Table S1. Comparison of sample characteristics across respondents with and without missing data, from the National Longitudinal Study of Adolescent Health.

	Respondents with no missing data	Respondents with any missing Data
	n=7,976	n=6,008
Sex, N(%)		
Women	4,039 (47.1)	3,163 (48.2)
Race, N(%)		
White	4,601 (70.3)	3,230 (66.1)
Black	1,612 (14.0)[a]	1,440 (19.3)
Asian	553 (4.2)	354 (2.4)
Hispanic	1,210 (11.5)[a]	984 (12.2)
Age (years), mean (SE)		
Wave II	16.4 (0.1)[a]	17.5 (0.1)
Wave IV CVD Risk Factors, N(%)		
Diabetes	426 (5.1)	385 (6.2)
Hypertension	1,904 (25.3)	1,562 (27.9)
Inflammation	1,930 (30.2)	1,482 (32.9)

[a]Statistically significant difference in characteristics for the sample with no missing data relative to the sample with any missing data using Chi-squared tests (categorical) or t-tests (continuous) at Bonferroni-corrected $p<0.006$ level (type 1 error rate 0.05 across 9 comparisons).

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Table S2. Mean BMI or proportion of smokers at waves II, III, and IV for measured values across all visits versus a combination of measured and imputed values, from the National Longitudinal Study of Adolescent Health[a]

	Measured	Measured and Imputed
BMI (kg/m^2), mean (SE)[b]		
Wave II (mean age: 16.9y)	23.1 (0.1)	23.3 (0.0)
Wave III (mean age: 22.5y)	26.4 (0.1)	26.6 (0.1)
Wave IV (mean age: 29.0y)	29.0 (0.1)	29.0 (0.1)
Smoker, % (SE)[c]		
Wave II (mean age: 16.9y)	19.5 (0.4)	20.5 (0.4)
Wave III (mean age: 22.5y)	31.9 (0.4)	32.2 (0.4)
Wave IV (mean age: 29.0y)	32.4 (0.4)	32.4 (0.4)

[a]Multiple Imputation Chained Equations model in Stata 12 was used to impute values for continuous BMI (n=6,008; obs=3,860 wave II; obs=3,185 wave III; obs=164 wave IV) and categorical smoking status (n=6,008; obs=3,558 wave II; obs=2,370 wave III; obs=41 wave IV). The imputation model included age at each wave, race, parental history of diabetes, variables correcting for survey design including: longitudinal survey weights, region, and indicator variables for oversampled groups: disabled, blacks from well-educated families, Chinese, Cubans, and Puerto Ricans. Diabetes, hypertension, and inflammation were included in the imputation model for BMI and smoking to preserve outcome-predictor associations appropriately. Longitudinal sample weights and clustering at the school level (primary sampling unit) accounted for survey design methods and nonresponse bias. Imputation was carried out separately by sex.

[b]Measured at wave II: 10,131 observations; wave III 10,799 observations; wave IV: 13,820 observations. Measured and imputed: 13,984 observations at all waves.

[c]Measured at wave II: 10,426 observations; wave III 11,614 observations; wave IV: 13,943 observations. Measured and imputed: 13,984 observations at all waves.

Table S3. Complete case analysis (n=7,976): model coefficients and 95% confidence intervals from separate logistic regressions predicting diabetes, hypertension, or inflammation at wave IV for those with no missing information (n=7,976), from the National Longitudinal Study of Adolescent Health[a,b]

	Diabetes Beta (95% CI)[c]	Hypertension Beta (95% CI)	Inflammation Beta (95% CI)[d]
Wave II BMI (kg/m^2)	0.07 (0.04, 0.11)***	0.09 (0.06, 0.11)***	0.12 (0.10, 0.15)***
Annualized BMI change waves II-III (kg/m^2/year)	0.49 (0.22, 0.76)***	0.49 (0.32, 0.67)***	0.60 (0.42, 0.78)***
Annualized BMI change waves III-IV (kg/m^2/year)	0.33 (0.10, 0.56)**	0.46 (0.22, 0.70)***	0.78 (0.48, 1.08)***
Female	0.10 (-1.20, 1.40)	-0.64 (-1.46, 0.18)	1.20 (0.38, 2.03)**
Female*wave II BMI	0.01 (-0.04, 0.06)	-0.01 (-0.04, 0.02)	-0.04 (-0.07, 0.00)
Female*annualized BMI change waves II-III	0.06 (-0.31, 0.42)	0.02 (-0.21, 0.24)	0.22 (-0.03, 0.47)
Female*annualized BMI change waves III-IV	-0.08 (-0.46, 0.29)	-0.04 (-0.33, 0.25)	0.42 (0.05, 0.79)*
Region 1 (referent)	--	--	--
Region 2	0.01 (-0.42, 0.45)	0.18 (-0.08, 0.44)	0.23 (-0.03, 0.49)
Region 3	0.12 (-0.25, 0.48)	0.13 (-0.11, 0.36)	0.11 (-0.14, 0.36)
Region 4	-0.13 (-0.65, 0.39)	0.12 (-0.13, 0.37)	0.23 (-0.10, 0.56)
Wave II age (years)	0.14 (0.02, 0.27)*	0.03 (-0.02, 0.07)	-0.02 (-0.07, 0.03)
Wave II smoker	-0.24 (-0.81, 0.33)	-0.01 (-0.23, 0.20)	0.01 (-0.19, 0.21)
Wave III smoker	-0.03 (-0.57, 0.52)	0.27 (0.06, 0.48)*	0.15 (-0.08, 0.39)
Wave IV smoker	0.21 (-0.23, 0.65)	-0.01 (-0.18, 0.15)	0.04 (-0.20, 0.28)
White (referent)	--	--	--
Black	1.42 (1.08, 1.76)*	0.28 (0.06, 0.50)*	-0.05 (-0.28, 0.18)
Asian	0.39 (-0.66, 1.44)	0.17 (-0.14, 0.48)	-0.39 (-0.75, -0.04)*
Hispanic	0.34 (-0.10, 0.78)	0.10 (-0.15, 0.35)	0.17 (-0.08, 0.42)
Constant	-8.29 (-10.54, -6.04)***	-3.88 (-4.77, -2.99)***	-4.76 (-5.81, -3.71)***

[a]Models are survey-weighted and adjust for age at wave II, smoking status at waves II, III, and IV, race, region, and cluster at the school level (primary sampling unit).

[b]Diabetes defined as HbA1c $\geq$ 6.5%, doctor diagnosis, or self-report of diabetes medication. Hypertension defined as systolic/diastolic blood pressure $\geq$ 140/90 mmHg, doctor diagnosis, or self-report of antihypertensive medication. Inflammation defined as high-sensitive C-reactive protein between 3 and 10 mg/L.

[c]Model for diabetes additionally controlled for family history of diabetes.

[d]Model for inflammation additionally controlled for use of anti-inflammatory medication (yes vs no), the presence of subclinical infection markers (0, 1, 2, or 3+ markers) or inflammatory diseases (0, 1, 2, or 3+ inflammatory diseases) at time of wave IV survey.

Abbreviations: CI: Confidence Interval.

Stars denote significance via Wald test at p<0.05 (*), p<0.01 (**), or p<0.001 (***) level.

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Table S4. Complete case analysis (n=7,976): wave II BMI, BMI change between wave II-III and III-IV, wave IV BMI, and Odds Ratios (95% Confidence Intervals) from separate logistic regressions for diabetes, hypertension, or inflammation at wave IV for those with no missing data (n=7,976), from the National Longitudinal Study of Adolescent Health[a]

Wave II BMI (15y)	BMI Change Waves II-III (15-20y)[b]	BMI Change Waves III-IV (20-27y)[b]	Wave IV BMI (27y)	Group	Men Diabetes	Women Diabetes	Men Hypertension	Women Hypertension	Men Inflammation	Women Inflammation
23.0	None	None	23.0	Ref	1.00	1.00	1.00	1.00	1.00	1.00
Groups with BMI~30 kg/m² at wave IV[c]										
23.0	Large	Small	30.2	A	2.01 (1.36, 2.97)	2.17 (1.55, 3.05)	2.03 (1.58, 2.62)	2.08 (1.73, 2.49)	2.36 (1.83, 3.05)	3.26 (2.53, 4.19)^{AB,AC,AD}
23.0	Small	Large	30.5	B	1.57 (1.20, 2.06)	1.44 (1.05, 1.98)^{BC}	1.82 (1.39, 2.38)	1.73 (1.41, 2.14)^{BC}	2.65 (1.88, 3.72)	4.39 (3.51, 5.48)^{BD}
23.0	Medium	Medium	30.9	C	1.81 (1.35, 2.43)	1.78 (1.36, 2.33)	1.99 (1.58, 2.51)	1.95 (1.63, 2.33)	2.68 (2.03, 3.54)	4.23 (3.46, 5.17)^{CD}
30.0	Small	Small	31.0	D	1.85 (1.46, 2.34)	1.80 (1.13, 2.85)	2.00 (1.70, 2.35)	1.78 (1.25, 2.54)	2.70 (2.24, 3.25)	3.47 (2.30, 5.24)
Groups with BMI~36 kg/m² at wave IV[c]										
23.0	Large	Large	36.7	E	2.88 (1.71, 4.86)	2.83 (1.77, 4.53)	3.35 (2.24, 5.01)	3.26 (2.40, 4.44)	5.54 (3.44, 8.92)	12.08 (8.51, 17.15)^{EF,EG,EH,EI}
30.0	Medium	Medium	36.9	F	2.76 (2.00, 3.81)	2.84 (2.05, 3.93)^{FH}	3.27 (2.51, 4.25)	2.98 (2.41, 3.68)^{FH}	5.69 (4.19, 7.72)	6.66 (5.21, 8.53)^{FG,FI}
36.0	Small	Small	37.0	G	2.88 (1.88, 4.44)	3.23 (2.03, 5.15)	3.33 (2.48, 4.47)	2.93 (2.23, 3.85)	5.71 (4.08, 7.99)	3.73 (2.80, 4.97)^{GH,GI}
30.0	Large	Small	37.2	H	3.39 (2.15, 5.32)	3.87 (2.60, 5.76)	3.69 (2.72, 5.01)	3.52 (2.81, 4.40)	5.65 (4.06, 7.87)	6.05 (4.35, 8.41)^{HI}
30.0	Small	Large	37.5	I	2.64 (1.90, 3.68)	2.57 (1.74, 3.79)	3.29 (2.40, 4.51)	2.93 (2.28, 3.78)	6.33 (4.37, 9.17)	8.14 (6.21, 10.67)

[a]Models are survey-weighted and adjust for age at wave II, smoking status at waves II, III, and IV, race, region, and cluster at the school level (primary sampling unit). Models additionally controlled for parental history of diabetes (yes/no) [diabetes model] and anti-inflammatory medication use (yes/no), presence of subclinical infection markers (0, 1, 2, or ≥3 markers), current infections/inflammatory disease (0, 1, 2, or ≥3 infections/inflammatory diseases at survey).
[b]Small (~20th percentile), medium (~60th percentile), and large (~90th percentile) annualized change in BMI between waves II-III or waves III-IV are based upon the distribution in the analytic sample.
[c]Post-hoc tests for OR differences within groups with wave IV BMI~30 kg/m² (A-D) or ~36 kg/m² (E-I) were tested using χ^2 tests, with significance set at the $p<0.05$ level. Superscripts next to ORs refer to statistically significant differences between two groups (e.g., superscript of "AD" means that groups "A" and "D" have statistically significantly different ORs for a particular outcome).

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Table S5. Model coefficients and 95% confidence intervals from separate logistic regressions predicting diabetes, hypertension, or inflammation at wave IV with additional control for attained education, from the National Longitudinal Study of Adolescent Health[a,b]

	Diabetes	Hypertension	Inflammation
	Beta (95% CI)[c]	Beta (95% CI)	Beta (95% CI)[d]
Wave II BMI (kg/m^2)	0.10 (0.08, 0.13)***	0.09 (0.07, 0.11)***	0.12 (0.09, 0.14)***
Annualized BMI change waves II-III (kg/m^2/year)	0.60 (0.29, 0.91)***	0.53 (0.38, 0.68)***	0.66 (0.43, 0.89)***
Annualized BMI change waves III-IV (kg/m^2/year)	0.23 (0.00, 0.46)*	0.43 (0.25, 0.60)***	0.86 (0.63, 1.10)***
Female	0.95 (-0.05, 1.94)	-0.46 (-1.15, 0.24)	1.13 (0.44, 1.81)**
Female*wave II BMI	-0.03 (-0.07, 0.01)	-0.02 (-0.04, 0.01)	-0.03 (-0.06, 0.00)
Female*annualized BMI change waves II-III	-0.13 (-0.57, 0.31)	-0.03 (-0.21, 0.15)	0.11 (-0.21, 0.44)
Female*annualized BMI change waves III-IV	-0.10 (-0.42, 0.23)	-0.03 (-0.25, 0.19)	0.32 (0.01, 0.62)*
Region 1 (referent)	--	--	--
Region 2	-0.07 (-0.41, 0.26)	0.15 (-0.05, 0.35)	0.09 (-0.12, 0.29)
Region 3	0.03 (-0.24, 0.29)	0.16 (-0.01, 0.33)	0.05 (-0.14, 0.23)
Region 4	-0.20 (-0.56, 0.16)	0.00 (-0.17, 0.18)	0.11 (-0.11, 0.33)
Wave II age (years)	0.08 (0.01, 0.15)*	0.06 (0.02, 0.09)**	0.01 (-0.03, 0.04)
Wave II smoker	-0.09 (-0.53, 0.35)	-0.02 (-0.25, 0.22)	-0.10 (-0.29, 0.08)
Wave III smoker	0.04 (-0.35, 0.44)	0.18 (0.00, 0.36)	0.10 (-0.10, 0.30)
Wave IV smoker	0.02 (-0.29, 0.32)	0.03 (-0.12, 0.17)	0.11 (-0.08, 0.30)
White (referent)	--	--	--
Black	1.39 (1.10, 1.67)***	0.08 (-0.08, 0.24)	0.04 (-0.15, 0.23)
Asian	0.46 (-0.31, 1.23)	0.25 (-0.01, 0.50)	-0.55 (-0.83, -0.27)***
Hispanic	0.64 (0.32, 0.96)***	-0.08 (-0.28, 0.12)	0.08 (-0.11, 0.28)
Not high-school graduate (referent)	--	--	--
High-school graduate	-0.26 (-0.51, 0.00)	-0.10 (-0.25, 0.04)	-0.17 (-0.36, 0.02)
Some college	-0.46 (-0.89, -0.04)***	-0.12 (-0.31, 0.07)	-0.22 (-0.42, -0.02)*
College graduate	-0.35 (-0.77, 0.07)	-0.09 (-0.33, 0.15)	-0.18 (-0.39, 0.04)
Constant	-7.67 (-9.09, -6.26)***	-4.37 (-5.09, -3.65)*	-4.83 (-5.68, -3.97)***

[a]Models are survey-weighted and adjust for age at wave II, smoking status at waves II, III, and IV, race, region, attained education at wave IV and cluster at the school level (primary sampling unit).

[b]Diabetes defined as HbA1c $\geq$ 6.5%, doctor diagnosis, or self-report of diabetes medication. Hypertension defined as systolic/diastolic blood pressure $\geq$ 140/90 mmHg, doctor diagnosis, or self-report of antihypertensive medication. Inflammation defined as high-sensitive C-reactive protein between 3 and 10 mg/L.

[c]Model for diabetes additionally controlled for family history of diabetes.

[d]Model for inflammation additionally controlled for use of anti-inflammatory medication (yes vs no), the presence of subclinical infection markers (0, 1, 2, or 3+ markers) or inflammatory diseases (0, 1, 2, or 3+ inflammatory diseases) at time of wave IV survey.

Abbreviations: CI: Confidence Interval.

Stars denote significance via Wald test at $p < 0.05$ (*), $p < 0.01$ (**), or $p < 0.001$ (***) level.

Table S6. Model coefficients and 95% confidence intervals from separate logistic regressions predicting diabetes, hypertension, or inflammation at wave IV with additional adjustment for diet and physical activity, from the National Longitudinal Study of Adolescent Health[a,b]

	Diabetes Beta (95% CI)[c]	**Hypertension** Beta (95% CI)	**Inflammation** Beta (95% CI)[d]
Wave II BMI (kg/m^2)	0.10 (0.07, 0.13)***	0.09 (0.07, 0.11)***	0.12 (0.10, 0.15)***
Annualized BMI change waves II-III (kg/m^2/year)	0.53 (0.21, 0.85)***	0.48 (0.31, 0.65)***	0.62 (0.44, 0.80)***
Annualized BMI change waves III-IV (kg/m^2/year)	0.25 (-0.04, 0.54)	0.44 (0.22, 0.66)***	0.78 (0.51, 1.06)***
Female	0.74 (-0.33, 1.81)*	-0.51 (-1.31, 0.29)	1.28 (0.47, 2.09)**
Female*wave II BMI	-0.02 (-0.06, 0.02)	-0.02 (-0.05, 0.01)	-0.04 (-0.07, -0.01)*
Female*annualized BMI change waves II-III	0.01 (-0.36, 0.39)	0.05 (-0.16, 0.26)	0.20 (-0.05, 0.44)
Female*annualized BMI change waves III-IV	0.03 (-0.37, 0.42)	-0.03 (-0.30, 0.23)	0.40 (0.06, 0.74)*
Region 1 (referent)	--	--	--
Region 2	0.02 (-0.36, 0.39)	0.20 (-0.04, 0.44)	0.23 (0.00, 0.47)
Region 3	0.13 (-0.20, 0.47)	0.20 (-0.03, 0.42)	0.05 (-0.17, 0.28)
Region 4	-0.04 (-0.50, 0.42)	0.08 (-0.17, 0.33)	0.23 (-0.06, 0.52)
Wave II age (years)	0.10 (-0.01, 0.22)*	0.03 (-0.01, 0.08)	-0.03 (-0.08, 0.03)
Wave II smoker	-0.12 (-0.63, 0.39)	-0.04 (-0.26, 0.17)	-0.01 (-0.21, 0.20)
Wave III smoker	0.03 (-0.48, 0.54)	0.24 (0.02, 0.47)*	0.11 (-0.11, 0.33)
Wave IV smoker	0.20 (-0.20, 0.60)	0.00 (-0.17, 0.17)	0.01 (-0.23, 0.25)
White (referent)	--	--	--
Black	1.38 (1.05, 1.71)*	0.16 (-0.04, 0.36)	0.01 (-0.23, 0.24)
Asian	0.51 (-0.52, 1.54)	0.14 (-0.18, 0.47)	-0.33 (-0.66, 0.00)
Hispanic	0.58 (0.20, 0.95)**	0.04 (-0.20, 0.27)	0.14 (-0.08, 0.37)
SSB consumed past 7 days	0.05 (0.01, 0.08)	0.00 (-0.02, 0.03)	0.00 (-0.03, 0.03)
FF consumed past 7 days	0.00 (-0.02, 0.01)	0.00 (0.00, 0.01)	0.01 (0.00, 0.01)*
Wave II moderate/vigorous PA past 7 days	-0.01 (-0.05, 0.04)	0.00 (-0.01, 0.02)	-0.01 (-0.03, 0.02)
Wave III moderate/vigorous PA past 7 days	-0.01 (-0.04, 0.02)	0.00 (-0.01, 0.02)	-0.01 (-0.02, 0.01)
Wave IV moderate/vigorous PA past 7 days	0.00 (-0.04, 0.04)	-0.01 (-0.02, 0.01)	-0.01 (-0.03, 0.00)
Constant	-8.25 (-10.62, -5.88)***	-4.09 (-5.07, -3.11)***	-4.57 (-5.63, -3.50)***

[a]Models are survey-weighted and adjust for age at wave II, smoking status at waves II, III, and IV, race, region, sugar-sweetened beverages consumed and number of fast food eating occasions in the last seven days, number of sports, biking, walking, or skating activities in the last seven days at waves II, III, and IV, and cluster at the school level (primary sampling unit).

[b]Diabetes defined as HbA1c $\geq$ 6.5%, doctor diagnosis, or self-report of diabetes medication. Hypertension defined as systolic/diastolic blood pressure $\geq$ 140/90 mmHg, doctor diagnosis, or self-report of antihypertensive medication. Inflammation defined as high-sensitive C-reactive protein between 3 and 10 mg/L.

[c]Model for diabetes additionally controlled for family history of diabetes.

[d]Model for inflammation additionally controlled for use of anti-inflammatory medication (yes vs no), the presence of subclinical infection markers (0, 1, 2, or 3+ markers) or inflammatory diseases (0, 1, 2, or 3+ inflammatory diseases) at time of wave IV survey.

Abbreviations: CI: Confidence Interval; SSB: sugar-sweetened beverages; FF: fast food; PA: physical activity

Stars denote significance via Wald test at p<0.05 (*), p<0.01 (**), or p<0.001 (***) level.