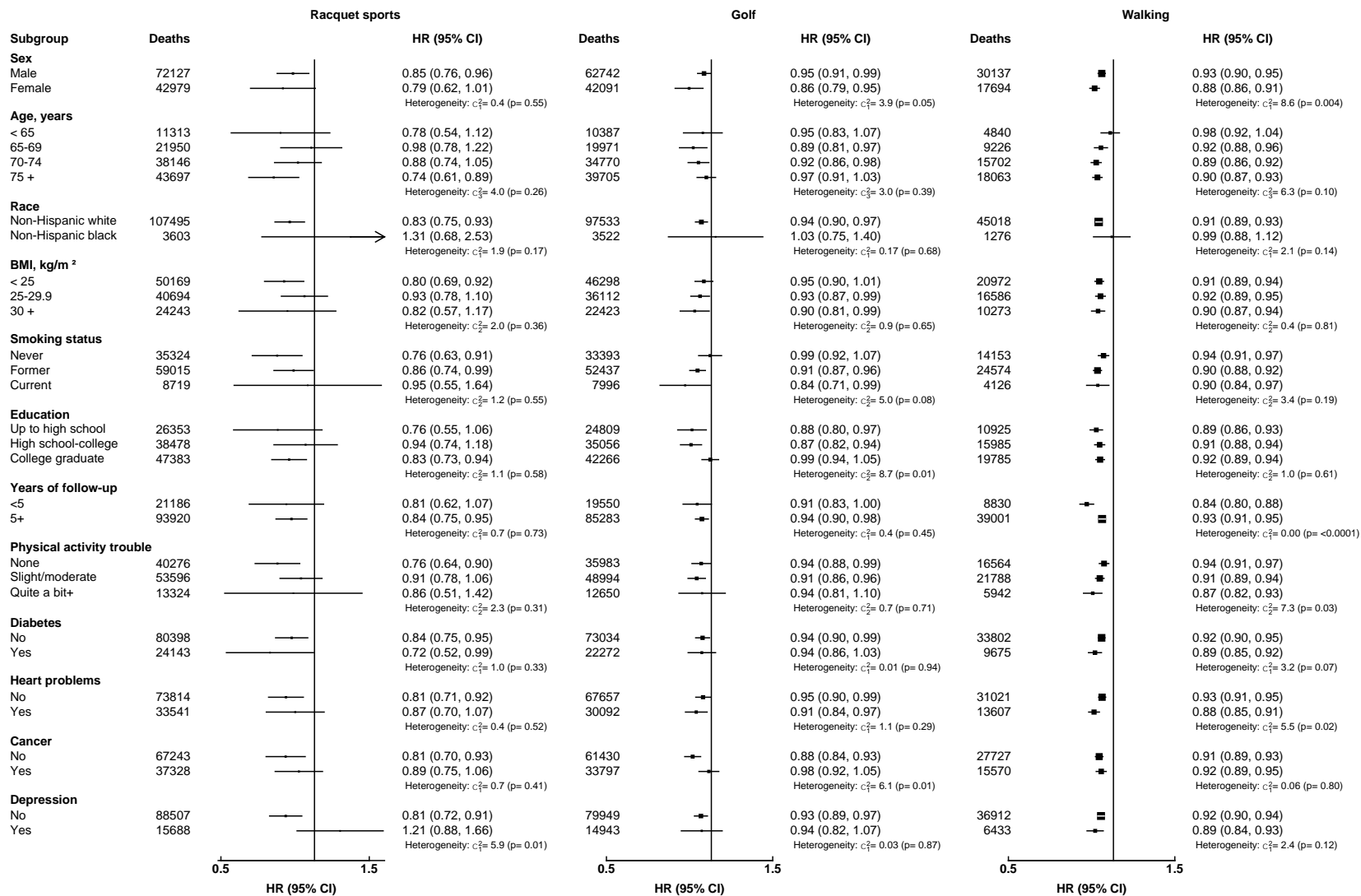
eFigure 2. Log-Log Plots to Assess Proportional Hazards Assumption With All-Cause Mortality (continued)



eFigure 3. Associations of Activity Types With All-Cause Mortality by Subgroups

HRs for the associations of meeting the recommended physical activity levels through different leisure time physical activities (7.5-<15 MET hrs/wk vs 0) with all-cause mortality, stratified by subgroups. HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the activity of interest). Heterogeneity in the associations for follow-up time was examined using in two different subgroups defined by follow-up period, using a χ^2 for heterogeneity. Heterogeneity in the associations for the non-case dependent subgroups was assessed using a χ^2 interaction term. The boxes represent the HRs, and vertical lines represent 95% CIs.

Abbreviations: CI=confidence interval; HR=hazard ratio; MET= metabolic equivalent of task.



eFigure 3. Associations of Activity Types With All-Cause Mortality by Subgroups (continued)

HRs for the associations of meeting the recommended physical activity levels through different leisure time physical activities with all-cause mortality (7.5-<15 MET hrs/wk vs 0), stratified by subgroups. HRs were adjusted for age, sex, racial/ethnic group, education, smoking status, BMI, alcohol consumption, marriage status, trouble with physical, history of stroke, history of heart attack, angina, or coronary artery disease, history of diabetes, ever been diagnosed with cancer, total MET hours per week from non-leisure time activities, sedentary time, weight training frequency and total MET hours per week from other leisure time activities (excluding the activity of interest). Heterogeneity in the associations for follow-up time was examined using in two different subgroups defined by follow-up period, using a χ^2 for heterogeneity. Heterogeneity in the associations for the non-case dependent subgroups was assessed using a χ^2 interaction term. The boxes represent the HRs, and vertical lines represent 95% CIs.

Abbreviations: CI=confidence interval; HR=hazard ratio; MET= metabolic equivalent of task.

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