SUPPLEMENTAL MATERIAL

eTable 1. Effects of baseline characteristics on all-cause mortality, using Cox regression models, in the Golestan Cohort Study

Variables (reference category)	Sex-adjusted	Full- adjusted*
Sex (women)	-	1.21 (1.12-1.29)
Residence (urban)	1.19 (1.12-1.26)	0.90 (0.84-0.97)
Education (no formal education)	0.75 (0.70-0.80)	0.86 (0.80-0.93)
Marital status (married)	1.31 (1.22-1.40)	1.15 (1.07-1.23)
Ethnicity (Turkmen)	0.91 (0.86-0.96)	0.94 (0.88-0.99)
Tobacco (never use)	1.62 (1.53-1.72)	1.24 (1.16-1.33)
Opium (never use)	1.93 (1.83-2.04)	1.61 (1.51-1.71)
Alcohol (never drink)	1.23 (1.10-1.37)	1.11 (0.99-1.25)
Physical activity		
Tertile 2 vs 1	0.72 (0.68-0.76)	0.74 (0.69-0.78)
Tertile 3 vs 1	0.58 (0.54-0.63)	0.60 (0.56-0.65)
Fruit/vegetable consumption		
Tertile 2 vs 1	0.90 (0.85-0.95)	0.96 (0.91-1.02)
Tertile 3 vs 1	0.81 (0.76-0.86)	0.93 (0.87-0.99)
Wealth score		
Quintile 2 vs 1	0.89 (0.83-0.95)	0.93 (0.86-1.00)
Quintile 3 vs 1	0.70 (0.65-0.75)	0.74 (0.69-0.79)
Quintile 4 vs 1	0.69 (0.64-0.74)	0.75 (0.69-0.81)
Quintile 5 vs 1	0.58 (0.53-0.63)	0.66 (0.60-0.72)

Data are hazard ratios (95% CI), with age as the time scale. *Adjusted for all variables in the table.

eTable 2: Baseline characteristics of the Golestan Cohort Study participants, based on sex

	Women n=28811	Men n=21234	All n=50045
Age (year, n=50045)	51.5 (8.5)	52.7 (9.4)	52.1 (8.9)
Ethnicity (n=50045)			
Turkmen	21202 (73.6)	16051 (75.6)	37253 (74.4)
Others	7609 (26.4)	5183 (24.4)	12792 (25.6)
Marital status (n=50045)			
Married	23286 (80.8)	20669 (97.3)	43955 (87.8)
Others (e.g., single, divorced, widowed)	5525 (19.2)	565 (2.7)	6090 (12.2)
Residence (n=50045)			
Urban	6100 (21.2)	3934 (18.5)	10034 (20.1)
Rural	22711 (78.8)	17300 (81.5)	40011 (80.0)
Education (n=50045)			
No formal schooling	24700 (85.7)	10418 (49.1)	35118 (70.2)
Some formal schooling	4111 (14.3)	10816 (50.9)	14927 (29.8)
Wealth score (n=50045)			
Quintile 1	6416 (22.3)	4330 (20.4)	10746 (21.5)
Quintile 2	5450 (18.9)	3838 (18.1)	9288 (18.6)
Quintile 3	6257 (21.7)	4617 (21.7)	10874 (21.7)
Quintile 4	5383 (18.7)	4099 (19.3)	9482 (19.0)
Quintile 5	5305 (18.4)	4350 (20.5)	9655 (19.3)
Alcohol drinking (n=50045)			
Never	28790 (99.9)	19526 (92.0)	48316 (96.6)
Ever	21 (0.1)	1708 (8.0)	1729 (3.5)
Tobacco using (n=50045)			
Never	27748 (96.3)	11430 (53.8)	39178 (78.3)
Ever	1063 (3.7)	9804 (46.2)	10867 (21.7)
Opium Using (n=50045)			
Never	26458 (91.8)	15087 (71.1)	41545 (83.0)
Ever	2353 (8.2)	6147 (29.0)	8500 (17.0)
Physical activity (MET min/week, n=49928)			
1st tertile	4882 (16.9)	12719 (60.1)	17601 (35.3)
2nd tertile	11351 (39.5)	4464 (21.1)	15815 (31.7)
3rd tertile	12520 (43.5)	3992 (18.9)	16512 (33.1)
Vegetables/fruit consumption (g/day, n=49170)			
1st tertile	10393 (36.7)	5997 (28.7)	16390 (33.3)
2nd tertile	9544 (33.7)	6846 (32.8)	16390 (33.3)
3rd tertile	8358 (29.5)	8032 (38.5)	16390 (33.3)
Preexisting chronic diseases* (n=50045)			
No	24149 (83.8)	18362 (86.5)	42511 (85.0)
Yes	4662 (16.2)	2872 (13.5)	7534 (15.1)

*Heart diseases, stroke, cancers, chronic obstructive respiratory diseases, asthma, chronic renal failure, chronic hepatic failure, and tuberculosis.

Data are mean (SD) or n (%).

eTable 3: Baseline characteristics of the Golestan Cohort Study participants, based on Body Mass Index (BMI)

	BMI<18.5 N=2410	18.5≤BMI<25 N=17929	25≤BMI<30 N=16973	30≤BMI<35 N=9183	BMI≥35 N=3542
Age (year, n=50037)	52.7 (45.9-61.0)	51.0 (45.1-59.4)	49.9 (44.7-57.4)	49.3 (44.4-55.9)	49.3 (44.5-55.4)
Sex (n=50037)					
Women	1153 (4.0)	8317 (28.9)	9701 (33.7)	6596 (22.9)	3041 (10.6)
Men	1257 (5.9)	9612 (45.3)	7272 (34.3)	2587 (12.2)	501 (2.4)
Ethnicity (n=50037)					
Turkmen	1660 (4.5)	13130 (35.3)	12762 (34.3)	6920 (18.6)	2777 (7.5)
Others	750 (5.9)	4799 (37.5)	4211 (32.9)	2263 (17.7)	765 (6.0)
Marital status (n=50037)					
Married	2025 (4.6)	15848 (36.1)	15053 (34.3)	8023 (18.3)	2999 (6.8)
Others	385 (6.3)	2081 (34.2)	1920 (31.5)	1160 (19.1)	543 (8.9)
Residence (n=50037)					
Urban	229 (2.3)	2530 (25.2)	3827 (38.2)	2423 (24.2)	1022 (10.2)
Rural	2181 (5.5)	15399 (38.5)	13146 (32.9)	6760 (16.9)	2520 (6.3)
Education (n=50037)					
No formal schooling	1873 (5.3)	12890 (36.7)	11301 (32.2)	6382 (18.2)	2666 (7.6)
Some formal schooling	537 (3.6)	5039 (33.8)	5672 (38.0)	2801 (18.8)	876 (5.9)
Wealth score (n=50037)					
Quintile 1	960 (8.9)	5013 (46.7)	2960 (27.6)	1364 (12.7)	447 (4.2)
Quintile 2	539 (5.8)	3889 (41.9)	2891 (31.1)	1432 (15.4)	536 (5.8)
Quintile 3	461 (4.2)	3947 (36.30)	3836 (35.3)	1888 (17.4)	741 (6.8)
Quintile 4	291 (3.1)	2852 (30.1)	3433 (36.2)	2101 (22.2)	802 (8.5)
Quintile 5	159 (1.7)	2228 (23.1)	3853 (39.9)	2398 (24.8)	1016 (10.5)
Waist circumference (cm, n=50037)	72 (68-75.5)	85 (79.5-90)	98 (93.5-103)	108 (103-112)	118 (112-123)
Hip circumference (cm, n=50036)	85 (82-88)	93 (90-96)	101 (97-104)	107 (104-111)	117 (112-122)
Alcohol drinking (n=50037)					
Never	2290 (4.7)	17195 (35.6)	16377 (33.9)	8950 (18.5)	3497 (7.2)
Ever	120 (6.9)	734 (42.5)	596 (34.5)	233 (13.5)	45 (2.6)
Tobacco using (n=50037)					
Never	1332 (3.4)	12353 (31.5)	14016 (35.8)	8145 (20.8)	3327 (8.5)
Ever	1078 (9.9)	5576 (51.3)	2957 (27.2)	1038 (9.6)	215 (2.0)
Opium Using (n=50037)					
Never	1332 (3.2)	13575 (32.7)	14879 (35.8)	8426 (20.3)	3328 (8.0)
Ever	1078 (12.7)	4354 (51.2)	2094 (24.6)	757 (8.9)	214 (2.5)
Physical activity (MET min/week, n=49920)					
1st tertile	1042 (5.9)	6868 (39.0)	6042 (34.3)	2676 (15.2)	966 (5.5)
2nd tertile	713 (4.5)	5250 (33.2)	5312 (33.6)	3176 (20.1)	1364 (8.6)
3rd tertile	645 (3.9)	5771 (35.0)	5577 (33.8)	3312 (20.1)	1206 (7.3)
Vegetables/fruit consumption (g/day, n=49162)					
1st tertile	6813 (41.6)	5025 (30.7)	2432 (14.8)	951 (5.8)	1165 (7.1)
2nd tertile	5866 (35.8)	5614 (34.3)	3041 (18.6)	1132 (6.9)	736 (4.5)
3rd tertile	4893 (29.9)	6058 (37.0)	3583 (21.9)	1409 (8.6)	444 (2.7)
Preexisting chronic diseases* (n=50037)					
No	1913 (4.5)	15520 (36.5)	14496 (34.1)	7708 (18.1)	2867 (6.8)
Yes	497 (6.6)	2409 (32.0)	2477 (32.9)	1475 (19.6)	675 (9.0)

*Heart diseases, stroke, cancers, chronic obstructive respiratory diseases, asthma, chronic renal failure, chronic hepatic failure, and tuberculosis.
Data are median (percentile 25-75) or n (%).

eTable 4. Baseline anthropometric measure characteristics in the Golestan Cohort Study

Measures (unit, number)	**Women**		**Men**	
	Categorization	**Mean (SD)**	**Categorization**	**Mean (SD)**
WC (cm, 50044)	Quintile cut-points: 84, 93, 100, 108	96.2 (14.1)	Quintile cut-points: 82, 90, 98, 106	94.1 (13.2)
HC (cm, 50042)	Quintile cut-points: 92, 97, 102, 108	100.3 (10.2)	Quintile cut-points: 92, 96, 100, 105	98.4 (7.8)
Ht (cm, 50037)	Quintile cut-points: 149, 152, 155, 158.5	153.8 (5.8)	Quintile cut-points: 162, 166, 169.5, 173	167.8 (6.7)
WHtR (50037)	Quintile cut-points: 0.55, 0.60, 0.65, 0.70	0.63 (0.09)	Quintile cut-points: 0.49, 0.54, 0.58, 0.63	0.56 (0.08)
WHR (50041)	Quintile cut-points: 0.88, 0.94, 0.98, 1.03	0.96 (0.09)	Quintile cut-points: 0.88, 0.93, 0.97, 1.02	0.95 (0.08)
BMI (kg/m^2, 50037)	Underweight (<18.5), normal (18.5-<25), mild obese (30-≤35), moderate to severe obese (≥35)	27.8 (5.7)	Underweight (<18.5), normal (18.5-<25), mild obese (30-≤35), moderate to severe obese (≥35)	25.1 (4.6)
BMI ≥18.5 (kg/m^2, 47627)	Quintile cut-points: 23.46, 26.41, 29.24, 32.63	28.3 (5.4)	Quintile cut-points: 21.61, 24.06, 26.40, 29.07	25.6 (4.3)

WC denotes waist circumference, HC hip circumference, Ht height, WHtR waist-to-height ratio, WHR waist-to-hip ratio, and BMI body-mass index.

eTable 5. Correlation coefficients between anthropometric measures among women and men, in the Golestan Cohort Study

	BMI	Waist	Hip	WHR	WHtR
Women					
BMI	1				
WC	0.89	1			
HC	0.89	0.81	1		
WHR	0.48	0.74	0.21	1	
WHtR	0.89	0.97	0.75	0.76	1
Men					
BMI	1				
WC	0.91	1			
HC	0.87	0.87	1		
WHR	0.70	0.87	0.52	1	
WHtR	0.91	0.96	0.79	0.88	1

BMI denotes body-mass index, WC waist circumference, HC hip circumference, WHR waist-to-hip ratio, and WHtR waist-to-height ratio.

eTable 6. Effects of one standard deviation increase in anthropometric measures on all-cause and cardiovascular mortality, in the Golestan Cohort Study*

Anthropometric in the models	All-cause mortality			Cardiovascular mortality		
	All (n=6651)	Women (n=2955)	Men (n=3696)	All (n=2778)	Women (n=1297)	Men (n=1499)
WC	1.08 (1.05-1.11)	1.06 (1.01-1.10)	1.10 (1.06-1.14)	1.20 (1.15-1.26)	1.11 (1.04-1.18)	1.30 (1.23-1.38)
HC	0.97 (0.94-1.00)	0.93 (0.90-0.98)	1.02 (0.98-1.06)	1.05 (1.01-1.10)	0.97 (0.91-1.03)	1.19 (1.12-1.26)
Ht	0.92 (0.88-0.96)	0.92 (0.89-0.96)	0.96 (0.93-1.00)	0.92 (0.86-0.97)	0.91 (0.86-0.96)	0.97 (0.92-1.03)
BMI	1.04 (1.01-1.07)	1.01 (0.97-1.06)	1.08 (1.04-1.12)	1.16 (1.11-1.21)	1.05 (0.99-1.12)	1.29 (1.22-1.37)
Combination of WC with HC						
WC (HC-adjusted)	1.33 (1.26-1.39)	1.34 (1.25-1.43)	1.29 (1.20-1.39)	1.51 (1.40-1.61)	1.43 (1.29-1.58)	1.51 (1.36-1.68)
HC (WC-adjusted)	0.76 (0.72-0.80)	0.74 (0.69-0.79)	0.82 (0.76-0.88)	0.75 (0.70-0.81)	0.72 (0.65-0.80)	0.83 (0.75-0.93)
WHR	1.16 (1.12-1.19)	1.17 (1.13-1.22)	1.13 (1.09-1.18)	1.27 (1.22-1.32)	1.23 (1.16-1.30)	1.31 (1.24-1.38)
Combinations of BMI with WC and/or HC						
BMI (HC-adjusted)	1.28 (1.21-1.36)	1.33 (1.22-1.44)	1.21 (1.13-1.30)	1.46 (1.34-1.60)	1.37 (1.21-1.55)	1.47 (1.33-1.64)
BMI (WC-adjusted)	0.88 (0.82-0.94)	0.85 (0.78-0.93)	0.95 (0.87-1.04)	0.90 (0.82-0.99)	0.82 (0.72-0.94)	1.11 (0.98-1.26)
BMI (WC and HC-adjusted)	1.07 (0.99-1.15)	1.10 (0.99-1.22)	1.05 (0.96-1.15)	1.14 (1.02-1.27)	1.07 (0.91-1.26)	1.25 (1.09-1.43)
WC (HC and BMI-adjusted	1.28 (1.21-1.36)	1.28 (1.18-1.40)	1.25 (1.15-1.37)	1.42 (1.30-1.55)	1.38 (1.22-1.57)	1.32 (1.16-1.51)
HC (WC and BMI-adjusted)	0.74 (0.70-0.79)	0.70 (0.64-0.77)	0.80 (0.74-0.87)	0.71 (0.65-0.77)	0.70 (0.62-0.80)	0.77 (0.69-0.87)
Combination of Ht and WC						
WC (Ht-adjusted)	1.09 (1.06-1.12)	1.07 (1.03-1.12)	1.11 (1.07-1.16)	1.23 (1.17-1.28)	1.13 (1.06-1.20)	1.32 (1.25-1.40)
Ht (WC-adjusted)	0.90 (0.86-0.94)	0.91 (0.88-0.95)	0.94 (0.91-0.98)	0.87 (0.82-0.93)	0.89 (0.84-0.95)	0.92 (0.87-0.98)
WHtR	1.11 (1.07-1.14)	1.08 (1.04-1.13)	1.11 (1.07-1.16)	1.24 (1.19-1.30)	1.14 (1.08-1.22)	1.32 (1.24-1.39)

WC denotes waist circumference, HC hip circumference, Ht height, BMI body-mass index, WHR waist-to-hip ratio, and WHtR waist-to-height ratio. Data are Hazard Ratios (95% confidence intervals), with age as the time scale, adjusted for ethnicity, residence, marital status, education, wealth score, physical activity, tobacco use, opium use, alcohol drinking, fruit/vegetable consumption, and sex, if applicable.*After exclusion of participants with BMI<18.5 kg/m^2.

eTable 7. The association of one standard deviation increase in anthropometric measures with all-cause and cardiovascular mortality, stratified by baseline age, in the Golestan Cohort Study*

Anthropometrics in the models†	All-cause mortality			Cardiovascular mortality		
	All (n=47635)	**<55 years (n=32025)**	**≥55 years (n=15610)**	**All (n=47635)**	**<55 years (n=32025)**	**≥55 years (n=15610)**
BMI	1.04 (1.01-1.07)	1.09 (1.04-1.15)	1.01 (0.98-1.05)	1.16 (1.11-1.21)	1.25 (1.16-1.35)	1.12 (1.06-1.18)
WC	1.08 (1.05-1.11)	1.13 (1.08-1.19)	1.05 (1.01-1.09)	1.20 (1.15-1.26)	1.29 (1.20-1.39)	1.16 (1.10-1.22)
HC	0.97 (0.94-1.00)	0.98 (0.93-1.03)	0.97 (0.93-1.00)	1.05 (1.01-1.10)	1.07 (0.99-1.16)	1.05 (1.00-1.11)
WHtR	1.11 (1.07-1.14)	1.17 (1.11-1.23)	1.07 (1.03-1.11)	1.24 (1.19-1.30)	1.36 (1.26-1.47)	1.19 (1.12-1.25)
WHR	1.16 (1.12-1.19)	1.24 (1.19-1.30)	1.11 (1.07-1.15)	1.27 (1.22-1.32)	1.41 (1.31-1.51)	1.21 (1.15-1.27)
WC and HC						
WC (hip-adjusted)	1.33 (1.26-1.39)	1.52 (1.40-1.65)	1.23 (1.16-1.31)	1.51 (1.40-1.61)	1.80 (1.59-2.04)	1.37 (1.25-1.49)
HC (waist-adjusted)	0.76 (0.72-0.80)	0.69 (0.63-0.75)	0.81 (0.76-0.87)	0.75 (0.70-0.81)	0.65 (0.57-0.75)	0.81 (0.74-0.89)

BMI denotes body-mass index, WC waist circumference, HC hip circumference, WHtR waist-to-height ratio, and WHR waist-to-hip ratio. *After exclusion of participants with BMI<18.5 kg/m². Data are Hazard Ratios (95% confidence intervals). †Cox regression models, with age as the time scale, adjusted for sex, ethnicity, residence, marital status, education, wealth score, physical activity, tobacco use, opium use, alcohol drinking, and fruit/vegetable consumption.

eTable 8. Effects of one standard deviation increase in anthropometric measures on all-cause and cardiovascular mortality, after exclusion of participants with a history of chronic diseases at baseline in the Golestan Cohort Study*

Anthropometrics in the models†	All-cause mortality			Cardiovascular mortality		
	All	**Women**	**Men**	**All**	**Women**	**Men**
BMI	1.04 (1.00-1.08)	1.01 (0.96-1.06)	1.08 (1.03-1.13)	1.15 (1.08-1.21)	1.02 (0.94-1.10)	1.30 (1.21-1.39)
WC	1.09 (1.05-1.12)	1.07 (1.02-1.12)	1.10 (1.06-1.16)	1.21 (1.15-1.28)	1.12 (1.03-1.21)	1.31 (1.22-1.41)
HC	0.96 (0.93-1.00)	0.92 (0.87-0.97)	1.03 (0.98-1.08)	1.03 (0.98-1.09)	0.92 (0.85-1.00)	1.20 (1.11-1.28)
WHtR	1.11 (1.07-1.15)	1.10 (1.04-1.15)	1.12 (1.07-1.17)	1.25 (1.19-1.33)	1.15 (1.07-1.25)	1.32 (1.23-1.42)
WHR	1.17 (1.14-1.21)	1.20 (1.15-1.26)	1.14 (1.09-1.19)	1.31 (1.25-1.37)	1.29 (1.20-1.38)	1.32 (1.23-1.41)
WC and HC						
WC (hip-adjusted)	1.37 (1.29-1.44)	1.41 (1.30-1.52)	1.29 (1.19-1.40)	1.59 (1.47-1.73)	1.56 (1.40-1.75)	1.51 (1.33-1.72)
HC (waist-adjusted)	0.74 (0.70-0.79)	0.69 (0.64-0.75)	0.82 (0.76-0.89)	0.70 (0.64-0.76)	0.64 (0.56-0.72)	0.84 (0.73-0.96)

BMI denotes body-mass index, WC waist circumference, HC hip circumference, WHtR waist-to-height ratio, and WHR waist-to-hip ratio. Data are Hazard Ratios (95% confidence intervals). †Cox regression models, with age as the time scale, adjusted for ethnicity, residence, marital status, education, wealth score, physical activity, tobacco use, opium use, alcohol drinking, fruit/vegetable consumption, and sex, if applicable. *After exclusion of participants with BMI<18.5 kg/m^2. History of chronic diseases was defined as a history of heart disease, stroke, cancers, chronic obstructive respiratory diseases, asthma, chronic renal failure, chronic hepatic failure, and tuberculosis.

eTable 9. Comparison between effects of anthropometric measure quintiles and mortality, after exclusion of participants with a history of chronic diseases at baseline in the Golestan Cohort Study*

		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	P for trend
All-cause mortality							
All participants							
BMI	1	0.95 (0.87-1.03)	1.00 (0.91-1.09)	1.06 (0.96-1.16)	1.09 (0.98-1.21)	0.047
WC	1	0.99 (0.90-1.09)	1.04 (0.94-1.15)	1.08 (0.98-1.20)	1.21 (1.09-1.34)	<0.001
WHtR	1	1.03 (0.93-1.13)	1.08 (0.98-1.19)	1.15 (1.04-1.28)	1.30 (1.17-1.45)	<0.001
WHR	1	1.10 (0.98-1.22)	1.18 (1.06-1.31)	1.28 (1.15-1.42)	1.50 (1.36-1.67)	<0.001
Hip-adjusted WC	1	1.13 (1.02-1.24)	1.34 (1.20-1.51)	1.55 (1.36-1.76)	1.95 (1.68-2.26)	<0.001
Women							
BMI	1	0.91 (0.79-1.04)	0.98 (0.86-1.13)	1.00 (0.87-1.15)	0.97 (0.83-1.13)	0.833
WC	1	0.91 (0.79-1.05)	0.99 (0.85-1.15)	1.05 (0.90-1.22)	1.12 (0.97-1.31)	0.009
WHtR	1	0.90 (0.77-1.06)	1.11 (0.95-1.29)	1.10 (0.94-1.28)	1.18 (1.02-1.38)	<0.001
WHR	1	1.18 (0.99-1.42)	1.20 (1.01-1.44)	1.44 (1.22-1.72)	1.65 (1.40-1.95)	<0.001
Hip-adjusted WC	1	1.06 (0.91-1.23)	1.34 (1.13-1.59)	1.58 (1.31-1.92)	1.93 (1.55-2.40)	<0.001
Men							
BMI	1	0.95 (0.85-1.07)	0.95 (0.84-1.08)	1.06 (0.94-1.21)	1.16 (1.01-1.32)	0.001
WC	1	1.07 (0.94-1.21)	1.04 (0.92-1.19)	1.10 (0.96-1.26)	1.29 (1.12-1.47)	<0.001
WHtR	1	1.10 (0.97-1.26)	1.03 (0.90-1.19)	1.21 (1.05-1.39)	1.31 (1.14-1.50)	<0.001
WHR	1	1.02 (0.89-1.17)	1.17 (1.02-1.33)	1.16 (1.01-1.33)	1.40 (1.23-1.60)	<0.001
Hip-adjusted WC	1	1.16 (1.01-1.33)	1.24 (1.06-1.46)	1.41 (1.18-1.70)	1.73 (1.40-2.13)	<0.001
Cardiovascular mortality							
All participants							
BMI	1	1.20 (1.04-1.39)	1.45 (1.25-1.69)	1.58 (1.35-1.84)	1.46 (1.23-1.73)	<0.001
WC	1	1.18 (1.00-1.39)	1.48 (1.26-1.75)	1.58 (1.34-1.87)	1.74 (1.47-2.05)	<0.001
WHtR	1	1.18 (1.00-1.39)	1.49 (1.27-1.76)	1.62 (1.37-1.92)	1.88 (1.58-2.25)	<0.001
WHR	1	1.39 (1.15-1.68)	1.47 (1.22-1.77)	1.86 (1.55-2.24)	2.29 (1.91-2.73)	<0.001
Hip-adjusted WC	1	1.38 (1.16-1.64)	2.03 (1.67-2.46)	2.47 (2.00-3.05)	3.18 (2.50-4.04)	<0.001
Women							
BMI	1	1.07 (0.86-1.32)	1.18 (0.95-1.46)	1.25 (1.00-1.57)	1.03 (0.81-1.31)	0.672
WC	1	1.13 (0.89-1.43)	1.26 (0.99-1.60)	1.41 (1.11-1.79)	1.37 (1.07-1.75)	0.005
WHtR	1	1.02 (0.78-1.33)	1.51 (1.18-1.94)	1.46 (1.13-1.87)	1.46 (1.13-1.88)	<0.001
WHR	1	1.57 (1.15-2.14)	1.52 (1.11-2.07)	2.06 (1.53-2.77)	2.33 (1.74-3.12)	<0.001
Hip-adjusted WC	1	1.41 (1.10-1.80)	1.97 (1.50-2.59)	2.56 (1.90-3.46)	3.02 (2.14-4.26)	<0.001
Men							
BMI	1	1.28 (1.04-1.59)	1.60 (1.30-1.97)	1.78 (1.43-2.22)	2.07 (1.66-2.58)	<0.001
WC	1	1.26 (1.00-1.59)	1.58 (1.26-1.99)	1.78 (1.41-2.24)	2.14 (1.70-2.71)	<0.001
WHtR	1	1.31 (1.02-1.67)	1.36 (1.06-1.74)	1.91 (1.50-2.43)	2.18 (1.72-2.78)	<0.001
WHR	1	1.27 (0.99-1.62)	1.47 (1.15-1.86)	1.68 (1.32-2.13)	2.25 (1.79-2.83)	<0.001
Hip-adjusted WC	1	1.30 (1.01-1.67)	1.74 (1.32-2.29)	2.09 (1.54-2.85)	2.65 (1.87-3.74)	<0.001
Non-cardiovascular mortality							
All participants							
BMI	1	0.86 (0.77-0.97)	0.80 (0.70-0.91)	0.79 (0.69-0.91)	0.86 (0.75-1.00)	0.009
WC	1	0.90 (0.80-1.02)	0.82 (0.72-0.94)	0.84 (0.73-0.96)	0.91 (0.79-1.05)	0.281
WHtR	1	0.93 (0.82-1.05)	0.89 (0.78-1.02)	0.89 (0.77-1.03)	0.95 (0.82-1.11)	0.791
WHR	1	0.95 (0.83-1.10)	1.02 (0.89-1.17)	1.01 (0.88-1.16)	1.10 (0.96-1.27)	0.006
Hip-adjusted WC	1	1.01 (0.89-1.15)	1.03 (0.88-1.21)	1.15 (0.96-1.38)	1.38 (1.12-1.70)	<0.001
Women							
BMI	1	0.78 (0.65-0.95)	0.81 (0.66-0.98)	0.79 (0.64-0.97)	0.87 (0.70-1.07)	0380
WC	1	0.80 (0.66-0.98)	0.82 (0.67-1.01)	0.83 (0.67-1.03)	0.95 (0.77-1.17)	0.726
WHtR	1	0.87 (0.70-1.08)	0.98 (0.79-1.21)	0.86 (0.69-1.07)	1.02 (0.82-1.26)	0.333
WHR	1	1.02 (0.80-1.30)	1.09 (0.86-1.38)	1.24 (0.98-1.56)	1.37 (1.09-1.73)	<0.001
Hip-adjusted WC	1	0.92 (0.75-1.13)	1.08 (0.85-1.38)	1.22 (0.93-1.60)	1.54 (1.13-2.10)	<0.001
Men							
BMI	1	0.86 (0.73-1.00)	0.76 (0.64-0.89)	0.79 (0.66-0.94)	0.78 (0.65-0.94)	0.008
WC	1	1.01 (0.86-1.18)	0.80 (0.68-0.95)	0.83 (0.69-1.00)	0.89 (0.73-1.07)	0.114
WHtR	1	1.00 (0.85-1.19)	0.91 (0.76-1.09)	0.92 (0.77-1.11)	0.89 (0.74-1.08)	0.250
WHR	1	0.90 (0.76-1.07)	1.00 (0.84-1.19)	0.90 (0.75-1.07)	0.96 (0.80-1.15)	0.910
Hip-adjusted WC	1	1.10 (0.92-1.30)	0.94 (0.76-1.17)	1.03 (0.81-1.32)	1.19 (0.89-1.59)	0.079

BMI denotes body-mass index, WC waist circumference, WHtR waist-to-height ratio, and WHR waist-to-hip ratio. Data are Hazard Ratios (95% confidence intervals), age is the time scale, adjusted for ethnicity, residence, marital status, education, wealth score, physical activity, tobacco use, opium use, alcohol drinking, fruit/vegetable consumption, and sex, if applicable. P for trends are based on continues variables. *After exclusion of participants with BMI<18.5 kg/m^2. History of chronic diseases was defined as a history of heart disease, stroke, cancers, chronic obstructive respiratory diseases, asthma, chronic renal failure, chronic hepatic failure, and tuberculosis. Quintile cut-points for all measures are shown in Appendix, eTable 4.

eTable 10. The association of one standard deviation increase in anthropometric measures with all-cause and cardiovascular mortality, stratified by baseline age, in participants without history of chronic diseases at baseline in the Golestan Cohort Study*

Anthropometrics in the models†	All-cause mortality			Cardiovascular mortality		
	All (n=40598)	**<55 years (n=28183)**	**≥55 years (n=12415)**	**All (n=40598)**	**<55 years (n=28183)**	**≥55 years (n=12415)**
BMI	1.04 (1.00-1.08)	1.09 (1.03-1.16)	1.01 (0.96-1.05)	1.15 (1.08-1.21)	1.26 (1.15-1.38)	1.09 (1.01-1.16)
WC	1.09 (1.05-1.12)	1.15 (1.09-1.21)	1.05 (1.01-1.10)	1.21 (1.15-1.28)	1.33 (1.22-1.45)	1.16 (1.08-1.23)
HC	0.96 (0.93-1.00)	0.99 (0.93-1.05)	0.95 (0.91-1.00)	1.03 (0.98-1.09)	1.07 (0.98-1.17)	1.02 (0.95-1.09)
WHtR	1.11 (1.07-1.15)	1.18 (1.12-1.25)	1.08 (1.03-1.13)	1.25 (1.19-1.33)	1.41 (1.28-1.55)	1.18 (1.10-1.26)
WHR	1.17 (1.14-1.21)	1.26 (1.19-1.32)	1.13 (1.09-1.18)	1.31 (1.25-1.37)	1.47 (1.35-1.59)	1.23 (1.16-1.30)
WC and HC						
WC (hip-adjusted)	1.37 (1.29-1.44)	1.53 (1.40-1.68)	1.28 (1.20-1.38)	1.59 (1.47-1.73)	1.94 (1.68-2.24)	1.43 (1.29-1.59)
HC (waist-adjusted)	0.74 (0.70-0.79)	0.69 (0.62-0.76)	0.78 (0.72-0.84)	0.70 (0.64-0.76)	0.61 (0.52-0.71)	0.76 (0.68-0.84)

BMI denotes body-mass index, WC waist circumference, HC hip circumference, WHtR waist-to-height ratio, and WHR waist-to-hip ratio. Data are Hazard Ratios (95% confidence intervals). †Cox regression models, with age as the time scale, adjusted for sex, ethnicity, residence, marital status, education, wealth score, physical activity, tobacco use, opium use, alcohol drinking, and fruit/vegetable consumption. *After exclusion of participants with BMI<18.5 kg/m^2. History of chronic diseases was defined as a history of heart disease, stroke, cancers, chronic obstructive respiratory diseases, asthma, chronic renal failure, chronic hepatic failure, and tuberculosis.

eTable 11. Association between Body-Mass Index (BMI) and mortality in the Golestan Cohort Study, before and after exclusion of participants with a history of chronic diseases, ever tobacco use, or ever opium use at baseline, and/or death within the first 5 years of follow-up

		BMI<18.5	18.5≤BMI<25	25≤BMI<30	30≤BMI<35	BMI≥35
All participants						
Total follow-up time (person-years)		23008	180578	174328	95171	36833
All-cause mortality	No. of deaths	576	2754	2005	932	381
		1.27 (1.16-1.40)	1	1.00 (0.94-1.06)	1.03 (0.95-1.12)	1.21 (1.08-1.35)
Cardiovascular mortality	No. of deaths	173	1015	942	470	176
		1.02 (0.87-1.21)	1	1.26 (1.15-1.38)	1.39 (1.23-1.56)	1.44 (1.22-1.71)
After restriction						
Follow-up time (person-years)		8332	101270	118544	68905	27614
All-cause mortality	No. of deaths	67	672	641	333	146
		1.13 (0.87-1.46)	1	1.04 (0.93-1.17)	1.12 (0.98-1.29)	1.33 (1.10-1.60)
Cardiovascular mortality	No. of deaths	19	187	240	144	47
		1.06 (0.64-1.74)	1	1.39 (1.14-1.70)	1.72 (1.37-2.17)	1.39 (0.99-1.96)
Women						
Total follow-up time (person-years)		11341	85174	100775	68871	31778
All-cause mortality	No. of deaths	218	981	915	554	286
		1.21 (1.04-1.41)	1	0.95 (0.86-1.04)	0.96 (0.86-1.07)	1.09 (0.95-1.25)
Cardiovascular mortality	No. of deaths	71	395	415	269	128
		0.93 (0.72-1.21)	1	1.08 (0.94-1.24)	1.16 (0.99-1.37)	1.16 (0.94-1.44)
After restriction						
Follow-up time (person-years)		6333	64388	80025	54561	24861
All-cause mortality	No. of deaths	44	351	376	234	118
		1.11 (0.80-1.54)	1	1.03 (0.88-1.19)	1.07 (0.90-1.27)	1.20 (0.97-1.49)
Cardiovascular mortality	No. of deaths	14	111	148	93	38
		1.04 (0.57-1.89)	1	1.28 (0.99-1.64)	1.33 (1.00-1.78)	1.10 (0.74-1.62)
Men						
Total follow-up time (person-years)		11667	95405	73553	26300	5056
All-cause mortality	No. of deaths	358	1773	1090	378	95
		1.29 (1.15-1.46)	1	1.04 (0.96-1.12)	1.13 (1.01-1.27)	1.61 (1.30-1.99)
Cardiovascular mortality	No. of deaths	102	620	527	201	48
		1.06 (0.85-1.31)	1	1.39 (1.23-1.57)	1.66 (1.40-1.96)	2.27 (1.68-3.06)
After restriction						
Follow-up time (person-years)		1998	36882	38518	14344	2753
All-cause mortality	No. of deaths	23	321	265	99	28
		1.18 (0.76-1.81)	1	1.07 (0.90-1.27)	1.25 (0.98-1.59)	2.04 (1.36-3.07)
Cardiovascular mortality	No. of deaths	5	76	92	51	9
		1.07 (0.43-2.66)	1	1.59 (1.16-2.18)	2.81 (1.93-4.10)	2.96 (1.46-6.00)

Data are Hazard Ratios (95% confidence interval). Age is the time scale. Hazard ratio adjusted for ethnicity, residence, marital status, education, wealth score, physical activity, tobacco use, opium use, alcohol drinking, fruit/vegetable consumption, and sex, if applicable.

eTable 12. Association between waist circumference after adjustment for hip circumference and mortality in the Golestan Cohort Study, before and after exclusion of participants with a history of chronic diseases, ever tobacco use, or ever opium use at baseline, and/or death within the first 5 years of follow-up restriction*

		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	P for trend
All participants							
Total follow-up time (person-years)		105775	108097	94094	103143	98861	
All-cause mortality	No. of deaths	1680	1363	1143	1212	1253	
		1	1.03 (0.95-1.11)	1.24 (1.13-1.37)	1.41 (1.26-1.57)	1.75 (1.54-1.98)	<0.001
Cardiovascular mortality	No. of deaths	538	518	529	584	609	
			1.22 (1.06-1.39)	1.78 (1.52-2.07)	2.11 (1.78-2.49)	2.62 (2.16-3.17)	<0.001
After restriction							
Follow-up time (person-years)		55651	68183	63729	70077	67058	
All-cause mortality	No. of deaths	318	346	381	387	428	
		1	1.08 (0.92-1.28)	1.58 (1.32-1.90)	1.67 (1.36-2.05)	2.23 (1.77-2.81)	<0.001
Cardiovascular mortality	No. of deaths	79	101	138	152	167	
		1	1.33 (0.97-1.84)	2.50 (1.79-3.49)	3.01 (2.09-4.32)	4.10 (2.74-6.12)	<0.001
Women							
Total follow-up time (person-years)		56708	60212	55310	61611	64113	
All-cause mortality	No. of deaths	653	557	512	576	657	
		1	1.00 (0.89-1.13)	1.24 (1.08-1.42)	1.43 (1.22-1.66)	1.73 (1.45-2.07)	<0.001
Cardiovascular mortality	No. of deaths	233	236	226	271	313	
		1	1.26 (1.04-1.52)	1.63 (1.31-2.02)	1.99 (1.57-2.52)	2.40 (1.83-3.15)	<0.001
After restriction							
Follow-up time (person-years)		41057	47603	44290	48145	49086	
All-cause mortality	No. of deaths	192	194	227	236	274	
		1	1.02 (.83-1.27)	1.47 (1.17-1.85)	1.74 (1.35-2.25)	2.25 (1.69-3.00)	<0.001
Cardiovascular mortality	No. of deaths	49	70	88	95	102	
		1	1.71 (1.17-2.50)	2.68 (1.79-4.00)	3.52 (2.26-5.47)	4.40 (2.69-7.21)	<0.001
Men							
Total follow-up time (person-years)		49067	47885	38784	41532	34748	
All-cause mortality	No. of deaths	1027	806	631	636	596	
		1	1.03 (0.93-1.15)	1.17 (1.02-1.33)	1.30 (1.12-1.52)	1.59 (1.33-1.90)	<0.001
Cardiovascular mortality	No. of deaths	305	282	303	313	296	
		1	1.14 (.94-1.38)	1.63 (1.31-2.03)	2.02 (1.58-2.58)	2.43 (1.84-3.20)	<0.001
After restriction							
Follow-up time (person-years)		14594	20579	19438	21933	17972	
All-cause mortality	No. of deaths	126	152	154	151	154	
		1	1.23 (.94-1.61)	1.57 (1.15-2.14)	1.59 (1.12-2.26)	1.86 (1.25-2.77)	<0.001
Cardiovascular mortality	No. of deaths	30	31	50	57	65	
		1	1.02 (0.57-1.80)	1.59 (0.85-2.97)	2.08 (1.06-4.07)	2.50 (1.19-5.24)	0.001

Data are Hazard Ratios (95% confidence intervals). Age is the time scale. Hazard ratio adjusted for hip circumference, ethnicity, residence, marital status, education, wealth score, physical activity, tobacco use, opium use, alcohol drinking, fruit/vegetable consumption, and sex, if applicable. P for trends are based on continues variable.

eTable 13. Effects of one standard deviation increase in waist circumference after adjustment for hip circumference on cardiovascular mortality, stratified by body-mass index and waist-to-hip ratio categories, in the Golestan Cohort Study

	All participants		Participants without history of chronic diseases at baseline*	
	Crude	**Adjusted†**	**Crude**	**Adjusted†**
BMI categories				
BMI<18.5	1.34 (0.90-1.97)	1.17 (0.79-1.73)	1.40 (0.85-2.32)	1.30 (0.78-2.15)
18.5≤BMI<25	1.62 (1.41-1.85)	1.72 (1.50-1.97)	1.63 (1.38-1.91)	1.75 (1.49-2.06)
25≤BMI<30	1.63 (1.42-1.87)	1.51 (1.31-1.75)	1.72 (1.46-2.03)	1.61 (1.35-1.91)
BMI≥30	1.45 (1.27-1.66)	1.27 (1.09-1.47)	1.45 (1.25-1.67)	1.26 (1.07-1.47)
WHR categories				
WHR <0.9	1.06 (0.73-1.56)	1.07 (0.73-1.57)	1.16 (0.73-1.84)	1.20 (0.75-1.93)
0.9-≤WHR<1.0	1.47 (1.08-2.01)	1.63 (1.19-2.23)	1.49 (1.02-2.19)	1.66 (1.13-2.44)
1.0-≤WHR<1.1	1.57 (1.18-2.10)	1.63 (1.22-2.18)	1.49 (1.04-2.14)	1.55 (1.08-2.22)
WHR≥1.1	1.19 (0.81-1.74)	1.22 (0.83-1.78)	1.07 (0.65-1.76)	1.15 (0.70-1.88)

BMI denotes body-mass index and WHR waist-to-hip ratio. Data are Hazard Ratios (95% confidence intervals) with age as the time scale.
*History of chronic diseases was defined as a history of heart disease, stroke, cancers, chronic obstructive respiratory diseases, asthma, chronic renal failure, chronic hepatic failure, and tuberculosis. †Adjusted for sex, ethnicity, residence, marital status, education, tobacco use, opium use, and alcohol drinking, in addition to hip circumference.

eTable 14. Population Attributable fraction related to all-cause and cardiovascular mortality, in the Golestan cohort study

Fantasy scenario	Characteristics*	All-cause mortality (n=6651)		Cardiovascular mortality (n=2778)	
		PAF	Number of preventable deaths	PAF	Number of preventable deaths
Normal BMI	18.5≤BMI<25 kg/m²	0.03 (0.00 to 0.06)	200 (0 to 399)	0.14 (0.10 to 0.18)	389 (278 to 500)
First quintile of WC	WC≤83 cm	-0.03 (-0.08 to 0.01)	-200 (-532 to 67)	0.20 (0.14 to 0.26)	556 (389 to 722)
First quintile of WHtR	WHtR<0.5165	0.01 (-0.04 to 0.05)	67 (-266 to 333)	0.24 (0.17 to 0.29)	667 (472 to 806)
First quintile of WHR	WHR<0.8843	0.09 (0.04 to 0.14)	599 (266 to 931)	0.29 (0.22 to 0.35)	806 (611 to 972)
First quintile of Hip-adjusted WC	WC≤83 cm and HC fixed at mean level (97.5-101cm)	0.17 (0.12 to 0.22)	1131 (798 to 1463)	0.36 (0.30 to 0.42)	1000 (833 to 1167)
First quintile of WC and fifth quintile of HC	WC≤83 cm and HC≥107.5	0.41 (0.32 to 0.48)	2727 (2128 to 3192)	0.55 (0.46 to 0.63)	1528 (1278 to 1750)

PAF denotes population attributable fraction, BMI body-mass index, WHtR waist-to-height ratio, WHR waist-to-hip ratio, WC waist circumference, and HC hip circumference. PAFs (95% confidence intervals) are calculated based on Cox regression models, with age as the time scale, adjusted for sex, ethnicity, residence, marital status, education, tobacco use, opium use, alcohol drinking, physical activity, fruit/vegetable consumption, and wealth score. *The anthropometric measures were set to the least risk and all other variables were left unchanged.