

Supplementary Table 36. Average mediated proportions for DNA methylation and clinical mediators on the relationship between race and ethnicity and all-cause mortality, among completed cases from NHANES 1999-2002 cohort (n=2,401). Bold indicates statistical significance (p-value<0.05), and bold with two asterisks indicates significance passed Bonferroni adjustment (p-value<0.0021).

	Model 1. Black (N= 516) vs. White (N= 943)		Model 2. Hispanic (N=859) vs. White (N= 943)		Model 3. Other races (N=83) vs. White (N= 943)	
	Average mediated proportion	(95% CI)	Average mediated proportion	(95% CI)	Average mediated proportion	(95% CI)
Chronological age clocks						
Hannum	-19.1%**	(-37.8% - 10.5%)	5.8%	(-4.4% 20.7%)	4.5%	(-100.1% 99.9%)
Hovarth	-5.2%**	(-14.6% - 0.7%)	-4.9%	(-23.4% 1.3%)	-1.3%	(-93.6% 56.7%)
Weidner	-2.5%**	(-8.2% - 0.3%)	-3.9%	(-17.5% 0.6%)	-4.9%	(-98.1% 82.1%)
Lin	-2.9%	(-10.6% 0.3%)	-3.5%	(-15.7% 1.7%)	-3.8%	(-62.5% 73.0%)
Vidal-Bralo	-14.6%**	(-35.9% - 4.9%)	-10.2%**	(-40.9% - 2.4%)	-13.5%	(-251.5%159.5%)
SkinBlood	-4.9%**	(-15.5% - 0.5%)	0.1%	(-4.1% 4.4%)	1.0%	(-38.1% 47.3%)
Zhang	-9.9%**	(-27.0% - 2.8%)	-1.1%	(-8.2% 2.4%)	-2.4%	(-59.4% 50.6%)
Physiological functioning clocks						
PhenoAge	-6.8%	(-22.8% 0.6%)	9.4%	(-1.7% 36.3%)	5.7%	(-119.3%161.6%)
GrimAge	34.4%**	(18.7% 66.8%)	15.7%	(-16.5% 52.8%)	12.0%	(-193.5%234.7%)
GrimAge2	46.0%**	(26.6% 88.7%)	39.3%**	(17.6% 120.0%)	24.8%	(-206.7%288.7%)
Pace of aging clock						
DunedinPoAm	23.6%**	(10.0% 48.9%)	29.4%**	(11.2% 83.1%)	27.2%	(-211.4%340.7%)
Clocks trained on other aging biomarkers						
Yang	7.4%	(-6.8% 20.9%)	3.8%	(-9.4% 19.7%)	1.3%	(-98.4% 124.6%)
Telomere	-44.4%**	(-79.1% - 27.2%)	2.5%	(-19.4% 19.3%)	9.1%	(-177.4%157.2%)
Behavioral/Lifestyle measures						
Sedentary behavior	27.8%**	(13.4% 54.0%)	24.1%**	(5.9% 80.7%)	18.3%	(-258.0%230.9%)
Healthy eating index	6.6%**	(0.7% 18.7%)	3.3%	(-6.4% 24.3%)	-0.1%	(-39.6% 42.9%)
Smoking pack years	-19.0%**	(-45.3% - 8.5%)	-15.0%**	(-48.0% - 5.1%)	-10.4%	(-155.5%171.8%)
Alcohol drinker	13.6%**	(5.4% 27.6%)	10.7%**	(1.5% 49.2%)	20.6%	(-334.4%457.4%)
Anthropometric measures						
Waist to thigh ratio	-33.7%**	(-86.4% - 17.0%)	16.4%**	(4.3% 59.3%)	7.7%	(-240.8%251.2%)
BMI	2.3%	(-7.1% 15.0%)	0.3%	(-17.2% 18.0%)	-0.2%	(-28.1% 30.2%)
Clinical used blood Biomarkers						
Total cholesterol	-0.6%	(-4.5% 1.3%)	0.0%	(-4.7% 3.6%)	-0.3%	(-35.1% 20.0%)
HDL	-0.8%	(-6.6% 2.8%)	5.7%	(-5.0% 17.9%)	1.4%	(-40.2% 41.0%)
LDL	0.0%	(-4.6% 5.1%)	0.1%	(-6.0% 5.7%)	0.1%	(-6.6% 15.0%)
Glucose	7.7%**	(1.9% 17.9%)	5.6%**	(1.0% 19.6%)	7.1%	(-137.9% 92.1%)
C-reactive protein	9.5%**	(3.0% 23.0%)	1.7%	(-2.2% 8.8%)	-0.7%	(-56.2% 57.8%)

Supplementary Table 37. Average mediated proportions for DNA methylation and clinical mediators on the relationship between education attainment and all-cause mortality, among completed cases from NHANES 1999-2002 cohort (n=2,399). Bold indicates statistical significance (p-value<0.05), and bold with two asterisks indicates significance passed Bonferroni adjustment (p-value<0.0021).

	Model 1. Less than high school (N=1,093) vs. College degree or higher (N= 370)			Model 2. High school graduate/GED (N=496) vs. College degree or higher (N= 370)			Model 3. Some college or associates degree (N=440) vs. College degree or higher (N= 370)		
	Average mediated proportion	(95% CI)		Average mediated proportion	(95% CI)		Average mediated proportion	(95% CI)	
Chronological age clocks									
Hannum	1.7%	(-0.1%	4.4%)	4.4%	(0.3% <td>13.4%)</td> <td>0.5%</td> <td>(-6.9%</td> <td>7.7%)</td>	13.4%)	0.5%	(-6.9%	7.7%)
Hovarth	-0.1%	(-1.9%	1.3%)	-1.7%	(-8.9%	1.3%)	-4.1%	(-14.0% <td>- 0.2%)</td>	- 0.2%)
Weidner	-0.2%	(-3.2%	1.1%)	0.1%	(-3.0%	3.7%)	-0.9%	(-7.8%	1.6%)
Lin	-0.2%	(-2.2%	1.2%)	-1.2%	(-5.5%	1.0%)	-0.5%	(-5.4%	3.1%)
Vidal-Bralo	-0.7%	(-3.3%	0.6%)	-0.3%	(-5.0%	1.6%)	-0.7%	(-5.8%	2.6%)
SkinBlood	0.3%	(-0.9%	2.4%)	0.9%	(-1.2%	5.7%)	0.0%	(-3.4%	2.7%)
Zhang	0.5%	(-0.8%	2.4%)	0.2%	(-1.7%	3.1%)	-0.1%	(-5.5%	3.2%)
Physiological functioning clocks									
PhenoAge	6.8%**	(2.8% <td>13.4%)</td> <td>2.9%</td> <td>(-1.3%</td> <td>12.2%)</td> <td>3.1%</td> <td>(-5.0%</td> <td>12.4%)</td>	13.4%)	2.9%	(-1.3%	12.2%)	3.1%	(-5.0%	12.4%)
GrimAge	23.5%**	(13.2% <td>37.0%)</td> <td>18.7%**</td> <td>(8.1% <td>41.7%)</td> <td>31.8%**</td> <td>(17.8% <td>57.5%)</td> </td></td>	37.0%)	18.7%**	(8.1% <td>41.7%)</td> <td>31.8%**</td> <td>(17.8% <td>57.5%)</td> </td>	41.7%)	31.8%**	(17.8% <td>57.5%)</td>	57.5%)
GrimAge2	28.1%**	(16.9% <td>42.9%)</td> <td>21.4%**</td> <td>(9.9% <td>48.5%)</td> <td>32.4%**</td> <td>(17.2% <td>64.2%)</td> </td></td>	42.9%)	21.4%**	(9.9% <td>48.5%)</td> <td>32.4%**</td> <td>(17.2% <td>64.2%)</td> </td>	48.5%)	32.4%**	(17.2% <td>64.2%)</td>	64.2%)
Pace of aging clock									
DunedinPoAm	13.3%**	(6.1% <td>22.5%)</td> <td>11.4%**</td> <td>(2.8% <td>27.6%)</td> <td>22.0%**</td> <td>(11.0% <td>38.0%)</td> </td></td>	22.5%)	11.4%**	(2.8% <td>27.6%)</td> <td>22.0%**</td> <td>(11.0% <td>38.0%)</td> </td>	27.6%)	22.0%**	(11.0% <td>38.0%)</td>	38.0%)
Clocks trained on other aging biomarkers									
Yang	-0.8%	(-4.2%	2.3%)	1.2%	(-1.5%	6.0%)	0.3%	(-3.9%	4.5%)
Telomere	5.3%**	(1.9% <td>10.1%)</td> <td>5.7%**</td> <td>(1.9% <td>13.1%)</td> <td>3.5%</td> <td>(-0.9%</td> <td>10.9%)</td> </td>	10.1%)	5.7%**	(1.9% <td>13.1%)</td> <td>3.5%</td> <td>(-0.9%</td> <td>10.9%)</td>	13.1%)	3.5%	(-0.9%	10.9%)
Behavioral/Lifestyle measures									
Sedentary behavior	13.3%**	(6.9% <td>23.5%)</td> <td>20.8%**</td> <td>(9.8% <td>42.7%)</td> <td>5.9%</td> <td>(-1.4%</td> <td>19.3%)</td> </td>	23.5%)	20.8%**	(9.8% <td>42.7%)</td> <td>5.9%</td> <td>(-1.4%</td> <td>19.3%)</td>	42.7%)	5.9%	(-1.4%	19.3%)
Healthy eating index	2.3%	(-7.1%	14.1%)	1.2%	(-14.7%	13.4%)	3.8%	(-5.7%	14.4%)
Smoking pack years	10.2%**	(4.5% <td>18.2%)</td> <td>11.0%</td> <td>(2.1% <td>31.2%)</td> <td>16.4%**</td> <td>(7.4% <td>31.0%)</td> </td></td>	18.2%)	11.0%	(2.1% <td>31.2%)</td> <td>16.4%**</td> <td>(7.4% <td>31.0%)</td> </td>	31.2%)	16.4%**	(7.4% <td>31.0%)</td>	31.0%)
Alcohol drinker	2.6%	(-2.5%	8.5%)	7.1%	(0.7% <td>19.6%)</td> <td>2.1%</td> <td>(-2.5%</td> <td>10.5%)</td>	19.6%)	2.1%	(-2.5%	10.5%)
Anthropometric measures									
Waist to thigh ratio	5.6%**	(1.7% <td>12.8%)</td> <td>2.8%</td> <td>(-4.7%</td> <td>10.8%)</td> <td>4.6%</td> <td>(-2.8%</td> <td>14.6%)</td>	12.8%)	2.8%	(-4.7%	10.8%)	4.6%	(-2.8%	14.6%)
BMI	0.4%	(-4.6%	6.1%)	3.1%	(-2.0%	15.3%)	5.3%	(-7.0%	23.6%)
Clinical used blood Biomarkers									
Total cholesterol	0.0%	(-1.5%	1.7%)	-0.1%	(-13.2%	10.1%)	-3.1%	(-14.8%	2.2%)
HDL	-0.1%	(-6.6%	5.5%)	0.1%	(-4.7%	5.2%)	0.0%	(-4.4%	3.8%)
LDL	-3.8%	(-14.6%	0.5%)	10.6%	(-27.0%	60.9%)	-4.7%	(-60.0%	19.9%)
Glucose	2.4%	(0.1%	6.5%)	1.3%	(-2.0%	7.0%)	-1.7%	(-11.6%	4.1%)
C-reactive protein	2.0%	(0.5% <td>4.9%)</td> <td>0.7%</td> <td>(-2.3%</td> <td>4.1%)</td> <td>0.8%</td> <td>(-3.2%</td> <td>6.2%)</td>	4.9%)	0.7%	(-2.3%	4.1%)	0.8%	(-3.2%	6.2%)

Supplementary Table 38. Average mediated proportions for DNA methylation and clinical mediators on the relationship between household income and all-cause mortality, among completed cases from NHANES 1999-2002 cohort (n=2,123). Bold indicates statistical significance (p-value<0.05), and bold with two asterisks indicates significance passed Bonferroni adjustment (p-value<0.0021).

	Model 1. PIR<1 (N=373) vs. PIR 5+ (N= 399)		Model 2. PIR 1-2 (N=591) vs. PIR 5+ (N= 399)		Model 3. PIR 2-5 (N=760) vs. PIR 5+ (N= 399)	
	Average mediated proportion	(95% CI)	Average mediated proportion	(95% CI)	Average mediated proportion	(95% CI)
Chronological age clocks						
Hannum	3.1%	(-0.6% 7.8%)	3.8%	(-0.0% 8.2%)	-0.1%	(-7.3% 6.5%)
Hovarth	-0.1%	(-2.7% 1.4%)	-0.2%	(-4.1% 3.3%)	0.1%	(-3.8% 4.1%)
Weidner	0.3%	(-1.6% 2.9%)	1.2%	(-1.2% 4.6%)	0.0%	(-1.8% 2.5%)
Lin	0.1%	(-1.5% 2.5%)	-0.7%	(-2.9% 0.9%)	-0.9%	(-6.9% 2.7%)
Vidal-Bralo	-0.3%	(-3.0% 1.0%)	1.2%	(-1.9% 4.9%)	0.0%	(-2.3% 2.7%)
SkinBlood	-0.3%	(-3.8% 1.8%)	0.0%	(-1.7% 2.1%)	-0.2%	(-3.4% 4.3%)
Zhang	-0.4%	(-2.8% 1.2%)	-0.5%	(-2.9% 1.4%)	-0.8%	(-5.7% 1.6%)
Physiological functioning clocks						
PhenoAge	5.3%	(0.4% 14.4%)	10.0%**	(3.3% 20.3%)	3.2%	(-1.6% 13.5%)
GrimAge	32.6%**	(20.6% 49.6%)	24.2%**	(13.7% 42.9%)	19.7%	(7.2% 52.3%)
GrimAge2	37.1%**	(22.7% 57.4%)	28.4%**	(17.2% 54.3%)	22.7%**	(9.3% 61.1%)
Pace of aging clock						
DunedinPoAm	19.4%**	(9.2% 35.6%)	14.1%**	(5.7% 30.3%)	13.3%	(2.0% 38.0%)
Clocks trained on other aging biomarkers						
Yang	0.2%	(-4.9% 5.1%)	0.8%	(-3.2% 5.6%)	0.0%	(-3.1% 2.2%)
Telomere	2.2%	(-1.0% 7.4%)	6.8%**	(2.7% 13.3%)	2.9%	(-0.7% 9.6%)
Behavioral/Lifestyle measures						
Sedentary behavior	20.4%	(4.7% 40.8%)	10.9%	(1.9% 26.2%)	13.7%	(1.2% 46.1%)
Healthy eating index	4.9%	(-9.6% 20.5%)	-0.2%	(-7.1% 8.6%)	4.8%	(-2.5% 26.2%)
Smoking pack years	11.2%**	(4.8% 19.2%)	11.6%	(3.4% 28.6%)	13.2%**	(4.2% 35.4%)
Alcohol drinker	-3.6%	(-19.8% 7.8%)	1.8%	(-11.2% 13.2%)	6.0%	(-1.6% 20.2%)
Anthropometric measures						
Waist to thigh ratio	4.9%	(-2.1% 12.4%)	6.1%	(-1.8% 16.3%)	10.2%	(1.2% 26.3%)
BMI	-1.1%	(-11.8% 8.3%)	0.6%	(-12.9% 8.2%)	1.6%	(-11.9% 14.3%)
Clinical used blood Biomarkers						
Total cholesterol	-0.1%	(-3.8% 3.4%)	0.2%	(-1.8% 3.6%)	-0.6%	(-7.1% 3.4%)
HDL	-3.8%	(-16.0% 5.4%)	0.2%	(-7.6% 7.1%)	0.7%	(-6.2% 9.4%)
LDL	-1.7%	(-15.7% 4.6%)	-0.4%	(-37.6% 25.1%)	1.4%	(-73.5% 95.2%)
Glucose	6.2%	(1.3% 15.3%)	1.7%	(-2.5% 7.6%)	3.7%	(-0.5% 14.0%)
C-reactive protein	2.0%	(0.4% 5.2%)	4.8%	(0.6% 10.5%)	2.4%	(-0.2% 7.8%)