Supplementary Online Content

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

Table S1. Comparison between those in the analytic sample (Accelerometer) and those who did not wear the device or who did not have at least one valid wear day (No accelerometer)

	Accelerometer	No accelerometer	Difference	
	(n=4,840)	(n=1,515)	(Accel - No Accel)	p^2
	Mean (SE)	**Mean (SE)**		
Age (years)	56.8 (0.4)	58.1 (1.3)	-1.3	0.07
BMI (kg/m2)	28.9 (0.1)	28.8 (0.3)	0.1	0.43
	% (SE)	**% (SE)**		
Sex (male)	46.5 (0.9)	49.1 (1.8)	-2.6	0.27
Ethnicity (Non-Hispanic black)	10.2 (1.3)	11.2 (1.3)	-1.0	0.38
BMI Status (Obese)	35.9 (1.0)	32.4 (1.7)	3.5	<0.001
Education (Less than high school)	17.4 (1.2)	23.2 (1.5)	-5.8	<0.001
Alcohol consumption (Current)	66.9 (1.7)	57.2 (1.7)	9.7	<0.001
Smoking habits (Current)	21.1 (0.9)	21.7 (1.3)	-0.6	0.77
Diabetes mellitus (Yes)	11.2 (0.6)	13.1 (1.4)	-1.9	0.16
Stroke (Yes)	3.9 (0.4)	6.2 (0.7)	-2.3	0.003
Coronary heart disease (Yes)	5.4 (0.4)	7.2 (1.0)	-1.8	0.002
Chronic bronchitis (Yes – current)	3.9 (0.3)	4.6 (0.6)	-0.7	0.55
Emphysema (Yes)	2.7 (0.4)	3.1 (0.7)	-0.4	0.54
Heart failure (Yes)	3.8 (0.3)	4.9 (0.7)	-1.1	0.03
Mobility limitation (Yes)[1]	22.2 (1.0)	31.2 (1.8)	-9.0	<0.001
Cancer/Malignancy (Yes)	12.9 (0.6)	10.9 (1.1)	2.0	0.12
General health (Fair/Poor)	18.4 (1.1)	20.2 (1.3)	-1.8	<0.001

Percentages, means, and confidence intervals are estimated using US population weights.
[1]Mobility limitation was assessed among those 60+ years of age, or younger individuals reporting some type of physical or mental limitation. Mobility limitation was defined as a report of having difficulty walking for a quarter mile, without special equipment, or walking up ten steps
[2]p-values indicate statistically significant differences between accelerometer vs. no accelerometer groups if p<0.05.

Table S2. Evaluation of model fit (C statistic) comparing covariate adjusted model 1 to model 2 with additional adjustment for steps/day

	C statistic
Model 1	0.787
Model 2	0.824

Model 1 – age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health.
Model 2 – Model 1 + steps/day

Table S3. Adjusted hazard ratios and mortality rates for all-cause mortality

Steps/day	Hazard ratios (95% CI)	
2000	1.51 (1.41, 1.62)	
4000	REFERENT	
6000	0.68 (0.64, 0.72)	
8000	0.49 (0.44, 0.55)	
10000	0.40 (0.34, 0.46)	
12000	0.35 (0.28, 0.45)	
14000	0.34 (0.28, 0.45)	
16000	0.34 (0.21, 0.56)	
p trend	<0.001	
Steps/day	Mortality rates (95% CI)	
2000	21.7 (19.4, 23.9)	
4000	14.4 (13.0, 15.7)	
6000	9.7 (8.6, 10.8)	
8000	7.1 (5.7, 8.4)	
10000	5.7 (4.4,7.0)	
12000	5.1 (3.8, 6.5)	
14000	4.9 (2.9, 6.9)	
16000	4.9 (2.0, 7.8)	

Hazard ratios and mortality rates were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. Estimated hazard ratios were computed using a cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day). Mortality rates were computed using the 2003 mortality rate for US adults (11.4 deaths per 1000 adults/year). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.

Table S4. Adjusted hazard ratios and mortality rates for all-cause mortality by **sex**

	Men	**Women**
Steps/day	Hazard ratios (95% CI)	Hazard ratios (95% CI)
2000	1.49 (1.33, 1.68)	1.57 (1.36, 1.82)
4000	REFERENT	REFERENT
6000	0.68 (0.62, 0.75)	0.66 (0.57, 0.76)
8000	0.48 (0.41, 0.58)	0.48 (0.37, 0.62)
10000	0.38 (0.31, 0.45)	0.41 (0.29, 0.58)
12000	0.32 (0.26, 0.39)	0.40 (0.26, 0.63)
14000	0.28 (0.20, 0.38)	0.45 (0.26, 0.77)
16000	0.26 (0.16, 0.41)	0.53 (0.27, 1.02)
p trend	<0.001	<0.001
Steps/day	Mortality rates (95% CI)	Mortality rates (95% CI)
2000	26.2 (22.2, 30.3)	18.0 (14.1, 21.9)
4000	17.7 (15.6, 19.7)	11.4 (10.3, 12.6)
6000	12.0 (9.4, 14.5)	7.6 (6.4, 8.7)
8000	8.6 (5.5, 11.6)	5.5 (4.1, 6.8)
10000	6.6 (4.1, 9.2)	4.7 (3.3, 6.0)
12000	5.6 (3.5, 7.6)	4.7 (2.9, 6.4)
14000	4.9 (2.6, 7.2)	5.2 (2.8, 7.5)
16000	4.5 (1.2, 7.9)	6.1 (2.2, 10.0)

Hazard ratios and mortality rates were adjusted for age, diet quality, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. Estimated hazard ratios were computed separately by sex using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day). Mortality rates were computed using 2003 mortality rates for US adults by sex (men, 13.0 deaths per 1000 adults/year; women, 9.9 deaths per 1000 adults/year). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.

Table S5. Adjusted hazard ratios and mortality rates for all-cause mortality by **age group**

	Age group		
	40-49 years	50-64 years	≥65 years
Steps/day	Hazard ratios (95% CI)		
2000	1.35 (0.98, 1.86)	1.72 (1.36, 2.17)	1.78 (1.61, 1.97)
4000	REFERENT	REFERENT	REFERENT
6000	0.75 (0.56, 1.00)	0.60 (0.48, 0.75)	0.58 (0.53, 0.64)
8000	0.58 (0.35, 0.96)	0.39 (0.27, 0.58)	0.38 (0.32, 0.44)
10000	0.47 (0.26, 0.87)	0.30 (0.18, 0.50)	0.29 (0.23, 0.36)
12000	0.41 (0.22, 0.76)	0.26 (0.14, 0.49)	0.26 (0.19, 0.35)
14000	0.37 (0.19, 0.71)	0.25 (0.12, 0.54)	0.27 (0.18, 0.40)
16000	0.34 (0.16, 0.72)	0.26 (0.10, 0.66)	0.29 (0.16, 0.51)
p trend	0.004	0.004	<0.001
Steps/day	Mortality rates (95% CI)		
2000	7.6 (2.4, 12.9)	39.0 (21.6, 56.3)	78.4 (67.8, 88.9)
4000	5.6 (2.5, 8.8)	18.1 (10.0, 26.2)	44.0 (41.2, 46.8)
6000	4.2 (2.9, 5.5)	8.8 (6.2, 11.3)	25.8 (23.0, 28.6)
8000	3.3 (2.4, 4.2)	4.9 (2.5, 7.3)	16.5 (14.4, 18.6)
10000	2.7 (1.8, 3.5)	3.4 (1.2, 5.6)	12.9 (10.1, 15.7)
12000	2.3 (1.3, 3.3)	2.9 (0.7, 5.1)	11.5 (5.8, 17.1)
14000	2.1 (0.5, 3.7)	2.8 (0.2, 5.4)	11.8 (2.7, 20.9)
16000	1.9 (0.0, 4.2)	3.1 (0.0, 6.2)	12.5 (0.6, 24.4)

Hazard ratios and mortality rates were adjusted for diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. Estimated hazard ratios were computed separately by age group using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day). Mortality rates were computed using 2003 mortality rates for US adults by age group (40-49 years, 3.1 deaths per 1000 adults/year; 50-64 years, 9.4 deaths per 1000 adults/year; 65+ yrs, 35.8 deaths per 1000 adults/year). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.

Table S6. Adjusted hazard ratios and mortality rates for all-cause mortality by **race-ethnicity**

	Race-ethnicity		
	Non-Hispanic White	Non-Hispanic Black	Mexican-American
Steps/day	Hazard ratios (95% CI)		
2000	1.53 (1.39, 1.68)	1.59 (1.37, 1.85)	1.25 (0.99, 1.58)
4000	REFERENT	REFERENT	REFERENT
6000	0.67 (0.62, 0.73)	0.65 (0.56, 0.74)	0.81 (0.65, 1,00)
8000	0.48 (0.42, 0.55)	0.45 (0.35, 0.59)	0.66 (0.45, 0.98)
10000	0.38 (0.32, 0.46)	0.37 (0.26, 0.51)	0.56 (0.34, 0.93)
12000	0.34 (0.25, 0.47)	0.34 (0.23, 0.51)	0.50 (0.28, 0.86)
14000	0.33 (0.19, 0.55)	0.35 (0.22, 0.55)	0.44 (0.24, 0.81)
16000	0.33 (0.15, 0.70)	0.37 (0.22, 0.64)	0.40 (0.21, 0.78)
p trend	<0.001	<0.001	0.02
Steps/day	Mortality rates (95% CI)		
2000	18.8 (16.5, 21.2)	26.7 (20.8, 32.6)	10.1 (5.6, 14.6)
4000	12.3 (10.9, 13.7)	16.8 (14.4, 19.2)	8.1 (4.1, 12.0)
6000	8.2 (7.0, 9.4)	10.9 (9.0, 12.8)	6.5 (5.1, 7.9)
8000	5.9 (4.5, 7.3)	7.6 (5.4, 9.7)	5.3 (2.8, 7.9)
10000	4.7 (3.1, 6.3)	6.2 (3.8, 8.6)	4.6 (1.8, 7.3)
12000	4.2 (2.4, 6.0)	5.6 (3.2, 8.1)	4.0 (1.8, 6.2)
14000	4.0 (1.3, 6.8)	5.8 (3.4, 8.2)	3.6 (2.0, 5.1)
16000	4.0 (0.1, 7.9)	6.2 (3.5, 8.9)	3.2 (1.7, 4.8)

Hazard ratios and mortality rates were adjusted for age, diet quality, sex, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. Estimated hazard ratios were computed separately by race/ethnicity using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day). Mortality rates were computed using 2003 mortality rates for US adults by ethnicity (non-Hispanic Whites, 10.0 deaths per 1000 adults/year; non-Hispanic Blacks, 13.8 deaths per 1000 adults/year; Mexican-Americans, 5.6 deaths per 1000 adults/year). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.

Table S7. Association between stepping intensity and all-cause mortality: hazard ratios and mortality rates (per 1,000 adults/year)

			Quartiles				
		1	**2**	**3**	**4**	
Bout cadence (steps per minute)	No bouts	60-76.0	76.1-81.0	81.1-88.5	>88.5	
	(n=496)	(n=1,129)	(n=1,023)	(n=1,116)	(n=1,076)	p trend
N deaths	320	277	183	215	170	
Hazard ratios Model 1	2.15 (1.83, 2.52)	1.00 (REF)	0.91 (0.71, 1.18)	1.01 (0.82, 1.23)	0.95 (0.77, 1.17)	0.80
Model 2	1.72 (1.42, 2.08)	1.00 (REF)	0.95 (0.73, 1.24)	1.05 (0.85, 1.29)	1.07 (0.88, 1.29)	0.61
Mortality rates Model 1	18.5 (17.1, 19.8)	8.7 (6.2, 11.1)	7.9 (5.9, 9.9)	8.7 (5.8, 11.6)	8.2 (5.3, 11.1)	
Model 2	16.0 (14.4, 17.5)	9.4 (6.9, 11.8)	8.9 (6.9, 10.9)	9.7 (6.6, 12.8)	9.9 (6.3, 13.5)	
Peak 30 cadence (steps per minute)	No bouts	0-56.0	56.1-69.2	69.3-82.8	>82.8	
	(n=496)	(n=1,080)	(n=1,153)	(n=1,074)	(n=1,037)	p trend
N deaths	320	406	207	124	108	
Hazard ratios Model 1	1.91 (1.57, 2.31)	1.00 (REF)	0.74 (0.61, 0.89)	0.59 (0.41, 0.85)	0.52 (0.37, 0.74)	<0.001
Model 2	1.69 (1.37, 2.08)	1.00 (REF)	0.91 (0.76, 1.10)	0.86 (0.66, 1.23)	0.90 (0.65, 1.27)	0.34
Mortality rates Model 1	19.0 (17.7, 20.4)	10.0 (7.1, 12.9)	7.4 (5.0, 9.9)	5.9 (3.5, 8.4)	5.2 (3.2, 7.3)	
Model 2	15.7 (14.2, 17.3)	9.4 (6.9, 11.8)	8.6 (5.6, 11.50)	8.0 (4.6, 11.3)	8.4 (4.0, 12.9)	
Peak 1 cadence (steps per minute)	No bouts	0-89.9	90.0-101.9	102.0-112.4	>112.4	
	(n=496)	(n=1,055)	(n=1,141)	(n=1,065)	(n=1,083)	p trend
N deaths	320	351	226	146	122	
Hazard ratios Model 1	2.01 (1.68, 2.40)	1.00 (REF)	0.87 (0.71, 1.05)	0.74 (0.55, 1.00)	0.74 (0.55, 0.98)	0.04
Model 2	1.71 (1.39, 2.11)	1.00 (REF)	1.02 (0.85, 1.23)	0.97 (0.74, 1.28)	1.10 (0.81, 1.49)	0.80
Mortality rates Model 1	18.4 (17.0, 19.7)	9.1 (6.2, 12.0)	8.0 (5.3, 10.7)	6.7 (4.3, 9.2)	6.7 (4.5, 9.0)	
Model 2	15.1 (13.3, 16.8)	8.9 (6.2, 11.6)	9.0 (6.1, 11.9)	8.6 (5.2, 11.9)	9.7 (6.1, 13.3)	

Step intensity was defined using quartiles of: Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater; Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive); Peak 1 cadence: average steps per minute recorded for the highest minute in a day

No bouts – No bouts of 2 consecutive minutes or greater; 496 participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.

Model 1 – age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and stepping intensity

Model 2 – Model 1 + steps per day (continuous)

P trend was computed separately for model 1 and 2 and did not include the no bout group.

Table S8. Adjusted hazard ratios for all-cause mortality across quartiles of step intensity using walking bout cadence, peak 30-min cadence, and peak 1-min cadence – **men**.

Quartiles		1	2	3	4	
Bout cadence (steps per minute)	No bouts	60-75.4	75.5-79.6	79.7-85.8	>85.8	
	(n=178)	(n=777)	(n=672)	(n=430)	(n=348)	p trend
N deaths	140	220	156	98	66	
Model 1	2.42 (1.86, 3.13)	1.00 (REF)	1.10 (0.85, 1.41)	1.08 (0.82, 1.43)	0.79 (0.60, 1.04)	0.38
Model 2	1.74 (1.32, 2.30)	1.00 (REF)	1.12 (0.88, 1.44)	1.11 (0.84, 1.47)	0.88 (0.69, 1.13)	0.74
Peak 30 cadence (steps per minute)	No bouts	0-59.9	60.0-72.2	72.3-84.4	>84.4	
	(n=178)	(n=638)	(n=561)	(n=510)	(n=518)	p trend
N deaths	140	283	116	80	61	
Model 1	1.98 (1.50, 2.62)	1.00 (REF)	0.64 (0.49, 0.83)	0.66 (0.44, 1.01)	0.40 (0.28, 0.58)	<0.001
Model 2	1.64 (1.21, 2.22)	1.00 (REF)	0.82 (0.62, 1.08)	1.05 (0.69, 1.60)	0.75 (0.51, 1.10)	0.43
Peak 1 cadence (steps per minute)	No bouts	0-91.6	91.7-101.7	101.8-110.8	>110.8	
	(n=178)	(n=613)	(n=550)	(n=500)	(n=564)	p trend
N deaths	140	252	124	87	77	
Model 1	2.09 (1.61, 2.72)	1.00 (REF)	0.79 (0.61, 1.03)	0.71 (0.47, 1.07)	0.56 (0.43, 0.74)	0.002
Model 2	1.65 (1.23, 2.28)	1.00 (REF)	0.94 (0.70, 1.26)	0.93 (0.63, 1.39)	0.88 (0.65, 1.20)	0.66

Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 178 male participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Model 1 – age, diet quality, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and stepping intensity
Model 2 – Model 1 + steps per day (continuous)
P trend was computed separately for each model 1 and 2 and did not include the no bout group.

Table S9. Adjusted hazard ratios for all-cause mortality across quartiles of step intensity using walking bout cadence, peak 30-min cadence, and peak 1-min cadence – **women**.

Quartiles		1	2	3	4	
Bout cadence (steps per minute)	No bouts	60-76.9	77.0-83.0	83.1-90.6	>90.6	
	(n=318)	(n=520)	(n=541)	(n=529)	(n=527)	p trend
N deaths	180	93	64	78	70	
Model 1	2.27 (1.72, 2.98)	1.00 (REF)	0.86 (0.55, 1.33)	1.19 (0.84, 1.69)	1.14 (0.83, 1.57)	0.54
Model 2	1.89 (1.43, 2.51)	1.00 (REF)	0.87 (0.56, 1.36)	1.27 (0.88. 1.83)	1.28 (0.93, 1.74)	0.33
Peak 30 cadence (steps per minute)	No bouts	0-52.7	52.8-66.0	66.1-81.0	>81.0	
	(n=318)	(n=471)	(n=584)	(n=555)	(n=507)	p trend
N deaths	180	143	78	42	42	
Model 1	1.99 (1.59, 2.49)	1.00 (REF)	0.91 (0.65, 1.28)	0.49 (0.28, 0.86)	0.78 (0.43, 1.39)	0.17
Model 2	1.80 (1.42, 2.28)	1.00 (REF)	1.06 (0.76, 1.49)	0.64 (0.38, 1.10)	1.21 (0.73, 2.02)	0.32
Peak 1 cadence (steps per minute)	No bouts	0-87.6	87.7-102.3	102.4-113.8	>113.8	
	(n=318)	(n=471)	(n=565)	(n=539)	(n=542)	p trend
N deaths	180	116	84	56	49	
Model 1	2.15 (1.65, 2.81)	1.00 (REF)	1.01 (0.70, 1.45)	0.78 (0.47, 1.32)	0.97 (0.62, 1.53)	0.61
Model 2	1.89 (1.41, 2.52)	1.00 (REF)	1.14 (0.82, 1.58)	0.98 (0.59, 1.61)	1.34 (0.88, 2.02)	0.76

Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 178 male participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Model 1 – age, diet quality, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and stepping intensity
Model 2 – Model 1 + steps per day (continuous)
P trend was computed separately for each model 1 and 2 and did not include the no bout group.

Table S10. Adjusted hazard ratios for all-cause mortality across quartiles of step intensity using walking bout cadence, peak 30-min cadence, and peak 1-min cadence – age **40-49 years.**

Quartiles		1	2	3	4	
Bout cadence (steps per minute)	No bouts	60.0-76.8	76.9-82.2	82.3-89.1	>89.1	
	(n=34)	(n=296)	(n=316)	(n=323)	(n=300)	p trend
N deaths	5	19	14	15	16	
Model 1	3.53 (1.61, 7.78)	1.00 (REF)	0.96 (0.40, 2.31)	0.89 (0.38, 2.07)	0.89 (0.40, 1.96)	0.74
Model 2	2.69 (1.07, 6.80)	1.00 (REF)	1.00 (0.41, 2.43)	0.88 (0.38, 2.05)	0.88 (0.40, 1.96)	0.73
Peak 30 cadence (steps per minute)	No bouts	0-64.1	64.2-75.2	75.3-87.6	>87.6	
	(n=34)	(n=305)	(n=314)	(n=311)	(n=305)	p trend
N deaths	5	25	11	12	16	
Model 1	2.16 (0.96, 4.84)	1.00 (REF)	0.20 (0.07, 0.54)	0.52 (0.23, 1.15)	0.66 (0.25, 1.74)	0.13
Model 2	2.04 (0.88, 4.78)	1.00 (REF)	0.23 (0.07, 0.72)	0.62 (0.23, 1.69)	0.85 (0.25, 2.96)	0.46
Peak 1 cadence (steps per minute)	No bouts	0-97.9	98.0-107.0	107.1-116.0	>116.0	
	(n=34)	(n=322)	(n=291)	(n=312)	(n=310)	p trend
N deaths	5	24	12	12	16	
Model 1	2.81 (1.30, 6.08)	1.00 (REF)	0.56 (0.24, 1.32)	0.52 (0.20, 1.38)	0.85 (0.34, 2.15)	0.42
Model 2	2.48 (1.04, 5.89)	1.00 (REF)	0.64 (0.26, 1.58)	0.63 (0.22, 1.79)	1.07 (0.37, 3.08)	0.81

Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 178 male participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Model 1 – diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and stepping intensity
Model 2 – Model 1 + steps per day (continuous)
P trend was computed separately for each model 1 and 2 and did not include the no bout group.

Table S11. Adjusted hazard ratios for all-cause mortality across quartiles of step intensity using walking bout cadence, peak 30-min cadence, and peak 1-min cadence – age **50-64 years.**

Quartiles			1	2	3	4	
Bout cadence (steps per minute)	No bouts		60.0-75.8	75.9-80.7	80.8-88.1	>88.1	
	(n=108)		(n=397)	(n=391)	(n=425)	(n=442)	p trend
N deaths	44		53	50	57	42	
Model 1	2.26 (1.34, 3.83)		1.00 (REF)	0.99 (0.64, 1.52)	1.15 (0.66, 2.01)	1.04 (0.61, 1.76)	0.69
Model 2	1.73 (1.02, 2.93)		1.00 (REF)	1.05 (0.66, 1.66)	1.20 (0.70, 2.05)	1.17 (0.69, 1.98)	0.45
Peak 30 cadence (steps per minute)	No bouts		0-58.7	58.8-70.2	70.3-82.9	>82.9	
	(n=108)		(n=411)	(n=407)	(n=422)	(n=415)	p trend
N deaths	44		86	49	37	30	
Model 1	1.79 (1.03, 3.10)		1.00 (REF)	0.72 (0.38, 1.36)	0.53 (0.24, 1.17)	0.49 (0.23, 1.06)	0.08
Model 2	1.59 (0.89, 2.84)		1.00 (REF)	0.97 (0.57, 1.65)	0.85 (0.45, 1.62)	1.06 (0.53, 2.11)	0.68
Peak 1 cadence (steps per minute)	No bouts		0-91.6	91.7-102.5	102.6-112.0	>112.0	
	(n=108)		(n=410)	(n=404)	(n=410)	(n=431)	p trend
N deaths	44		78	50	40	34	
Model 1	2.11 (1.18, 3.78)		1.00 (REF)	0.95 (0.55, 1.63)	0.88 (0.41, 1.89)	0.86 (0.45, 1.66)	0.77
Model 2	1.73 (0.94, 3.21)		1.00 (REF)	1.20 (0.72, 2.00)	1.25 (0.62, 2.51)	1.44 (0.81, 2.56)	0.24

Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 178 male participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Model 1 – diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and stepping intensity
Model 2 – Model 1 + steps per day (continuous)
P trend was computed separately for each model 1 and 2 and did not include the no bout group.

Table S12. Adjusted hazard ratios for all-cause mortality across quartiles of step intensity using walking bout cadence, peak 30-min cadence, and peak 1-min cadence – age **65+ years.**

Quartiles		1	2	3	4	
Bout cadence (steps per minute)	No bouts	60.0-74.6	74.7-80.0	80.1-86.7	>86.7	
	(n=363)	(n=385)	(n=391)	(n=380)	(n=417)	p trend
N deaths	277	164	149	151	141	
Model 1	2.66 (2.10, 3.37)	1.00 (REF)	0.93 (0.68, 1.25)	0.96 (0.75, 1.24)	0.91 (0.72, 1.15)	0.53
Model 2	1.86 (1.49, 2.32)	1.00 (REF)	1.04 (0.79, 1.38)	1.08 (0.85, 1.38)	1.18 (0.95, 1.46)	0.31
Peak 30 cadence (steps per minute)	No bouts	0-41.1	41.2-55.3	55.4-69.9	>69.9	
	(n=363)	(n=204)	(n=431)	(n=475)	(n=463)	p trend
N deaths	277	114	206	157	128	
Model 1	1.73 (1.30, 2.30)	1.00 (REF)	0.72 (0.53, 0.97)	0.45 (0.33, 0.62)	0.35 (0.25, 0.51)	<0.001
Model 2	1.66 (1.27, 2.17)	1.00 (REF)	0.93 (0.67, 1.31)	0.80 (0.51, 1.26)	0.89 (0.53, 1.48)	0.36
Peak 1 cadence (steps per minute)	No bouts	0-74.6	74.7-91.0	91.1-104.5	>104.5	
	(n=363)	(n=215)	(n=429)	(n=455)	(n=474)	p trend
N deaths	277	103	201	161	140	
Model 1	2.37 (1.77, 3.18)	1.00 (REF)	1.01 (0.71, 1.44)	0.74 (0.52, 1.05)	0.60 (0.40, 0.88)	0.01
Model 2	2.04 (1.57, 2.66)	1.00 (REF)	1.30 (0.91, 1.84)	1.18 (0.82, 1.72)	1.22 (0.75, 1.98)	0.48

Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 178 male participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Model 1 – age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and stepping intensity
Model 2 – Model 1 + steps per day (continuous)
P trend was computed separately for each model 1 and 2 and did not include the no bout group.

Table S13. Correlation matrix for stepping intensity and total steps per day

	Bout cadence	Peak 30 cadence	Peak 1 cadence	Total steps/day
Bout cadence	1	0.62	0.62	0.17
Peak 30 cadence		1	0.88	0.77
Peak 1 cadence			1	0.63

All p-values <0.001.

Table S14. All-cause mortality rates (per 1,000 adults/year) for the joint associations between steps per day and stepping intensity.

	Steps/day			
	<4000	4000-7999	8000-11999	12000+
	MR (95% CI)	MR (95% CI)	MR (95% CI)	MR (95% CI)
Bout cadence (steps per minute)				
No bouts	23.3 (18.6, 28.0)	16.8 (10.1, 23.5)	22.5 (0.0, 54.2)	-
60.0-76.0	14.9 (8.2, 21.6)	8.9 (6.9, 10.9)	6.6 (1.7, 11.5)	5.4 (0.0, 16.5)
76.1-81.0	11.9 (5.4, 18.3)	9.2 (6.3, 12.1)	5.5 (1.7, 9.2)	5.0 (0.0, 17.5)
81.1-88.5	14.9 (0.0, 30.4)	10.1 (6.1, 14.2)	5.6 (0.9, 10.2)	5.4 (0.0, 19.4)
88.6-155.0	15.6 (4.7, 26.6)	10.8 (4.4, 17.3)	5.7 (0.9, 10.3)	5.1 (0.0, 14.3)
Peak 30 cadence (steps per minute)				
No bouts	23.5 (18.6, 28.4)	16.8 (9.8, 23.7)	22.5 (0.0, 53.5)	-
18.5-56.0	14.3 (8.7, 19.8)	10.0 (8.0, 12.0)	8.3 (0.0, 22.4)	-
56.1-69.2	21.4 (0.0, 57.4)	9.4 (6.4, 12.3)	6.2 (1.7, 10.6)	3.6 (0.0, 14.2)
69.3-82.8	-	7.9 (1.2, 14.6)	5.6 (1.3, 9.8)	5.7 (0.0, 16.9)
82.9-149.5	-	8.9 (0.0, 23.2)	5.4 (1.1, 9.6)	4.9 (0.0, 12.5)
Peak 1 cadence (steps per minute)				
No bouts	23.3 (18.3, 28.2)	16.8 (10.1, 23.5)	22.6 (0.0, 55.0)	-
39.2-89.9	14.0 (8.2, 19.8)	9.2 (7.4, 11.0)	7.2 (0.9, 13.4)	6.5 (0.0, 22.1)
90.0-101.9	13.6 (4.4, 22.7)	9.7 (5.7, 13.7)	6.4 (1.9, 10.9)	5.2 (0.0, 16.6)
102.0-112.4	25.9 (0.0, 58.7)	9.1 (5.8, 12.5)	5.0 (1.4, 8.6)	5.1 (0.0, 20.3)
112.5-173.3	15.1 (0.0, 51.7)	12.4 (4.6, 20.3)	5.7 (1.5, 9.9)	5.2 (0.0, 16.2)

Step intensity was defined as:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 496 participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Mortality rates (MR) were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. Rates were computed using the 2003 mortality rate for US adults (11.4 deaths per 1000 adults/year). Models included US population and study design weights to account for the complex survey design and models were replicated 5 times to account for imputed steps data. Confidence intervals were calculated as ±1.96 standard errors and values were truncated to 0 when confidence intervals were negative.

Table S15. Adjusted hazard ratios and mortality rates for CVD and Cancer mortality

	CVD	Cancer
Steps/day	Hazard ratios (95% CI)	Hazard ratios (95% CI)
2000	1.51 (1.32, 1.72)	1.23 (1.09, 1.53)
4000	REFERENT	REFERENT
6000	0.68 (0.60, 0.76)	0.82 (0.72, 0.92)
8000	0.49 (0.40, 0.60)	0.67 (0.54, 0.82)
10000	0.40 (0.30, 0.52)	0.55 (0.42, 0.72)
12000	0.35 (0.24, 0.52)	0.45 (0.31, 0.66)
14000	0.34 (0.24, 0.52)	0.37 (0.21, 0.66)
16000	0.34 (0.15, 0.77)	0.31 (0.14, 0.70)
Steps/day	Mortality rates (95% CI)	Mortality rates (95% CI)
2000	7.3 (6.2, 8.4)	4.9 (3.8, 5.9)
4000	4.6 (3.9, 5.4)	4.0 (3.2, 3.8)
6000	3.0 (2.2, 3.9)	3.3 (2.8, 3.8)
8000	2.1 (1.1, 3.2)	2.7 (2.0, 3.4)
10000	1.7 (0.7, 2.7)	2.4 (1.7, 3.1)
12000	1.5 (0.6, 2.4)	2.2 (1.3, 3.1)
14000	1.5 (0.4, 2.6)	2.1 (0.6, 3.5)
16000	1.6 (0.1, 3.0)	2.0 (0.0, 4.0)

Hazard ratios and mortality rates were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. . Estimated hazard ratios were computed separately for cardiovascular disease (CVD) and cancer using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day). Mortality rates were computed using 2003 mortality rates for US adults (CVD, 3.9 deaths per 1000 adults/year; Cancer, 3.3 deaths per 1000 adults/year). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.

Table S16. Adjusted hazard ratios for **cardiovascular disease mortality** across quartiles of stepping intensity

Quartiles		1	2	3	4	
Bout cadence (steps per minute)	No bouts	60-76.0	76.1-81.0	81.1-88.5	>88.5	
	(n=496)	(n=1,129)	(n=1,023)	(n=1,116)	(n=1,076)	p trend
N deaths	127	90	68	69	52	
Model 1	2.26 (1.69, 3.01)	1.00 (REF)	1.03 (0.65, 1.62)	1.06 (0.77, 1.45)	0.82 (0.54, 1.24)	0.63
Model 2	1.80 (1.30, 2.49)	1.00 (REF)	1.07 (0.67, 1.69)	1.10 (0.80, 1.50)	0.94 (0.63, 1.40)	0.99
Peak 30 cadence (steps per minute)	No bouts	0-56.0	56.1-69.2	69.3-82.8	>82.8	
	(n=496)	(n=1,080)	(n=1,153)	(n=1,074)	(n=1,037)	p trend
N deaths	127	144	66	35	34	
Model 1	1.95 (1.53, 2.49)	1.00 (REF)	0.66 (0.48, 0.91)	0.61 (0.38, 0.98)	0.40 (0.24, 0.67)	0.002
Model 2	1.73 (1.30, 2.29)	1.00 (REF)	0.82 (0.56, 1.20)	0.89 (0.52, 1.53)	0.69 (0.35, 1.38)	0.13
Peak 1 cadence (steps per minute)	No bouts	0-89.9	90.0-101.9	102.0-112.4	>112.4	
	(n=496)	(n=1,055)	(n=1,141)	(n=1,065)	(n=1,083)	p trend
N deaths	127	133	65	48	33	
Model 1	1.87 (1.45, 2.40)	1.00 (REF)	0.61 (0.42, 0.89)	0.59 (0.36, 0.98)	0.50 (0.28, 0.88)	0.006
Model 2	1.63 (1.22, 2.16)	1.00 (REF)	0.71 (0.49, 1.03)	0.75 (0.45, 1.24)	0.72 (0.38, 1.36)	0.09

Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 178 male participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Model 1 – age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and stepping intensity
Model 2 – Model 1 + steps per day (continuous)
P trend was computed separately for each model 1 and 2 and did not include the no bout group.

Table S17. Adjusted hazard ratios for **cancer mortality** across quartiles of stepping intensity

Quartiles			1	2	3	4	
Bout cadence (steps per minute)		No bouts	60-76.0	76.1-81.0	81.1-88.5	>88.5	
		(n=496)	(n=1,129)	(n=1,023)	(n=1,116)	(n=1,076)	p trend
N deaths		47	70	48	69	49	
Model 1		1.26 (0.73, 2.18)	1.00 (REF)	1.07 (0.72, 1.60)	1.45 (0.91, 2.29)	1.31 (0.74, 2.31)	0.20
Model 2		1.07 (0.56, 2.02)	1.00 (REF)	1.10 (0.74, 1.63)	1.49 (0.94, 2.35)	1.41 (0.82, 2.40)	0.12
Peak 30 cadence (steps per minute)		No bouts	0-56.0	56.1-69.2	69.3-82.8	>82.8	
		(n=496)	(n=1,080)	(n=1,153)	(n=1,074)	(n=1,037)	p trend
N deaths		47	91	67	44	34	
Model 1		1.08 (0.64, 1.83)	1.00 (REF)	1.12 (0.75, 1.66)	0.72 (0.42, 1.23)	0.71 (0.33, 1.54)	0.35
Model 2		0.98 (0.55, 1.74)	1.00 (REF)	1.33 (0.87, 2.04)	0.98 (0.58, 1.67)	1.13 (0.54, 2.35)	0.62
Peak 1 cadence (steps per minute)		No bouts	0-89.9	90.0-101.9	102.0-112.4	>112.4	
		(n=496)	(n=1,055)	(n=1,141)	(n=1,065)	(n=1,083)	p trend
N deaths		47	77	73	40	46	
Model 1		1.24 (0.75, 2.04)	1.00 (REF)	1.42 (0.99, 2.05)	1.00 (0.62, 1.60)	1.32 (0.78, 2.23)	0.32
Model 2		1.06 (0.60, 1.89)	1.00 (REF)	1.67 (1.13, 2.48)	1.30 (0.79, 2.15)	1.91 (1.10, 3.31)	0.03

Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
No bouts – No bouts of 2 consecutive minutes or greater; 178 male participants did not accumulate a single bout of 2 consecutive minutes or greater and were flagged for each stepping intensity metric results in order to facilitate direct comparisons.
Model 1 – age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health, and stepping intensity
Model 2 – Model 1 + steps per day
P trend was computed separately for each model 1 and 2 and did not include the no bout group.

Table S18. Adjusted hazard ratios for steps per day and mortality (8000 vs. 4000 steps/day) in the analytic sample and in complete case analysis*, US adults aged 40+.

	8000 vs. 4000 steps/day	
	Analytic sample (N=4,840)	Complete case analysis* (n=4,416)
All-cause mortality	0.49 (0.44, 0.55)	0.48 (0.42, 0.55)
CVD mortality	0.49 (0.40, 0.60)	0.48 (0.40, 0.58)
Cancer mortality	0.67 (0.54, 0.82)	0.63 (0.50, 0.80)
Men	0.48 (0.41, 0.58)	0.46 (0.38,0.56)
Women	0.48 (0.37, 0.62)	0.49 (0.36, 0.65)
40-49yrs	0.58 (0.35, 0.96)	0.55 (0.28, 1.08)
50-64yrs	0.39 (0.27, 0.58)	0.40 (0.27, 0.59)
65+yrs	0.38 (0.32, 0.44)	0.37 (0.31, 0.43)
Non-Hispanic White	0.48 (0.42, 0.55)	0.48 (0.41, 0.56)
Non-Hispanic Black	0.45 (0.35, 0.59)	0.46 (0.33, 0.64)
Mexican-American	0.66 (0.45, 0.98)	0.68 (0.43, 1.09)

*Complete case analysis excluded participants with any missing covariate information
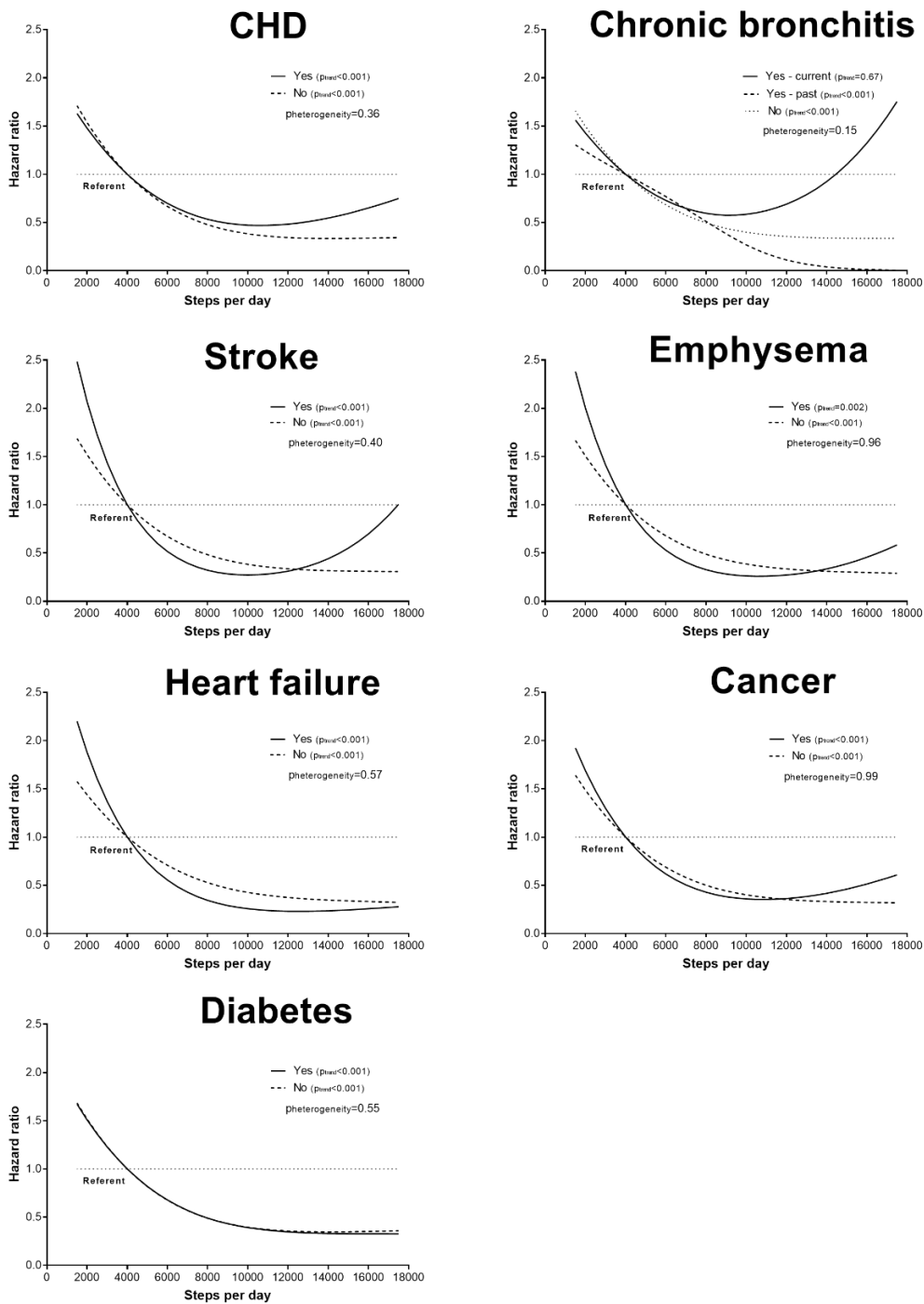Hazard ratios were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. Estimated hazard ratios were computed using a cox proportional hazards model with restricted cubic spline functions.

Table S19. Adjusted hazard ratios for stepping intensity and all-cause mortality (Quartile 4 vs. 1) in the analytic sample and in complete case analysis*, US adults aged 40+.

	Quartile 4 vs. Quartile 1	
	Analytic sample (N=4,840)	Complete case analysis* (n=4,416)
Bout cadence	1.07 (0.88, 1.29)	1.15 (0.92, 1.44)
Peak 30 cadence	0.90 (0.65, 1.27)	0.97 (0.68, 1.39)
Peak 1 cadence	1.10 (0.81, 1.49)	1.16 (0.83, 1.62)

*Complete case analysis excluded participants with any missing covariate information
Step intensity was defined using quartiles of:
Bout cadence: average steps per minute in a day in bouts of 2 consecutive minutes or greater;
Peak 30 cadence: average steps per minute recorded for the 30 highest minutes in a day (not required to be consecutive);
Peak 1 cadence: average steps per minute recorded for the highest minute in a day
Hazard ratios were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, self-reported general health, and steps per day (continuous)

Figure S1. Adjusted hazard ratios for all-cause mortality stratified by education and behavioral risk factors (smoking, alcohol consumption, and healthy eating index).
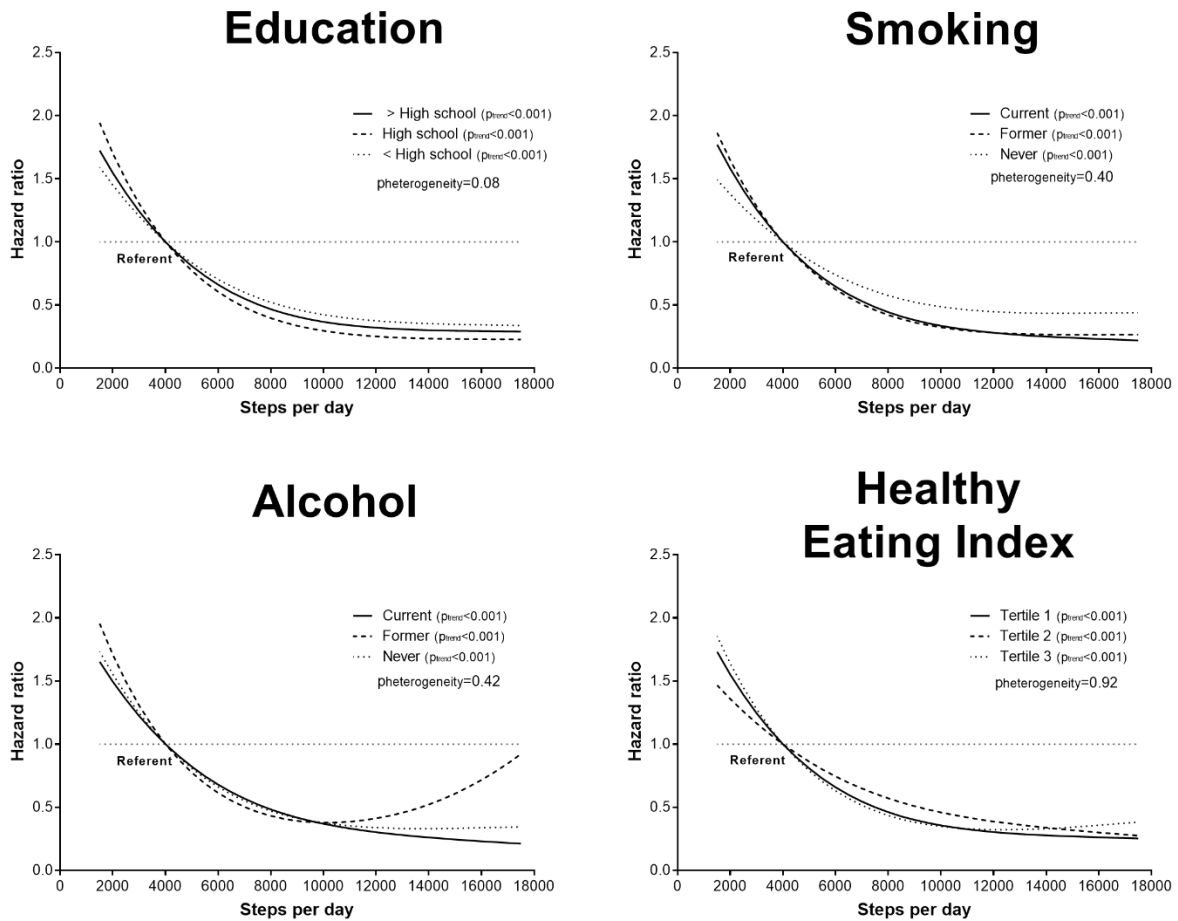
Hazard ratios were adjusted for including age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health (not including the respective confounder of interest). Estimated hazard ratios were computed separately for each level of the confounder of interest using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day; horizontal dotted line). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.
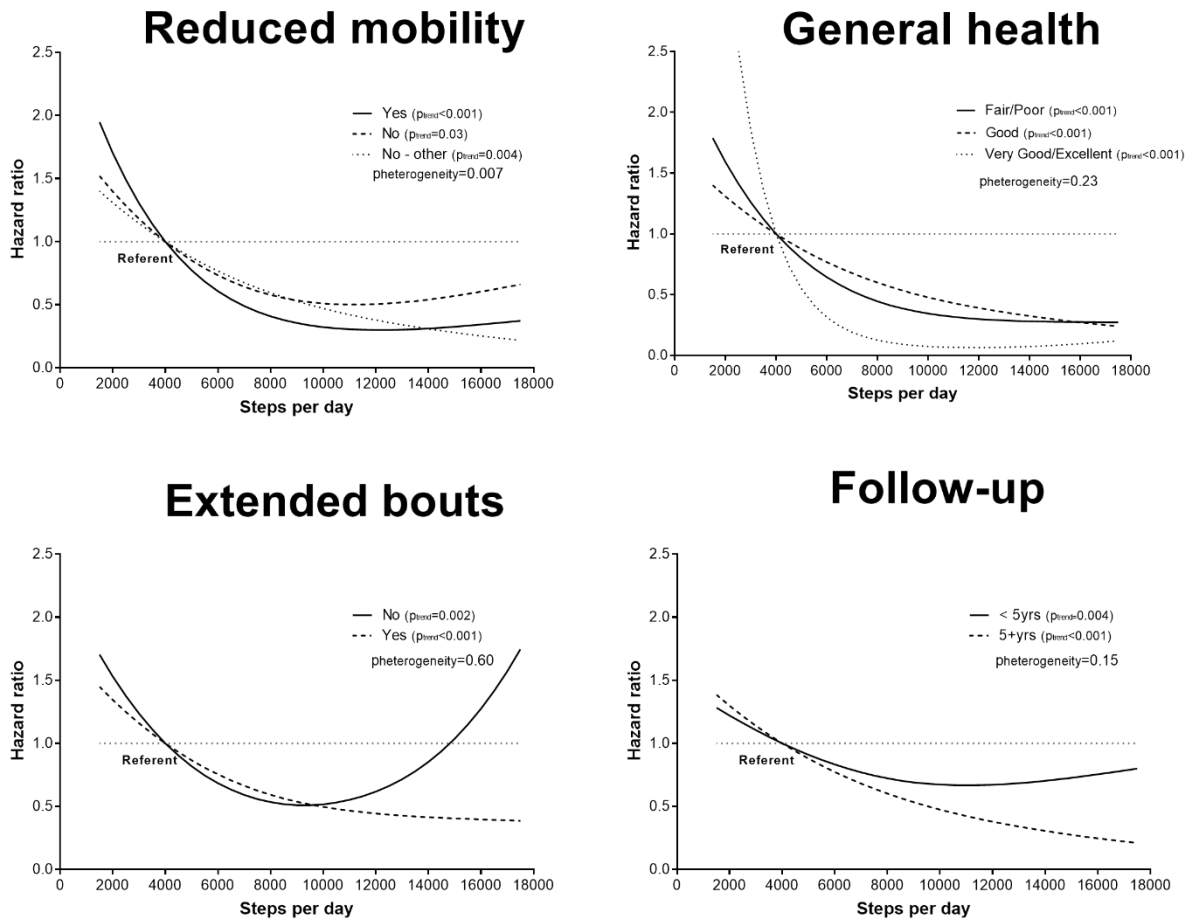
Figure S2. Adjusted hazard ratios for all-cause mortality stratified by prevalent comorbid conditions.

Hazard ratios were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health (not including the respective chronic condition of interest). Estimated hazard ratios were computed separately for diabetes, coronary heart disease, and cancer condition using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day; horizontal dotted line). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.
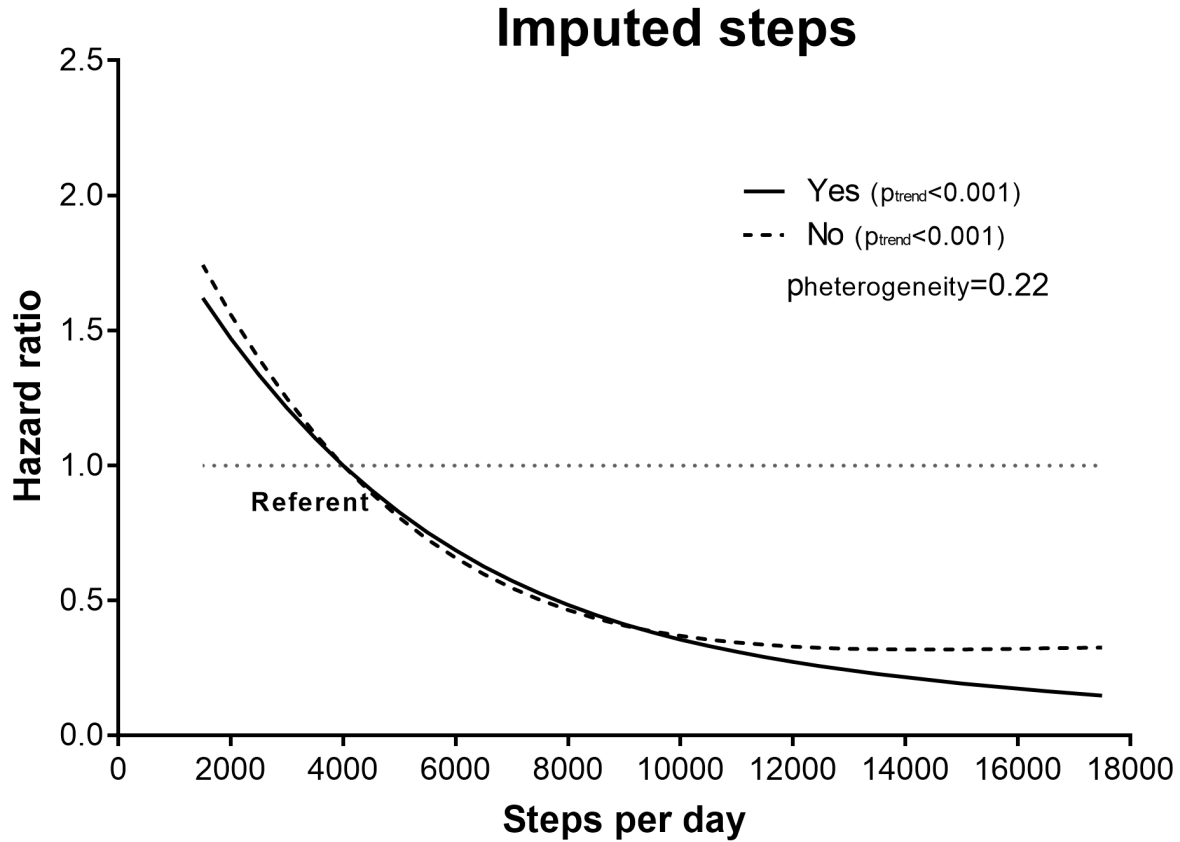
Figure S3. Adjusted hazard ratios for all-cause mortality stratified by mobility limitation, self-reported general health, ability to accumulate extended stepping bouts, and length of follow-up.

Hazard ratios were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health (not including the respective variable of interest). Estimated hazard ratios were computed separately for each level of the reverse causality variable using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day; horizontal dotted line). Models included US population and study design weights to account for the complex survey design in NHANES. All models were replicated 5 times to account for imputed steps generated in ~14% of the sample.

Figure S4. Adjusted hazard ratios for all-cause mortality among adults with and without imputed steps.

Imputed steps

Legend:
— Yes ($p_{trend}<0.001$)
- - - No ($p_{trend}<0.001$)
pheterogeneity=0.22

Referent

Y-axis: Hazard ratio (0.0, 0.5, 1.0, 1.5, 2.0, 2.5)
X-axis: Steps per day (0, 2000, 4000, 6000, 8000, 10000, 12000, 14000, 16000, 18000)

Hazard ratios were adjusted for age, diet quality, sex, race-ethnicity, BMI, education, alcohol consumption, smoking status, diabetes, stroke, coronary heart disease, heart failure, cancer, chronic bronchitis, emphysema, mobility limitation, and self-reported general health. Estimated hazard ratios were computed separately for individuals with and without imputed steps using cox proportional hazards model with restricted cubic spline functions using 3 knots (at 5th, 50th, and 95th of US weighted percentiles for steps per day equivalent to approximately 3 000, 9 000, and 16 000 steps per day). The ~10th percentile was set as the referent group (referent=4 000 steps/day; horizontal dotted line). Models included US population and study design weights to account for the complex survey design in NHANES. The model using individuals with imputed steps was replicated 5 times to account for imputed steps generated in this subgroup.