

Supplementary Table 1. Hazard ratios (HRs) for all-cause and cardiovascular disease (CVD) mortality by changes in physical activity (PA) from 2003-8 (baseline) to 2012 (1st repeated examination), and followed up for mortality until December 2017 in 14,704 participants of the Guangzhou Biobank Cohort Study, excluding those with poor health at baseline.

Change in PA	Person years	No. of deaths	Crude HR (95%CI)	AHR ^a (95% CI)
All-cause				
Low-low	70	1	1.06 (0.15-7.54)	1.16 (0.16-8.31)
Low-moderate	2,211	20	0.65 (0.41-1.04)	0.80 (0.50-1.28)
Low-high	7,403	42	0.43 (0.31-0.61)***	0.69 (0.49-0.99)*
Moderate-low	1,036	17	1.08 (0.65-1.78)	1.27 (0.77-2.10)
Moderate-moderate	10,265	147	Ref.	Ref.
Moderate-high	33,253	305	0.68 (0.56-0.82)***	0.87 (0.71-1.07)
High-low	1,468	25	1.12 (0.73-1.71)	1.31 (0.85-2.00)
High-moderate	10,714	123	0.79 (0.62-1.00)	0.93 (0.73-1.18)
High-high	48,691	383	0.58 (0.48-0.70)***	0.81 (0.66-0.98)*
Increase [†]	42,867	367	0.63 (0.52-0.77)***	0.85 (0.70-1.03)
Decrease to low [‡]	2,504	42	1.10 (0.78-1.55)	1.29 (0.91-1.82)
CVD				
Low-low	70	1	2.93 (0.40-21.15)	3.17 (0.43-23.24)
Low-moderate	2,211	7	0.63 (0.29-1.39)	0.75 (0.34-1.66)
Low-high	7,403	10	0.29 (0.15-0.57)***	0.52 (0.26-1.02)
Moderate-low	1,036	8	1.30 (0.62-2.73)	1.53 (0.73-3.23)
Moderate-moderate	10,265	55	Ref.	Ref.
Moderate-high	33,253	88	0.54 (0.38-0.75)***	0.69 (0.49-0.97)*
High-low	1,468	6	0.68 (0.29-1.59)	0.75 (0.32-1.74)
High-moderate	10,714	43	0.72 (0.48-1.08)	0.84 (0.56-1.25)
High-high	48,691	123	0.51 (0.37-0.70)***	0.70 (0.51-0.97)*
Increase [†]	42,867	105	0.50 (0.36-0.70)***	0.67 (0.48-0.93)*
Decrease to low [‡]	2,504	14	0.94 (0.52-1.68)	1.06 (0.59-1.91)

Ref: reference; AHR: adjusted hazard ratio; CI: confidence interval;

[†]: Increase: low-moderate, low-high, and moderate-high;

[‡]: Decrease to low: moderate-low and high-low;

^a: Adjusted for sex, age, occupation, personal income, education, drinking, smoking and self-rated health

***p<0.001,**p<0.01,*p<0.05

Supplementary Table 2. Hazard ratios (HRs) for all-cause and cardiovascular disease (CVD) mortality by changes in physical activity (PA) from 2003-8 (baseline) to 2012 (1st repeated examination), and followed up for mortality until December 2017 in 16,699 participants of the Guangzhou Biobank Cohort Study, excluding those with hard CVD history (self-reported stroke, MI or CHD) at baseline.

Change in PA	Person years	No. of deaths	Crude HR (95%CI)	AHR ^a (95% CI)
All-cause				
Low-low	69	2	2.07 (0.51-8.32)	3.52 (0.87-14.24)
Low-moderate	2,363	25	0.74 (0.48-1.12)	0.90 (0.59-1.37)
Low-high	8,160	50	0.45 (0.33-0.61)***	0.71 (0.52-0.98)*
Moderate-low	1,265	22	1.10 (0.71-1.72)	1.25 (0.80-1.95)
Moderate-moderate	12,170	181	Ref.	Ref.
Moderate-high	38,421	386	0.71 (0.60-0.85)**	0.90 (0.75-1.07)
High-low	1,565	29	1.18 (0.79-1.74)	1.35 (0.91-2.00)
High-moderate	12,140	150	0.82 (0.66-1.02)	0.94 (0.75-1.16)
High-high	54,344	474	0.62 (0.52-0.73)***	0.84 (0.71-1.00)
Increase [†]	48,944	461	0.67 (0.56-0.80)***	0.87 (0.73-1.04)
Decrease to low [‡]	2,830	51	1.14 (0.84-1.56)	1.30 (0.95-1.78)
CVD				
Low-low	69	2	6.03 (1.47-24.62)*	11.98 (2.89-49.71)**
Low-moderate	2,363	9	0.77 (0.38-1.55)	0.94 (0.47-1.89)
Low-high	8,160	14	0.37 (0.21-0.66)**	0.66 (0.37-1.18)
Moderate-low	1,265	8	1.10 (0.52-2.28)	1.23 (0.59-2.57)
Moderate-moderate	12,170	64	Ref.	Ref.
Moderate-high	38,421	119	0.64 (0.47-0.86)**	0.81 (0.60-1.10)
High-low	1,565	8	0.88 (0.42-1.83)	0.97 (0.46-2.04)
High-moderate	12,140	57	0.86 (0.60-1.24)	0.99 (0.69-1.42)
High-high	54,344	161	0.60 (0.45-0.81)**	0.84 (0.62-1.12)
Increase [†]	48,944	142	0.60 (0.45-0.81)**	0.80 (0.59-1.08)
Decrease to low [‡]	2,830	16	0.97 (0.56-1.68)	1.09 (0.63-1.88)

Ref: reference; AHR: adjusted hazard ratio; CI: confidence interval;

[†]: Increase: low-moderate, low-high, and moderate-high;

[‡]: Decrease to low: moderate-low and high-low;

^a: Adjusted for sex, age, occupation, personal income, education, drinking, smoking and self-rated health

***p<0.001,**p<0.01,*p<0.05

Supplementary Table 3. Hazard ratios (HRs) for all-cause and cardiovascular disease (CVD) mortality by changes in physical activity (PA) from 2003-8 (baseline) to 2012 (1st repeated examination), and followed up for mortality until December 2017 in 17,784 participants of the Guangzhou Biobank Cohort Study, excluding deaths within the first 3 years.

Change in PA	Person years	No. of deaths	Crude HR (95%CI)	AHR ^a (95% CI)
All-cause				
Low-low	83	2	2.21 (0.55-8.91)	2.77 (0.68-11.24)
Low-moderate	2,507	21	0.73 (0.46-1.15)	0.93 (0.59-1.47)
Low-high	8,675	42	0.46 (0.32-0.64)***	0.75 (0.53-1.06)
Moderate-low	1,352	21	1.18 (0.75-1.87)	1.36 (0.86-2.14)
Moderate-moderate	13,145	159	Ref.	Ref.
Moderate-high	41,650	336	0.72 (0.60-0.87)**	0.93 (0.76-1.13)
High-low	1,660	27	1.24 (0.82-1.86)	1.48 (0.98-2.23)
High-moderate	13,225	134	0.82 (0.65-1.03)	0.94 (0.74-1.19)
High-high	58,535	399	0.61 (0.51-0.73)***	0.84 (0.69-1.01)
Increase [†]	52,832	399	0.68 (0.57-0.82)***	0.91 (0.75-1.09)
Decrease to low [‡]	3,012	48	1.21 (0.88-1.67)	1.42 (1.03-1.97)*
CVD				
Low-low	83	2	5.98 (1.46-24.47)*	7.82 (1.88-32.49)**
Low-moderate	2,507	7	0.66 (0.30-1.44)	0.82 (0.38-1.80)
Low-high	8,675	14	0.42 (0.23-0.74)**	0.75 (0.42-1.35)
Moderate-low	1,352	9	1.28 (0.63-2.57)	1.44 (0.72-2.91)
Moderate-moderate	13,145	61	Ref.	Ref.
Moderate-high	41,650	114	0.66 (0.48-0.90)**	0.85 (0.62-1.16)
High-low	1,660	9	1.03 (0.51-2.07)	1.19 (0.59-2.41)
High-moderate	13,225	53	0.83 (0.57-1.19)	0.94 (0.65-1.37)
High-high	58,535	142	0.57 (0.43-0.78)***	0.79 (0.58-1.08)
Increase [†]	52,832	135	0.62 (0.46-0.84)**	0.83 (0.61-1.13)
Decrease to low [‡]	3,012	18	1.14 (0.67-1.93)	1.30 (0.77-2.21)

Ref: reference; AHR: adjusted hazard ratio; CI: confidence interval;

[†]: Increase: low-moderate, low-high, and moderate-high;

[‡]: Decrease to low: moderate-low and high-low;

^a: Adjusted for sex, age, occupation, personal income, education, drinking, smoking and self-rated health

***p<0.001,**p<0.01,*p<0.05

Supplementary Table 4. Hazard ratios (HRs) for all-cause and cardiovascular disease (CVD) mortality by changes in physical activity (PA) from 2003-8 (baseline) to 2012 (1st repeated examination), and followed up for mortality until December 2017 in 18,104 participants of the Guangzhou Biobank Cohort Study.

Change in PA	Person years	No. of deaths	Crude HR (95%CI)	AHR ^a (95% CI)
All-cause				
Low-low	83	2	1.66 (0.41-6.70)	2.38 (0.59-9.61)
Low-moderate	2,513	26	0.70 (0.46-1.05)	0.90 (0.60-1.36)
Low-high	8,697	54	0.44 (0.33-0.59)***	0.72 (0.53-0.98)*
Moderate-low	1,369	30	1.36 (0.92-1.99)	1.54 (1.05-2.26)*
Moderate-moderate	13,221	203	Ref.	Ref.
Moderate-high	41,822	430	0.71 (0.60-0.83)***	0.90 (0.76-1.07)
High-low	1,669	32	1.18 (0.81-1.71)	1.43 (0.98-2.08)
High-moderate	13,294	168	0.81 (0.66-0.99)*	0.93 (0.75-1.14)
High-high	58,749	516	0.60 (0.51-0.71)***	0.82 (0.69-0.97)*
Increase [†]	53,032	510	0.66 (0.56-0.78)***	0.88 (0.74-1.04)
Decrease to low [‡]	3,038	62	1.26 (0.95-1.67)	1.48 (1.11-1.97)**
CVD				
Low-low	83	2	4.79 (1.17-19.51)*	7.42 (1.81-30.53)**
Low-moderate	2,513	9	0.69 (0.35-1.38)	0.89 (0.44-1.78)
Low-high	8,697	18	0.42 (0.25-0.71)**	0.77 (0.46-1.30)
Moderate-low	1,369	16	1.95 (1.13-3.35)*	2.20 (1.28-3.78)**
Moderate-moderate	13,221	73	Ref.	Ref.
Moderate-high	41,822	139	0.65 (0.49-0.86)**	0.84 (0.63-1.12)
High-low	1,669	11	1.08 (0.57-2.04)	1.28 (0.68-2.42)
High-moderate	13,294	64	0.84 (0.60-1.18)	0.97 (0.69-1.36)
High-high	58,749	178	0.59 (0.45-0.77)***	0.81 (0.61-1.07)
Increase [†]	53,032	166	0.62 (0.47-0.81)**	0.83 (0.63-1.10)
Decrease to low [‡]	3,038	27	1.47 (0.94-2.29)	1.70 (1.09-2.65)*

Ref: reference; AHR: adjusted hazard ratio; CI: confidence interval;

[†]: Increase: low-moderate, low-high, and moderate-high;

[‡]: Decrease to low: moderate-low and high-low;

^a: Adjusted for sex, age, occupation, personal income, education, alcohol use, amount of smoking and self-rated health

***p<0.001,**p<0.01,*p<0.05

Supplementary Table 5. Hazard ratios (HRs) for all-cause and cardiovascular disease (CVD) mortality by changes in physical activity (PA) from 2003-8 (baseline) to 2012 (1st repeated examination), and followed up for mortality until December 2017 in 18,104 participants of the Guangzhou Biobank Cohort Study.

Change in PA	Person years	No. of deaths	Crude HR (95%CI)	AHR ^a (95% CI)
All-cause				
Low-low	83	2	1.66 (0.41-6.70)	2.06 (0.51-8.33)
Low-moderate	2,513	26	0.70 (0.46-1.05)	0.88 (0.59-1.33)
Low-high	8,697	54	0.44 (0.33-0.59)***	0.71 (0.52-0.97)*
Moderate-low	1,369	30	1.36 (0.92-1.99)	1.54 (1.05-2.27)*
Moderate-moderate	13,221	203	Ref.	Ref.
Moderate-high	41,822	430	0.71 (0.60-0.83)***	0.90 (0.76-1.07)
High-low	1,669	32	1.18 (0.81-1.71)	1.42 (0.97-2.06)
High-moderate	13,294	168	0.81 (0.66-0.99)*	0.94 (0.76-1.15)
High-high	58,749	516	0.60 (0.51-0.71)***	0.83 (0.70-0.98)*
Increase [†]	53,032	510	0.66 (0.56-0.78)***	0.87 (0.74-1.03)
Decrease to low [‡]	3,038	62	1.26 (0.95-1.67)	1.48 (1.11-1.97)**
CVD				
Low-low	83	2	4.79 (1.17-19.51)*	5.95 (1.44-24.64)*
Low-moderate	2,513	9	0.69 (0.35-1.38)	0.88 (0.44-1.77)
Low-high	8,697	18	0.42 (0.25-0.71)**	0.77 (0.45-1.29)
Moderate-low	1,369	16	1.95 (1.13-3.35)*	2.22 (1.29-3.82)**
Moderate-moderate	13,221	73	Ref.	Ref.
Moderate-high	41,822	139	0.65 (0.49-0.86)**	0.83 (0.62-1.11)
High-low	1,669	11	1.08 (0.57-2.04)	1.30 (0.68-2.45)
High-moderate	13,294	64	0.84 (0.60-1.18)	0.97 (0.69-1.36)
High-high	58,749	178	0.59 (0.45-0.77)***	0.82 (0.62-1.08)
Increase [†]	53,032	166	0.62 (0.47-0.81)**	0.83 (0.63-1.09)
Decrease to low [‡]	3,038	27	1.47 (0.94-2.29)	1.72 (1.10-2.69)*

Ref: reference; AHR: adjusted hazard ratio; CI: confidence interval;

[†]: Increase: low-moderate, low-high, and moderate-high;

[‡]: Decrease to low: moderate-low and high-low;

^a: Adjusted for sex, age, occupation, personal income, education, alcohol use, smoking, self-rated health and self-reported CVD

***p<0.001,**p<0.01,*p<0.05