Supplementary Materials

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Table S1. Percentage of U.S. adults with optimal levels of all 5 cardiometabolic components*, overall and by sociodemographic sub-groups, 1999-2018

	Percentage (95% CI)†										
Characteristics	1999-2000 n=3334	2001-2002 n=3906	2003-2004 n=3750	2005-2006 n=3926	2007-2008 n=4455	2009-2010 n=4704	2011-2012 n=4103	2013-2014 n=4501	2015-2016 n=4237	2017-2018 n=3869	p-trend‖	*p-trend-interaction*¶
Overall	7.7 (6.0-9.4)	8.2 (7.2-9.3)	8.4 (7.3-9.5)	8.3 (7.2-9.5)	7.0 (6.1-8.0)	8.0 (6.6-9.3)	6.5 (5.2-7.8)	7.8 (6.9-8.7)	6.4 (5.2-7.7)	6.8 (5.4-8.1)	0.02	
Age group, y												*0.15*
20-34	14.4 (11.6-17.1)	15.2 (12.9-17.4)	18.4 (15.6-21.2)	16.5 (13.9-19.1)	15.2 (12.8-17.7)	17.8 (14.9-20.7)	14.8 (12.4-17.3)	16.2 (13.9-18.6)	15.3 (12.7-17.9)	15.3 (11.6-19.1)		
35-49	7.9 (4.4-11.5)	9.5 (8.2-10.8)	7.6 (6.1-9.2)	8.6 (6.7-10.5)	6.9 (5.1-8.7)	7.6 (6.1-9.1)	6.4 (4.9-7.9)	7.8 (6.4-9.3)	6.0 (4.2-7.8)	6.5 (4.7-8.2)		
50-64	2.1 (0.8-3.4)	2.0 (1.0-2.9)	2.7 (1.0-4.5)	3.1 (2.3-4)	2.8 (1.5-4.0)	2.6 (1.1-4.1)	1.9 (0.7-3.1)	4.0 (2.7-5.2)	2.2 (0.7-3.7)	3.1 (0.8-5.5)		
≥65	0.7 (0.3-1.2)	0.5 (0.0-1.0)	0.1 (0.0-0.4)	1.7 (1.0-2.3)	0.3 (0.0-0.6)	0.8 (0.1-1.6)	0.7 (0.0-1.5)	0.8 (0.0-1.7)	0.4 (0.0-1.2)	0.4 (0.0-1.0)		
Sex												*0.59*
Male	3.1 (2.1-4)	3.5 (2.6-4.4)	4.2 (3-5.4)	4.6 (3.7-5.5)	3.4 (2.4-4.5)	4.1 (3.1-5)	3.6 (2.5-4.6)	4.1 (3-5.2)	4.0 (2.9-5)	3.1 (1.9-4.4)		
Female	10 (7.9-12.1)	10.6 (8.9-12.4)	11.4 (9.9-12.9)	11.4 (9.9-13)	10.5 (8.8-12.2)	10.1 (8.9-11.3)	8.3 (6.9-9.7)	11.9 (10.1-13.7)	9.4 (7.5-11.3)	10.4 (8.2-12.6)		
Race/Ethnicity												*0.01*
Mexican American	5.9 (4.3-7.5)	5.3 (3.9-6.8)	5.2 (3.2-7.3)	5.2 (3.6-6.7)	4.7 (3.5-5.9)	3.9 (3-4.8)	4.6 (2.1-7.2)	2.9 (1.7-4)	2.5 (1.2-3.8)	3.2 (1.4-4.9)		
Other Hispanic	5.3 (1.8-8.8)	4.2 (1.6-6.9)	7.2 (2.8-11.6)	5.7 (2.5-8.9)	6.6 (3.5-9.8)	4.8 (3.5-6)	4.8 (2.9-6.7)	7.8 (5-10.5)	3.9 (2.3-5.5)	4.9 (2.7-7.1)		
Non-Hispanic White	7.0 (5.2-8.8)	8.2 (6.8-9.5)	8.7 (7.4-10.1)	8.7 (7.5-9.8)	7.8 (6.5-9.1)	8.1 (6.8-9.4)	6.0 (4.4-7.6)	9.0 (7.6-10.3)	8.0 (6.5-9.6)	8.4 (6.3-10.4)		
Non-Hispanic Black	5.9 (4.3-7.5)	5.7 (4.1-7.3)	5.4 (3.7-7.1)	4.7 (3.5-6)	4.5 (3.5-5.4)	4.1 (2.8-5.3)	4.3 (3.1-5.5)	5.8 (4.3-7.2)	4.2 (2.7-5.7)	5.0 (2.4-7.6)		
Other‡	6.0 (0.7-11.4)	4.3 (1.4-7.2)	8.6 (4.4-12.9)	14.9 (11.2-18.6)	8.0 (4.4-11.6)	9.3 (7-11.6)	10.4 (8.7-12.1)	10.6 (8.7-12.5)	9.0 (7.4-10.7)	5.6 (4.5-6.7)		
Education Level												*0.18*
<High school graduate	4.4 (2.3-6.5)	4.5 (2.9-6)	5.5 (4.4-6.7)	7.7 (5.3-10)	4.0 (2.9-5)	3.8 (2.6-5)	3.0 (1.7-4.3)	6.3 (4.4-8.2)	3.3 (1.3-5.4)	5.0 (2.8-7.2)		
High school graduate	6.7 (5.2-8.2)	6.4 (4.5-8.2)	6.0 (4.4-7.6)	5.9 (4.4-7.4)	5.3 (3.6-6.9)	5.6 (4.1-7.2)	4.5 (2.8-6.2)	6.2 (4.9-7.5)	4.4 (3.3-5.6)	4.4 (3.5-5.4)		
some college or AA degree	6.0 (4.3-7.8)	7.5 (6.1-8.9)	8.4 (7.2-9.6)	7.0 (5-9.1)	7.4 (5.5-9.3)	7.4 (5.9-8.8)	6.1 (4.8-7.5)	5.9 (4.5-7.4)	5.6 (3.9-7.3)	5.9 (4.4-7.4)		

college graduate+	9.5 (5.9-13.1)	9.1 (6.5-11.7)	10.8 (8.8-12.7)	11.4 (9.6-13.2)	10.2 (8-12.5)	10.1 (7.7-12.5)	8.0 (6.2-9.9)	12.5 (10.4-14.6)	10.6 (8-13.1)	10.3 (7.6-13.0)	
Ratio of Family Income to Poverty[§]											*0.68*
<1.30	5.4 (3.8-6.9)	5.3 (4.5-6.2)	7 (5.7-8.3)	6.2 (4.6-7.9)	5.7 (4.4-6.9)	5.3 (4.3-6.3)	5.3 (3.7-6.9)	5.3 (4.5-6.1)	4.6 (3-6.3)	5.7 (4.1-7.3)	
1.30-2.99	5.5 (4.1-6.8)	6.7 (5.3-8.1)	8.5 (6.8-10.1)	6.3 (4.7-8)	5.8 (4.9-6.7)	6.4 (5-7.7)	4.5 (3.4-5.5)	6.5 (4.8-8.2)	5.9 (4.7-7.1)	6.4 (4.2-8.6)	
≥ 3.00	7.8 (5.7-10)	7.9 (6.3-9.5)	7.8 (6.2-9.4)	9.5 (7.6-11.4)	8.2 (6.7-9.7)	8.8 (6.9-10.6)	7.3 (5.9-8.8)	10.5 (9-12.1)	8.3 (6.7-9.9)	7.4 (5.8-9)	

AA- Associate of Arts; BMI- body mass index; CI- confidence interval; CHD- coronary heart disease; CVD- cardiovascular disease; DBP – diastolic blood pressure; FPG – fasting plasma glucose; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; WC – waist circumference.

[*]Optimal cardiometabolic health defined as optimal levels for all five components of cardiometabolic health: adiposity (BMI<25 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men)); blood glucose (FPG <100 mg/dL and HbA1c <5.7% and not taking diabetes medication)[45]; blood lipids (TC:HDL <3.5:1 and not taking lipid lowering medication); blood pressure (SBP < 120 mmHg, DBP < 80 mmHg and not taking blood pressure medication); and history of CVD (no self-reported CHD, heart failure, heart attack, stroke, or angina). See Table 1 for further details of definitions and sources.

[†]Percentages were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults. All sub-group analyses were further age-standardized to the 2017-18 survey cycle U.S. adult age proportions.

[‡]Other includes race/ethnicity other that non-Hispanic white, non-Hispanic black, and Hispanic, including multiracial.

[§] Represents the ratio of family income to the federal poverty threshold, adjusting for household size. A higher ratio indicates a higher level of income.

[||]Overall time trends assessed by treating survey year as a continuous variable in a survey-weighted regression model. Sociodemographic factors were all modeled as indicator categories in the adjusted analyses. P<0.05 considered statistically significant.

[¶]To assess the statistical significance of subgroup differences in trends over time, a survey-weighted Wald *F* test was used to evaluate the set of multiplicative interaction terms between the survey year as a continuous variable and each sociodemographic subgroup (age, sex, race/ethnicity, education level, income) as an indicator category in adjusted regressions. P<0.05 considered statistically significant.

Table S2. Mean count of optimal levels of 5 cardiometabolic components*, overall and by sociodemographic sub-groups, among U.S. adults, 1999-2018

	Mean (95% CI)†										
Characteristics	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018	p-trend‖ | p-trend-interaction¶
Overall	2.5 (2.4-2.6)	2.5 (2.4-2.6)	2.5 (2.4-2.5)	2.5 (2.4-2.6)	2.4 (2.3-2.4)	2.4 (2.3-2.4)	2.3 (2.2-2.4)	2.4 (2.3-2.4)	2.3 (2.2-2.4)	2.2 (2.1-2.3)	<0.001
Age, y											*<0.001*
20-34	3.1 (3.1-3.2)	3.2 (3.1-3.3)	3.2 (3.2-3.3)	3.2 (3.1-3.3)	3.1 (3-3.2)	3.2 (3.1-3.2)	3.1 (3-3.2)	3.2 (3.1-3.3)	3.2 (3.1-3.2)	3.1 (2.9-3.2)	
35-49	2.7 (2.5-2.9)	2.6 (2.5-2.7)	2.6 (2.5-2.6)	2.6 (2.5-2.7)	2.5 (2.4-2.6)	2.5 (2.4-2.6)	2.5 (2.4-2.5)	2.6 (2.5-2.6)	2.5 (2.4-2.6)	2.4 (2.3-2.5)	
50-64	2.0 (1.8-2.1)	2.0 (1.9-2.1)	2.0 (1.9-2.2)	2.1 (2.0-2.1)	1.9 (1.9-2.0)	2.0 (1.9-2.0)	1.9 (1.8-2.0)	2.0 (1.9-2.1)	1.9 (1.8-2.0)	1.8 (1.7-2.0)	
≥65	1.7 (1.6-1.8)	1.6 (1.5-1.7)	1.6 (1.5-1.6)	1.6 (1.5-1.7)	1.4 (1.3-1.6)	1.5 (1.5-1.6)	1.5 (1.4-1.6)	1.5 (1.4-1.6)	1.5 (1.4-1.5)	1.4 (1.3-1.4)	
Sex											*0.63*
Male	2.2 (2-2.3)	2.1 (2.1-2.2)	2.1 (2.1-2.2)	2.2 (2.1-2.2)	2.1 (2-2.1)	2 (2-2.1)	2.1 (2-2.1)	2.1 (2.1-2.2)	2 (2-2.1)	1.9 (1.9-2)	
Female	2.6 (2.5-2.7)	2.7 (2.6-2.7)	2.6 (2.5-2.7)	2.7 (2.6-2.7)	2.5 (2.5-2.6)	2.6 (2.5-2.6)	2.5 (2.4-2.6)	2.6 (2.5-2.7)	2.5 (2.4-2.6)	2.5 (2.4-2.6)	
Race/Ethnicity											*0.12*
Mexican American	2.3 (2.2-2.4)	2.3 (2.2-2.3)	2.2 (2.1-2.3)	2.2 (2.2-2.3)	2.1 (2-2.2)	2 (1.9-2.2)	2.1 (2-2.3)	2.1 (2-2.2)	2 (1.9-2.1)	2.0 (1.9-2.1)	
Other Hispanic	2.3 (2.1-2.4)	2.3 (2.1-2.6)	2.4 (2.3-2.6)	2.4 (2.2-2.6)	2.2 (2.1-2.4)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	2.3 (2.2-2.5)	2.1 (2-2.2)	2.2 (2.1-2.3)	
Non-Hispanic White	2.4 (2.3-2.5)	2.5 (2.4-2.5)	2.4 (2.3-2.5)	2.5 (2.4-2.5)	2.3 (2.2-2.4)	2.4 (2.3-2.4)	2.3 (2.2-2.4)	2.4 (2.4-2.5)	2.3 (2.3-2.4)	2.3 (2.2-2.4)	
Non-Hispanic Black	2.4 (2.3-2.4)	2.3 (2.1-2.4)	2.3 (2.2-2.4)	2.2 (2.2-2.3)	2.2 (2.1-2.3)	2.1 (2.1-2.2)	2.1 (2-2.3)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	
Asian/Other‡	2.4 (2-2.9)	2.2 (2-2.4)	2.4 (2.2-2.6)	2.7 (2.5-2.8)	2.6 (2.4-2.7)	2.5 (2.4-2.6)	2.5 (2.4-2.7)	2.5 (2.4-2.6)	2.4 (2.2-2.6)	2.2 (2.1-2.3)	
Education Level											*0.03*
< High school graduate	2.2 (2.1-2.3)	2.2 (2.1-2.2)	2.2 (2.2-2.3)	2.2 (2.2-2.3)	2.1 (2-2.2)	2.1 (2-2.2)	2.1 (2-2.2)	2.1 (2.1-2.2)	2 (1.9-2.2)	2.1 (2-2.2)	
High school graduate	2.3 (2.2-2.4)	2.3 (2.2-2.4)	2.3 (2.2-2.4)	2.3 (2.2-2.4)	2.1 (2-2.3)	2.2 (2.1-2.3)	2.1 (2-2.2)	2.2 (2.1-2.3)	2.1 (2-2.2)	2.1 (2-2.2)	
Some college or AA degree	2.5 (2.3-2.6)	2.5 (2.4-2.5)	2.4 (2.3-2.5)	2.4 (2.3-2.5)	2.3 (2.2-2.4)	2.3 (2.2-2.4)	2.3 (2.2-2.4)	2.3 (2.2-2.3)	2.2 (2.1-2.3)	2.2 (2.1-2.2)	
College graduate +	2.6 (2.5-2.8)	2.6 (2.5-2.7)	2.5 (2.4-2.7)	2.7 (2.6-2.8)	2.6 (2.5-2.7)	2.6 (2.5-2.7)	2.5 (2.4-2.6)	2.7 (2.6-2.8)	2.6 (2.5-2.6)	2.5 (2.3-2.6)	
Income level§											*0.17*
<1.3	2.2 (2.2-2.3)	2.2 (2.1-2.3)	2.3 (2.2-2.4)	2.3 (2.1-2.4)	2.2 (2.1-2.3)	2.2 (2.1-2.2)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	2.1 (2-2.2)	2.1 (2-2.2)	
1.3-2.99	2.3 (2.2-2.5)	2.4 (2.3-2.5)	2.3 (2.2-2.4)	2.4 (2.3-2.4)	2.2 (2.2-2.3)	2.3 (2.2-2.3)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	
≥3.00	2.5 (2.4-2.6)	2.5 (2.4-2.5)	2.4 (2.4-2.5)	2.5 (2.5-2.6)	2.4 (2.3-2.5)	2.4 (2.4-2.5)	2.4 (2.3-2.5)	2.5 (2.5-2.6)	2.4 (2.3-2.5)	2.3 (2.2-2.4)	

AA- Associate of Arts; BMI- body mass index; CI- confidence interval; CHD- coronary heart disease; CVD- cardiovascular disease; DBP – diastolic blood pressure; FPG – fasting plasma glucose; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; WC – waist circumference.

*Cardiometabolic components include: adiposity, blood glucose control, blood pressure, blood lipids, and history of cardiovascular disease. Definitions for optimal for each component are a followss: Adiposity: BMI<25 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); Blood glucose: FPG <100 mg/dL and HbA1c <5.7% and not taking diabetes medication[45]; Blood lipids: TC:HDL <3.5:1 and not taking lipid lowering medication; Blood pressure: SBP < 120 mmHg, DBP < 80 mmHg and not taking blood pressure medication; History of CVD: no CVD-related conditions including CHD, heart attack, heart failure or stroke. See Table 1 for further details of definitions and sources.

†Mean counts were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults. All sub-group analyses were further age-standardized to the 2017-18 survey cycle U.S. adult age proportions.

‡Other includes race/ethnicity other that non-Hispanic white, non-Hispanic black, and Hispanic, including multiracial.

§Represents the ratio of family income to the federal poverty threshold, adjusting for household size. A higher ratio indicates a higher level of income.

||Overall time trends assessed by treating survey year as a continuous variable in a survey-weighted regression model. P<0.05 considered statistically significant.

¶To assess the statistical significance of subgroup differences in trends over time, a survey-weighted Wald *F* test was used to evaluate the set of multiplicative interaction terms between the survey year as a continuous variable and each sociodemographic subgroup (age, sex, race/ethnicity, education level, income) as an indicator category in adjusted regressions. P<0.05 considered statistically significant.

AA- associates degree; BMI- body mass index; CI- confidence interval; CHD- coronary heart disease; CVD- cardiovascular disease; DBP – diastolic blood pressure; FPG – fasting plasma glucose; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; WC – waist circumference.

Table S3. Mean count of intermediate health levels of 5 cardiometabolic components*, overall and by sociodemographic sub-groups, among U.S. adults, 1999-2018

	Mean (95% CI)†										
Characteristics	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018	p-trend‖ | *p-trend-interaction*¶
Overall	1.4 (1.3-1.4)	1.4 (1.4-1.4)	1.4 (1.4-1.5)	1.4 (1.4-1.5)	1.5 (1.5-1.6)	1.5 (1.5-1.6)	1.6 (1.5-1.6)	1.5 (1.5-1.6)	1.6 (1.5-1.6)	1.6 (1.5-1.6)	<0.001
Age, y											*<0.001*
20-34	1.2 (1.1-1.2)	1.2 (1.2-1.3)	1.1 (1.1-1.2)	1.1 (1.1-1.2)	1.2 (1.2-1.3)	1.2 (1.1-1.3)	1.2 (1.2-1.3)	1.2 (1.1-1.2)	1.2 (1.2-1.3)	1.2 (1.1-1.3)	
35-49	1.4 (1.3-1.5)	1.4 (1.4-1.5)	1.4 (1.3-1.5)	1.4 (1.4-1.4)	1.5 (1.4-1.5)	1.5 (1.4-1.6)	1.6 (1.5-1.6)	1.4 (1.3-1.4)	1.5 (1.4-1.5)	1.5 (1.5-1.6)	
50-64	1.6 (1.5-1.7)	1.6 (1.5-1.7)	1.6 (1.5-1.7)	1.7 (1.6-1.7)	1.7 (1.6-1.8)	1.8 (1.7-1.8)	1.8 (1.7-1.9)	1.7 (1.6-1.8)	1.8 (1.7-1.9)	1.8 (1.7-1.8)	
≥65	1.5 (1.4-1.6)	1.6 (1.5-1.7)	1.7 (1.6-1.8)	1.7 (1.7-1.8)	1.8 (1.7-1.9)	1.9 (1.8-1.9)	1.9 (1.8-1.9)	1.9 (1.8-2)	1.8 (1.8-1.9)	1.9 (1.8-2)	
Sex											*0.03*
Male	1.6 (1.6-1.7)	1.7 (1.7-1.7)	1.7 (1.6-1.7)	1.7 (1.7-1.7)	1.8 (1.7-1.8)	1.8 (1.8-1.8)	1.8 (1.8-1.9)	1.7 (1.7-1.8)	1.8 (1.7-1.8)	1.8 (1.8-1.9)	
Female	1.2 (1.2-1.3)	1.2 (1.2-1.3)	1.2 (1.2-1.3)	1.3 (1.2-1.3)	1.3 (1.3-1.4)	1.3 (1.3-1.4)	1.4 (1.4-1.5)	1.3 (1.3-1.3)	1.4 (1.3-1.4)	1.3 (1.3-1.4)	
Race/Ethnicity											*0.29*
Mexican American	1.4 (1.4-1.5)	1.5 (1.4-1.6)	1.5 (1.4-1.5)	1.5 (1.5-1.6)	1.6 (1.6-1.6)	1.6 (1.5-1.7)	1.5 (1.4-1.6)	1.6 (1.6-1.7)	1.6 (1.5-1.7)	1.6 (1.6-1.7)	
Other Hispanic	1.5 (1.4-1.6)	1.5 (1.4-1.6)	1.3 (1.1-1.5)	1.4 (1.3-1.6)	1.5 (1.5-1.6)	1.6 (1.5-1.7)	1.6 (1.6-1.7)	1.5 (1.4-1.6)	1.6 (1.6-1.7)	1.7 (1.6-1.7)	
Non-Hispanic White	1.4 (1.4-1.5)	1.4 (1.4-1.5)	1.4 (1.4-1.5)	1.5 (1.4-1.5)	1.5 (1.5-1.6)	1.5 (1.5-1.6)	1.6 (1.6-1.7)	1.5 (1.4-1.5)	1.6 (1.5-1.6)	1.6 (1.5-1.6)	
Non-Hispanic Black	1.4 (1.3-1.5)	1.4 (1.4-1.5)	1.4 (1.4-1.5)	1.5 (1.5-1.6)	1.5 (1.4-1.5)	1.6 (1.6-1.7)	1.6 (1.5-1.6)	1.5 (1.5-1.6)	1.6 (1.5-1.6)	1.5 (1.4-1.6)	
Asian/Other‡	1.3 (1.2-1.5)	1.5 (1.4-1.7)	1.4 (1.3-1.6)	1.3 (1.2-1.4)	1.5 (1.4-1.7)	1.5 (1.4-1.6)	1.6 (1.5-1.7)	1.5 (1.4-1.6)	1.5 (1.4-1.6)	1.7 (1.7-1.8)	
Education Level											*0.1*
<High school graduate	1.4 (1.4-1.5)	1.5 (1.5-1.6)	1.4 (1.3-1.5)	1.4 (1.4-1.5)	1.6 (1.5-1.6)	1.6 (1.5-1.7)	1.6 (1.5-1.8)	1.6 (1.5-1.7)	1.7 (1.6-1.8)	1.6 (1.5-1.7)	
High school graduate	1.4 (1.3-1.5)	1.5 (1.4-1.6)	1.5 (1.4-1.5)	1.5 (1.5-1.6)	1.6 (1.5-1.7)	1.6 (1.6-1.7)	1.7 (1.6-1.7)	1.6 (1.5-1.6)	1.7 (1.6-1.7)	1.6 (1.5-1.7)	
Some college or AA degree	1.4 (1.3-1.5)	1.4 (1.3-1.4)	1.4 (1.3-1.5)	1.5 (1.4-1.5)	1.5 (1.4-1.5)	1.5 (1.5-1.6)	1.6 (1.5-1.7)	1.5 (1.5-1.6)	1.6 (1.5-1.6)	1.6 (1.5-1.7)	
College graduate +	1.5 (1.4-1.5)	1.4 (1.4-1.5)	1.5 (1.4-1.6)	1.4 (1.3-1.5)	1.5 (1.5-1.6)	1.5 (1.5-1.6)	1.6 (1.5-1.6)	1.4 (1.3-1.5)	1.5 (1.4-1.5)	1.5 (1.5-1.6)	
Income level§											*0.27*
<1.3	1.4 (1.3-1.5)	1.4 (1.4-1.5)	1.3 (1.3-1.4)	1.5 (1.4-1.5)	1.4 (1.4-1.5)	1.5 (1.5-1.6)	1.5 (1.5-1.6)	1.5 (1.4-1.6)	1.5 (1.5-1.6)	1.6 (1.5-1.6)	
1.3-2.99	1.4 (1.3-1.5)	1.4 (1.3-1.4)	1.4 (1.4-1.5)	1.4 (1.4-1.5)	1.6 (1.5-1.6)	1.6 (1.5-1.6)	1.7 (1.6-1.8)	1.6 (1.5-1.6)	1.6 (1.6-1.7)	1.5 (1.5-1.6)	
≥3.00	1.4 (1.4-1.5)	1.5 (1.5-1.5)	1.5 (1.4-1.6)	1.5 (1.5-1.5)	1.6 (1.5-1.6)	1.6 (1.5-1.6)	1.6 (1.5-1.7)	1.5 (1.4-1.5)	1.6 (1.5-1.6)	1.6 (1.6-1.7)	

AA- Associate of Arts; BMI- body mass index; CI- confidence interval; CHD- coronary heart disease; CVD- cardiovascular disease; DBP – diastolic blood pressure; FPG – fasting plasma glucose; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; WC – waist circumference.

*Cardiometabolic components include: adiposity, blood glucose control, blood pressure, blood lipids, and prevalent cardiovascular disease. Definitions for intermediate levels each component are as follows: Adiposity: BMI 25-30 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); Blood glucose: FPG 100-125 mg/dL or HbA1c 5.7-6.4% , or FPG <100 mg/dL and HbA1c <5.7% and taking diabetes medication[45]; Blood lipids: TC:HDL 3.5-5:1, or TC:HDL <3.5:1 and taking lipid lowering medication; Blood pressure: SBP 120-139 mmHg or DBP 80-89 mmHg; or SBP < 120 mmHg, DBP < 80 mmHg and taking blood pressure medication; History of CVD: angina only. See Table 1 for further details of definitions and sources.

Criteria for poor levels of each cardiometabolic risk and condition can be found in Table 1.

†Mean counts were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults. All sub-group analyses were further age-standardized to the 2017-18 survey cycle U.S. adult age proportions.

‡Other includes race/ethnicity other that non-Hispanic white, non-Hispanic black, and Hispanic, including multiracial.

§Represents the ratio of family income to the federal poverty threshold, adjusting for household size. A higher ratio indicates a higher level of income.

||Overall time trends assessed by treating survey year as a continuous variable in a survey-weighted regression model. Sociodemographic factors were all modeled as indicator categories in the adjusted analyses. P<0.05 considered statistically significant.

¶To assess the statistical significance of subgroup differences in trends over time, a survey-weighted Wald *F* test was used to evaluate the set of multiplicative interaction terms between the survey year as a continuous variable and each sociodemographic subgroup (age, sex, race/ethnicity, education level, income) as an indicator category in adjusted regressions. P<0.05 considered statistically significant.

Table S4. Mean count of poor levels of 5 cardiometabolic components*, overall and by sociodemographic sub-groups, among U.S. adults, 1999-2018

	Mean (95% CI) †										
Characteristics	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018	p-trend‖ | *p-trend-interaction*¶
Overall	1.1 (1.0-1.2)	1.1 (1.0-1.1)	1.1 (1.1-1.2)	1.1 (1.0-1.1)	1.1 (1.1-1.2)	1.1 (1.1-1.1)	1.1 (1.0-1.2)	1.1 (1.1-1.1)	1.1 (1.1-1.2)	1.2 (1.1-1.3)	0.10
Age, y											*<0.001*
20-34	0.7 (0.6-0.8)	0.6 (0.6-0.7)	0.6 (0.6-0.7)	0.7 (0.6-0.7)	0.7 (0.6-0.7)	0.6 (0.6-0.7)	0.6 (0.5-0.7)	0.7 (0.6-0.7)	0.7 (0.6-0.7)	0.7 (0.6-0.8)	
35-49	1.0 (0.8-1.1)	1.0 (0.9-1.1)	1.0 (1-1.1)	1.0 (0.9-1)	1.0 (0.9-1.1)	1.0(1.0-1.1)	1.0 (0.9-1.1)	1.0 (1.0-1.1)	1.1 (1.0-1.2)	1.0 (0.9-1.1)	
50-64	1.5 (1.3-1.6)	1.4 (1.3-1.5)	1.4 (1.3-1.5)	1.3 (1.2-1.4)	1.3 (1.3-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.4 (1.3-1.5)	
≥65	1.8 (1.7-2.0)	1.8 (1.7-1.8)	1.8 (1.7-1.9)	1.7 (1.6-1.7)	1.7 (1.6-1.9)	1.6 (1.5-1.7)	1.6 (1.6-1.7)	1.6 (1.6-1.7)	1.7 (1.5-1.8)	1.7 (1.7-1.8)	
Sex											*0.94*
Male	1.2 (1.1-1.3)	1.2 (1.1-1.2)	1.2 (1.1-1.3)	1.1 (1.1-1.2)	1.2 (1.1-1.2)	1.2 (1.1-1.2)	1.1 (1-1.2)	1.1 (1.1-1.2)	1.2 (1.1-1.3)	1.2 (1.1-1.3)	
Female	1.2 (1.1-1.3)	1.1 (1.1-1.2)	1.2 (1.1-1.2)	1.1 (1-1.1)	1.1 (1.1-1.2)	1.1 (1-1.1)	1.1 (1-1.2)	1.1 (1.1-1.1)	1.1 (1.1-1.2)	1.2 (1.1-1.2)	
Race/Ethnicity											*0.08*
Mexican American	1.3 (1.2-1.4)	1.2 (1.2-1.3)	1.3 (1.2-1.4)	1.2 (1.2-1.3)	1.3 (1.2-1.4)	1.3 (1.3-1.4)	1.3 (1.2-1.5)	1.3 (1.2-1.3)	1.4 (1.3-1.5)	1.3 (1.2-1.5)	
Other Hispanic	1.2 (1.1-1.4)	1.1 (1-1.3)	1.2 (1-1.4)	1.1 (0.9-1.3)	1.2 (1.1-1.4)	1.2 (1.1-1.3)	1.2 (1.1-1.3)	1.2 (1.1-1.3)	1.3 (1.2-1.4)	1.2 (1.1-1.3)	
Non-Hispanic White	1.2 (1-1.3)	1.1 (1.1-1.2)	1.1 (1.1-1.2)	1.1 (1-1.1)	1.1 (1-1.2)	1.1 (1-1.1)	1.1 (1-1.1)	1.1 (1.1-1.1)	1.1 (1-1.2)	1.2 (1.1-1.3)	
Non-Hispanic Black	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.3)	1.3 (1.2-1.4)	1.3 (1.2-1.3)	1.3 (1.2-1.3)	1.3 (1.2-1.3)	1.3 (1.2-1.3)	1.3 (1.2-1.4)	
Asian/Other‡	1.2 (0.8-1.6)	1.2 (1-1.4)	1.1 (1-1.3)	1 (0.9-1.1)	0.9 (0.8-1.1)	1 (0.9-1.1)	0.9 (0.8-1)	0.9 (0.9-1)	1.1 (0.9-1.3)	1.1 (1-1.2)	
Education Level											*0.01*
<High school graduate	1.4 (1.3-1.4)	1.3 (1.3-1.4)	1.3 (1.2-1.4)	1.3 (1.3-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.3)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	
High school graduate	1.3 (1.2-1.4)	1.2 (1.1-1.3)	1.2 (1.2-1.3)	1.2 (1.1-1.3)	1.3 (1.1-1.4)	1.2 (1.1-1.3)	1.2 (1.2-1.3)	1.2 (1.2-1.3)	1.3 (1.2-1.3)	1.3 (1.2-1.4)	
Some college or AA degree	1.2 (1-1.3)	1.2 (1.1-1.2)	1.2 (1.1-1.3)	1.1 (1.1-1.2)	1.2 (1.1-1.2)	1.2 (1.1-1.2)	1.1 (1.1-1.2)	1.2 (1.2-1.2)	1.2 (1.1-1.3)	1.2 (1.2-1.3)	
College graduate +	0.9 (0.8-1.1)	0.9 (0.9-1)	1 (0.9-1.1)	0.9 (0.8-0.9)	0.9 (0.8-1)	0.8 (0.8-0.9)	0.9 (0.8-1)	0.9 (0.8-0.9)	1.0 (0.9-1)	1.0 (0.9-1.1)	
Income level§											*0.69*
<1.3	1.4 (1.3-1.5)	1.4 (1.3-1.5)	1.3 (1.3-1.4)	1.3 (1.2-1.4)	1.4 (1.3-1.5)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	1.3 (1.2-1.3)	1.3 (1.3-1.4)	1.3 (1.2-1.4)	
1.3-2.99	1.3 (1.2-1.4)	1.2 (1.1-1.3)	1.3 (1.2-1.3)	1.2 (1.2-1.3)	1.2 (1.1-1.3)	1.2 (1.1-1.2)	1.1 (1.1-1.2)	1.2 (1.2-1.3)	1.2 (1.1-1.3)	1.3 (1.2-1.4)	
≥3.00	1.1 (0.9-1.2)	1 (1-1.1)	1.1 (1-1.1)	1 (0.9-1)	1 (1-1.1)	1 (1-1.1)	1 (0.9-1.1)	1 (0.9-1)	1.1 (1-1.1)	1.1 (1-1.2)	

AA- Associate of Arts; BMI- body mass index; CI- confidence interval; CHD- coronary heart disease; CVD- cardiovascular disease; DBP – diastolic blood pressure; FPG – fasting plasma glucose; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; WC – waist circumference.

* Cardiometabolic components include: adiposity, blood glucose control, blood pressure, blood lipids, and prevalent cardiovascular disease. Definitions for poor levels for each component are as follows: Adiposity: BMI >30 kg/m^2 AND WC >88 cm (women)/WC >102 cm (men); Blood glucose: FPG ≥126 mg/dL or HbA1c ≥6.5%, regardless of medication usage[45]; Blood lipids: TC:HDL >5:1, regardless of medication usage; Blood pressure: SBP ≥140 mmHg or DBP ≥90 mmHg, regardless of medication usage; History of CVD: one or more of CHD, heart attack, heart failure or stroke. See Table 1 for further details of definitions and sources.

†Mean counts were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults. All sub-group analyses were further age-standardized to the 2017-18 survey cycle U.S. adult age proportions.

‡Other includes race/ethnicity other that non-Hispanic white, non-Hispanic black, and Hispanic, including multiracial.

§ Represents the ratio of family income to the federal poverty threshold, adjusting for household size. A higher ratio indicates a higher level of income.

‖Overall time trends assessed by treating survey year as a continuous variable in a survey-weighted regression model. Sociodemographic factors were all modeled as indicator categories in the adjusted analyses. P<0.05 considered statistically significant.

¶To assess the statistical significance of subgroup differences in trends over time, a survey-weighted Wald *F* test was used to evaluate the set of multiplicative interaction terms between the survey year as a continuous variable and each sociodemographic subgroup (age, sex, race/ethnicity, education level, income) as an indicator category in adjusted regressions. P<0.05 considered statistically significant.

Table S5. Percentage of U.S. adults with poor, intermediate, and optimal levels* for 5 cardiometabolic components separately, 1999-2018

Cardiometabolic component	Percentage (95% CI)†										
	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018	p-trend‡
Adiposity											
Optimal	33.8 (30.9-36.6)	32.7 (31.3-34.1)	30.6 (29.1-32.0)	30.1 (27.5-32.8)	29.4 (27.7-31.1)	28.4 (25.8-31.1)	28.1 (24.9-31.4)	26.7 (25.2-28.2)	24.9 (22.2-27.6)	24.0 (21.5-26.4)	<0.001
Intermediate	18.7 (16.4-21.0)	17.9 (16.7-19.2)	15.2 (13.7-16.7)	16.2 (14.6-17.9)	16.2 (14.7-17.8)	16.2 (15.2-17.2)	15.4 (13.9-16.9)	14.9 (14.1-15.7)	14.4 (12.4-16.5)	14.3 (12.6-16.1)	<0.001
Poor	47.7 (43.8-51.5)	49.5 (47.8-51.3)	54.3 (52.2-56.4)	53.8 (50.4-57.1)	54.5 (51.7-57.3)	55.5 (52.9-58.2)	56.6 (53.1-60.0)	58.6 (57.1-60.0)	60.8 (56.5-65.2)	61.9 (58.6-65.2)	<0.001
Blood glucose											
Optimal	59.4 (56.0-62.7)	54.2 (52.4-56)	53.5 (51.1-56.0)	52.9 (49.7-56)	45.5 (43.3-47.6)	43.5 (42.0-45.0)	42.8 (40.4-45.1)	45.1 (42.9-47.3)	40.7 (38.5-42.8)	36.9 (34.5-39.2)	<0.001
Intermediate	32.2 (29.7-34.7)	37.4 (35.3-39.5)	37.3 (35.4-39.1)	37.9 (35.4-40.4)	43.6 (42.0-45.2)	45.2 (44.2-46.2)	45.5 (43.2-47.7)	42.7 (40.6-44.8)	46.5 (44.9-48.1)	49.6 (47.4-51.8)	<0.001
Poor	8.6 (7.2-10.0)	8.6 (7.5-9.7)	9.4 (8.3-10.4)	9.3 (8.1-10.6)	11.1 (9.4-12.8)	11.5 (10.4-12.5)	11.9 (10.8-13)	12.4 (11.4-13.3)	13.0 (11.2-14.8)	13.7 (12.4-14.9)	<0.001
Blood pressure											
Optimal	40.3 (37.2-43.5)	40.9 (38.5-43.3)	38.9 (36.2-41.6)	39.8 (37.6-42)	39.9 (37.2-42.6)	41.6 (38.8-44.4)	39.2 (36.2-42.1)	41.4 (39.5-43.4)	37.1 (34.9-39.3)	36.5 (34.2-38.7)	0.03
Intermediate	40.6 (38.8-42.4)	41.2 (39.9-42.5)	42.4 (40.5-44.2)	42.8 (41.2-44.4)	44.1 (41.4-46.7)	44.1 (41.7-46.4)	45.8 (43.7-47.9)	43.6 (41.0-46.2)	46.5 (44.5-48.5)	44.2 (42.5-45.8)	<0.001
Poor	19.2 (16.7-21.7)	18.0 (16.4-19.6)	18.9 (16.4-21.3)	17.6 (16.2-19.0)	16.2 (15.3-17.0)	14.5 (13.3-15.6)	15.2 (13.5-16.9)	15.1 (13.3-16.9)	16.6 (14.9-18.3)	19.5 (17.6-21.4)	0.11
Blood lipids											
Optimal	29.9 (26.8-33.0)	33.5 (32.2-34.9)	37.1 (34.8-39.3)	37.5 (34.8-40.3)	32.7 (30.0-35.3)	34.9 (32.9-36.9)	33.8 (30.7-37.0)	36.6 (34.3-38.9)	38.6 (35.8-41.4)	37.0 (34.0-39.9)	<0.001
Intermediate	42.0 (39.9-44.0)	41.2 (39.2-43.1)	42.6 (40.8-44.4)	44.3 (42.2-46.4)	45.5 (43.6-47.5)	45.2 (43.0-47.5)	49.3 (46.8-51.7)	46.4 (43.5-49.2)	45.1 (43.0-47.2)	48.5 (45.8-51.1)	<0.001
Poor	28.3 (25.2-31.4)	25.5 (23.5-27.4)	20.5 (18.8-22.2)	18.3 (17.1-19.5)	22.0 (20.5-23.5)	20.0 (19.0-21.1)	17.0 (15.1-19.0)	17.2 (16.0-18.4)	16.5 (14.7-18.3)	14.7 (12.6-16.8)	<0.001
History of CVD											
Optimal	88.2 (86.4-90.0)	88.9 (87.2-90.6)	87.3 (85.4-89.2)	88.0 (86.5-89.4)	88.9 (87.5-90.2)	89.7 (88.6-90.8)	88.9 (87.8-90.0)	89 (87.6-90.3)	88.8 (87.8-89.8)	87.8 (86.3-89.3)	0.66
Intermediate	4.7 (3.6-5.8)	4.1 (3.3-4.9)	4.0 (3.3-4.6)	3.8 (3.4-4.3)	3.2 (2.7-3.7)	3.0 (2.5-3.4)	3.3 (2.8-3.8)	2.8 (2.3-3.4)	3.4 (3.0-3.7)	3.6 (3.0-4.2)	0.002
Poor	7.2 (6.2-8.3)	7.1 (5.9-8.3)	8.9 (7.3-10.4)	8.3 (7.0-9.7)	8.1 (7.0-9.2)	7.5 (6.4-8.6)	8.0 (6.9-9.0)	8.4 (7.4-9.3)	8.0 (7.0-9.0)	8.8 (7.3-10.2)	0.20

BMI- body mass index; CI- confidence interval; CHD- coronary heart disease; CVD- cardiovascular disease; DBP – diastolic blood pressure; FPG – fasting plasma glucose; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; WC – waist circumference.

*Criteria for optimal, intermediate and poor levels of each cardiometabolic component are as follows: Adiposity: optimal – BMI<25 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); intermediate – BMI 25-30 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); poor - BMI >30 kg/m^2 AND WC >88 cm (women)/WC >102 cm (men). Blood glucose: optimal – FPG <100 mg/dL and HbA1c <5.7% and not taking diabetes medication[45]; intermediate – FPG 100-125 mg/dL or HbA1c 5.7-6.4% , or FPG <100 mg/dL and HbA1c <5.7% and taking diabetes medication; poor -- FPG ≥126 mg/dL or HbA1c ≥6.5%, regardless of medication usage. Blood lipids: optimal – TC:HDL <3.5:1 and not taking lipid lowering medication; intermediate – TC:HDL 3.5-5:1, or TC:HDL <3.5:1 and taking lipid lowering medication; poor – TC:HDL >5:1, regardless of medication usage. Blood pressure: optimal – SBP < 120 mmHg, DBP < 80 mmHg and not taking blood pressure medication; intermediate – SBP 120-139 mmHg or DBP 80-89 mmHg; or SBP < 120 mmHg, DBP < 80 mmHg and taking blood pressure medication; poor – SBP ≥140 mmHg or DBP ≥90 mmHg, regardless of medication usage. History of CVD: optimal – no CVD-related conditions; intermediate – angina only; poor – one or more of CHD, heart attack, heart failure or stroke. See Table 1 for further details of definitions and sources.

†Percentages were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults

‡Statistical significance of time trends for individual cardiometabolic component categories were assessed by treating survey year as a continuous variable in a survey-weighted logistic regression model.

Table S6. Subsets of U.S. adults on medications and with and without optimal blood pressure and blood lipid biomarker levels within the intermediate category for each, 1999-2018*

	NHANES survey cycle										
	overall	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018
Blood Pressure†											
No. on BP medications within the intermediate category for BP (n)	10756	623	770	896	872	1307	1327	1190	1292	1245	1234
Subset on BP medications and with optimal BP levels (n, %)	3917 (39.1)	187 (32.1)	271 (39.1)	306 (36.4)	326 (38.4)	511 (40.8)	540 (43.4)	426 (38.1)	497 (39.4)	424 (38.3)	429 (40.2)
Blood lipids- TC:HDL‡||											
No. on lipid medications within the intermediate category for blood lipids (n)	8444	316	468	630	680	1009	1049	986	1079	1029	1198
No. on lipid medications and with optimal lipid levels (n, %)	4877 (56.5)	117 (28.8)	217 (40.6)	332 (51.1)	400 (59.5)	570 (53.3)	607 (57.0)	553 (55.3)	653 (58.2)	645 (64.3)	783 (63.3)
Blood lipids – LDL-C and TG§||											
No. on lipid medications within the intermediate category for blood lipids (n)	6973	261	378	476	534	848	880	808	888	890	1010
No. on lipid medications and with optimal lipid levels (n, %)	3264 (45.4)	51 (13.8)	130 (28.2)	186 (36.0)	245 (43.2)	363 (41.4)	415 (46.0)	386 (47.5)	474 (51.1)	454 (52.6)	560 (53.0)

*Percentages were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults and were age-standardized to the 2017-18 survey cycle U.S. adult age proportions.

†Criteria for intermediate levels for blood pressure were as follows: either SBP 120-139 mmHg or DBP 80-89 mmHg, regardless of BP medication usage; or SBP < 120 mmHg & DBP < 80 mmHg and taking BP medication. See Table 1 for further details of definitions and sources.

‡ Criteria for intermediate levels for blood lipids (primary metric) were as follows– TC:HDL between 3.5-5:1, regardless of lipid-lowering medication usage; or TC:HDL <3.5:1 and taking lipid lowering medication. See Table 1 for further details of definitions and sources.

§ Criteria for intermediate levels for blood lipids (secondary metric, sensitivity analysis) were as follows– either LDL-C 100-159 mg/dL or TG 150-174 mg/dL, regardless of medication usage; or LDL-C <100 mg/dL & TG<150 mg/dL and taking lipid lowering medication. See Table 1 for further details of definitions and sources.

||Number of respondents on lipid medications within the intermediate category for blood lipids differ based on which biomarker (TC:HDL ratio vs. LDL and TG) U.S.ed for categorization.

BP – blood pressure; DBP – diastolic blood pressure; LDL-C – low density lipoprotein cholesterol; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; TG- triglycerides

Table S7. Percentage of U.S. adults with metabolic syndrome*, overall and by sociodemographic sub-groups, 1999-2018

	Percentage (95% CI)†										
Characteristics	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018	p-trend‖ | *p-trend-interaction*¶
Overall	36.2 (33.2-39.1)	36.8 (35.0-38.6)	38.4 (36.0-40.7)	38.6 (36.0-41.3)	42.5 (39.5-45.4)	42.1 (39.9-44.2)	43.1 (39.3-46.9)	44.7 (43.0-46.5)	45.5 (42.1-48.8)	47.3 (45.3-49.3)	<0.001
Age, y											*<0.001*
20-34	17.5 (13.7-21.4)	15.1 (12.4-17.8)	15.4 (12.9-17.9)	14.0 (11.9-16.1)	18.2 (14.9-21.5)	16.8 (14.3-19.3)	18.6 (15.6-21.7)	19.2 (16.3-22.1)	19.7 (17.3-22.2)	23.1 (19.5-26.6)	
35-49	29.4 (24.8-34.1)	33.6 (30.2-37.0)	33.2 (30.9-35.5)	35.4 (32.0-38.8)	35.3 (32.2-38.4)	34.0 (31.4-36.6)	35.2 (30.0-40.4)	36.6 (34.4-38.8)	37.7 (33.2-42.3)	38.0 (34.6-41.4)	
50-64	55.7 (51.7-59.6)	52.1 (48.3-55.9)	54.0 (49.0-59.0)	50.7 (46.3-55.0)	57.0 (53.1-60.9)	57.1 (53.6-60.6)	55.9 (51.0-60.8)	57.8 (54.4-61.2)	57.6 (52.1-63.2)	57.1 (51.9-62.4)	
≥65	62.5 (59.1-65.9)	65.3 (62.5-68.0)	66.5 (63.3-69.6)	68.3 (65.9-70.7)	73.5 (69.3-77.7)	73.6 (70.5-76.7)	73.9 (69.1-78.7)	75.7 (72.7-78.8)	74.7 (71.6-77.8)	78.1 (75.9-80.4)	
Sex											*0.07*
Male	38 (33.9-42.1)	40.6 (38.5-42.8)	41.7 (38.8-44.6)	40 (37.9-42.2)	43.9 (41.3-46.5)	44.5 (42.4-46.7)	44.2 (41.4-46.9)	45.6 (43.1-48)	48.7 (45.3-52.2)	48.9 (46.7-51.1)	
Female	40.5 (38.1-42.9)	38.3 (36.3-40.4)	39.9 (37.2-42.5)	38.4 (36-40.8)	44.1 (41.4-46.7)	43.4 (40.6-46.1)	45.3 (42.1-48.6)	43.5 (41.7-45.4)	44.9 (42-47.8)	45.2 (41.8-48.6)	
Race/Ethnicity											*0.3*
Mexican American	41.7 (38.6-44.7)	41.3 (36.6-46.1)	45.9 (41.5-50.4)	41.5 (39-44)	47.2 (44.7-49.8)	50 (45.9-54.1)	49.1 (44.6-53.7)	47.9 (44.6-51.2)	52 (48.3-55.6)	52.2 (48.1-56.2)	
Other Hispanic	43.1 (37.6-48.7)	38.5 (30.5-46.4)	37.8 (27.4-48.1)	36.5 (29.2-43.9)	43.2 (40.1-46.2)	44.8 (41-48.6)	44.9 (41.2-48.5)	42.8 (38.9-46.8)	48.3 (44.6-52)	45.9 (41.9-50.0)	
Non-Hispanic White	38.8 (36.1-41.5)	39.3 (37.1-41.4)	40.3 (37.4-43.3)	38.1 (36.1-40.1)	44.8 (41.6-48)	43.1 (40.9-45.3)	44.3 (40.4-48.2)	44 (41.5-46.4)	46.5 (42.7-50.2)	46.6 (42.9-50.2)	
Non-Hispanic Black	37.7 (34.3-41.1)	39.8 (36.8-42.8)	39.6 (35.4-43.8)	42.6 (39-46.2)	42.3 (39.6-45.1)	48.2 (45.8-50.5)	48.4 (46.3-50.6)	49.1 (46-52.3)	46.8 (43.4-50.2)	47.6 (44.7-50.5)	
Asian/Other‡	41.4 (24.4-58.5)	39.3 (29.3-49.3)	39.2 (32.9-45.5)	42.8 (33.5-52)	33.5 (26.2-40.8)	39.2 (32.6-45.7)	39.2 (35.2-43.1)	39.4 (35.8-43.1)	44.2 (39.6-48.8)	46.7 (41.9-51.4)	
Education Level											*0.23*
<High school graduate	42.9 (39.8-45.9)	46.2 (44.3-48.1)	44.1 (41.3-46.9)	44.6 (41.7-47.4)	49 (44.6-53.4)	49.2 (46.2-52.1)	49.6 (47.1-52.2)	49.1 (46.7-51.6)	49.6 (45.3-54)	49.1 (44.7-53.6)	
High school graduate	42.4 (40-44.8)	42.4 (37.8-47)	42.2 (38.3-46)	41.9 (38.9-44.8)	48 (44.7-51.3)	47.6 (44-51.3)	47.5 (43.5-51.5)	47.8 (44.3-51.3)	50.9 (47.6-54.3)	51.9 (47.5-56.2)	
Some college or AA degree	39.2 (32.7-45.7)	39 (36.6-41.4)	40.4 (37.1-43.6)	40 (37-43)	44 (40.4-47.7)	47.5 (45.1-49.9)	46.5 (44.1-49)	48.3 (45.5-51)	49.6 (45-54.2)	50.2 (46.9-53.4)	

College graduate +	32.1 (26.1-38.2)	33.1 (30.7-35.5)	38.2 (32.7-43.7)	33.3 (30.5-36.1)	35.9 (32.1-39.6)	33.6 (30-37.2)	38.8 (34.2-43.5)	35.7 (32.2-39.2)	40.2 (36.7-43.7)	39.3 (34.9-43.6)	
Income level[§]											0.05
<1.3	43.2 (40-46.4)	44.5 (40.7-48.2)	42.4 (39.8-45)	44.2 (41.1-47.3)	48.7 (44.8-52.6)	49.4 (47.2-51.7)	48.7 (46.1-51.3)	48.8 (46.6-51)	47.8 (44.2-51.4)	50.6 (47-54.2)	
1.3-2.99	39.6 (36.7-42.4)	41.3 (38.2-44.5)	42.4 (38.9-46)	39.5 (37.1-42)	46.7 (43.6-49.7)	45.3 (43.7-46.9)	47 (44.9-49.1)	47.9 (43.6-52.2)	50.5 (47.5-53.6)	49.3 (45.2-53.5)	
≥3.00	37.3 (33.6-41.1)	37.1 (35.3-39)	39.7 (37.1-42.2)	37.6 (35.6-39.7)	40.8 (37.7-43.8)	41.1 (38.5-43.8)	41.5 (36.7-46.2)	40.7 (38.4-43)	44 (40.5-47.6)	44.2 (40.9-47.6)	

AA- Associates of Arts; AHA- American Heart Association; CI- confidence interval; DBP – diastolic blood pressure; HDL-C – HDL-cholesterol; NHANES – National Health and Nutrition Examination Survey; NHLBI – National Heart, Lung and Blood Institute; SBP – systolic blood pressure

[*] We evaluated metabolic syndrome according to the AHA/NHLBI scientific statement as the presence of three or more of the following metabolic components: HLD-C < 40 mg/dL (men)/<50 mg/dL (women) or on drug treatment for reduced HDL-C; triglycerides >= 150 mg/dL or on drug treatment for elevated triglycerides; blood pressure >=130 SBP or >=85 DBP or on antihypertensive drug treatment with a history of hypertension; waist circumference >=102 cm (men)/>=88 cm (women); and fasting plasma glucose >= 100 mg/dL or on drug treatment for elevated glucose.[12]

[†]Percentages were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults and were age-standardized to the 2017-18 survey cycle U.S. adult age proportions.

[‡]Other includes race/ethnicity other that non-Hispanic white, non-Hispanic black, and Hispanic, including multiracial.

[§] Represents the ratio of family income to the federal poverty threshold, adjusting for household size. A higher ratio indicates a higher level of income.

[||]Overall time trends assessed by treating survey year as a continuous variable in a survey-weighted regression model. Sociodemographic factors were all modeled as indicator categories in the adjusted analyses. P<0.05 considered statistically significant.

[¶]To assess the statistical significance of subgroup differences in trends over time, a survey-weighted Wald *F* test was used to evaluate the set of multiplicative interaction terms between the survey year as a continuous variable and each sociodemographic subgroup (age, sex, race/ethnicity, education level, income) as an indicator category in adjusted regressions. P<0.05 considered statistically significant.

Table S8. Characteristics of U.S. adults by NHANES survey, excluding all participants with missing biometric data*, 1999-2018

	No. of participants (weighted %)†									
	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018
Characteristics	n=1653	n=1992	n=228	n=1915	n=2194	n=2306	n=2065	n=2196	n=2052	n=1913
Age group, y										
20-34	456 (32.2)	572 (30.1)	69 (32.4)	586 (27.1)	501 (26.7)	591 (27.1)	568 (27.2)	541 (26.5)	494 (24)	435 (28.5)
35-49	418 (33.5)	547 (33.7)	46 (27)	492 (32.1)	568 (31.3)	598 (29.1)	548 (28.6)	581 (27)	521 (25.8)	439 (24.8)
50-64	376 (20.9)	433 (22.8)	49 (24.2)	409 (24.4)	563 (25.7)	569 (26)	516 (27.3)	590 (27.1)	556 (29.1)	563 (28.1)
≥ 65	403 (13.4)	440 (13.4)	64 (16.4)	428 (16.4)	562 (16.3)	548 (17.9)	433 (17)	484 (19.4)	481 (21.1)	476 (18.6)
Sex										
Male	791 (49.2)	967 (49.8)	112 (49.6)	939 (49.5)	1089 (48.8)	1097 (47.2)	1037 (49.6)	1059 (48.9)	1004 (48.5)	934 (49.6)
Female	862 (50.8)	1025 (50.2)	116 (50.4)	976 (50.5)	1105 (51.2)	1209 (52.8)	1028 (50.4)	1137 (51.1)	1048 (51.5)	979 (50.4)
Race/Ethnicity										
Mexican American	449 (5.9)	436 (7.5)	53 (9.3)	363 (7.5)	373 (8.1)	434 (8.9)	216 (7.8)	276 (8.5)	330 (7.6)	267 (9.3)
Other Hispanic	112 (9.6)	70 (4.4)	7 (2.8)	59 (3.2)	224 (4.3)	226 (4.8)	217 (6.6)	186 (5.2)	283 (6.2)	171 (6)
Non-Hispanic White	763 (71.4)	1084 (74)	114 (71.7)	993 (72.8)	1084 (71.1)	1167 (70.4)	826 (69)	1003 (68.4)	733 (67.7)	678 (64.2)
Non-Hispanic Black	286 (9.8)	341 (9.9)	46 (11.2)	409 (10.6)	424 (10.5)	359 (9.7)	466 (9.3)	421 (10.3)	400 (9.7)	432 (10.6)
Other‡	43 (3.3)	61 (4.3)	8 (5)	91 (5.9)	89 (6)	120 (6.2)	340 (7.3)	310 (7.6)	306 (8.8)	365 (9.9)
Education Level										
<High school graduate	561 (15.5)	506 (11.9)	60 (12.1)	422 (10.7)	597(12.4)	660 (13.7)	433 (14.4)	462 (13.7)	613 (13.8)	438 (15.3)
High school graduate	763 (71.4)	1084 (74.0)	114 (71.7)	993 (72.8)	1084 (71.1)	1167 (70.4)	826 (69.0)	1003 (68.4)	733 (67.7)	678 (64.2)
Some college or AA degree	286 (9.8)	341 (9.9)	46 (11.2)	409 (10.6)	424 (10.5)	359 (9.7)	466 (9.3)	421 (10.3)	400 (9.7)	432 (10.6)
College graduate +	43 (3.3)	61 (4.3)	8 (5.0)	91 (5.9)	89 (6.0)	120 (6.2)	340 (7.3)	310 (7.6)	306 (8.8)	365 (9.9)
Ratio of Family Income to Poverty§										
<1.30	471 (20.5)	504 (19.6)	60 (17.4)	484 (15.4)	644 (19.3)	766 (21.5)	724 (24)	753 (24.8)	645 (19.8)	521 (20)
1.30-2.99	508 (28.4)	628 (28.9)	66 (23.5)	599 (29.4)	748 (29.6)	736 (30)	596 (28)	591 (25.8)	709 (30.9)	695 (30.8)
≥ 3.00	674 (51.2)	860 (51.6)	102 (59.1)	832 (55.2)	802 (51.1)	804 (48.5)	745 (48)	852 (49.4)	698 (49.3)	697 (49.2)
Metabolic health characteristics (mean [SD])										
waist circumference (cm)	94.9 (15.8)	95.8 (14.9)	97.5 (14.8)	98 (16.4)	97.7 (15.3)	98.5 (16.1)	99.2 (16.0)	99.6 (16.8)	101.3 (17.0)	100.4 (17.0)
body mass index (kg/m^2)	27.7 (6.0)	27.9 (6.0)	28.2 (5.9)	28.6 (6.5)	28.3 (6.1)	28.7 (6.6)	28.8 (6.4)	29.1 (7.2)	29.5 (7.1)	29.5 (7.0)
HbA1c (%)	5.4 (0.9)	5.5 (0.8)	5.6 (1.1)	5.5 (0.9)	5.6 (0.9)	5.6 (0.8)	5.7 (1)	5.6 (1)	5.7 (1)	5.7 (0.9)
fasting plasma glucose	102 (29.8)	103.5(30.7)	106.9 (47.1)	103.1 (28.2)	105.8 (33.3)	105.4 (26.5)	107.6 (31.6)	107.2 (31.2)	109.5 (32.4)	110.3 (31.6)

total cholesterol	202 (39.9)	201 (43.4)	202.7 (51)	199.2 (42.4)	196 (40.8)	196 (41.4)	194.3 (40.6)	189.3 (41.1)	193.5 (41.8)	187.5 (41.4)
HDL-cholesterol	49.7 (14.7)	51.1 (15.3)	55.4 (17)	55.7 (16.0)	53.2 (15.4)	54.6 (16.3)	53.3 (14.8)	54 (16.5)	56.4 (19.6)	54.1 (15.3)
total cholesterol: HDL ratio	4.4 (1.6)	4.2 (1.5)	4 (2.1)	3.8 (1.3)	4 (1.4)	3.9 (1.4)	3.9 (1.2)	3.8 (1.4)	3.8 (1.4)	3.7 (1.2)
systolic blood pressure (mm Hg)	121.9(17.6)	122.2(18.3)	123.6 (17.7)	121.7 (17.3)	120.5 (16.8)	119.3 (16.3)	120.7 (16.4)	121.3 (16.7)	123.4 (16.9)	122.7 (17.5)
diastolic blood pressure (mm Hg)	72.4 (12.1)	72.4 (12)	71.6 (12.2)	69.1 (12.6)	69.7 (12.3)	68.4 (12)	70.5 (11.8)	68.8 (12.2)	69.7 (11.7)	72.4 (11.7)
Presence of cardiovascular disease[‖,¶]										
heart failure	47 (2.2)	53 (2)	14 (4.6)	53 (2.3)	63 (2.1)	54 (1.7)	70 (3.4)	69 (2.8)	75 (2.1)	62 (2)
coronary heart disease	46 (2.4)	82 (3.3)	13 (4.2)	67 (3.4)	96 (3.4)	101 (3.3)	71 (3.6)	85 (3.7)	89 (3.5)	88 (3.7)
myocardial infarction	55 (2.9)	83 (3.2)	18 (4.3)	76 (3.4)	112 (3.8)	97 (3.4)	69 (3.2)	88 (3.6)	91 (3.1)	96 (3.1)
stroke	52 (2.3)	45 (1.7)	6 (1)	65 (2.6)	86 (2.7)	77 (2.4)	74 (3)	78 (3.3)	78 (2.9)	88 (2.8)
angina	27 (1.6)	81 (3.4)	10 (2.2)	87 (4.0)	83 (2.8)	88 (2.9)	60 (2.5)	69 (3.0)	85 (3.6)	100 (4.4)
Cardiometabolic medications[‖]										
Diabetes medication, yes	101 (3.2)	140 (4.8)	36 (8.1)	154 (6.1)	251 (8)	241 (7.8)	236 (9.1)	235 (8.6)	280 (11)	306 (11.2)
Lipid-lowering medication, yes	122 (6.7)	211 (10)	36 (12.5)	288 (14.1)	434 (16.6)	442 (17.5)	407 (19.7)	465 (21.3)	439 (21.2)	454 (20.2)
Blood presure medication, yes	366 (17.2)	471 (19.5)	75 (21.6)	505 (24)	731 (27.5)	723 (27.2)	656 (30)	682 (28.5)	688 (30.2)	680 (29.1)

AA, Associate of Arts; HbA1c, Hemoglobin A1c; HDL, high-density lipoprotein; NHANES, National Health and Nutrition Examination Survey; SD, standard deviation

[*]Participants with any missing biometric outcomes used in our primary analysis (e.g., blood pressure, blood lipids) including fasting plasma glucose were excluded. Other biometrics not used in primary analysis and with high rates of missing (triglycerides, LDL-cholesterol) were not reported.

[†]Percentages were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults.

[‡]Other includes race/ethnicity other that non-Hispanic white, non-Hispanic black, and Hispanic, including multiracial.

[§] Represents the ratio of family income to the federal poverty threshold, adjusting for household size. A higher ratio indicates a higher level of income.

[‖]Participants with missing values for dichotomous self-reported variables (i.e., prevalent cardiovascular disease conditions, medication usage) were assumed to be normal (i.e. no prevalent condition, no medication usage).

[¶]Prior heart failure, myocardial infarction or stroke based on self-reported history of these conditions. Presence of angina based on the presence of a positive Rose Questionnaire or use of anti-anginal medication.

Table S9. Sensitivity analyses of primary cardiometabolic health outcomes among U.S. adults from 1999-2018, excluding all participants with any missing biometric data*

Cardiometabolic health outcome	Mean (95% CI)‡										
	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018	p-trend§
Mean count:†											
optimal	2.6 (2.5-2.7)	2.5 (2.4-2.6)	2.5 (2.2-2.8)	2.6 (2.4-2.7)	2.4 (2.3-2.5)	2.4 (2.3-2.5)	2.3 (2.2-2.4)	2.4 (2.3-2.5)	2.2 (2.1-2.3)	2.2 (2.1-2.3)	<0.001
intermediate	1.3 (1.2-1.4)	1.4 (1.4-1.5)	1.3 (1.1-1.5)	1.4 (1.4-1.5)	1.5 (1.5-1.6)	1.5 (1.4-1.6)	1.6 (1.6-1.7)	1.5 (1.4-1.6)	1.6 (1.6-1.7)	1.7 (1.6-1.7)	<0.001
poor	1.1 (1.0-1.2)	1.1 (1.0-1.1)	1.2 (1.0-1.4)	1.0 (0.9-1.1)	1.0 (1.0-1.1)	1.0 (1.0-1.1)	1.1 (1.0-1.2)	1.1 (1.0-1.1)	1.2 (1.1-1.3)	1.1 (1.0-1.2)	<0.001
Optimal cardiometabolic health (%)†	9.1 (6.9-11.2)	9.8 (7.6-11.9)	9.2 (4.0-14.4)	10.0 (8.0-11.9)	8.9 (7.1-10.6)	10.1 (7.5-12.7)	8.1 (6.5-9.6)	8.8 (7.2-10.4)	7.1 (5.0-9.3)	8.0 (5.9-10.1)	0.06

*All participants with missing values in any biometric variables used for primary outcomes (total cholesterol, HDL-C, waist circumference, BMI, HbA1c, systolic blood pressure, diastolic blood pressure,~ 10% or less missing each; fasting plasma glucose, ~60% missing) were excluded.

†Mean count of optimal, intermediate and poor cardiometabolic health based on five components include: adiposity, blood glucose control, blood pressure, blood lipids, and history of CVD. Optimal cardiometabolic health prevalence based on whether respondent had optimal levels for all five components. Criteria for optimal, intermediate and poor levels of each cardiometabolic component are as follows: Adiposity: optimal – BMI<25 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); intermediate – BMI 25-30 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); poor - BMI >30 kg/m^2 AND WC >88 cm (women)/WC >102 cm (men). Blood glucose: optimal – FPG <100 mg/dL and HbA1c <5.7% and not taking diabetes medication[45]; intermediate – FPG 100-125 mg/dL or HbA1c 5.7-6.4% , or FPG <100 mg/dL and HbA1c <5.7% and taking diabetes medication; poor -- FPG ≥126 mg/dL or HbA1c ≥6.5%, regardless of medication usage. Blood lipids: optimal – TC:HDL <3.5:1 and not taking lipid lowering medication; intermediate – TC:HDL 3.5-5:1, or TC:HDL <3.5:1 and taking lipid lowering medication; poor – TC:HDL >5:1, regardless of medication usage. Blood pressure: optimal – SBP < 120 mmHg, DBP < 80 mmHg and not taking blood pressure medication; intermediate – SBP 120-139 mmHg or DBP 80-89 mmHg; or SBP < 120 mmHg, DBP < 80 mmHg and taking blood pressure medication; poor – SBP ≥140 mmHg or DBP ≥90 mmHg, regardless of medication usage. History of CVD: optimal – no CVD-related conditions; intermediate – angina only; poor – one or more of CHD, heart attack, heart failure or stroke. See Table 1 for further details of definitions and sources.

‡Means and percentages were adjusted for NHANES survey weights to represent the national U.S. population of non-institutionalized adults.

§Time trends assessed by treating survey year as a continuous variable in a survey-weighted regression model. Sociodemographic factors were all modeled as indicator categories in the adjusted analyses. P<0.05 considered statistically significant.

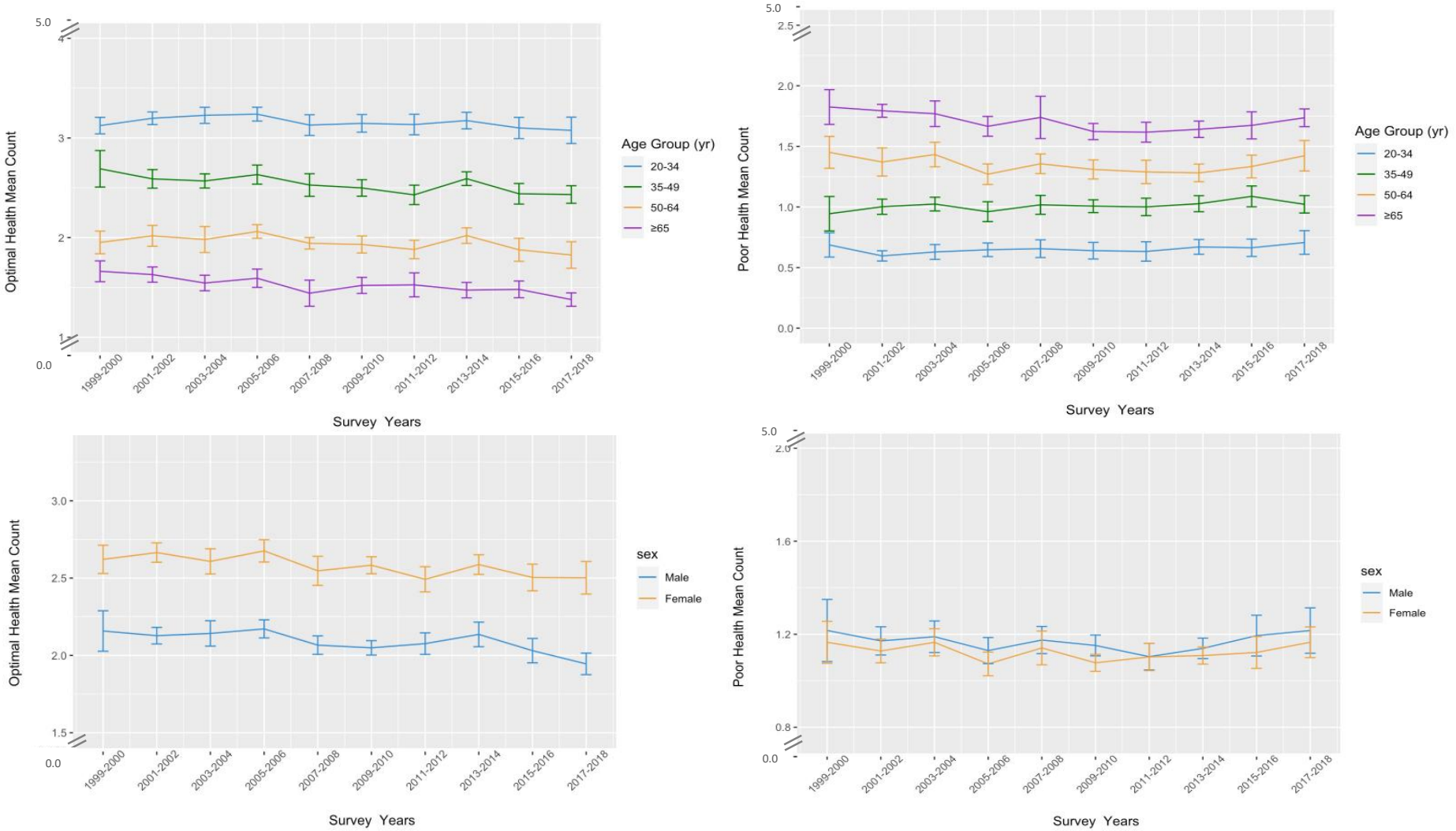

Figure S1. Trends in optimal and poor mean count of five cardiometabolic components among U.S. adults by age and sex, 1999-2018. Definitions for optimal and poor for each component of the mean count are as follows: Adiposity: optimal – BMI<25 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); poor - BMI >30 kg/m^2 AND WC >88 cm (women)/WC >102 cm (men). Blood glucose: optimal – FPG <100 mg/dL and HbA1c <5.7% and not taking diabetes medication[45]; poor -- FPG ≥126 mg/dL or HbA1c ≥6.5%, regardless of medication usage. Blood lipids: optimal – TC:HDL <3.5:1 and not taking lipid lowering medication; poor – TC:HDL >5:1, regardless of medication usage. Blood pressure: optimal – SBP < 120 mmHg, DBP < 80 mmHg and not taking blood pressure medication; poor – SBP ≥140 mmHg or DBP v90 mmHg, regardless of medication usage. History of CVD: optimal – no CVD-related conditions; poor – one or more of CHD, heart attack, heart failure or stroke. See Table 1 for further details of definitions and sources. Mean counts were survey-weighted using complex sampling weights and age-standardized to the 2017-18 survey cycle age proportions.
Abbreviations: BMI- body mass index; DBP – diastolic blood pressure; FPG – fasting plasma glucose; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; WC – waist circumference

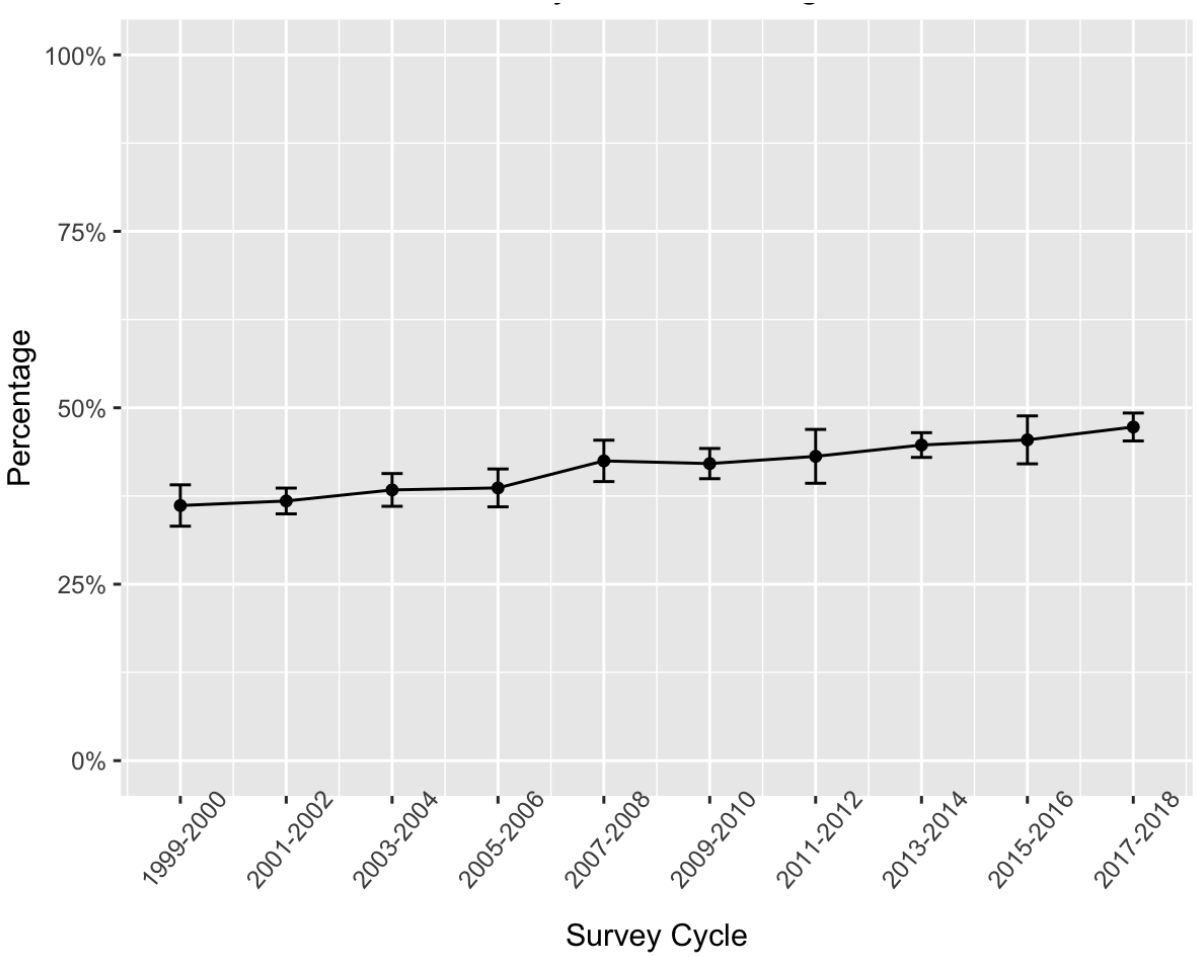

Figure S2. Prevalence of metabolic syndrome among U.S. adults,1999-2018. Metabolic syndrome defined by the ATPIII/NHLBI guidelines as presence of three or more of the following: HDL-C<40 mg/dL (men)/<50 mg/dL (women) or on drug treatment for reduced HDL-C; triglycerides ≥150 mg/dL or on drug treatment for elevated triglycerides; blood pressure ≥130 SBP or ≥85 DBP or on antihypertensive drug treatment with a history of hypertension; WC ≥102 cm (men)/ ≥88 cm (women); and FPG ≥100 mg/dL or on drug treatment for elevated glucose.[12] Prevalence was survey-weighted using complex sampling weights.
ATPIII, adult treatment panel III; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL-C, HDL cholesterol; NHLBI, Natinonal Heart, Lung and Blood Institute; SBP, systolic blood pressure; WC, waist circumference

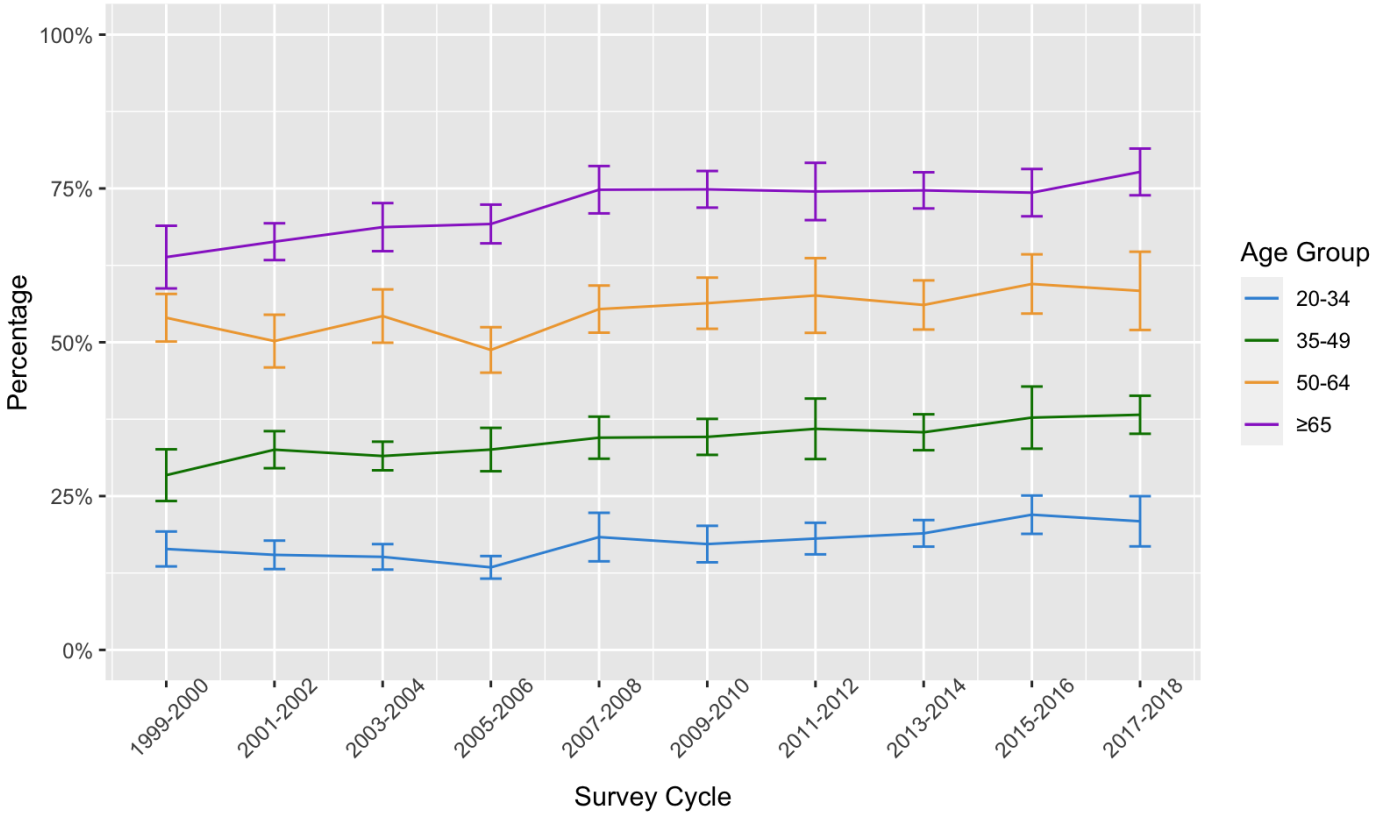

Figure S3. Prevalence of metabolic syndrome among U.S. adults by age group, 1999-2018. Metabolic syndrome defined by the ATPIII/NHLBI guidelines as presence of three or more of the following: HDL-C<40 mg/dL (men)/<50 mg/dL (women) or on drug treatment for reduced HDL-C; triglycerides ≥150 mg/dL or on drug treatment for elevated triglycerides; blood pressure ≥130 SBP or ≥85 DBP or on antihypertensive drug treatment with a history of hypertension; WC ≥102 cm (men)/ ≥88 cm (women); and FPG ≥100 mg/dL or on drug treatment for elevated glucose.[12] Prevalence was survey-weighted using complex sampling weights.
ATPIII, adult treatment panel III; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL-C, HDL cholesterol; NHLBI, Natinonal Heart, Lung and Blood Institute; SBP, systolic blood pressure; WC, waist circumference

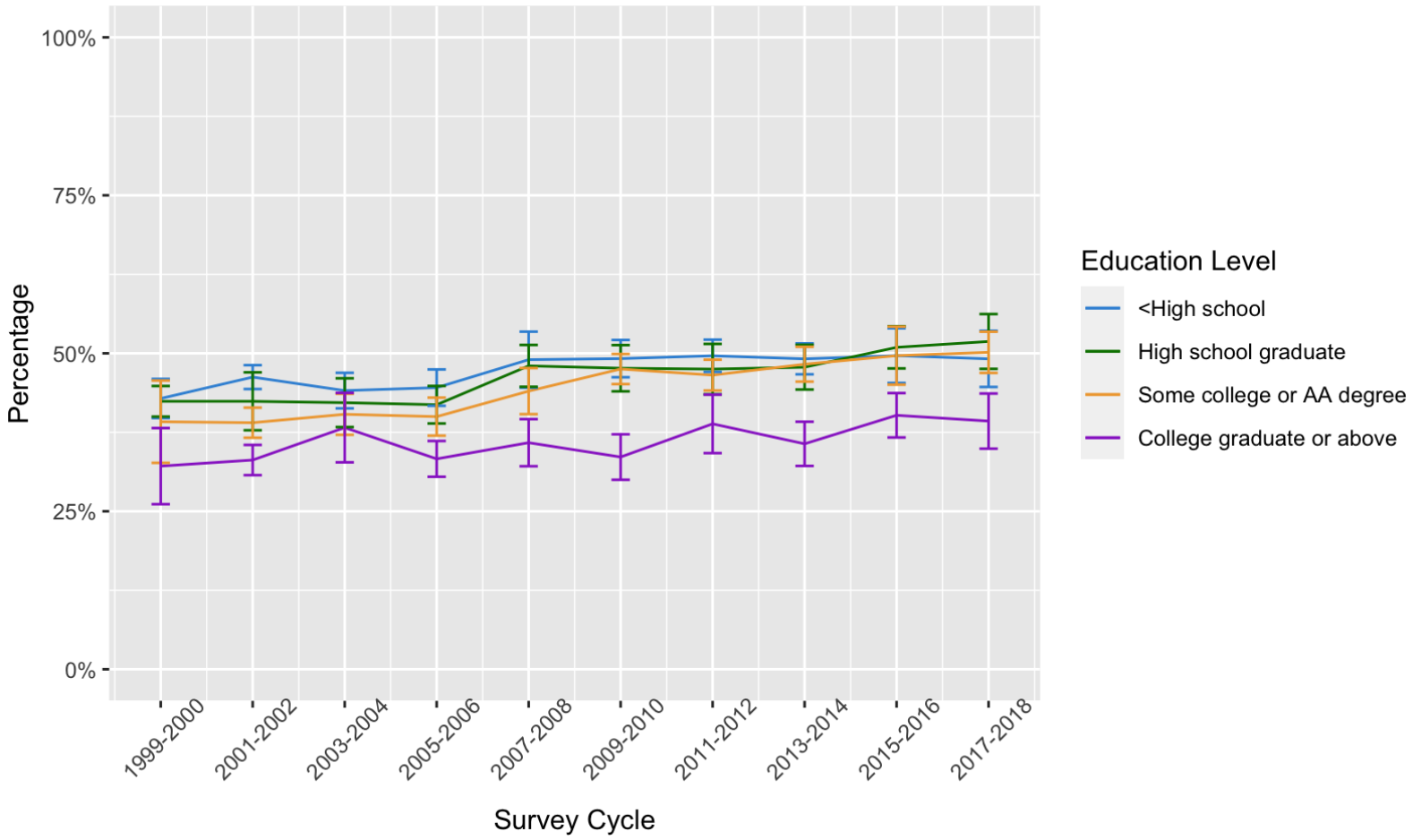

Figure S4. Prevalence of metabolic syndrome among U.S. adults by education level, 1999-2018. Metabolic syndrome defined by the ATPIII/NHLBI guidelines as presence of three or more of the following: HDL-C<40 mg/dL (men)/<50 mg/dL (women) or on drug treatment for reduced HDL-C; triglycerides ≥150 mg/dL or on drug treatment for elevated triglycerides; blood pressure ≥130 SBP or ≥85 DBP or on antihypertensive drug treatment with a history of hypertension; WC ≥102 cm (men)/ ≥88 cm (women); and FPG ≥100 mg/dL or on drug treatment for elevated glucose.[12] Prevalence was survey-weighted using complex sampling weights.
ATPIII, adult treatment panel III; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL-C, HDL cholesterol; NHLBI, Natinonal Heart, Lung and Blood Institute; SBP, systolic blood pressure; WC, waist circumference

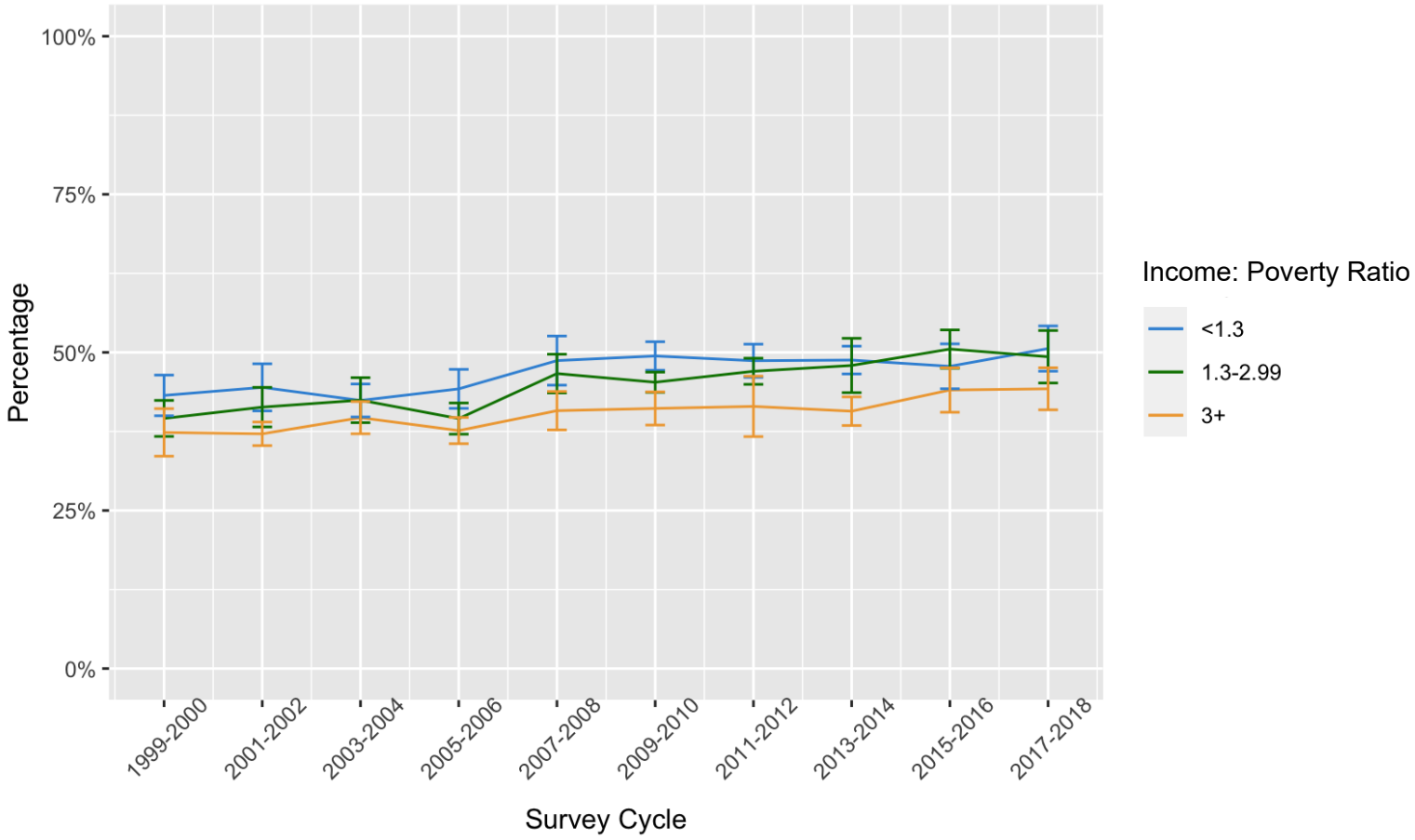

Figure S5. Prevalence of metabolic syndrome among U.S. adults by income level, 1999-2018. Metabolic syndrome defined by the ATPIII/NHLBI guidelines as presence of three or more of the following: HDL-C<40 mg/dL (men)/<50 mg/dL (women) or on drug treatment for reduced HDL-C; triglycerides ≥150 mg/dL or on drug treatment for elevated triglycerides; blood pressure ≥130 SBP or ≥85 DBP or on antihypertensive drug treatment with a history of hypertension; WC ≥102 cm (men)/ ≥88 cm (women); and FPG ≥100 mg/dL or on drug treatment for elevated glucose.[12] Prevalence was survey-weighted using complex sampling weights.
ATPIII, adult treatment panel III; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL-C, HDL cholesterol; NHLBI, Natinonal Heart, Lung and Blood Institute; SBP, systolic blood pressure; WC, waist circumference

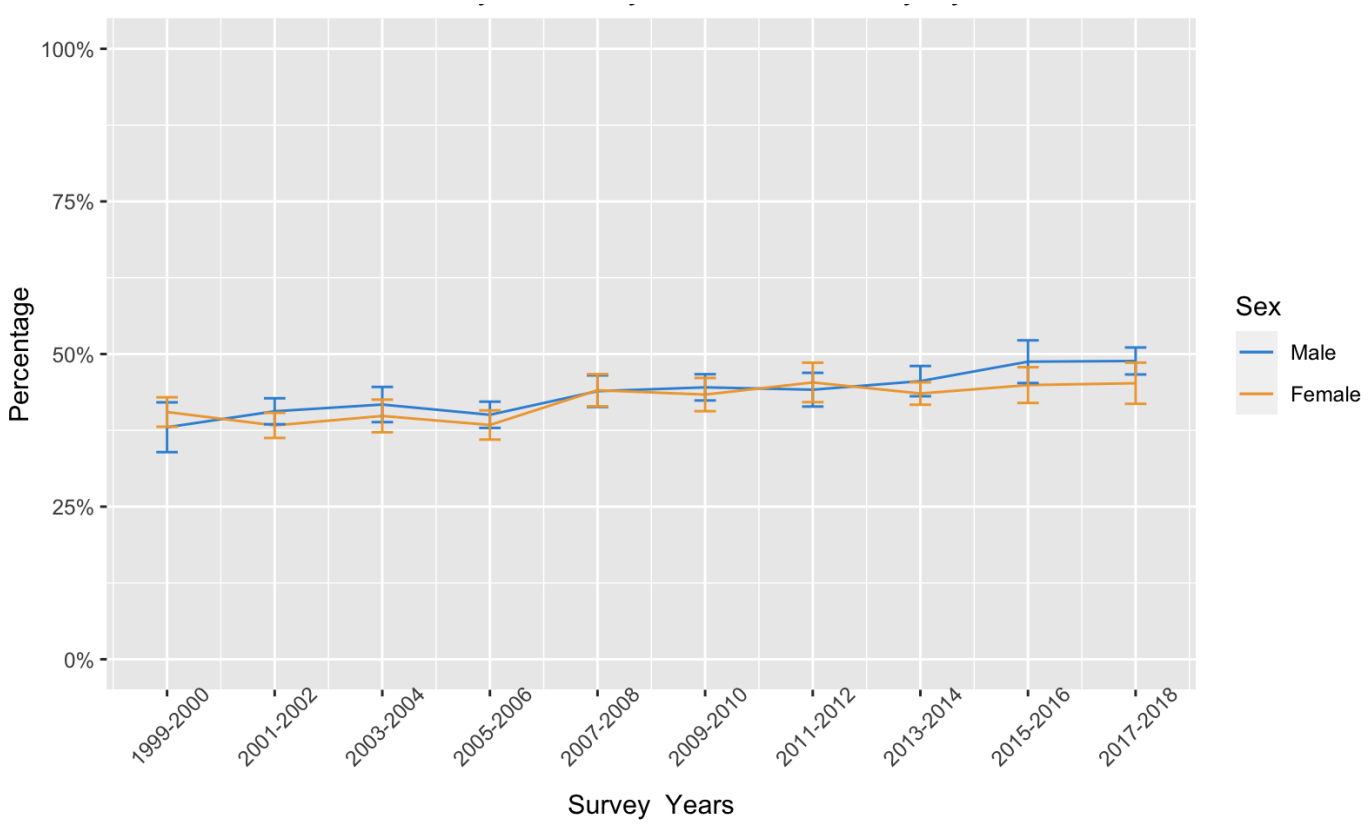

Figure S6. Prevalence of metabolic syndrome among U.S. adults by sex, 1999-2018. . Metabolic syndrome defined by the ATPIII/NHLBI guidelines as presence of three or more of the following: HDL-C<40 mg/dL (men)/<50 mg/dL (women) or on drug treatment for reduced HDL-C; triglycerides ≥150 mg/dL or on drug treatment for elevated triglycerides; blood pressure ≥130 SBP or ≥85 DBP or on antihypertensive drug treatment with a history of hypertension; WC ≥102 cm (men)/ ≥88 cm (women); and FPG ≥100 mg/dL or on drug treatment for elevated glucose.[12] Prevalence was survey-weighted using complex sampling weights.
ATPIII, adult treatment panel III; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL-C, HDL cholesterol; NHLBI, Natinonal Heart, Lung and Blood Institute; SBP, systolic blood pressure; WC, waist circumference

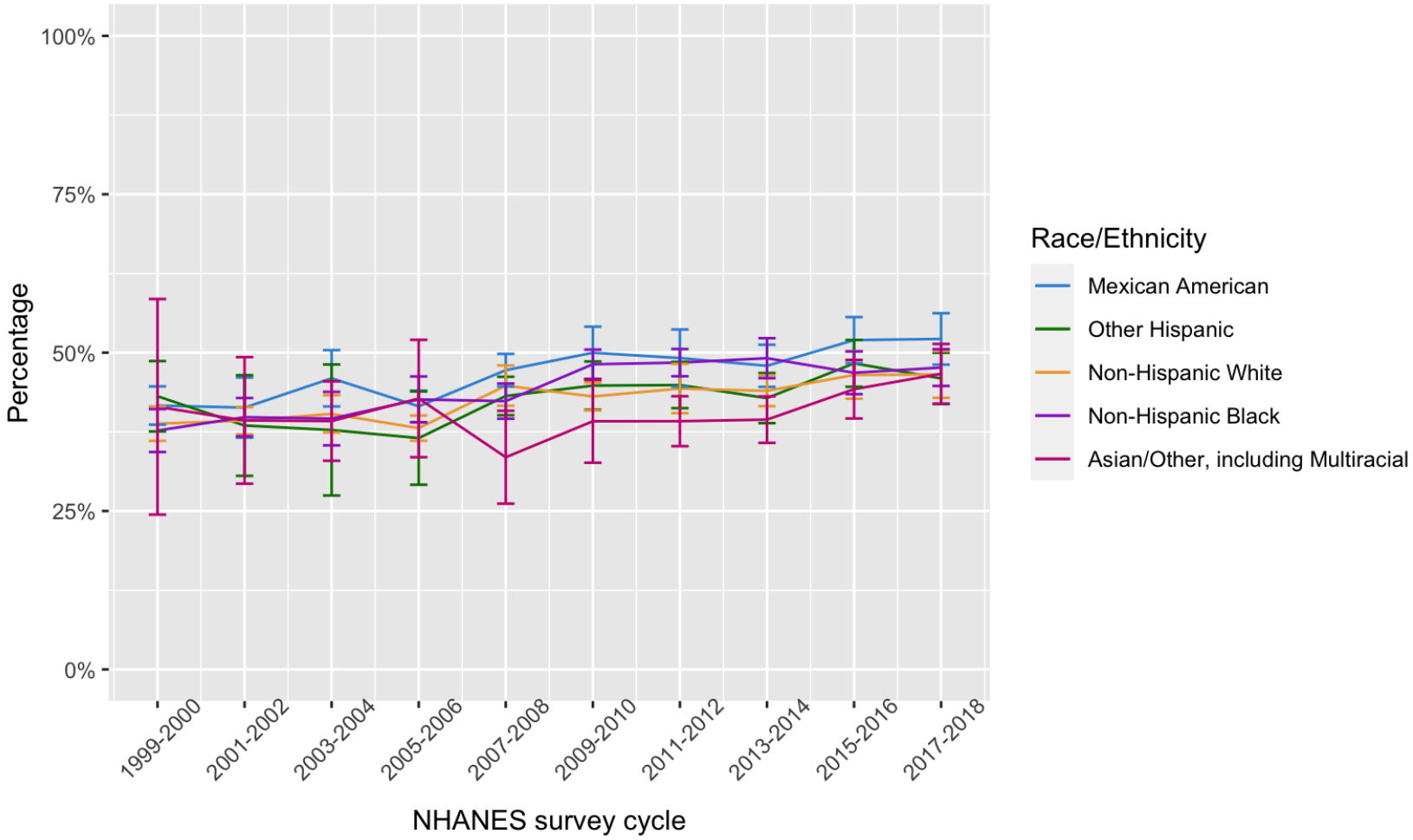

Figure S7. Prevalence of metabolic syndrome among U.S. adults by race/ethnicity, 1999-2018. Metabolic syndrome defined by the ATPIII/NHLBI guidelines as presence of three or more of the following: HDL-C<40 mg/dL (men)/<50 mg/dL (women) or on drug treatment for reduced HDL-C; triglycerides ≥150 mg/dL or on drug treatment for elevated triglycerides; blood pressure ≥130 SBP or ≥85 DBP or on antihypertensive drug treatment with a history of hypertension; WC ≥102 cm (men)/ ≥88 cm (women); and FPG ≥100 mg/dL or on drug treatment for elevated glucose.[12] Prevalence was survey-weighted using complex sampling weights.
ATPIII, adult treatment panel III; DBP, diastolic blood pressure; FPG, Fasting Plasma Glucose; HDL-C, HDL cholesterol; NHLBI, Natinonal Heart, Lung and Blood Institute; SBP, systolic blood pressure; WC, waist circumference

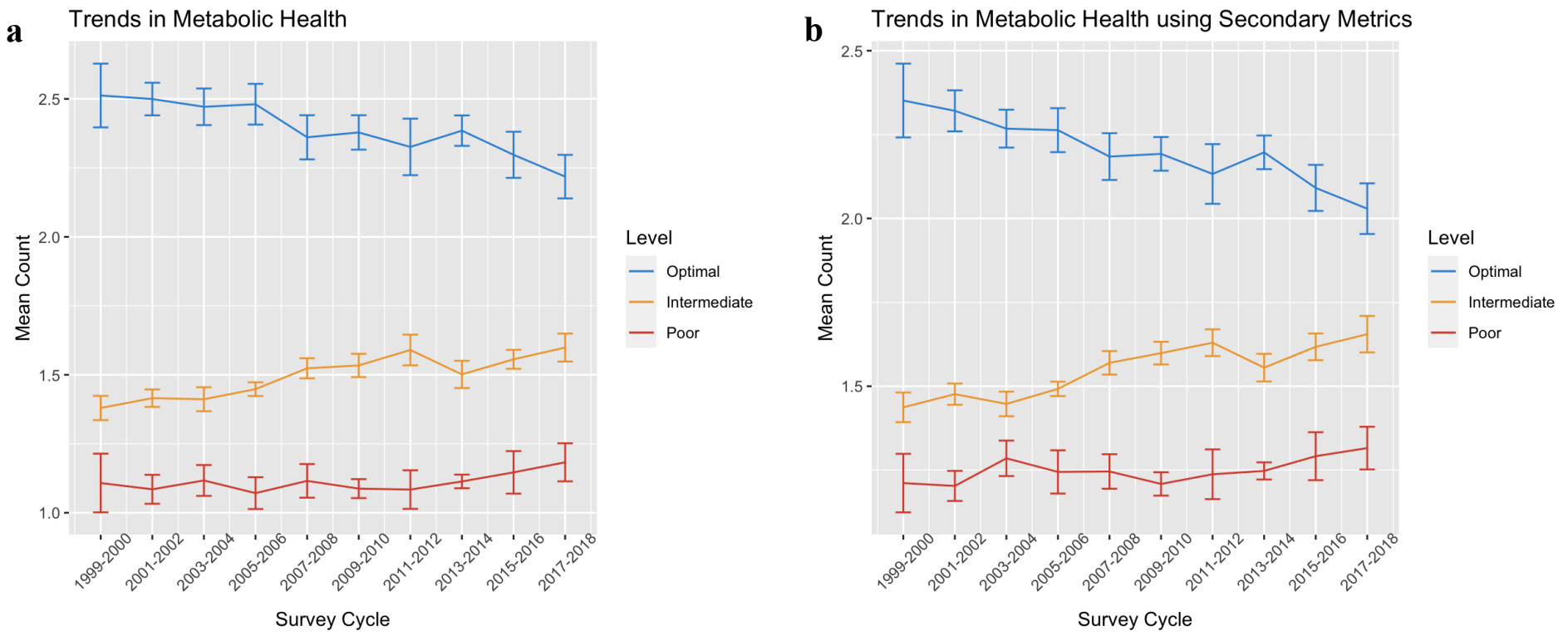

Figure S8. Trends in mean count of cardiometabolic components among U.S. adults with (A) primary versus (B) secondary metrics for cardiometabolic components, 1999-2018 Definitions for optimal, intermediate and poor for each component in primary and secondary metrics are as follows: Adiposity: optimal – BMI<25 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); intermediate – BMI 25-30 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); poor - BMI >30 kg/m^2 AND WC >88 cm (women)/WC >102 cm (men) – with BMI thresholds for Asian Americans altered based on guidelines from NICE UK, WHO, and ADA in secondary metric only. Blood glucose: optimal – FPG <100 mg/dL and HbA1c <5.7% and not taking diabetes medication; intermediate – FPG 100-125 mg/dL or HbA1c 5.7-6.4% , or FPG <100 mg/dL and HbA1c <5.7% and taking diabetes medication; poor -- FPG ≥126 mg/dL or HbA1c ≥6.5%, regardless of medication usage. Blood lipids: optimal – TC:HDL <3.5:1 and not taking lipid lowering medication; intermediate – TC:HDL 3.5-5:1, or TC:HDL <3.5:1 and taking lipid lowering medication; poor – TC:HDL >5:1, regardless of medication usage. In secondary metrics, blood lipids defined as: optimal: LDL<100 mg/dL, TG <150 mg/dL, and not taking lipid-lowering medication; intermediate: LDL-C 100-159 mg/dL or TG 150-174 mg/dL; or LD-CL<100 mg/dL, TG <150 mg/dL, and taking lipid-lowering medication; and poor: LDL-C ≥160 mg/dL or TG ≥175 mg/dL.. Blood pressure: optimal – SBP < 120 mmHg, DBP < 80 mmHg and not taking blood pressure medication; intermediate – SBP 120-139 mmHg or DBP 80-89 mmHg; or SBP < 120 mmHg, DBP < 80 mmHg and taking blood pressure medication; poor – SBP ≥140 mmHg or DBP ≥90 mmHg, regardless of medication usage. History of CVD: optimal – no CVD-related conditions; intermediate – angina only; poor – one or more of CHD, heart attack, heart failure or stroke. See Table 1 for further details of definitions and sources. Population proportions were survey-weighted using complex sampling weights.

Abbreviations: ADA – American Diabetes Associaton BMI- body mass index; CHD – coronary heart disease; CVD – cardiovascular disease; DBP – diastolic blood pressure; FPG – fasting plasma glucose; LDL-C – LDL cholesterol; NICE UK – National Insitute for Health and Care Excellence, UK; SBP – systolic blood pressure; TC:HDL – total cholesterol to HDL-cholesterol ratio; TG – trigylcerides; WC – waist circumference; WHO – World Health Organization

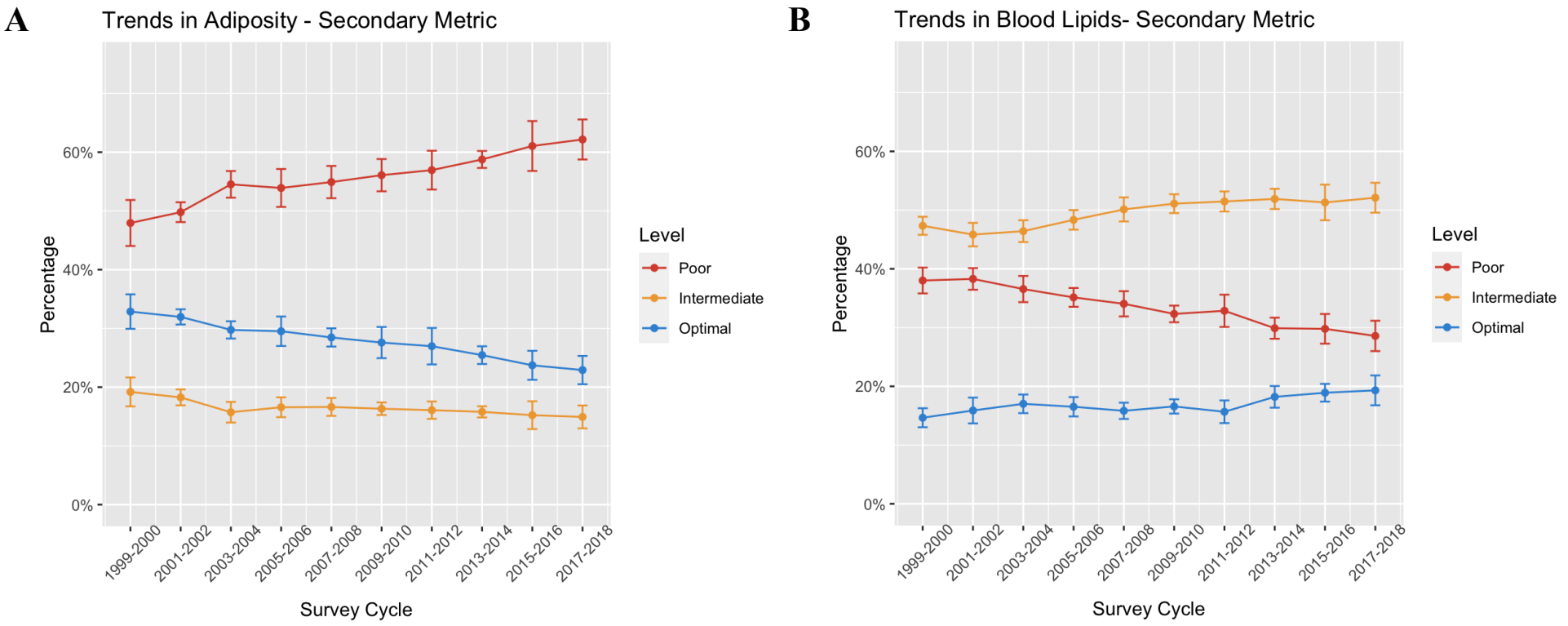

Figure S9. Trends in optimal, intermediate and poor levels of five cardiometabolic components using secondary metrics among U.S. adults, 1999-2018: (A) adiposity; (B) blood lipids. Definitions for optimal, intermediate and poor for each component are as follows: Adiposity: optimal – BMI<25 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); intermediate – BMI 25-30 kg/m^2 AND WC ≤88 cm (women)/WC ≤102 cm (men); poor - BMI >30 kg/m^2 AND WC >88 cm (women)/WC >102 cm (men) – with BMI thresholds for Asian Americans altered based on guidelines from NICE UK, WHO, and ADA. Blood lipids: Optimal: LDL<100 mg/dL, TG <150 mg/dL, and not taking lipid-lowering medication; intermediate: LDL-C 100-159 mg/dL or TG 150-174 mg/dL; or LD-CL<100 mg/dL, TG <150 mg/dL, and taking lipid-lowering medication; and poor: LDL-C ≥160 mg/dL or TG ≥175 mg/dL. Population proportions were survey-weighted using complex sampling weights.
Abbreviations: ADA – American Diabetes Associaton; BMI- body mass index; LDL-C – LDL cholesterol; NICE UK – National Insitute for Health and Care Excellence, UK; TG – trigylcerides; WC – waist circumference; WHO – World Health Organization

Text S1. Adjustment of fasting plasma glucose values to account for instrumental changes across NHANES survey cycles.

Between 1999-2018, four distinct laboratory instruments were used to analyze fasting plasma glucose levels in the NHANES survey population: Cobas C311 (2015-2018); Cobas 501 (1999-2004; 2009-14);Roche/Hitach 911 (2005-6); Roche ModP (2007-8).

In previous analyses, a method validation study was performed to compare results from instrument changes across survey cycles. Regression analyses wer performed, suggesting proportional differences in variability. Forward and backward equations were developed to adjust fasting plasma glucose results to other survey years.

The following equations were used to combine data from 1999-2018, transforming values to be consistent with Cobas C311 readings.

Y (Roche/Hitachi 911) = X (Roche ModP) – 1.139

Y (Cobas Mira 501) = 0.9835*X (Roche/Hitachi 911)

Y (Cobas C311) = 1.023 * X (Cobas Mira 501) - 0.5108

Text S2. Sensitivity analysis excluding participants with missing biomarker values and using alternative criteria for adiposity and blood lipids on overall cardiometabolic health metrics and individual risk components

Excluding participants with missing biometric values (**Table S8**), 8.0% (5.9-10.1%) of U.S. adults had optimal levels for all 5 components in 2017-18, declining from 9.1% (6.9-11.2%) in 1999-2000. Consistent with this, mean counts of optimal levels were also modestly higher than in the primary analysis, but overall findings and trends were not appreciably different (**Table S9**).

When using lower BMI cut-points in Asian adults for defining adiposity and assessing LDL cholesterol and triglyceride levels instead of the TC:HDL ratio for defining blood lipids, overall counts of optimal levels of cardiometabolic health were modestly lower, and poor levels, modestly higher, driven primarily by differences in the distribution of optimal, intermediate and poor levels of blood lipids (**Figure S8-9**). Specifically, counts of optimal levels of cardiometabolic components fell across all survey cycles (e.g., 1999-2000: 2.4 [2.2-2.5] vs. 2.5 [2.4-2.6]; 2017-18: 2.0 [2.0-2.1] vs. 2.2 [2.1-2.3]) (**Figure S8**). Similarly, counts of poor levels were modestly higher using these secondary metrics (1999-2000: 1.2 [1.1-1.3] vs. 1.1 [1.0-1.2]; 2017-18: 1.3 [1.3-1.4] vs. 1.2 [1.1 -1.3]). Variation was largely due to differences in proportions of U.S. adults characterized with optimal, intermediate or poor levels of blood lipids, rather than adiposity (**Figure S9**). For example, optimal blood lipid levels were much lower in every cycle using the secondary vs. primary metric (e.g., 1999-2000: 14.3% [12.1-16.4%] vs. 29.9% [26.8-33.0%]; 2017-2018: 19.0% [16.1-21.8%] vs. 37.0% [34.0-39.9%]), while both intermediate and poor levels were higher. However, a similar in magnitude decrease in poor levels of blood lipids (e.g., 1999-2000: 38.5% [36.8-40.3%] vs. 28.3% [25.2-31.4%]; 2017-18: 27.5% [24.6-30.5%] vs. 14.7% [12.6-16.85], and a similar increase in intermediate levels of blood lipids over time persisted using secondary metrics.