

Supplemental Material

Table S1. Secular trends in systolic blood pressure in obese adults during NHANES 1988-2014 (N=17,393).

	Mean (95% CI)					p value*
	1988-1992 (n=4016)	1999-2002 (n=2696)	2003-2006 (n=2830)	2007-2010 (n=4058)	2011-2014 (n=3793)	
All	126.1 (125.2-127.0)	126.6 (125.5-127.7)	125.7 (124.7-126.7)	123.2 (122.4-123.9)	124.4 (123.6-125.2)	<0.001
20-39 y	117.8 (116.5-119.2)	118.3 (116.5-120.1)	118.8 (117.6-119.9)	118.1 (117.2-119.0)	119.1 (118.2-120.1)	0.6
40-59 y	126.9 (125.4-128.3)	127.0 (125.7-128.3)	126.1 (124.8-127.3)	123.8 (122.6-124.9)	124.7 (123.5-125.9)	<0.001
60+ y	136.9 (135.6-138.2)	138.2 (136.1-140.2)	135.2 (133.4-137.1)	129.5 (128.2-130.8)	131.6 (130.1-133.1)	<0.001
Men	128.3 (127.1-129.6)	127.2 (125.9-128.5)	126.8 (125.6-128.0)	124.7 (123.7-125.8)	126.5 (125.5-127.6)	0.048
Women	124.6 (123.5-125.6)	126.2 (124.9-127.4)	124.6 (123.5-125.8)	121.6 (120.7-122.5)	122.5 (121.4-123.6)	<0.001
non-Hispanic Whites	126.0 (125.0-127.0)	126.1 (124.8-127.4)	125.1 (123.9-126.2)	122.8 (121.8-123.7)	123.8 (122.9-124.6)	<0.001
non-Hispanic Blacks	129.9 (129.1-130.7)	130.8 (129.1-132.4)	129.3 (128.0-130.6)	126.4 (124.7-128.0)	127.8 (126.2-129.4)	0.004
Mexican Americans	125.7 (125.0-126.5)	126.5 (124.8-128.2)	126.3 (124.7-128.0)	124.3 (122.8-125.8)	124.0 (122.6-125.5)	0.047

Systolic blood pressure is showed in the unit of mmHg.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.

Table S2. Secular trends in diastolic blood pressure in obese adults during NHANES 1988-2014 (N=17,325).

	Mean (95% CI)					p value*
	1988-1992 (n=4016)	1999-2002 (n=2684)	2003-2006 (n=2814)	2007-2010 (n=4036)	2011-2014 (n=3775)	
All	76.6 (76.0-77.2)	74.4 (73.4-75.3)	72.5 (71.9-73.0)	71.5 (70.6-72.4)	72.5 (71.9-73.1)	<0.001
20-39 y	76.8 (75.9-77.7)	73.0 (71.4-74.6)	71.2 (70.3-72.1)	71.4 (70.3-72.5)	72.3 (71.5-73.1)	0.001
40-59 y	78.9 (78.0-79.9)	77.9 (77.1-78.6)	76.6 (75.8-77.4)	75.2 (74.3-76.1)	75.6 (74.9-76.4)	<0.001
60+ y	72.8 (71.7-74.0)	71.1 (70.0-72.2)	68.2 (67.2-69.3)	66.0 (64.7-67.3)	68.2 (67.3-69.1)	<0.001
Men	79.9 (78.9-80.8)	76.8 (75.6-77.9)	74.0 (73.2-74.9)	73.6 (72.6-74.5)	74.3 (73.5-75.1)	<0.001
Women	74.3 (73.7-75.0)	72.5 (71.6-73.4)	71.0 (70.4-71.7)	69.7 (68.7-70.6)	71.0 (70.3-71.6)	<0.001
non-Hispanic Whites	76.9 (76.1-77.7)	74.3 (73.2-75.4)	72.5 (71.8-73.3)	71.6 (70.6-72.6)	72.9 (72.1-73.7)	<0.001
non-Hispanic Blacks	76.9 (76.0-77.8)	75.0 (73.8-76.2)	73.4 (72.2-74.5)	72.3 (70.9-73.7)	72.6 (71.2-73.9)	<0.001
Mexican Americans	76.0 (75.2-76.9)	74.5 (73.4-75.6)	71.2 (70.4-71.9)	70.6 (69.3-72.0)	71.3 (70.2-72.5)	<0.001

Diastolic blood pressure is showed in the unit of mmHg.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.

Table S3. Secular trends in ideal blood pressure health in obese during NHANES 1988-2014 (N=18,626).

	Prevalence (%; 95% CI)					p value*
	1988-1992 (n=4297)	1999-2002 (n=2854)	2003-2006 (n=3185)	2007-2010 (n=4334)	2011-2014 (n=3956)	
All	32.3 (30.1-34.4)	30.6 (28.8-32.5)	33.1 (30.8-35.5)	32.8 (30.4-35.2)	31.7 (29.6-33.8)	0.6
20-39 y	50.1 (45.7-54.5)	50.0 (45.3-54.7)	55.0 (50.8-59.1)	52.2 (48.5-55.9)	51.1 (47.7-54.5)	0.57
40-59 y	26.0 (23.0-29.0)	25.7 (23.2-28.3)	25.0 (21.7-28.2)	27.0 (23.5-30.5)	27.2 (24.1-30.4)	0.35
60+ y	15.7 (13.2-18.3)	9.9 (7.5-12.4)	13.7 (11.4-16.0)	13.3 (11.1-15.5)	10.2 (7.3-13.1)	0.33
Men	24.0 (20.0-28.0)	22.5 (19.2-25.7)	27.5 (24.5-30.6)	25.9 (23.0-28.8)	25.0 (22.0-28.1)	0.59
Women	38.2 (34.9-41.4)	36.7 (34.4-39.0)	38.2 (35.2-41.2)	39.1 (36.6-41.6)	37.5 (34.5-40.5)	0.76
non-Hispanic Whites	31.9 (29.0-34.8)	29.4 (26.7-32.1)	32.4 (29.0-35.8)	32.2 (29.2-35.2)	31.3 (28.6-34.0)	0.43
non-Hispanic Blacks	28.5 (26.1-30.8)	26.5 (23.6-29.5)	30.5 (27.2-33.9)	29.3 (25.9-32.7)	27.3 (24.0-30.7)	0.79
Mexican Americans	38.4 (34.9-41.9)	38.9 (34.4-43.4)	39.2 (34.9-43.6)	36.1 (31.2-41.0)	37.9 (34.1-41.7)	0.73

Ideal blood pressure health: untreated systolic blood pressure <120 mmHg and diastolic <80.

Prevalence was age-adjusted by the direct method to the year 2010 Census population using age groups 20-39 y, 40-59 y, and 60+ y.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.

Table S4. Secular trends in HbA1c in obese adults during NHANES 1988-2014 (N=17,773).

	Mean (95% CI)					p value*
	1988-1992 (n=4108)	1999-2002 (n=2741)	2003-2006 (n=3031)	2007-2010 (n=4091)	2011-2014 (n=3802)	
All	5.7 (5.6-5.8)	5.7 (5.7-5.7)	5.7 (5.6-5.7)	5.8 (5.8-5.9)	5.9 (5.8-5.9)	<0.001
20-39 y	5.3 (5.2-5.3)	5.3 (5.3-5.4)	5.4 (5.3-5.4)	5.5 (5.4-5.5)	5.5 (5.4-5.5)	<0.001
40-59 y	5.8 (5.7-6.0)	5.8 (5.7-5.9)	5.8 (5.7-5.8)	6.0 (5.9-6.1)	6.0 (5.9-6.1)	<0.001
60+ y	6.1 (6.0-6.1)	6.1 (6.0-6.2)	6.0 (5.9-6.1)	6.2 (6.1-6.3)	6.2 (6.1-6.3)	0.005
Men	5.7 (5.6-5.8)	5.8 (5.7-5.9)	5.7 (5.7-5.8)	5.9 (5.8-5.9)	5.9 (5.8-6.0)	0.005
Women	5.7 (5.6-5.8)	5.6 (5.6-5.7)	5.7 (5.6-5.7)	5.8 (5.8-5.9)	5.8 (5.8-5.9)	<0.001
non-Hispanic Whites	5.6 (5.5-5.7)	5.6 (5.5-5.7)	5.6 (5.5-5.6)	5.7 (5.7-5.8)	5.8 (5.7-5.8)	<0.001
non-Hispanic Blacks	6.1 (6.0-6.2)	6.0 (5.9-6.1)	6.0 (5.9-6.0)	6.1 (6.0-6.2)	6.1 (6.0-6.1)	0.19
Mexican Americans	5.9 (5.8-6.0)	5.8 (5.7-5.9)	6.0 (5.9-6.2)	6.0 (5.9-6.1)	6.1 (5.9-6.2)	0.004

HbA1c is showed in the unit of %.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.

Table S5. Secular trends in prevalence of diabetes in obese adults during NHANES 1988-2014 (N=18,626).

	Prevalence (%; 95% CI)					p value*
	1988-1992 (n=4297)	1999-2002 (n=2854)	2003-2006 (n=3185)	2007-2010 (n=4334)	2011-2014 (n=3956)	
All	11.3 (9.9-12.7)	14.1 (12.7-15.6)	16.5 (14.9-18.1)	19.4 (17.4-21.3)	19.0 (17.5-20.6)	<0.001
20-39 y	3.0 (1.8-4.1)	4.5 (2.9-6.2)	5.8 (3.9-7.7)	5.1 (4.0-6.2)	5.5 (4.1-6.9)	0.23
40-59 y	13.6 (10.5-16.8)	14.5 (12.0-17.0)	16.7 (14.6-18.8)	21.7 (19.0-24.5)	21.6 (17.9-25.3)	<0.001
60+ y	19.9 (17.6-22.3)	27.5 (24.3-30.7)	31.7 (27.8-35.5)	36.5 (31.5-41.5)	34.9 (32.2-37.5)	<0.001
Men	12.1 (9.7-14.5)	16.0 (13.0-19.0)	16.8 (14.8-18.8)	19.8 (17.9-21.7)	19.9 (17.5-22.4)	0.002
Women	10.7 (9.2-12.1)	12.7 (11.2-14.3)	16.3 (14.3-18.4)	19.0 (16.5-21.6)	18.4 (16.8-20.0)	<0.001
non-Hispanic Whites	9.8 (8.1-11.5)	12.1 (10.8-13.4)	14.3 (12.6-16.0)	17.1 (14.7-19.6)	16.9 (15.0-18.8)	<0.001
non-Hispanic Blacks	17.2 (15.2-19.2)	20.3 (17.5-23.2)	21.7 (18.6-24.7)	26.4 (24.0-28.8)	23.4 (20.5-26.4)	0.01
Mexican Americans	16.8 (14.3-19.3)	17.7 (15.3-20.1)	24.1 (20.0-28.2)	23.5 (20.7-26.3)	23.5 (20.6-26.4)	0.04

Diabetes: self-reported of diabetes diagnosed by their doctors or HbA1c $\geq 6.5\%$.

Prevalence was age-adjusted by the direct method to the year 2010 Census population using age groups 20-39 y, 40-59 y, and 60+ y.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.

Table S6. Secular trends in total cholesterol in obese adults during NHANES 1988-2014 (N=17,560).

	Mean (95% CI)					p value*
	1988-1992 (n=4064)	1999-2002 (n=2691)	2003-2006 (n=3008)	2007-2010 (n=4053)	2011-2014 (n=3744)	
All	214.5 (212.7-216.3)	206.7 (204.6-208.7)	201.8 (200.0-203.5)	196.9 (195.1-198.7)	193.7 (192.3-195.1)	<0.001
20-39 y	200.7 (197.3-204.1)	196.4 (193.1-199.7)	196.3 (193.1-199.5)	195.5 (192.6-198.3)	189.5 (186.3-192.6)	<0.001
40-59 y	218.4 (215.4-221.3)	212.7 (209.4-216.0)	207.7 (204.4-211.1)	202.3 (199.0-205.7)	201.2 (198.3-204.0)	<0.001
60+ y	228.6 (225.7-231.5)	212.5 (209.3-215.7)	200.7 (196.9-204.5)	190.7 (187.9-193.4)	188.5 (185.3-191.7)	<0.001
Men	210.9 (207.7-214.1)	205.0 (201.5-208.5)	199.9 (197.9-201.9)	194.9 (192.3-197.6)	190.8 (188.0-193.5)	<0.001
Women	216.9 (214.3-219.5)	207.7 (205.5-210.0)	203.1 (200.5-205.8)	198.2 (195.4-201.1)	195.9 (194.2-197.7)	<0.001
non-Hispanic Whites	216.2 (213.9-218.6)	207.8 (205.2-210.4)	203.2 (201.2-205.3)	197.2 (194.9-199.6)	194.5 (192.4-196.7)	<0.001
non-Hispanic Blacks	211.6 (208.9-214.2)	203.7 (199.8-207.5)	197.0 (193.7-200.2)	194.9 (192.0-197.7)	189.2 (186.5-191.9)	<0.001
Mexican Americans	210.7 (207.6-213.7)	202.5 (198.7-206.3)	198.9 (194.3-203.5)	198.9 (196.0-201.9)	193.2 (189.6-196.9)	0.003

Total cholesterol is showed in the unit of mg/dL.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.

Table S7. Secular trends in HDL cholesterol in obese adults during NHANES 1988-2014 (N=17,525).

	Mean (95% CI)					p value*
	1988-1992 (n=4029)	1999-2002 (n=2691)	2003-2006 (n=3008)	2007-2010 (n=4053)	2011-2014 (n=3744)	
All	45.4 (44.7-46.2)	46.0 (45.2-46.8)	48.7 (48.0-49.3)	46.4 (45.7-47.0)	47.4 (46.8-48.1)	0.001
20-39 y	44.4 (43.0-45.8)	44.5 (43.6-45.4)	47.1 (46.1-48.1)	44.6 (43.6-45.6)	45.6 (44.6-46.5)	0.15
40-59 y	44.8 (43.6-46.0)	45.5 (44.2-46.8)	48.1 (47.2-49.0)	46.1 (45.2-47.0)	47.5 (46.6-48.3)	0.007
60+ y	47.9 (46.7-49.1)	48.8 (47.9-49.8)	51.7 (50.6-52.8)	49.4 (48.6-50.2)	50.2 (49.2-51.1)	0.033
Men	40.2 (39.1-41.4)	40.6 (39.6-41.5)	43.4 (42.8-44.0)	41.4 (40.8-41.9)	42.6 (41.8-43.4)	0.007
Women	49.3 (48.5-50.1)	50.1 (48.9-51.2)	53.2 (52.1-54.3)	50.8 (50.0-51.7)	51.5 (50.7-52.3)	0.031
non-Hispanic Whites	44.3 (43.4-45.2)	44.9 (43.8-46.0)	47.7 (47.0-48.3)	45.2 (44.6-45.9)	47.0 (46.2-47.8)	0.001
non-Hispanic Blacks	51.1 (50.1-52.2)	51.3 (49.8-52.8)	53.9 (52.7-55.1)	52.0 (50.7-53.3)	51.2 (50.4-52.0)	0.89
Mexican Americans	45.1 (44.3-45.9)	45.4 (44.5-46.3)	47.8 (46.4-49.2)	46.1 (45.2-46.9)	46.4 (45.6-47.2)	0.18

HDL cholesterol is showed in the unit of mg/dL.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.

Table S8. Secular trends in ideal blood lipid health in obese adults during NHANES 1988-2014 (N=18,626).

	Prevalence (% , 95% CI)					p value*
	1988-1992 (n=4297)	1999-2002 (n=2854)	2003-2006 (n=3185)	2007-2010 (n=4334)	2011-2014 (n=3956)	
All	3.3 (2.3-4.3)	3.8 (2.9-4.7)	5.2 (4.1-6.3)	4.9 (4.1-5.7)	4.8 (4.0-5.6)	0.022
20-39 y	4.5 (2.3-6.8)	4.2 (2.7-5.7)	6.5 (4.7-8.3)	5.5 (3.8-7.1)	5.0 (3.9-6.0)	0.48
40-59 y	3.0 (1.9-4.0)	4.0 (2.4-5.6)	4.1 (2.6-5.6)	4.4 (3.2-5.6)	5.0 (3.5-6.5)	0.14
60+ y	2.0 (0.9-3.1)	2.9 (1.9-3.9)	5.0 (3.4-6.5)	4.8 (3.8-5.7)	4.5 (3.0-5.9)	0.02
Men	1.5 (0.6-2.3)	0.9 (0.4-1.4)	2.3 (1.4-3.1)	2.0 (1.3-2.7)	2.5 (1.5-3.5)	0.028
Women	4.7 (3.1-6.2)	6.0 (4.5-7.5)	7.7 (6.0-9.4)	7.4 (6.2-8.6)	6.8 (5.5-8.0)	0.16
non-Hispanic Whites	2.6 (1.2-4.0)	2.5 (1.4-3.5)	4.6 (3.1-6.0)	4.1 (3.2-5.0)	4.1 (2.9-5.3)	0.026
non-Hispanic Blacks	6.4 (5.2-7.6)	7.7 (6.0-9.5)	9.0 (7.4-10.6)	8.2 (6.2-10.2)	8.7 (7.2-10.2)	0.12
Mexican Americans	3.1 (2.1-4.2)	3.4 (1.8-5.1)	5.5 (3.3-7.6)	4.7 (3.2-6.2)	5.3 (3.8-6.9)	0.087

Ideal blood lipid health: untreated total cholesterol <200 mg/dL, and HDL ≥60 mg/dL.

Prevalence was age-adjusted by the direct method to the year 2010 Census population using age groups 20-39 y, 40-59 y, and 60+ y.

*: p value for trends, adjusted for age group, sex, and race/ethnicity when appropriate.