



Physical Inactivity and Obesity in the United States: At the Intersection of Politics, Socioeconomics, Race, and Culture

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Abstract: Efforts to reverse the physical inactivity (PI) and obesity pandemics in the United States (U.S.) have been unsuccessful. This commentary provides a view of PI and obesity in the U.S. from the intersection of politics, socioeconomics, race, and culture. On a national level, counties where the Democratic presidential candidate received more votes in 2020 than the Republican candidate had a lower PI and obesity prevalence. The percentage completing some college and Black individuals as well as median household income were higher in counties where the Democratic candidate received more votes. Regionally, unique, region-specific cultural identities and partisan coalition demographics were apparent and serve as potential explanations for inconsistencies in PI and obesity prevalence across the U.S. Identifying the driving forces of PI and obesity within specific U.S. regions and crafting messaging that has optimal efficacy on a local level is

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essential to reducing the burden of cardiovascular disease and other chronic conditions. (Curr Probl Cardiol 2023;48:102007.)

Efforts to reverse the physical inactivity (PI) and obesity pandemics in the United States (U.S.) have been unsuccessful.¹ These unfavorable health characteristics are a driving force for the chronic disease crisis this country currently faces, among which the increased incidence and prevalence of cardiovascular disease due to PI and obesity is a primary concern.^{2,3} Moreover, we painfully learned that PI and obesity were both associated with poor outcomes in those infected with severe acute respiratory syndrome coronavirus 2 during the coronavirus disease 2019 (COVID-19) pandemic.¹

While the broad public health messages of *move more and sit less* and reduce excess body mass is generally correct, its lack of individualization likely reduces effectiveness.² The reasons why people are physically inactive and/or experience obesity are complex and inadequately understood—personal views/beliefs, socioeconomic conditions, race, and cultural geography are examples of factors that can interact and influence PI and obesity prevalence. If we are to improve population health, we need to better understand the characteristics that influence PI and obesity and how they cluster and influence one another. This commentary provides a view of PI and obesity in the U.S. from the intersection of politics, socioeconomics, race, and culture. It builds off our recent publication demonstrating a strong relationship between increased voting access and better health outcomes.⁴

We obtained: 1) U.S. PI (2020), obesity (2020), median household income (2021), college attendance (2017-2021; 5-year estimate) and race (2021) data from the County Health Rankings (CHR) program of the University of Wisconsin Population Health Institute⁵; 2) 2020 Presidential election results from MIT Election Data and Science Lab⁶; and 3) the American Nations regions from the Nationhood Lab.⁷ Briefly, the *American Nations* model,⁸ developed by Colin Woodard, discerns, and maps North American regional cultures based on “first settler effects” and competing colonization patterns, which do not neatly fit within *state lines* as they are currently drawn. Regional differences in the American Nations model are founded in differing ideals of the distinct Euro-American colonial cultures that originated on the eastern and southern rims of the U.S. and then spread across the continent in mutually exclusive settlement bands. Descriptions of the *American Nation* cultures are described

elsewhere.⁹ The CHR, MIT, and Nationhood lab databases were linked through zip-code data common to all datasets. HealthPartners Institute Research Subjects Protection Program determined that this study is exempt from IRB review and ongoing oversight under 45 CFR Part 46 as it involves the analysis of existing, publicly available data sets.

In total, there were 81,010,926 and 74,012,824 votes for the Democratic and Republican candidate during the 2020 Presidential election, respectively. [Table](#) lists overall and American Nations county-level comparisons for PI, obesity, college attendance, median household income and percent Black population according to 2020 Presidential Election Results. Counties were divided by vote total for the Democratic and Republican candidate. On a national level, counties where the Democratic candidate received more votes compared to the Republican candidate had a lower prevalence of PI and obesity. In addition, the percentage completing some college and Black individuals as well as median household income were higher in counties where the Democratic candidate received more votes. Comparisons according to the American Nations, however, were more nuanced. PI and obesity prevalence were significantly higher for counties with a Democratic voting majority only in the Deep South/New France region - the opposite was found in Yankeedom, the Midlands, Greater Appalachia, Left Coast and Far West. There were no significant differences in PI and obesity prevalence in the New Netherland, Tidewater, and El Norte/Spanish Caribbean regions. In general, significantly higher percentages of completing some college and median household income aligned with a lower prevalence of PI and obesity. The percentage of Black individuals in a county was significantly higher in Democratic majority counties in all but 1 analysis. Data obtained was then entered into an artificial neural network (ANN) analysis (multilayer perceptron with one hidden layer architecture, batch 70/30 training/testing partition) to further assess their ability to predict Democratic versus Republican majority on a county level. Area under the curve was 0.90—percent correct predictions in the testing and training sample was $\geq 97\%$ and $\geq 57\%$ for Republican and Democratic County majority, respectively. Normalized rank order of importance of each ANN covariate predictor was: 1) percent of county population that was Black (100%); 2) obesity prevalence (76.4%); 3) PI prevalence (40.5%); 4) percent completing some college (40.5%); and 5) median household income (27%).

The factors driving the U.S. PI and obesity pandemics are complex and interrelated. Herein, we demonstrate that political viewpoints, cultural differences, education level, income, and race are influencing factors. Overall, independent *t*-test and ANN analyses indicates the following

TABLE. Overall and American nations county-level comparisons of physical inactivity, obesity, college attendance, median household income, and percent black according to 2020 presidential election results

	Number of counties		Percent physically inactive		Percent adult obesity		Percent completed some college		Median household income		Percent black	
	Dem.	Repub.	Dem.	Repub.	Dem.	Repub.	Dem.	Repub.	Dem.	Repub.	Dem.	Repub.
Overall	540	2575	24.3 ± 7.1 [†]	26.0 ± 4.6	34.2 ± 7.5 [†]	36.6 ± 3.4	64.9 ± 12.9*	57.4 ± 11.2	\$66K ± 23 [†]	\$57K ± 13	20.4 ± 23.0 [†]	6.8 ± 10.2
Yankeedom	117	323	19.8 ± 3.0 [†]	22.1 ± 2.5	31.1 ± 4.7 [†]	35.3 ± 2.8	70.5 ± 7.1 [†]	62.9 ± 8.0	\$73K ± 14 [†]	\$63K ± 10	6.1 ± 6.8 [†]	2.0 ± 2.4
New Netherland	17	7	22.7 ± 5.8	19.7 ± 3.5	25.3 ± 3.7	26.9 ± 2.7	71.2 ± 8.9	73.2 ± 4.6	\$91K ± 23	\$102K ± 14	15.5 ± 9.2 [†]	5.4 ± 2.6
Tidewater	58	73	24.0 ± 5.0	23.4 ± 3.3	36.8 ± 5.6	36.1 ± 3.1	65.1 ± 13.4*	59.5 ± 10.0	\$71K ± 26	\$68K ± 19	34.6 ± 18.3 [†]	20.6 ± 10.4
The Midlands	47	421	22.6 ± 4.5*	24.8 ± 2.9	33.5 ± 4.9 [†]	36.9 ± 2.5	71.4 ± 9.9 [†]	61.3 ± 9.9	\$73K ± 20 [†]	\$61K ± 9	14.1 ± 11.8 [†]	2.2 ± 2.9
Greater Appalachia	38	889	24.3 ± 3.6 [†]	28.1 ± 4.1	35.1 ± 3.8 [†]	37.7 ± 2.9	70.7 ± 9.3 [†]	54.4 ± 10.3	\$63K ± 20*	\$54K ± 13	19.1 ± 13.3 [†]	4.2 ± 4.8
Deep South/New France	116	410	32.6 ± 5.4	29.8 ± 3.8 [†]	42.4 ± 5.7	38.9 ± 3.3 [†]	53.9 ± 13.4	51.7 ± 10.8	\$45K ± 13 [†]	\$52K ± 12	53.8 ± 16.3 [†]	24.3 ± 11.7
El Norte/Spanish Caribbean	41	60	28.9 ± 8.1	29.0 ± 5.0	34.8 ± 7.5	36.3 ± 4.7	56.9 ± 10.8*	50.1 ± 14.0	\$55K ± 18	\$53K ± 10	3.4 ± 5.6	3.2 ± 2.9
Left Coast	36	18	18.1 ± 2.5*	19.8 ± 1.7	28.3 ± 4.1 [†]	32.9 ± 2.9	70.2 ± 8.2 [†]	57.6 ± 5.6	\$85K ± 22 [†]	\$62K ± 10	3.0 ± 3.0 [†]	0.93 ± 0.71
Far West	65	366	20.5 ± 6.5*	22.2 ± 3.3	29.1 ± 7.3 [†]	32.8 ± 3.8	66.5 ± 12.7*	62.4 ± 11.3	\$71K ± 21 [†]	\$60K ± 11	2.0 ± 2.7*	1.0 ± 1.3

Dem: Democratic majority county.

Repub.: Republican majority county.

Comparisons made by independent t-testing for each measure of interest.

* $P < 0.05$.

† $P < 0.001$.

general phenotyping: 1) Republican County Majority: Lower percent Black population—higher obesity and PI prevalence—lower college attendance and household income; and 2) Democratic County Majority: Higher percent Black population—lower obesity and PI prevalence—higher college attendance and household income. However, this phenotyping was not consistent across all *American Nations* regions (eg, Deep South/New France), nor was it as accurate in predicting Democratic County majority. Unique, region-specific cultural identities (ie, American Nations model) and partisan coalition demographics are potential explanations for inconsistencies in PI and obesity prevalence across the U.S. Partisan, region-specific differences in infrastructure investment (eg, public health) may also be an important factor. Clearly, influencing factors are interrelated and require a systems science^{10,11} approach to fully appreciate their independent and combined roles. Such work is imperative to identify the driving forces of PI and obesity within specific U.S. regions and in crafting messaging and programs that have optimal efficacy on a local level, which is essential to reducing the burden of cardiovascular disease as well as other chronic conditions.

Declaration of Competing Interest

No Conflicts or Disclosures for any author.

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