

SUPPLEMENTARY MATERIAL

Figure S1. Participant flow chart

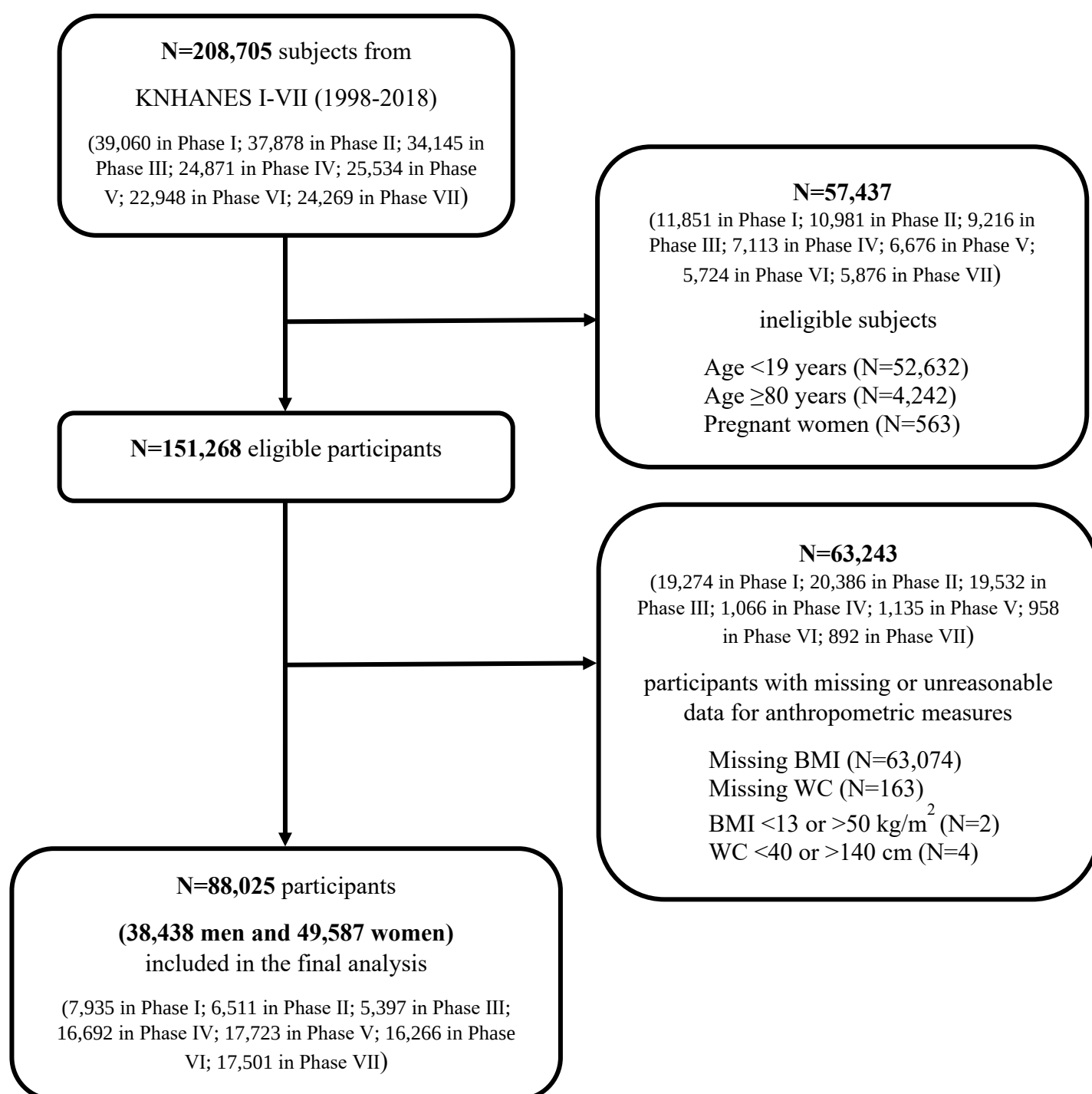
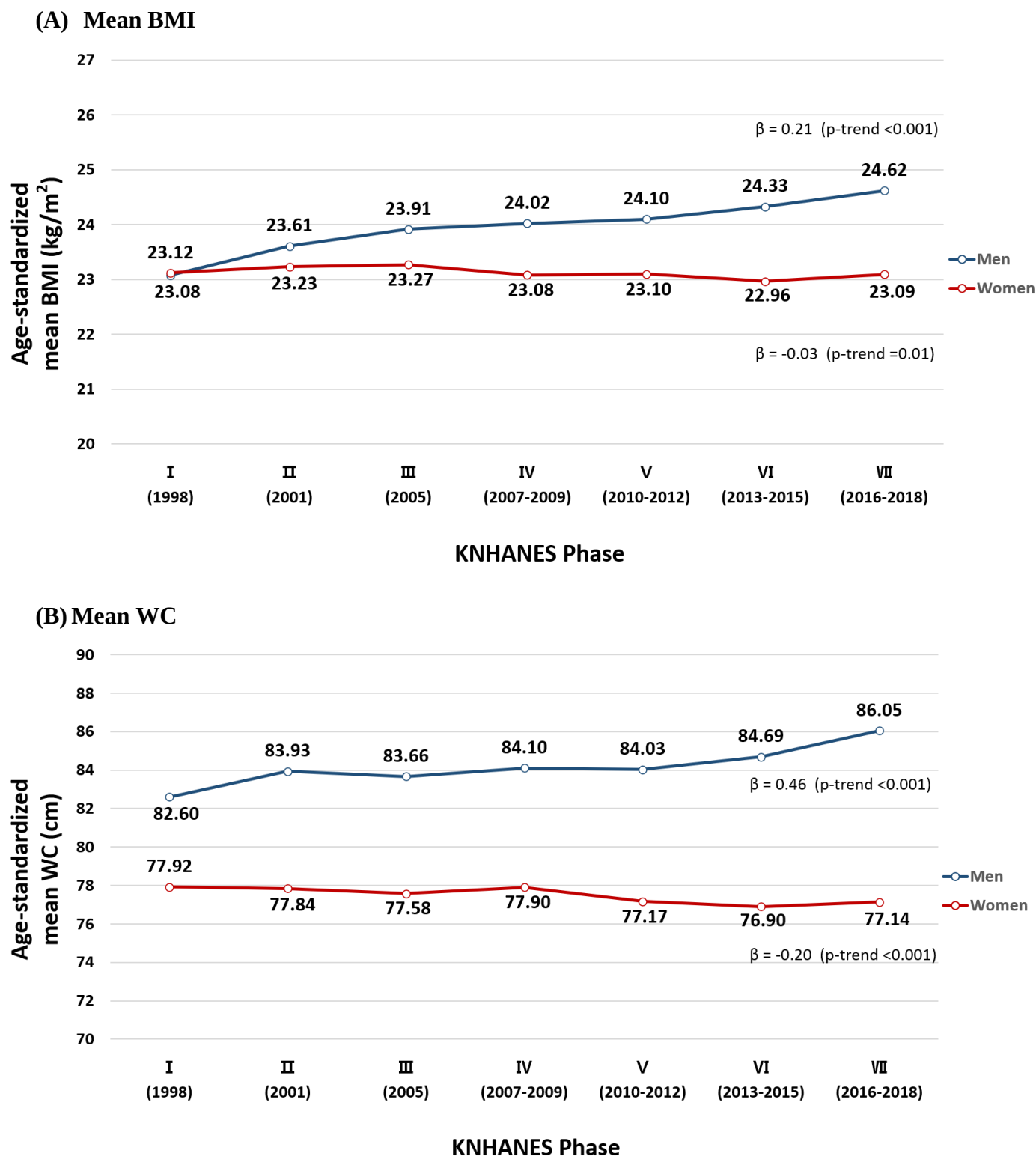


Figure S2. Age-standardized (A) mean BMI, (B) mean WC, and (C) mean WHtR among Korean men and women in the KNHANES I (1998) - VII (2016-2018). This figure shows the age-standardized mean values of (A) BMI, (B) WC, and (C) WHtR in Korean men and women from KNHANES I (1998) to VII (2016-2018). Age-standardization was performed using the 2005 Korean Census population as the reference population. The blue line indicates the age-standardized mean values in men. The red line indicates the age-standardized mean values in women. Beta and p-trend were estimated using weighted linear regression adjusted for age and survey design.



(C) Mean WHtR

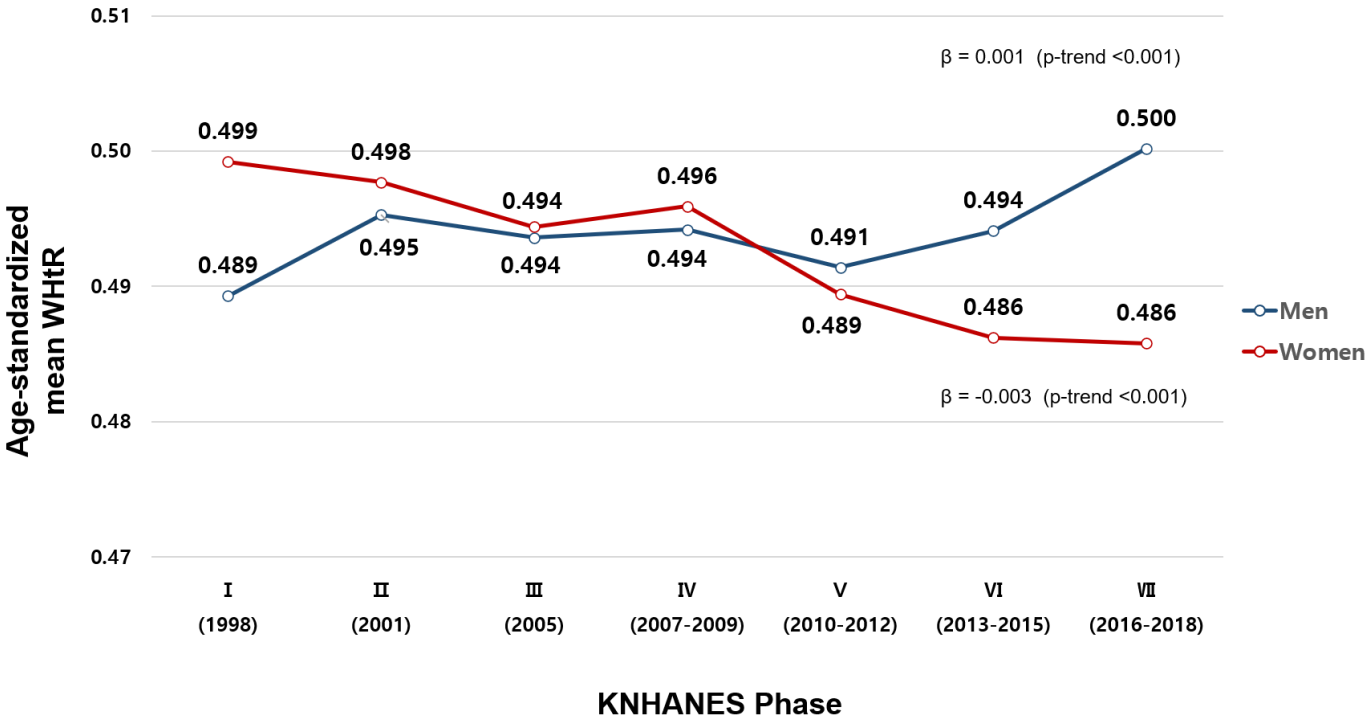
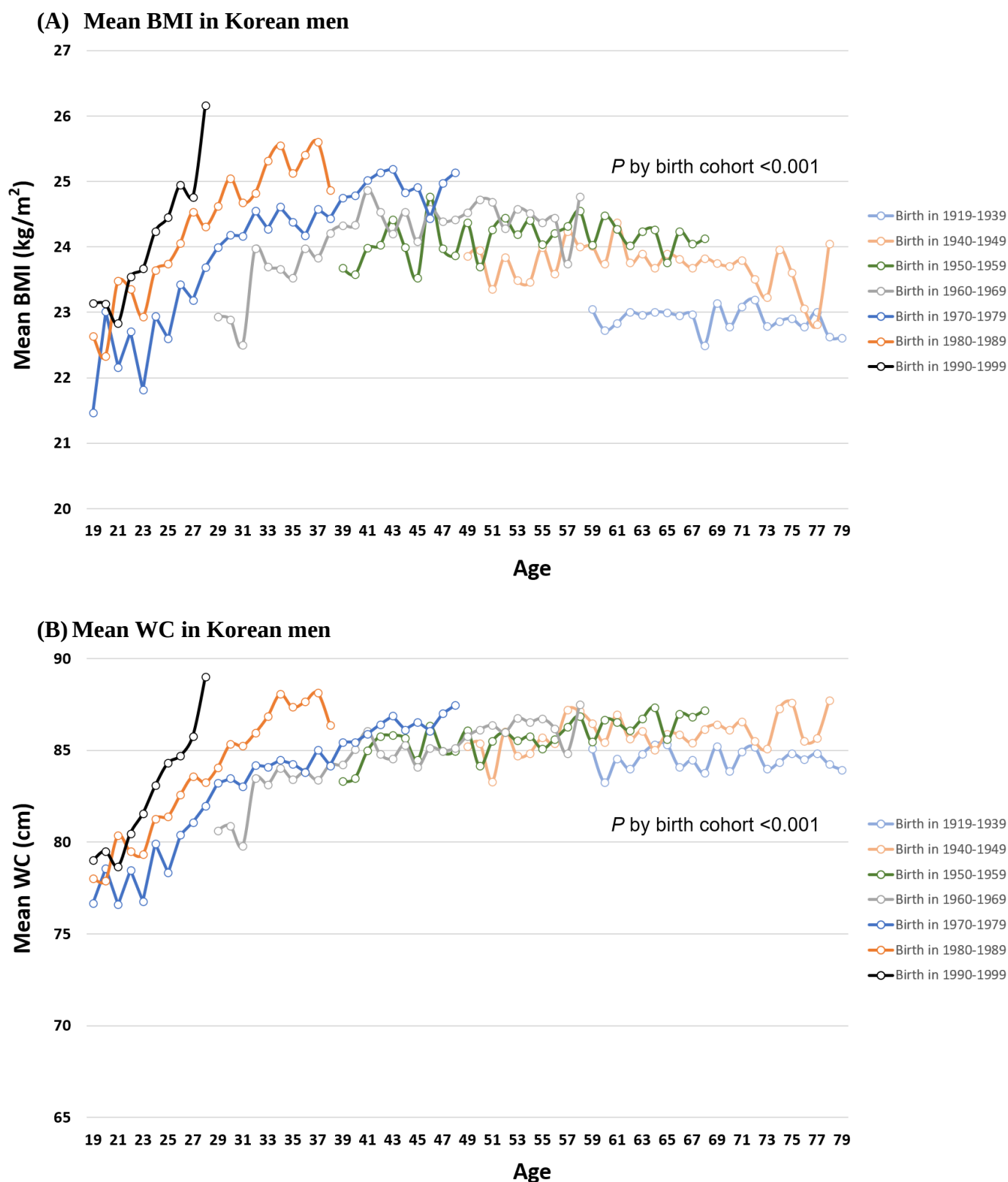
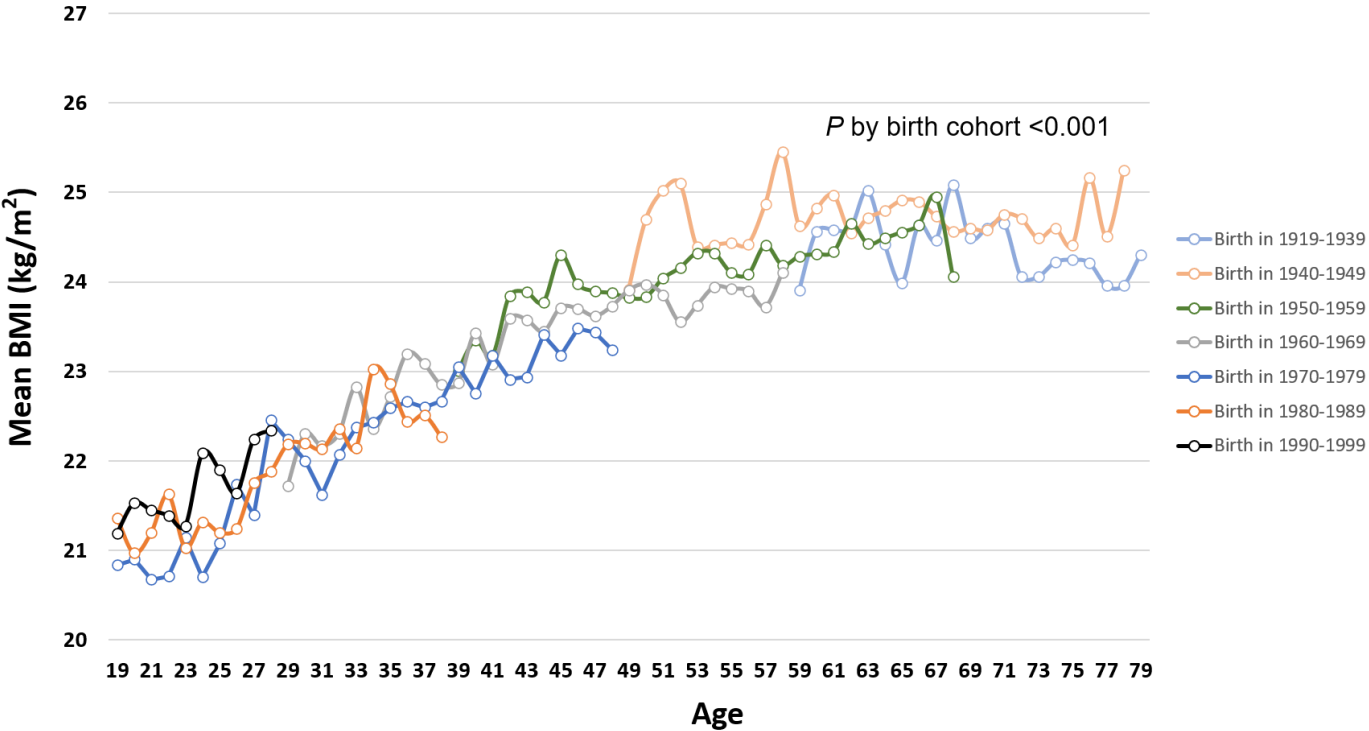


Figure S3. Trends of mean BMI and WC by birth cohort and age among Korean men and women in the KNHANES I (1998) - VII (2016-2018)

This figure shows the trends in values of (A) mean BMI in Korean men, (B) mean WC in Korean men, (C) mean BMI in Korean women and (D) mean WC in Korean women by birth cohort and age using data from KNHANES I (1998) to VII (2016-2018).



(C) Mean BMI in Korean women



(D) Mean WC in Korean women

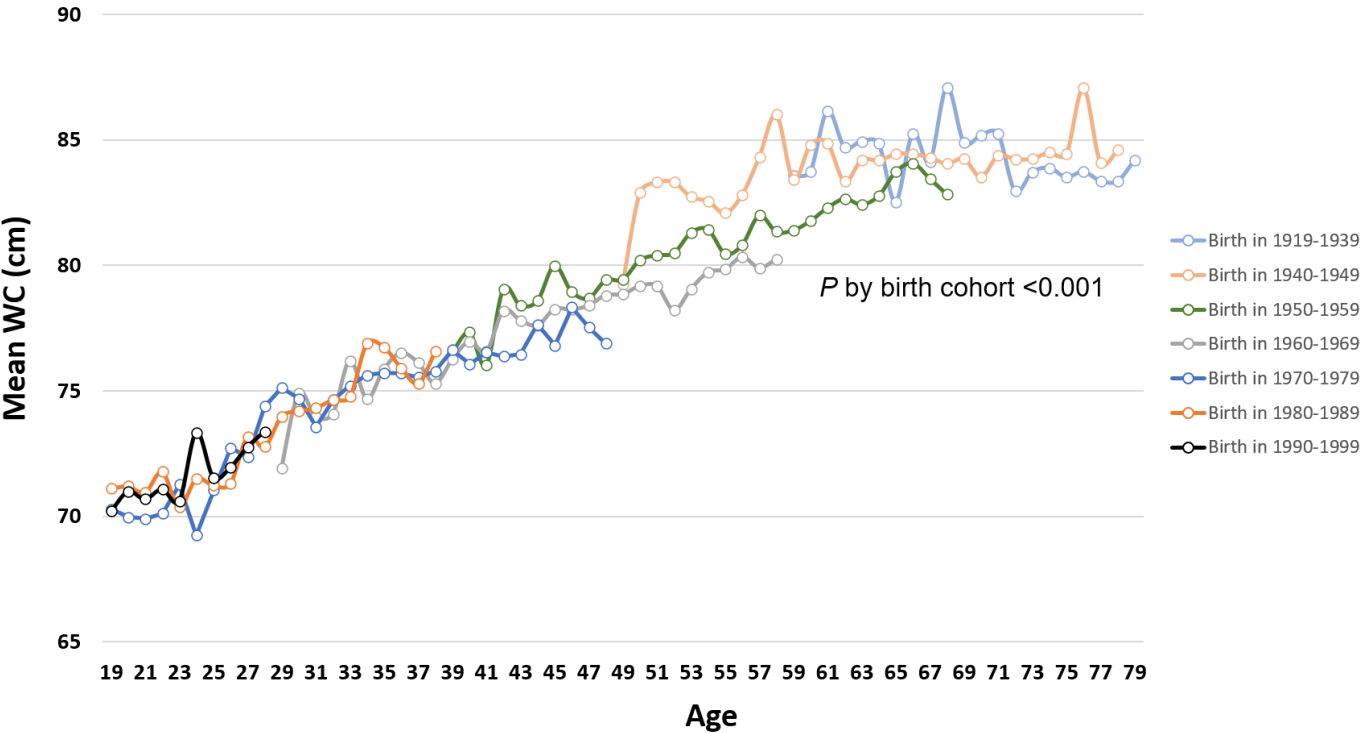
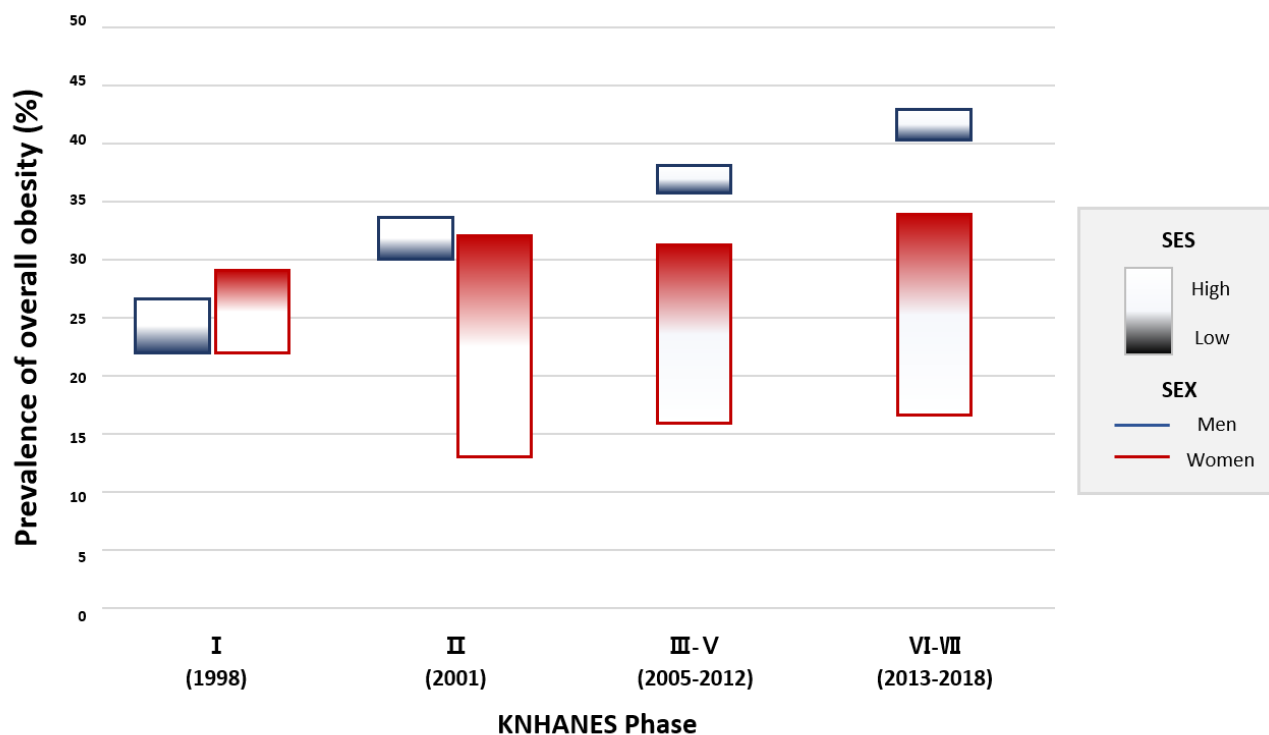


Figure S4. Summary of obesity transition in Korea

This figure summarizes the trends and inequalities in (A) overall obesity ($\text{BMI} \geq 25 \text{ kg/m}^2$) and (B) abdominal obesity prevalence by sex and socioeconomic status (SES) in Korean adults from KNHANES I (1998) to VII (2016-2018). The blue line is for men and the red line is for women. Brighter shade represents higher SES (the upper 50% of income levels and college or higher education) and darker shade represents lower SES (the lower 50% of income levels and high school or lower education). All results are age-standardized using the 2005 Korean Census population as the reference population.

(A)



(B)

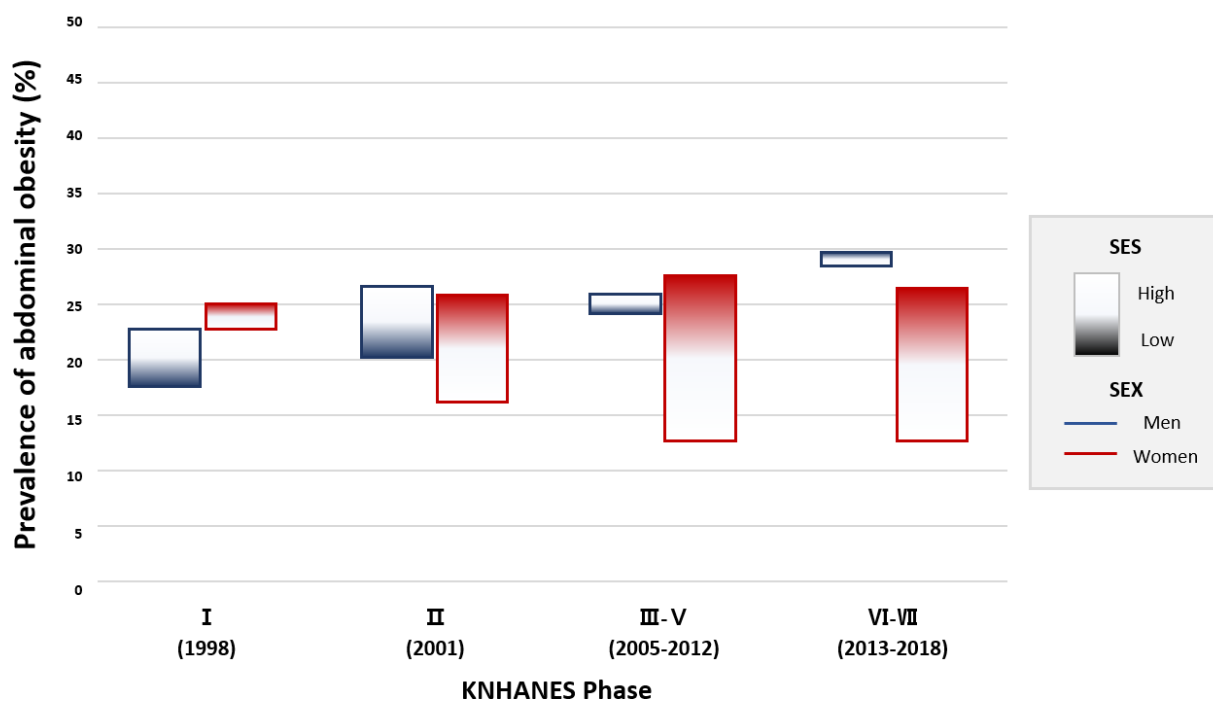


Table S1. Total number of participants by sex and sociodemographic factors: the KNHANES I-VII

		KNHANES													
		Men							Women						
Variables		I (1998)	II (2001)	III (2005)	IV (07-09)	V (10-12)	VI (13-15)	VII (16-18)	I (1998)	II (2001)	III (2005)	IV (07-09)	V (10-12)	VI (13-15)	VII (16-18)
N		3634	2884	2327	7172	7609	7062	7750	4301	3627	3070	9520	10114	9204	9751
		N (%)							N (%)						
Age	19-29 years	723 (28.6%)	520 (26.8%)	302 (23.1%)	993 (21.6%)	861 (20.3%)	915 (20.0%)	1007 (19.3%)	883 (26.7%)	659 (24.4%)	422 (21.6%)	1240 (19.7%)	1225 (18.7%)	1108 (17.8%)	1153 (17.0%)
	30-39 years	923 (27.2%)	727 (25.7%)	496 (24.7%)	1442 (23.3%)	1378 (21.6%)	1157 (20.1%)	1283 (19.1%)	1026 (25.5%)	909 (24.2%)	700 (22.8%)	1969 (21.6%)	1909 (20.0%)	1525 (18.5%)	1553 (17.2%)
	40-49 years	775 (19.8%)	689 (22.0%)	596 (23.5%)	1475 (23.3%)	1431 (22.7%)	1329 (21.8%)	1484 (21.2%)	853 (19.0%)	828 (21.3%)	740 (22.6%)	1922 (22.5%)	1830 (21.9%)	1760 (21.4%)	1911 (21.0%)
	50-59 years	575 (13.0%)	436 (13.1%)	407 (14.5%)	1243 (16.6%)	1473 (18.7%)	1403 (20.0%)	1510 (20.5%)	683 (13.2%)	510 (13.1%)	506 (14.5%)	1652 (16.7%)	2043 (18.7%)	1927 (20.2%)	2001 (20.8%)
	60-69 years	445 (8.2%)	351 (8.9%)	376 (9.4%)	1199 (9.9%)	1398 (10.3%)	1317 (11.2%)	1421 (12.9%)	559 (10.2%)	448 (10.8%)	432 (10.9%)	1574 (11.2%)	1722 (11.4%)	1584 (12.3%)	1795 (14.0%)
	70-79 years	193 (3.2%)	161 (3.6%)	150 (4.7%)	820 (5.4%)	1068 (6.3%)	941 (6.9%)	1045 (7.0%)	297 (5.6%)	273 (6.2%)	270 (7.7%)	1163 (8.3%)	1385 (9.3%)	1300 (9.9%)	1338 (10.0%)
Income	1st Quartile	843 (21.2%)	628 (21.8%)	604 (26.0%)	1759 (24.5%)	1815 (23.9%)	1719 (24.3%)	1897 (24.5%)	1017 (23.6%)	818 (22.6%)	768 (25.0%)	2303 (24.2%)	2456 (24.3%)	2250 (24.4%)	2431 (24.9%)
	2nd Quartile	942 (25.7%)	684 (23.7%)	578 (24.8%)	1723 (24.0%)	1886 (24.8%)	1775 (25.1%)	1948 (25.1%)	1113 (25.9%)	812 (22.4%)	789 (25.7%)	2347 (24.7%)	2536 (25.1%)	2291 (24.9%)	2441 (25.0%)
	3rd Quartile	959 (27.2%)	718 (24.9%)	547 (23.5%)	1748 (24.4%)	1904 (25.0%)	1776 (25.1%)	1940 (25.0%)	1042 (24.2%)	889 (24.5%)	755 (24.6%)	2315 (24.3%)	2505 (24.8%)	2317 (25.2%)	2421 (24.8%)
	4th Quartile	890 (25.9%)	694 (24.1%)	575 (24.7%)	1763 (24.6%)	1902 (25.0%)	1748 (24.8%)	1941 (25.0%)	1129 (26.2%)	891 (24.6%)	733 (23.9%)	2300 (24.2%)	2479 (24.5%)	2289 (24.9%)	2430 (24.9%)
	missing	0 (0.0%)	160 (5.5%)	23 (1.0%)	179 (2.5%)	102 (1.3%)	44 (0.6%)	24 (0.3%)	0 (0.0%)	217 (6.0%)	25 (0.8%)	255 (2.7%)	138 (1.4%)	57 (0.6%)	28 (0.3%)
Education	High school or less	2622 (72.2%)	1835 (63.6%)	1424 (61.2%)	4221 (58.9%)	4098 (53.9%)	3382 (47.9%)	3529 (45.5%)	3566 (82.9%)	2779 (76.6%)	2271 (74.0%)	6859 (72.0%)	6614 (65.4%)	5434 (59.0%)	5492 (56.3%)
	College or higher	1012 (27.8%)	1046 (36.3%)	878 (37.7%)	2872 (40.0%)	3224 (42.4%)	2940 (41.6%)	3790 (48.9%)	735 (17.1%)	841 (23.2%)	771 (25.1%)	2588 (27.2%)	3215 (31.8%)	3054 (33.2%)	3847 (39.5%)
	missing	0 (0.0%)	3 (0.1%)	25 (1.1%)	79 (1.1%)	287 (3.8%)	740 (10.5%)	431 (5.6%)	0 (0.0%)	7 (0.2%)	28 (0.9%)	73 (0.8%)	285 (2.8%)	716 (7.8%)	412 (4.2%)
Region	Seoul	730 (20.1%)	507 (17.6%)	413 (17.7%)	1182 (16.5%)	1601 (21.0%)	1340 (19.0%)	1475 (19.0%)	846 (19.7%)	653 (18.0%)	579 (18.9%)	1623 (17.0%)	2117 (20.9%)	1845 (20.0%)	1955 (20.0%)
	Metro urban	771 (21.2%)	845 (29.3%)	602 (25.9%)	1883 (26.3%)	1930 (25.4%)	1846 (26.1%)	2158 (27.8%)	923 (21.5%)	1062 (29.3%)	802 (26.1%)	2534 (26.6%)	2595 (25.7%)	2463 (26.8%)	2725 (27.9%)
	Non-metro urban	920 (25.3%)	892 (30.9%)	778 (33.4%)	2366 (33.0%)	2600 (34.2%)	2611 (37.0%)	2893 (37.3%)	1055 (24.5%)	1125 (31.0%)	1012 (33.0%)	3134 (32.9%)	3544 (35.0%)	3382 (36.7%)	3603 (37.0%)

	Rural	1213 (33.4%)	640 (22.2%)	534 (22.9%)	1741 (24.3%)	1478 (19.4%)	1265 (17.9%)	1224 (15.8%)	1477 (34.3%)	787 (21.7%)	677 (22.1%)	2229 (23.4%)	1858 (18.4%)	1514 (16.4%)	1468 (15.1%)
Occupation	Non-physical labor	700 (19.3%)	658 (22.8%)	559 (24.0%)	1706 (23.8%)	2007 (26.4%)	1724 (24.4%)	2208 (28.5%)	423 (9.8%)	392 (10.8%)	397 (12.9%)	1348 (14.2%)	1623 (16.0%)	1623 (17.6%)	2113 (21.7%)
	Physical labor	2106 (58.0%)	1526 (52.9%)	1223 (52.6%)	3571 (49.8%)	3525 (46.3%)	2886 (40.9%)	3219 (41.5%)	1643 (38.2%)	1175 (32.4%)	1059 (34.5%)	3149 (33.1%)	3144 (31.1%)	2632 (28.6%)	2915 (29.9%)
	Unemployed	810 (22.3%)	692 (24.0%)	524 (22.5%)	1763 (24.6%)	1751 (23.0%)	1691 (23.9%)	1877 (24.2%)	2235 (52.0%)	2059 (56.8%)	1614 (52.6%)	4911 (51.6%)	5062 (50.0%)	4237 (46.0%)	4313 (44.2%)
	Missing	18 (0.5%)	8 (0.3%)	21 (0.9%)	132 (1.8%)	326 (4.3%)	761 (10.8%)	446 (5.8%)	0 (0.0%)	1 (0.0%)	0 (0.0%)	112 (1.2%)	285 (2.8%)	712 (7.7%)	410 (4.2%)
Birth cohort	Birth in 1919-1939	699 (18.9%)	582 (9.1%)	805 (10.8%)	906 (11.5%)	642 (8.8%)	0 (0.0%)	0 (0.0%)	924 (18.1%)	687 (8.8%)	885 (9.3%)	1025 (9.9%)	780 (8.2%)	0 (0.0%)	0 (0.0%)
	Birth in 1940-1949	435 (11.7%)	428 (6.7%)	622 (8.3%)	753 (9.6%)	527 (7.2%)	119 (2.9%)	0 (0.0%)	612 (12.0%)	529 (6.7%)	711 (7.5%)	967 (9.4%)	636 (6.7%)	172 (3.2%)	0 (0.0%)
	Birth in 1950-1959	283 (7.6%)	419 (6.6%)	478 (6.4%)	542 (6.9%)	428 (5.9%)	177 (4.3%)	0 (0.0%)	431 (8.4%)	460 (5.9%)	588 (6.2%)	744 (7.2%)	591 (6.2%)	256 (4.8%)	0 (0.0%)
	Birth in 1960-1969	912 (24.6%)	1187 (18.5%)	1278 (17.2%)	1487 (19.0%)	1371 (18.8%)	891 (21.4%)	46 (2.9%)	1303 (25.5%)	1555 (19.8%)	1681 (17.7%)	1952 (18.9%)	1877 (19.7%)	1108 (20.8%)	44 (2.3%)
	Birth in 1970-1979	797 (21.5%)	1409 (22.0%)	1459 (19.6%)	1389 (17.7%)	1479 (20.2%)	911 (21.9%)	165 (10.5%)	1049 (20.5%)	1724 (21.9%)	1932 (20.4%)	1866 (18.0%)	1994 (20.9%)	1258 (23.6%)	291 (15.2%)
	Birth in 1980-1989	424 (11.4%)	1193 (18.6%)	1379 (18.5%)	1284 (16.4%)	1327 (18.2%)	943 (22.7%)	512 (32.6%)	558 (10.9%)	1480 (18.8%)	1787 (18.8%)	1841 (17.8%)	1752 (18.4%)	1163 (21.8%)	623 (32.4%)
	Birth in 1990-1999	158 (4.3%)	1187 (18.5%)	1429 (19.2%)	1480 (18.9%)	1531 (20.9%)	1115 (26.8%)	850 (54.0%)	234 (4.6%)	1425 (18.1%)	1912 (20.1%)	1949 (18.8%)	1892 (19.9%)	1376 (25.8%)	963 (50.1%)

Table S2. Result of the segmented regression models predicting overall (BMI $\geq$ 25kg/m²) and abdominal obesity prevalence by sex

	Men				Women			
	Overall obesity							
		95% CI				95% CI		
	β	Lower	Upper	P-value	β	Lower	Upper	P-value
Intercept β_0	0.266	0.242	0.291	<0.001	0.027	0.009	0.046	0.004
Baseline trend β_1	0.024	0.019	0.029	<0.001	-0.001	-0.006	0.003	0.574
Prevalence change after phase VI β_2	-0.023	-0.055	0.008	0.146	-0.025	-0.050	0.001	0.063
Slope change after phase VI β_3	0.011	-0.009	0.030	0.279	0.009	-0.007	0.024	0.286
	Abdominal obesity							
		95% CI				95% CI		
	β	Lower	Upper	P-value	β	Lower	Upper	P-value
Intercept β_0	0.098	0.077	0.119	<0.001	-0.081	-0.099	-0.062	<0.001
Baseline trend β_1	0.010	0.005	0.015	<0.001	-0.003	-0.008	0.001	0.142
Prevalence change after phase VI β_2	-0.040	-0.069	-0.011	0.007	-0.040	-0.067	-0.014	0.003
Slope change after phase VI β_3	0.041	0.023	0.059	<0.001	0.014	-0.002	0.030	0.085

The model used for the segmented regression was as follows. *Obesity prevalence at specific survey phase* = $\beta_0 + \beta_1 * Phase + \beta_2 * (PhaseVI \text{ or after}) + \beta_3 * Time \text{ after PhaseVI} + \beta_4 * Age + e_{Phase}$
 where β_0 indicates intercept; β_1 indicates baseline trend by phases; β_2 indicates immediate prevalence change after Phase VI; β_3 indicates slope change after Phase VI; β_4 indicates age effect (10-year intervals, continuous); and e_{Phase} indicates error term.

Table S3. Mean BMI and WC by demographic and socioeconomic factors in men and women: the KNHANES I-VII

KNHANES																			
Mean BMI in men & women (kg/m ²)																			
Variables		Men									Women								
		I (1998)	II (2001)	III (2005)	IV (2007- 2009)	V (2010- 2012)	VI (2013- 2015)	VII (2016- 2018)	Age- adjusted β	P for trend	I (1998)	II (2001)	III (2005)	IV (2007- 2009)	V (2010- 2012)	VI (2013- 2015)	VII (2016- 2018)	Age- adjusted β	P for trend
Age	19-29	22.5	23.0	23.2	23.7	23.7	23.7	24.3	0.24	<0.001	21.3	21.2	21.6	21.5	21.4	21.5	21.9	0.07	<0.05
	30-39	23.5	23.9	24.2	24.3	24.5	24.9	25.2	0.27	<0.001	22.8	22.7	22.6	22.3	22.6	22.5	22.5	-0.03	0.19
	40-49	23.9	24.2	24.5	24.3	24.5	24.8	24.9	0.15	<0.001	23.7	24.0	23.8	23.5	23.6	23.2	23.4	-0.10	<0.001
	50-59	23.4	23.8	24.4	24.3	24.1	24.4	24.5	0.13	<0.001	24.6	24.7	24.8	24.4	24.1	23.9	23.8	-0.17	<0.001
	60-69	22.6	23.2	23.7	23.7	23.9	24.0	24.2	0.21	<0.001	24.3	24.9	24.8	24.9	24.7	24.5	24.5	-0.05	0.06
	70-79	20.9	22.7	22.9	22.8	23.1	23.3	23.7	0.30	<0.001	23.6	23.9	23.9	24.2	24.3	24.5	24.7	0.17	<0.001
Income	1st Quartile	22.8	23.6	23.7	23.9	23.8	24.2	24.5	0.24	<0.001	23.0	23.5	23.4	23.6	23.7	23.6	23.9	0.05	0.02
	2nd Quartile	23.2	23.4	23.8	24.0	24.2	24.4	24.5	0.22	<0.001	23.2	23.4	23.5	23.4	23.4	23.3	23.5	-0.05	0.02
	3rd Quartile	23.0	23.7	24.1	24.1	24.1	24.3	24.7	0.22	<0.001	22.9	23.1	23.4	23.0	23.2	23.1	23.2	-0.05	0.02
	4th Quartile	23.5	23.8	24.3	24.3	24.4	24.4	24.6	0.16	<0.001	22.9	22.8	22.9	22.9	22.8	22.8	22.8	-0.08	<0.001
Education	High school or less	23.1	23.6	24.0	24.0	24.0	24.2	24.4	0.21	<0.001	23.4	23.8	24.0	23.9	24.1	24.0	24.2	0.02	0.08
	College or higher	23.2	23.7	23.9	24.2	24.3	24.4	24.7	0.19	<0.001	21.5	21.4	21.7	21.8	21.9	22.0	22.3	0.08	<0.001
Region	Seoul	23.1	23.5	23.8	24.2	24.1	24.4	24.5	0.20	<0.001	22.9	22.9	22.9	23.1	22.8	22.7	23.1	-0.08	<0.001
	Metro urban	23.3	23.7	24.1	23.9	24.1	24.2	24.5	0.16	<0.001	22.8	23.0	23.3	23.2	23.2	23.2	23.2	-0.04	0.06
	Non-metro urban	23.2	23.8	24.1	24.1	24.2	24.4	24.7	0.20	<0.001	22.9	23.0	23.2	23.2	23.2	23.3	23.3	-0.03	0.10
	Rural	22.8	23.4	23.7	24.1	24.0	24.4	24.7	0.28	<0.001	23.4	23.9	23.9	23.3	24.1	23.8	24.1	0.06	0.02
Occupation	Non-physical labor	23.6	24.0	24.3	24.4	24.6	24.6	24.9	0.18	<0.001	21.6	21.5	21.7	22.1	22.1	22.2	22.3	0.02	0.51
	Physical labor	23.2	23.7	24.1	24.0	24.0	24.3	24.6	0.19	<0.001	23.5	23.9	23.9	23.6	23.8	23.6	23.8	-0.03	0.09
	Unemployed	22.5	23.1	23.3	23.7	23.7	23.9	24.1	0.23	<0.001	23.0	23.2	23.5	23.3	23.4	23.3	23.6	-0.01	0.50
Mean WC in men & women (cm)																			

Variables		Men									Women								
		I (1998)	II (2001)	III (2005)	IV (2007- 2009)	V (2010- 2012)	VI (2013- 2015)	VII (2016- 2018)	Age- adjusted β	P for trend	I (1998)	II (2001)	III (2005)	IV (2007- 2009)	V (2010- 2012)	VI (2013- 2015)	VII (2016- 2018)	Age- adjusted β	P for trend
Age	19-29	79.0	79.9	79.5	81.5	81.1	81.4	83.3	0.62	<0.001	71.7	71.1	71.9	72.7	71.1	71.7	71.9	0.004	0.95
	30-39	82.7	83.9	83.0	83.9	84.3	85.8	87.0	0.71	<0.001	75.5	75.6	75.0	75.3	75.3	75.6	75.6	0.03	0.65
	40-49	85.1	86.1	85.2	85.0	84.9	85.5	86.6	0.20	<0.001	78.9	78.6	78.1	78.1	78.0	76.9	77.7	-0.25	<0.001
	50-59	84.9	85.5	87.2	86.0	85.2	85.8	86.7	0.16	0.01	83.3	83.1	82.4	82.1	80.7	79.6	79.6	-0.75	<0.001
	60-69	83.5	85.1	85.3	85.9	85.8	85.8	87.1	0.43	<0.001	84.5	85.1	84.4	85.1	83.8	82.8	82.9	-0.45	<0.001
	70-79	79.9	85.1	84.8	83.8	84.8	85.4	86.9	0.79	<0.001	82.8	83.7	83.2	83.9	83.6	84.2	84.6	0.27	<0.05
Income	1st Quartile	81.5	83.5	82.8	83.7	83.4	84.6	85.9	0.58	<0.001	78.0	78.6	78.4	79.3	78.8	79.0	79.5	-0.01	0.88
	2nd Quartile	82.4	82.9	83.2	84.0	84.4	84.8	86.0	0.52	<0.001	77.8	78.3	77.9	79.0	78.2	77.7	78.7	-0.22	<0.001
	3rd Quartile	81.9	83.7	84.1	84.4	83.9	84.7	86.3	0.48	<0.001	77.2	77.7	78.1	77.7	77.7	77.5	77.6	-0.27	<0.001
	4th Quartile	83.5	84.2	84.5	84.7	84.9	85.2	86.4	0.32	<0.001	77.1	76.2	76.7	77.3	76.5	76.6	76.6	-0.33	<0.001
Education	High school or less	82.7	84.1	84.3	84.5	84.4	85.1	86.5	0.39	<0.001	78.8	79.7	80.0	80.7	80.5	80.3	81.2	-0.11	<0.05
	College or higher	81.8	83.1	82.7	83.8	83.9	84.4	86.0	0.49	<0.001	72.3	71.8	72.4	73.4	73.2	73.8	74.5	0.17	<0.05
Region	Seoul	82.5	83.8	83.4	84.1	83.1	84.9	86.4	0.45	<0.001	77.6	77.2	76.4	77.4	75.4	75.9	77.5	-0.38	<0.001
	Metro urban	82.8	83.7	84.1	84.0	85.0	84.7	85.6	0.31	<0.001	76.5	76.9	78.3	78.8	78.4	77.9	77.6	-0.25	<0.001
	Non-metro urban	82.3	84.0	83.5	84.0	83.8	84.6	86.3	0.47	<0.001	77.1	76.7	77.3	77.8	77.3	77.8	78.1	-0.13	0.03
	Rural	81.9	83.0	83.4	84.9	84.7	85.2	86.6	0.65	<0.001	79.3	80.8	79.7	80.0	81.0	79.8	80.4	-0.02	0.81
Occupation	Non-physical labor	83.2	84.4	84.4	84.8	85.0	85.4	87.0	0.46	<0.001	72.3	71.6	72.0	74.0	73.5	74.2	74.2	0.02	0.81
	Physical labor	83.0	84.1	83.8	84.1	84.0	84.6	86.0	0.34	<0.001	79.2	79.2	79.2	79.4	79.4	78.7	79.6	-0.23	<0.001
	Unemployed	80.5	82.1	82.6	83.6	83.4	84.2	85.4	0.57	<0.001	77.6	78.2	78.6	79.0	78.5	78.4	79.3	-0.14	<0.05

Values for mean BMI and WC are not adjusted for age. β coefficients were estimated from weighted linear regression models for mean BMI or WC values, adjusting for age (10-year intervals, continuous). Tests for trend were performed by including the KNHANES phase as a continuous variable in the models.

Table S4. The prevalence, odds ratios (ORs) and 95% confidence intervals (CIs) of overall and abdominal obesity by region and occupation type in women: the KNHANES I-VII

		Overall obesity				Abdominal obesity			
		Among unemployed and physical labor women		Among non-physical labor women		Among unemployed and physical labor women		Among non-physical labor women	
Phase		Seoul and metro-urban	Rural and non-metro urban areas	Seoul and metro-urban	Rural and non-metro urban areas	Seoul and metro-urban	Rural and non-metro urban areas	Seoul and metro-urban	Rural and non-metro urban areas
I (1998)	Prevalence	26.0 %	28.1 %	13.7 %	13.3 %	22.1 %	24.5 %	7.9 %	7.7 %
	OR (95% CI)	1.0 (ref)	0.97 (0.82, 1.16)	1.0 (ref)	0.94 (0.52, 1.70)	1.0 (ref)	0.94 (0.77, 1.15)	1.0 (ref)	1.00 (0.48, 2.09)
II (2001)	Prevalence	27.3 %	32.4 %	9.0 %	10.9 %	23.9 %	26.7 %	5.1 %	4.7 %
	OR (95% CI)	1.0 (ref)	1.15 (0.95, 1.38)	1.0 (ref)	1.29 (0.57, 2.93)	1.0 (ref)	0.98 (0.78, 1.23)	1.0 (ref)	0.92 (0.35, 2.42)
III (2005)	Prevalence	29.3 %	31.8 %	10.9 %	16.2 %	24.9 %	26.4 %	7.8 %	7.9 %
	OR (95% CI)	1.0 (ref)	1.02 (0.82, 1.26)	1.0 (ref)	1.59 (0.78, 3.25)	1.0 (ref)	0.92 (0.73, 1.15)	1.0 (ref)	1.00 (0.39, 2.53)
IV (2007-2009)	Prevalence	29.3 %	30.2 %	14.5 %	14.0 %	26.7 %	28.2 %	9.7 %	10.4 %
	OR (95% CI)	1.0 (ref)	1.04 (0.92, 1.17)	1.0 (ref)	1.00 (0.68, 1.48)	1.0 (ref)	1.03 (0.88, 1.21)	1.0 (ref)	1.15 (0.75, 1.77)
V (2010-2012)	Prevalence	27.8 %	33.4 %	17.8 %	17.6 %	23.4 %	28.9 %	11.5 %	13.0 %
	OR (95% CI)	1.0 (ref)	1.20 (1.05, 1.37)	1.0 (ref)	0.88 (0.63, 1.21)	1.0 (ref)	1.18 (1.02, 1.36)	1.0 (ref)	1.04 (0.70, 1.54)
VI (2013-2015)	Prevalence	26.2 %	31.4 %	18.0 %	17.2 %	21.5 %	27.2 %	10.6 %	12.0 %
	OR (95% CI)	1.0 (ref)	1.26 (1.12, 1.42)	1.0 (ref)	0.90 (0.67, 1.22)	1.0 (ref)	1.31 (1.13, 1.51)	1.0 (ref)	1.11 (0.76, 1.61)
VII (2016-2018)	Prevalence	30.4 %	33.1 %	17.0 %	16.7 %	26.5 %	29.2 %	10.2 %	12.0 %
	OR (95% CI)	1.0 (ref)	1.08 (0.96, 1.22)	1.0 (ref)	0.92 (0.70, 1.20)	1.0 (ref)	1.08 (0.94, 1.24)	1.0 (ref)	1.12 (0.83, 1.51)

Prevalence is not age-adjusted.

ORs and CIs are adjusted for age (19-29, 30-39, 40-49, 50-59, 60-69, 70-79 years), income level (1st, 2nd, 3rd, 4th quartiles) and education level (some high school or less, some college or higher).

Table S5. Beta coefficients (β) and 95% confidence intervals (CI) for the associations of socioeconomic factors (income, education, region, occupation) with mean BMI and WC in men: the KNHANES I-VII

Mean BMI in men										
KNHANES Phase (year)										
Variables		I (1998)	II (2001)	III (2005)	IV (2007-2009)	V (2010-2012)	VI (2013-2015)	VII (2016-2018)		
		β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	
Income	1st Quartile	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	2nd Quartile	0.33 (0.00, 0.66)	-0.20 (-0.58, 0.19)	0.11 (-0.37, 0.58)	0.10 (-0.18, 0.38)	0.28 (-0.03, 0.60)	0.14 (-0.16, 0.44)	-0.04 (-0.33, 0.26)		
	3rd Quartile	0.17 (-0.18, 0.52)	0.02 (-0.35, 0.38)	0.37 (-0.17, 0.91)	0.22 (-0.09, 0.53)	0.15 (-0.17, 0.48)	-0.02 (-0.29, 0.26)	0.15 (-0.14, 0.44)		
	4th Quartile	0.50 (0.13, 0.88)	0.12 (-0.29, 0.53)	0.62 (0.12, 1.12)	0.34 (0.05, 0.62)	0.45 (0.12, 0.78)	0.17 (-0.11, 0.46)	0.07 (-0.22, 0.36)		
Education	High school or less	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	College or higher	0.25 (-0.04, 0.54)	0.07 (-0.27, 0.41)	-0.12 (-0.56, 0.33)	0.10 (-0.15, 0.34)	0.01 (-0.26, 0.28)	0.14 (-0.11, 0.38)	0.01 (-0.24, 0.26)		
Region	Seoul	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Metro urban	0.17 (-0.19, 0.53)	0.14 (-0.27, 0.54)	0.32 (-0.19, 0.83)	-0.30 (-0.59, -0.01)	0.03 (-0.26, 0.32)	-0.21 (-0.49, 0.08)	0.01 (-0.27, 0.28)		
	Non-metro urban	0.08 (-0.31, 0.46)	0.18 (-0.23, 0.58)	0.19 (-0.29, 0.66)	-0.12 (-0.40, 0.16)	0.16 (-0.12, 0.44)	-0.07 (-0.32, 0.19)	0.23 (-0.01, 0.48)		
	Rural	0.01 (-0.39, 0.40)	-0.20 (-0.61, 0.21)	-0.02 (-0.55, 0.51)	0.01 (-0.33, 0.35)	0.07 (-0.28, 0.43)	0.05 (-0.29, 0.40)	0.30 (-0.06, 0.65)		
Occupation	Non-physical labor	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Physical labor	-0.09 (-0.37, 0.19)	-0.17 (-0.56, 0.21)	-0.05 (-0.49, 0.39)	-0.18 (-0.44, 0.08)	-0.43 (-0.70, -0.16)	-0.04 (-0.29, 0.20)	-0.23 (-0.47, 0.01)		
	Unemployed	-0.30 (-0.69, 0.10)	-0.34 (-0.82, 0.15)	-0.32 (-0.89, 0.25)	-0.13 (-0.47, 0.21)	-0.45 (-0.81, -0.09)	0.05 (-0.27, 0.38)	-0.36 (-0.69, -0.03)		

Mean WC in men										
KNHANES Phase (year)										
Variables		I (1998)	II (2001)	III (2005)	IV (2007-2009)	V (2010-2012)	VI (2013-2015)	VII (2016-2018)		
		β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	
Income	1st Quartile	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	2nd Quartile	0.74 (-0.16, 1.64)	-0.53 (-1.54, 0.48)	0.32 (-0.95, 1.60)	0.26 (-0.53, 1.05)	0.74 (-0.11, 1.59)	0.25 (-0.53, 1.04)	-0.15 (-0.93, 0.62)		

	3rd Quartile	0.23 (-0.71, 1.16)	-0.12 (-1.16, 0.92)	0.80 (-0.62, 2.22)	0.67 (-0.14, 1.49)	0.14 (-0.73, 1.01)	-0.20 (-0.98, 0.58)	0.13 (-0.63, 0.88)
	4th Quartile	1.31 (0.38, 2.25)	0.43 (-0.66, 1.53)	1.49 (0.15, 2.84)	0.79 (0.03, 1.56)	1.03 (0.13, 1.93)	0.31 (-0.49, 1.11)	0.02 (-0.74, 0.78)
Education	High school or less	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	College or higher	0.39 (-0.40, 1.17)	0.15 (-0.71, 1.02)	0.05 (-1.14, 1.25)	0.33 (-0.33, 0.99)	0.37 (-0.36, 1.10)	0.35 (-0.30, 1.01)	-0.10 (-0.75, 0.54)
Region	Seoul	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Metro urban	0.24 (-0.84, 1.33)	-0.12 (-1.19, 0.96)	0.72 (-0.60, 2.05)	-0.11 (-1.00, 0.77)	2.01 (1.17, 2.84)	-0.11 (-0.87, 0.66)	-0.73 (-1.51, 0.05)
	Non-metro urban	-0.30 (-1.47, 0.86)	-0.06 (-1.09, 0.97)	-0.01 (-1.28, 1.25)	-0.28 (-1.16, 0.60)	0.97 (0.11, 1.83)	-0.13 (-0.88, 0.62)	-0.06 (-0.76, 0.65)
	Rural	-0.61 (-1.79, 0.58)	-1.43 (-2.58, -0.28)	-0.60 (-2.02, 0.83)	0.55 (-0.40, 1.50)	1.70 (0.66, 2.73)	0.20 (-0.81, 1.20)	0.20 (-0.75, 1.15)
Occupation	Non-physical labor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Physical labor	-0.28 (-1.10, 0.53)	-0.43 (-1.40, 0.53)	-0.78 (-1.99, 0.42)	-0.70 (-1.39, -0.01)	-1.24 (-1.95, -0.52)	-0.74 (-1.43, -0.06)	-1.06 (-1.69, -0.42)
	Unemployed	-0.86 (-1.97, 0.26)	-0.84 (-2.01, 0.34)	-0.91 (-2.53, 0.71)	-0.49 (-1.38, 0.40)	-0.97 (-1.92, -0.01)	0.01 (-0.86, 0.87)	-0.91 (-1.76, -0.06)

Mutually adjusted for age (19-29, 30-39, 40-49, 50-59, 60-69, 70-79 years), income level (1st, 2nd, 3rd, 4th quartiles), education level (high school or less, college or higher), region (Seoul, metro urban, non-metro urban, rural) and occupation (non-physical labor, physical labor, unemployed).

Table S6. Beta coefficients (β) and 95% confidence intervals (CI) for the associations of socioeconomic factors (income, education, region, occupation) with mean BMI and WC in women: the KNHANES I-VII

Mean BMI in women										
KNHANES Phase (year)										
Variables		I (1998)	II (2001)	III (2005)	IV (2007-2009)	V (2010-2012)	VI (2013-2015)	VII (2016-2018)		
		β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	
Income	1st Quartile	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	2nd Quartile	0.15 (-0.16, 0.46)	-0.01 (-0.40, 0.39)	0.18 (-0.20, 0.56)	-0.16 (-0.43, 0.10)	-0.23 (-0.50, 0.03)	-0.29 (-0.53, -0.04)	-0.34 (-0.58, -0.11)		
	3rd Quartile	-0.04 (-0.35, 0.28)	-0.19 (-0.57, 0.19)	0.26 (-0.15, 0.67)	-0.46 (-0.72, -0.20)	-0.28 (-0.53, -0.03)	-0.41 (-0.67, -0.15)	-0.50 (-0.76, -0.25)		
	4th Quartile	-0.02 (-0.32, 0.29)	-0.28 (-0.70, 0.14)	-0.14 (-0.55, 0.28)	-0.57 (-0.83, -0.31)	-0.51 (-0.78, -0.24)	-0.63 (-0.89, -0.36)	-0.69 (-0.94, -0.45)		
Education	High school or less	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	College or higher	-0.78 (-1.08, -0.47)	-1.06 (-1.39, -0.72)	-1.16 (-1.53, -0.79)	-1.08 (-1.34, -0.81)	-1.13 (-1.38, -0.87)	-0.87 (-1.10, -0.64)	-0.99 (-1.22, -0.76)		
Region	Seoul	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Metro urban	-0.06 (-0.35, 0.23)	-0.09 (-0.45, 0.27)	0.14 (-0.27, 0.55)	-0.03 (-0.28, 0.22)	0.31 (0.02, 0.60)	0.28 (0.01, 0.54)	-0.05 (-0.31, 0.21)		
	Non-metro urban	-0.06 (-0.32, 0.21)	-0.05 (-0.42, 0.32)	0.16 (-0.25, 0.58)	0.14 (-0.12, 0.40)	0.23 (-0.20, 0.48)	0.46 (0.22, 0.70)	0.03 (-0.19, 0.26)		
	Rural	-0.07 (-0.38, 0.23)	0.13 (-0.30, 0.56)	0.34 (-0.14, 0.82)	-0.18 (-0.44, 0.08)	0.62 (0.32, 0.93)	0.54 (0.25, 0.83)	0.31 (-0.04, 0.66)		
Occupation	Non-physical labor	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Physical labor	0.27 (-0.09, 0.64)	0.46 (0.02, 0.89)	0.45 (-0.07, 0.97)	-0.09 (-0.40, 0.23)	0.10 (-0.20, 0.39)	0.05 (-0.22, 0.31)	0.41 (0.14, 0.68)		
	Unemployed	0.23 (-0.08, 0.55)	0.14 (-0.23, 0.50)	0.55 (0.10, 0.99)	0.11 (-0.15, 0.37)	0.15 (-0.12, 0.42)	-0.01 (-0.26, 0.23)	0.40 (0.16, 0.63)		

Mean WC in women										
KNHANES Phase (year)										
Variables		I (1998)	II (2001)	III (2005)	IV (2007-2009)	V (2010-2012)	VI (2013-2015)	VII (2016-2018)		
		β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	
Income	1st Quartile	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	2nd Quartile	0.16 (-0.61, 0.94)	0.10 (-0.92, 1.12)	-0.05 (-1.07, 0.98)	-0.50 (-1.19, 0.19)	-0.66 (-1.30, -0.01)	-1.14 (-1.80, -0.48)	-0.67 (-1.29, -0.05)		

	3rd Quartile	-0.40 (-1.20, 0.41)	-0.27 (-1.21, 0.67)	0.23 (-0.88, 1.34)	-1.29 (-1.97, -0.61)	-0.70 (-1.33, -0.06)	-1.20 (-1.90, -0.49)	-1.39 (-2.03, -0.74)
	4th Quartile	-0.60 (-1.44, 0.24)	-0.93 (-2.02, 0.16)	-0.76 (-1.89, 0.37)	-1.67 (-2.40, -0.95)	-1.49 (-2.15, -0.83)	-2.03 (-2.74, -1.33)	-2.14 (-2.77, -1.51)
Education	High school or less	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	College or higher	-1.89 (-2.77, -1.02)	-3.07 (-3.96, -2.19)	-3.07 (-3.97, -2.17)	-3.10 (-3.78, -2.41)	-2.62 (-3.24, -2.00)	-2.41 (-3.02, -1.81)	-2.37 (-2.94, -1.80)
Region	Seoul	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Metro urban	-1.14 (-2.14, -0.14)	-0.93 (-1.98, 0.12)	1.13 (0.07, 2.19)	0.90 (-0.09, 1.89)	2.72 (1.88, 3.56)	1.45 (0.65, 2.26)	-0.56 (-1.32, 0.20)
	Non-metro urban	-0.78 (-1.72, 0.15)	-0.89 (-1.90, 0.12)	0.54 (-0.59, 1.67)	0.42 (-0.62, 1.45)	1.65 (0.86, 2.45)	1.66 (0.93, 2.39)	0.07 (-0.62, 0.77)
	Rural	-1.22 (-2.19, -0.24)	0.27 (-0.93, 1.47)	0.64 (-0.70, 1.98)	0.86 (-0.26, 1.99)	3.27 (2.39, 4.14)	1.99 (1.09, 2.90)	0.65 (-0.32, 1.62)
Occupation	Non-physical labor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Physical labor	1.26 (0.18, 2.34)	1.28 (0.05, 2.51)	1.26 (-0.10, 2.63)	-0.15 (-0.91, 0.61)	0.60 (-0.13, 1.32)	-0.05 (-0.76, 0.65)	1.25 (0.61, 1.88)
	Unemployed	1.02 (0.13, 1.92)	1.01 (-0.02, 2.03)	1.82 (0.64, 3.00)	0.66 (0.00, 1.33)	0.94 (0.28, 1.60)	0.17 (-0.44, 0.79)	1.53 (0.96, 2.09)

Mutually adjusted for age (19-29, 30-39, 40-49, 50-59, 60-69, 70-79 years), income level (1st, 2nd, 3rd, 4th quartiles), education level (high school or less, college or higher), region (Seoul, metro urban, non-metro urban, rural) and occupation (non-physical labor, physical labor, unemployed).