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Disparities in Multiple Sleep Characteristics among US-born and Foreign-born Non-Hispanic Whites and Hispanic/Latino Heritage Groups in the United States: Modification by Birthplace and Language Preference

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The authors declare they have no conflict of interest.

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The data are publicly available. No additional data are available.

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ABSTRACT

Background: Prior studies suggest that sleep health may vary by birthplace and Hispanic/Latino heritage.

Methods: Using pooled 2004-2017 National Health Interview Survey data, we investigated whether sleep disparities varied by birthplace among adult non-Hispanic Whites (NHWs) and Hispanic/Latinos in the United States (US). Adjusting for sociodemographic and behavioral/clinical characteristics, survey-weighted Poisson regressions with robust variance estimated prevalence ratios (PRs) and 95% confidence intervals (CIs) of self-reported sleep characteristics (e.g., sleep duration, trouble and staying asleep) among (1) foreign-born NHWs and Hispanic/Latino heritage groups vs. US-born NHWs and (2) Hispanic/Latino heritage groups vs. foreign-born NHWs.

Results: Among 254,699 participants with a mean age±standard error 47±0.9 years, 81% selfidentified as NHW, 12% Mexican, 2% Puerto Rican, 1% Cuban, 1% Dominican, and 3% Central/South American. Compared to US-born NHWs, foreign-born NHWs were more likely to report poor sleep quality (e.g., $PR_{trouble staying asleep}$ =1.27 [95% CI:1.17-1.37]), and US-born Mexicans were no more likely to report non-recommended sleep duration while foreign-born Mexicans were less likely (e.g., $PR_{s5-hours}$ =0.52 [0.47-0.57]). Overall, Mexicans had lower prevalence of poor sleep quality vs. US-born NHWs, and PRs were lowest for foreign-born Mexicans. US-born Mexicans were more likely than foreign-born NHWs to report shorter sleep duration. Regardless of birthplace, Puerto Ricans were more likely to report shorter sleep durations vs. NHWs. Generally, sleep duration and quality were better among Cubans and Dominicans vs. US-born NHWs but were similar vs. foreign-born NHWs. Conclusion: Sleep disparities varied by birthplace and Hispanic/Latino heritage, and each characteristic should be considered in sleep disparities research.

Keywords: Sleep; Emigrants and Immigrants; Hispanic Americans; European Continental Ancestry Group; Health Status Disparities; Acculturation

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Article summary

- Although prior evidence suggests that sleep health differs by birthplace or immigration status and by Hispanic/Latino heritage/descent (e.g., Mexican, Puerto Rican), prior studies of sleep health disparities often include both United States (US)-born and foreign-born non-Hispanic Whites (NHWs) in the reference group and, despite diversity in heritage/descent, combine Latinos into one comparison group.
- Using recent, nationally representative data, we simultaneously considered how both birthplace and Hispanic/Latino heritage may modify differences in sleep between Latinos and NHWs.
- There was a higher prevalence of poor sleep quality characteristics among foreign-born NHWs compared to US-born NHWs.
- Disparities in sleep between Latino heritage groups and NHWs varied by birthplace, and English language interview was associated with worse sleep duration and quality among Mexicans and Puerto Ricans.
- Our results highlight the importance of considering birthplace, heritage, and language preference/acculturation as potential modifiers in future studies of sleep health disparities, which can also support data driven approaches towards targeted interventions.

Strengths and limitations of this study

Although limited by the cross-sectional study design, use of self-reported data, use of a unidimensional proxy measure of language acculturation, and potential for residual confounding, study strengths include: the use of recent nationally representative data consisting of a large sample size that allowed for robust stratification, assessment of several important sleep dimensions, and adjustment for multiple relevant confounders.

INTRODUCTION

Poor sleep, which is prevalent among United States (US) adults [1, 2] and disproportionately affects certain racial/ethnic minority groups [3], may partially explain racial/ethnic disparities in poor health indicators like obesity [4-6]. Studies of racial/ethnic disparities in sleep to date may be limited by imprecise measurement of characteristics related to the social construct of race/ethnicity. For instance, evidence suggests that certain Hispanic/Latino heritage groups (e.g., Puerto Ricans) but not others (e.g., Mexicans) are more likely to report worse sleep compared to non-Hispanic Whites (NHWs) [7]. However, heterogenous heritage groups within the Hispanic/Latino community are often combined into one category [7-10]. Further, the reference group of NHWs is also heterogenous and usually comprises both US-born and foreign-born NHWs despite evidence of sleep disparities between the two [9, 11]. As illustrated by the socioecological framework, both an individual's characteristics and social context should be considered to better understand health behaviors and outcomes [12]. Therefore, in addition to individual characteristics like birthplace, ethnicity, and cultural background, consideration of the social environment related to culture (e.g., language spoken with friends) in studies of racial/ethnic disparities is important. For instance, language acculturation is a strong indicator of overall acculturation that is hypothesized to influence disparities in health behaviors [13, 14].

Recent studies using nationally representative data have not yet simultaneously considered immigration status/birthplace, heterogeneity in heritage, and language preference as modifying factors of racial/ethnic disparities in multiple sleep health characteristics among Hispanics/Latinos compared to NHWs [7, 9, 11, 15-17]. Although a recent study used National Health Interview Survey (NHIS) data and reported variation in Hispanic/Latino-NHW differences in sleep duration by Hispanic/Latino heritage [18], the study lacked information regarding other important sleep quality characteristics and did not compare the sleep of foreign-born and US-born NHWs [17]. To address important research gaps, we used the most recent data from a

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large, nationally representative sample of the US adult population of Hispanics/Latinos and NHWs to disentangle immigration status (birthplace) and heritage as contributors to sleep disparities. We sought to determine whether multiple sleep characteristics differed between (1) foreign-born and US-born NHWs and (2) both foreign-born and US-born Hispanic/Latino heritage groups compared to NHWs. In a secondary aim, we investigated language preference as a modifier.

METHODS

NHIS

The NHIS is the largest annually administered cross-sectional, in-person household survey in the US. NHIS survey protocols are described in detail elsewhere [19]. Briefly, NHIS uses a multistage probability sampling design to obtain a nationally representative sample of the non-institutionalized civilian population of children and adults in the US. After recruitment, trained interviewers used computer-assisted personal interviewing to obtain health-related data from participants. All provided informed consent. NHIS recruitment and data collection protocols were approved by the National Center for Health Statistics Review Board.

Study Population

We pooled self-reported NHIS data collected from survey years 2004 to 2017, which were merged by the Integrated Health Interview Series [20]. The overall response rate was 80% for adults (range: 74.2% in 2008 - 83.8% in 2004). Eligible participants were aged \geq 18 years and self-identified as either NHW alone or Hispanic/Latino of any race. In this analysis, we focused on NHW and Hispanic/Latino of any race participants because they represent the majority and largest ethnic minority populations in the US. Of 329,279 participants, ineligible participants were excluded, sequentially, if data were missing or implausible for sleep duration ($\leq 2 \text{ or } \geq 23 \text{ hours}; 2.2\%$) or birthplace (0.1%) or were currently pregnant (0.9%) (Supplemental Figure S1). Hispanic/Latino participants who reported "other" or multiple ethnicities (1.4%) were excluded because study objectives were to distinguish between Hispanic/Latino heritage groups. After excluding participants with missing data on potential confounders (18.1%), the final analytic sample comprised 254,699 participants.

Patient and Public Involvement

Patients and the public were not involved in the development and design of this study.

Measures

Race/ethnicity

Participants were asked, 'What race do you consider yourself to be?' with response options that met the Office of Management Budget Race and Ethnic Standards for Federal Statistics and Administrative Reporting [21]. Participants provided a 'yes' or 'no' response to 'Do you consider yourself to be Hispanic or Latino?'. Participants who self-identified as White race alone and non-Hispanic were categorized as NHW. Only region of birth (e.g., Europe) was available among NHW participants (Supplemental Table S1), which prevented measurement of national heritage among NHWs. Participants of any race who self-identified as Hispanic/Latino were asked to provide Hispanic origin, ancestry, or heritage with response options of Puerto Rican, Cuban, Dominican, Mexican, and Central/South American.

Multiple Sleep Characteristics

Participants responded to the following question: 'On average, how many hours of sleep do you get in a 24-hour period?". Reported values ≥30 minutes were rounded up to the nearest hour and values of <30 minutes were rounded down to the nearest hour; NHIS provided average sleep duration in whole numbers [19]. Using evidence-based recommendations [22],

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we defined two non-mutually exclusive levels of short sleep duration: very short (≤5-hours) and short (<7-hours). Long sleep duration may be associated with worse health or be an artifact of poor health; therefore, we defined long sleep as >9-hours and recommended sleep as 7-9-hours [23].

During survey years 2013 to 2017, participants reported the number of times/week they had trouble falling asleep, trouble staying asleep, nonrestorative sleep (awoke not feeling rested), and sleep medication during the week prior to the interview. We defined frequent trouble falling asleep, trouble staying asleep, nonrestorative sleep, and sleep medication use as reports of \geq 3 nights (or days) per week versus <3 nights (or days) per week.

Birthplace

Participants were asked "Where were you born?". Birthplace included dichotomous categories of US-born (born in a US state or the District of Colombia [D.C.]) or foreign-born (not born in a US state or D.C., born in a US territory [including Puerto Rico], or born outside of the US and US territories).

Language of Interview

Language is an important dimension of acculturation associated with health behaviors (e.g., smoking) among Hispanics/Latinos [13]. Language of interview was the assumed language preference, and we derived a proxy three-level language acculturation variable: English (high acculturation), English and Spanish (medium acculturation), or Spanish (low acculturation).

Potential Confounders

Parameterizations of each potential confounder are listed in Table 1. Sociodemographic characteristics included age category, sex/gender, annual household income, educational attainment, unemployed/not in the labor force, 2000 Standard Occupational Classification categories for longest held occupation, marital/cohabitating status, time in the US, and Census region of residence. Health behaviors included smoking status, physical activity based on the Guidelines for Americans [24], and alcohol consumption. Clinical characteristics included body mass index (BMI) category calculated from self-reported height and weight [25], serious psychological distress [26], and self-report of physician-diagnosed dyslipidemia (available for survey years 2011-2017), hypertension, prediabetes or diabetes, and cancer. Certain behavioral and clinical characteristics were not considered individually but were used to define "ideal" cardiovascular health (yes vs. no), a dichotomized version of the American Heart Association's metric that includes meeting all of the following criteria: never smoker/quit smoking in the prior 12 months, normal BMI, and no report of physician diagnosis of dyslipidemia, hypertension, or prediabetes/diabetes [27].

Statistical Analysis

All analyses accounted for the NHIS complex survey design using survey weights to account for non-response and oversampling of certain groups (e.g., racial/ethnic minorities, older adults). We applied direct age standardization using the 2010 Census as the reference population to estimate descriptive statistics. Poisson regressions with robust variance estimated prevalence ratios (PRs) and 95% confidence intervals (CIs) for each sleep characteristic among foreign-born NHWs and both US-born and foreign-born Hispanic/Latino heritage groups, separately, compared to US-born NHWs (Table 2). With the same approach, we estimated PRs and 95% CIs for each sleep characteristic among each US-born and foreign-born NHWs (Table 3).

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Models were adjusted for *a priori* potential confounders: age category, sex/gender, annual household income, educational attainment, employment status, occupational class, marital status, region of residence, alcohol consumption, serious psychological distress, "ideal" cardiovascular health, and cancer. Lastly, in a secondary analysis, we further stratified by language of interview (English, English and Spanish, and Spanish) as a proxy measure of language acculturation and compared sleep characteristics for each Hispanic/Latino heritage group to US-born NHWs (Figure 1). Four separate sensitivity analyses are described in Table 4. We performed all analyses using Stata/SE 15. A two-sided p-value of 0.05 was used to determine statistical significance.

RESULTS

Study Population Characteristics

Among 254,669 participants, mean age ± standard error was 47±0.9 years (Table 1). Most participants self-identified as NHW (81%) and the remainder as Hispanic/Latino of the following heritage: Mexican (12%), Puerto Rican (2%), Cuban (1%), Dominican (1%), Central/South American (3%). Most (96%) NHW and approximately half of Mexican (47%) and Puerto Rican (50%) participants were US-born. Most Cubans (78%), Dominicans (84%), and Central/South Americans (86%) were foreign-born. We present but do not interpret results for Central/South Americans because of within-group heritage heterogeneity.

Foreign-born NHWs Compared to US-born NHWs

Compared to US-born NHWs, foreign-born NHWs were not more likely to report nonrecommended sleep duration (Table 2), but were more likely to report trouble staying asleep (PR=1.27 [1.17-1.37]), nonrestorative sleep (PR=1.06 [1.00-1.12]), and sleep medication use (PR=1.34 [1.16-1.55]).

US-born and foreign-born Hispanic/Latino Heritage Groups Compared to US-born NHWs Compared to US-born NHWs, US-born Mexicans were as likely to report nonrecommended sleep duration; however, foreign-born Mexicans were less likely to report nonrecommended sleep duration (PR_{very short}=0.52 [0.47-0.57], PR_{short}=0.70 [0.67-0.73], PR_{long}=0.75 [0.66-0.85]). Overall, Mexicans were less likely to report trouble falling, trouble staying asleep, nonrestorative sleep, and sleep medication use compared to US-born NHWs; however, racial/ethnic differences were larger across comparisons between foreign-born Mexicans and US-born NHWs.

Overall, both US-born and foreign-born/island-born Puerto Ricans were more likely than US-born NHWs to report very short sleep (PR 1.39 [1.26-1.53]) and short sleep (PR= 1.20 [1.14-1.25]) with little variation by nativity/birthplace. Similarly, there was negligible variation by birthplace for sleep quality characteristics among US-born and foreign-born/island-born Puerto Ricans who were marginally less likely to report trouble staying asleep (PR=0.91 [0.83-1.00]) and no more likely to report other poor sleep quality characteristics compared to US-born NHWs.

Small sample sizes resulted in wide confidence intervals for US-born and foreign-born Cubans and Dominicans. Overall, adults of Cuban heritage were less likely to report nonrecommended sleep duration and poor sleep quality characteristics compared to US-born NHWs. However, only non-US born Cubans had lower prevalence of short sleep and poor sleep quality characteristics. Generally, Dominicans were less likely to report trouble falling asleep and no more likely to report non-restorative sleep or sleep medication use compared to US-born NHWs. However, only foreign-born Dominicans were less likely to report short sleep and trouble staying asleep. Page 15 of 59

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US-born and foreign-born Hispanic/Latino Heritage Groups Compared to foreign-born NHWs

Compared to foreign-born NHWs, US-born Mexicans were more likely to report short sleep duration (PR=1.19 [1.12-1.26]) but foreign-born Mexicans were no more likely. US-born Mexicans were no more likely to report trouble staying asleep compared to foreign-born NHWs (PR=0.97 [0.86-1.10]); however, foreign-born Mexicans were less likely to report trouble staying asleep (PR= 0.72 [0.62-0.84]; Table 3). Overall, Puerto Rican adults were more likely to report very short and short sleep duration, trouble falling asleep, trouble staying asleep, and sleep medication use compared to foreign-born NHWs with little evidence of variation by birthplace. Small sample sizes of US-born Cubans and Dominicans resulted in wide, often overlapping confidence intervals limiting the ability to examine differences by birthplace.

Hispanic/Latino-Heritage Groups Compared to US-born NHWs: Modification by Language of Interview

Prevalence of non-recommended sleep duration among foreign-born Mexicans compared to US-born NHWs were lowest among subpopulations of foreign-born Mexicans with English/Spanish and Spanish versus English interviews (Figure 1). Additionally, among Mexicans, overall, those with Spanish interviews had the lowest prevalence of poor sleep quality compared to US-born NHWs. Among Puerto Ricans, overall, those with Spanish interviews had similar prevalence of shorter sleep durations and suggestively better sleep quality characteristics compared to US-born NHWs. Among Cubans and Dominicans, albeit imprecise, patterns of variation by language of interview were similar to those among Mexicans. Results of sensitivity analyses are provided in Table 4.

DISCUSSION

In a nationally representative sample of NHW and Hispanic/Latino adults, we found sleep disparities between foreign-born and US-born NHWs, and differences in sleep characteristics varied by Hispanic/Latino heritage, birthplace/nativity, and language of interview among Hispanics/Latinos compared to NHWs. Compared to US-born NHWs, foreign-born NHWs had a higher prevalence of poor sleep quality indicators. Although habitual sleep duration was similar between US-born Mexicans and their NHW counterparts, foreign-born Mexican adults reported better sleep duration than US-born NHWs. Better sleep quality among foreign-born Mexican adults compared to US-born NHWs was of greater magnitude than the better sleep quality reported by US-born Mexicans compared to US-born NHWs. Puerto Rican adults generally reported worse sleep duration compared to NHWs. Acknowledging small sample sizes, foreign-born Cubans and Dominicans may generally have even better sleep duration and quality compared to US-born NHWs than US-born Cubans and Dominicans. Overall, Spanish language preference may be associated with increasingly better sleep among Hispanic/Latino heritage groups.

Our results are consistent with prior studies that suggest differences in sleep by birthplace and language preference. Most studies report better subjective sleep among foreignborn compared to US-born adults [10, 11, 15, 16], and our results were generally in agreement across each Hispanic/Latino heritage group except Puerto Ricans. Further, our results suggesting that birthplace is a modifier of sleep duration are congruent with findings of both an earlier study of NHIS data and the multisite Study of Women's Health Across the Nation (SWAN) where short sleep duration and sleep complaints were more often reported by US-born adults versus their foreign-born counterparts [10, 15]. Results of SWAN also suggested that language acculturation may mediate differences in sleep complaints, and similarly, completion of interviews in English versus Spanish were positively associated with probably clinically significant insomnia in a separate study of pregnant Latina women in San Diego [10, 28]. Like

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our study, a different nationally-representative sample found no differences in short sleep duration among US-born Mexicans compared to US-born NHWs but lower odds of short sleep duration among foreign-born Mexicans compared to NHWs [7]. Prior studies either comprised solely individuals of Mexican heritage or used a heterogenous Hispanic/Latino category [7, 10, 15, 16, 28]. Importantly, our study extended this literature by illustrating heterogeneity across Hispanic/Latino heritage groups [29].

Differences in study populations, the grouping of Hispanics/Latinos, and sleep assessments likely contribute differences between results of our and some prior studies. Among Mexican women aged 21-40 years in Northern California, birthplace and language preference were not associated with sleep disturbances [30]. In a prior study using 2012 NHIS data, short sleep was more prevalent among US-born Hispanics/Latinos compared to US-born NHWs, and there were no differences in sleep duration between foreign-born Hispanics/Latinos and NHWs [9]. However, all individuals of Hispanic/Latino heritage were combined. In a recent study using 2004-2017 NHIS data, investigators reported higher odds of short sleep among all Hispanic/Latino heritage groups except US-born Cubans compared to NHWs [17]. Our conflicting results are likely due to differences in categorization of sleep duration (e.g., ≤6 hours and ≥9 hours versus 7-8 hours), adjustment sets, and modeling approaches [17, 23, 31]. Unlike our study, a multidimensional language acculturation measure was not associated with selfreported sleep problems among middle-aged Puerto Rican, Cuban, and Dominican women in New Jersey [29].

Several environmental and cultural factors that influence sleep behaviors and sleep health likely explain our findings. Lower social status, lower socioeconomic position, and stress related to immigration status among foreign-born NHWs likely drive the disparity with US-born NHWs. Variation in sleep by birthplace and Hispanic/Latino heritage is likely due to differentially experienced environments and unique cultural backgrounds that influence health and coping behaviors. Housing environments, color-related stigma and discrimination, social (including

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acculturation) stressors, structural barriers, and health behaviors like smoking vary by Hispanic/Latino heritage groups with individuals of Puerto Rican descent usually more negatively affected compared to other heritage groups, which may manifest as differences in sleep health [13, 32-38].

There are several study limitations. First, the cross-sectional study design precluded our ability to make causal assumptions about birthplace as a predictor of sleep health. Secondly, all data were self-reported; however, misclassification of individuals into categories of race/ethnicity, sleep duration and quality, birthplace/nativity, language preference/acculturation, and covariates is likely non-differential [39]. Third, our unidimensional, proxy measure of language acculturation did not capture the full breadth of acculturation [40], and data was not available for NHWs; however, psychometric analyses have shown language explains most of the variance in acculturation scales [13]. Nonetheless, future studies would benefit from using multidimensional measures of acculturation. Fourth, the observational nature of the study fosters potential for residual confounding. Fifth, small sample sizes upon stratification (e.g., Dominicans) and within group heterogeneity (e.g., birthplace for NHWs and Central/South Americans) limited interpretability of results for certain heritage groups. Lastly, we tested for many associations and did not adjust for multiple comparisons due to the novelty of our study and our interest in identifying potential associations that may warrant further investigation.

Study strengths included the use of the most recently available data collected from a nationally representative and large sample that allowed for robust stratification by birthplace, race/ethnicity, Hispanic/Latino heritage, and language preference/acculturation as well as adjustment for multiple confounders. Further, we used evidence-based categories of sleep duration, assessed multiple important sleep dimensions, and directly estimated prevalence ratios [18, 23, 31]. Our study extended prior literature as one of the few using national data to compare sleep health between US-born and foreign-born NHWs as well as between foreign-born Hispanic/Latinos and their NHW counterparts [9, 11].

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In conclusion, consideration of variation in birthplace/nativity, heritage, language, and other cultural factors in future studies of racial/ethnic disparities in sleep health is important. Sleep disparities studies in the US often consider NHWs as the reference group despite heterogeneity in birthplace, which may lead to inaccurate conclusions about racial/ethnic disparities in sleep health. Studies also often combine Hispanic/Latino heritage groups despite cultural heterogeneity. Future studies should disentangle cultural contributors in the social environment that influence sleep health and sleep health behaviors. Findings from such studies have the potential to inform culturally tailored public health interventions designed to improve racial/eume sleep health among racial/ethnic subpopulations.

AUTHOR CONTRIBUTIONS

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Page 25 of 59 Table 1. Age-standardized Sociodemographic, Health Behavior, and Clinical Characteristics among non-Hispanic White and Hispanic/Latino Adults, National Health Interview Survey, 2004-2017 (N=254,669) ^a

Race/Ethnicity and Heritage	Overall		White (n=207.154)			Mexican (n=30.100)			Puerto Rican (n=5.077)		с	uban (n=2.51	8)	Dor	minican (n=1.0	658)	Central/ S	outh America	n (n=8.162)
2 Nativity		All	US-born (ves)	US-born (no)	All	US-born (ves)	US-born (no)	All	US-born (ves)	US-born (no)	All	US-born (ves)	US-born (no)	All	US-born (ves)	US-born (no)	All	US-born (ves)	US-born (no)
4 n (%)	254,699	207,154 (81%)	198,297 (96%)	8,857 (4%)	30,100 (12%)	14,282 (47%)	15,818 (53%)	5,077 (2%)	2,544 (50%)	2,533 (50%)	2,518 (1%)	559 (22%)	1,959 (78%)	1,658 (1%)	264 (16%)	1,394 (84%)	8,162 (3%)	1,113 (14%)	7,049 (86%)
5 Sociodemographic 6 Characteristics																			
7 Age, mean ± SE (years)	46.8±0.9	48.0±0.1	47.9±0.1	48.7±0.2	39.4±0.2	38.1±0.2	40.5±0.2	43.0±0.3	37.6±0.3	49.2±0.5	47.8±0.4	35.8±0.8	51.9±0.5	41.8±0.5	30.8±0.9	44.6±0.5	40.4±0.2	30.1±0.4	42.2±0.2
9 Female (%)	49	50	50	49	45	49	40	48	47	48	44	42	44	56	53	57	49	55	48
10 Annual Household Income (%)																			
12 <\$35,000	30	28	28	27	44	37	51	46	35	52	42	25	45	54	36	56	43	24	44
13 \$35,000-\$74,999	33	32	32	29	34	35	34	30	31	31	32	29	34	30	38	30	34	39	34
14 ≥\$75,000	37	40	40	44	21	29	15	24	33	17	26	46	21	16	26	14	23	37	21
15 Educational Attainment						Jr													
17 <hr/> High school	11	8	8	7	40	19	60	25	13	30	14	4	15	36	10	38	27	7	29
18 High school graduate	29	28	29	22	28	34	22	30	31	29	32	18	36	25	16	27	27	18	27
19 Some college	30	31	31	26	22	33	12	27	35	23	26	39	22	23	55	20	23	36	22
20 ≥ College	30	33	32	45	10	14	6	18	22	18	29	39	26	16	20	14	23	39	22
22 Unemployed/Not in the Labor Force (%)	38	38	38	36	38	40	36	46	43	49	37	33	37	40	47	39	33	27	33
Occupational Class (%)																			
24 Professional/ 25 management	21	22	22	27	9	13	5	12	17	9	18	32	15	9	20	7	11	24	10
26 Support Services	35	46	46	45	31	44	19	41	45	39	40	49	37	39	52	37	34	54	32
27 Laborers	45	31	32	28	60	43	76	47	38	52	42	19	48	53	28	55	55	22	58
Marital/Co-habiting Status (%)																			
30 Married/living with partner 31 or cohabitating	65	65	65	68	64	58	70	55	56	56	65	69	67	51	43	52	60	51	62
32 Divorced/widowed/no live- In partner	21	20	20	20	21	23	20	26	23	28	22	12	23	32	37	33	24	25	24
33 Single/no live-in partner	14	14	14	12	14	18	11	19	21	16	14	19	10	17	20	14	16	24	14
35 Language of Interview																			
36 English	95	100	100	99	64	91	39	81	91	73	45	85	36	45	88	40	54	88	51
38 English and Spanish	2	0	0	0	15	6	23	9	6	11	10	8	11	14	9	14	16	7	16
39 Spanish	3	0	0	0	21	2	38	11	3	16	45	7	54	42	3	46	30	5	33
$\frac{40}{41}$ Time in the US (states) (%)																			
42 ≥15 years	24	22	100	78	77	100	77	80	100	80	66	100	66	75	100	75	70	100	70
43 <15 years	76	78	0	22	23	0	23	20	0	20	34	0	34	25	0	25	30	0	30
44								Doc	10 24 of 2	5									

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Region of Residence (%)																			
Northeast	18	19	19	29	2	1	3	50	46	49	9	12	8	75	54	77	23	13	23
Midwest	25	28	29	17	10	10	10	9	9	9	4	12	2	2	3	1	5	5	5
South	34	34	34	26	35	40	31	32	31	36	82	68	85	21	38	20	43	37	44
West	22	20	19	29	53	49	56	8	14	6	5	8	4	2	5	2	30	45	28
Health Behaviors																			
Sleep duration (%)																			
<6 hours	8	8	8	7	8	9	7	15	14	15	8	11	8	13	12	13	8	8	8
<7 hours	29	29	28	27	28	31	25	39	39	39	29	30	28	34	31	34	31	30	31
0																			
7-9 hours	67	67	67	69	67	64	70	56	57	57	68	69	69	63	67	64	67	68	67
3 Sleep Characteristics	4	4	4	3	4	5	5	4	4	5	3	1	3	3	2	3	2	2	2
4 <u>(%)</u>																			ļ
5 [(≥3 nights)	20	21	21	17	19	22	17	27	26	27	18	30	16	19	15	19	18	31	16
6 Trouble Staying Asleep	20	20	20	22	22	26	10	20	20	20	20	22	10	21	10	21	20	20	10
8 Sleep Medication Use	29	30	30	23		20	10	29	29	20	20	33	19	21	10	21	20	20	19
9 (≥3 nights) Nonrestorative Sleep:	11	11	11	8	7	8	6	12	13	12	8	7	7	10	6	10	5	14	5
0 Did not wake feeling																			
1 rested ⊃ (≥3 days)	64	63	63	66	65	63	67	61	63	61	66	55	67	63	52	64	67	71	67
3 Smoking status (%)																			
4 Never/ quit >12 months	00	70	70			0.4		0.1	70		0.4		0.4	00		00	01		04
$5 \frac{\text{prior}^{n}}{1000}$	80	/9	/9	83	86	84	88	81	79	81	84	88	84	93	92	93	91	86	91
6 7 Current	2	2	2	1	1	1	1	2	2	1	1	1	1	1	0	1	1	2	1
8 Leisure-time Physical	18	20	20	15	13	15	11	18	19	17	15	11	15	6	8	6	9	12	8
9 Activity (%)																			ļ
0 Never/unable	33	32	32	31	44	39	48	47	39	52	52	35	56	59	57	60	43	30	45
J Does not meet PA	<u>1</u> 9	19	19	18	18	18	18	17	18	16	12	9	12	14	12	14	18	20	17
A Meets PA guidelines b*	47	49	49	51	38	43	34	37	43	32	36	56	31	27	30	26	39	50	38
Alcohol Consumption																			
6 Lifetime abstainer	16	14	14	18	25	19	30	26	20	30	30	18	32	35	21	36	29	15	30
7 Former	16	16	16	10	18	17	19	18	15	19	10	8	11	13	17	13	16	9	17
8 Current	68	70	70	72	57	64	51	56	65	51	60	74	57	52	62	50	55	75	53
⁹ Clinical Characteristics (%)																			
Body Mass Index (BMI)																			
2 Normal (BMI 18.5 - <24.9 kg/m ²) *	34	35	35	40	24	24	24	26	22	27	33	40	31	30	17	32	31	33	31

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Pac	ne 27 of 59								В	MJ Open										
	Overweight (BMI 25.0-29.9 kg/m ²)	37	36	36	39	41	37	44	39	40	39	41	29	44	44	49	43	45	38	45
1	Obese (BMI ≥30.0 kg/m²)	29	29	29	21	35	38	32	36	38	34	26	31	25	26	34	25	25	30	24
2	Serious Psychological Distress ^d (% yes)	3	3	3	3	4	4	4	5	4	5	4	3	4	6	2	6	3	3	3
3 4	Dyslipidemia (% yes) •*	52	52	52	52	51	49	53	56	60	52	52	58	53	54	45	54	51	49	52
5	Hypertension (% yes) *	34	34	35	30	34	37	32	37	35	39	33	23	35	37	41	37	28	27	29
6	Prediabetes/diabetes (% yes) *	15	14	14	12	24	25	23	23	21	24	14	19	15	20	29	20	15	12	16
8	"Ideal" Cardiovascular Health ^f (% yes)	12	12	12	15	7	8	6	6	7	5	7	13	6	6	8	5	9	13	9
9 10	Cancer (% yes)	12	12	12	10	5	7	4	8	11	7	6	7	6	3	7	3	5	8	5

Note. Data is presented as percentages or means ± standard errors. All estimates are weighted for the survey's complex sampling design. All estimates except for age are age-standardized to the US 2010 population.

SE=standard error

12^a Data are presented as unweighted n's and weighted percentages. Percentages may not sum to 100 due to missing values or rounding.

13^b Weighted percentages for all represent the percentage of participants who self-identified as each racial/ethnic/heritage group in the study population. Weighted percentages for US-born (yes vs. no) represent the percentage of participants within each racial/ethnic/heritage group who are either US-born or foreign-born.

14c Meets PA guidelines defined as ≥150 minutes/week of moderate intensity or ≥75 minutes/week of vigorous intensity or ≥150 minutes/week of moderate + vigorous intensity physical activity.

15^d Heavy alcohol consumption defined as ≥2 drinks/day for women and ≥3 drinks/day for men.

 16°_{f} Kessler-6 psychological distress scale score ≥ 13 17_{g}° (Dyslipidemia defined as high cholesterol in the 12 months prior to interview. Available for survey years 2011-2017. 17_{g}° (Ideal" cardiovascular health includes never smoking/quit >12 months prior to interview, BMI 18.5 - <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes. er eview only

18* Indicator of "ideal" cardiovascular health

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Table 2. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Foreign-born non-Hispanic Whites and Hispanic/Latino Heritage Groups compared to U.S.-born non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=254,669)

			Prevalence Ra	atio (95% Confi	dence Interva	I)	
		Sleep Duration	1	\		/	
	(reference: r	ecommended	(7-9 hours))	S	leep Quality i	n the Past Wee	k
	`			Trouble	Trouble	Non-	Sleep
				Falling	Staying	restorative	Medication
	Very Short	Short	Long	Asleep	Asleep	Sleep	Use
	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)
Group <i>(n)</i>	(n=21,227)	(n=75,139)	(n=9,190)	(n=22,038)	(n=30,013)	(n=46,103)	(n=11,097)
U.Sborn Non-Hispanic White	Ref	Ref	Ref	Ref	Ref	Ref	Ref
(n=198,297)							
Foreign-born Non-Hispanic White	1.03	1.03	1.07	1.09	1.27	1.06	1.34
(n=8,857)	(0.93-1.13)	(0.99-1.08)	(0.92-1.24)	(0.99-1.19)	(1.17-1.37)	(1.00-1.12)	(1.16-1.55)
Mexican							
Overall	0.76	0.87	0.87	0.77	0.65	0.90	0.52
(n=30,100)	(0.71-0.81)	(0.85-0.90)	(0.79-0.96)	(0.72-0.82)	(0.62-0.69)	(0.87-0.94)	(0.46-0.58)
U.Sborn (yes)	1.04	1.04	0.98	0.92	0.80	0.97	0.66
(n=14,282)	(0.97-1.12)	(1.00-1.08)	(0.87-1.11)	(0.85-0.99)	(0.74-0.85)	(0.93-1.01)	(0.58-0.76)
U.Sborn (no)	0.52	0.70	0.75	0.59	0.50	0.81	0.36
(n=15,818)	(0.47-0.57)	(0.67-0.73)	(0.66-0.85)	(0.54-0.65)	(0.46-0.55)	(0.77-0.85)	(0.29-0.43)
Puerto Rican							
Overall	1.39	1.20	1.00	1.05	0.91	0.98	0.99
(n=5,077)	(1.26-1.53)	(1.14-1.25)	(0.84-1.20)	(0.95-1.17)	(0.83-1.00)	(0.92-1.05)	(0.85-1.15)
U.Sborn (yes)	1.44	1.23	1.08 🦷 🏉	1.05	0.97	1.00	0.96
(n=2,544)	(1.27-1.64)	(1.16-1.31)	(0.84-1.37)	(0.91-1.21)	(0.85-1.12)	(0.92-1.09)	(0.77-1.21)
U.Sborn (no)	1.32	1.15	0.94	1.06	0.84	0.95	1.02
(n=2,533)	(1.16-1.51)	(1.08-1.24)	(0.74-1.19)	(0.92-1.22)	(0.73-0.97)	(0.86-1.05)	(0.83-1.25)
Cuban							
Overall	0.83	0.89	0.69	0.78	0.70	0.90	0.68
(n=2,518)	(0.70-0.99)	(0.81-0.98)	(0.55-0.87)	(0.62-0.97)	(0.58-0.83)	(0.82-1.00)	(0.53-0.89)
U.Sborn (yes)	0.93	1.04	0.71	0.97	0.94	0.98	0.98
(n=559)	(0.66-1.29)	(0.89-1.21)	(0.34-1.47)	(0.72-1.31)	(0.70-1.26)	(0.82-1.17)	(0.57-1.69)
U.Sborn (no)	0.81	0.85	0.69	0.71	0.63	0.87	0.61
(n=1,959)	(0.66-0.99)	(0.76-0.95)	(0.54-0.88)	(0.53-0.95)	(0.49-0.79)	(0.78-0.98)	(0.43-0.85)
Dominican							
Overall	0.90	0.92	0.72	0.76	0.67	0.93	0.81
(n=1,658)	(0.76-1.08)	(0.83-1.01)	(0.49-1.05)	(0.62-0.92)	(0.55-0.83)	(0.82-1.05)	(0.54-1.20)
U.Sborn (yes)	1.09	1.09	1.15	0.73	0.97	0.98	0.64
(n=264)	(0.68-1.74)	(0.85-1.40)	(0.49-2.73)	(0.47-1.13)	(0.65-1.43)	(0.77-1.26)	(0.31-1.31)

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U.Sborn (no)	0.87	0.88	0.60	0.76	0.61	0.92	0.84
(n=1,394)	(0.73-1.03)	(0.79-0.98)	(0.38-0.93)	(0.62-0.95)	(0.48-0.78)	(0.79-1.07)	(0.54-1.30)
Central/South American							
Overall	0.78	0.93	0.68	0.76	0.65	0.89	0.42
(n=8,162)	(0.71-0.87)	(0.89-0.98)	(0.56-0.83)	(0.67-0.87)	(0.58-0.73)	(0.83-0.94)	(0.34-0.53)
IIS -born (ves)	1.30	1.18	0.82	1.21	0.98	1.05	0.64
(n=1,113)	(1.03-1.65)	(1.04-1.33)	(0.51-1.30)	(0.96-1.51)	(0.73-1.30)	(0.93-1.19)	(0.38-1.10)
U.Sborn (no)	0.72	0.89	0.66	0.68	0.59	0.85	0.39
(n=7,049)	(0.64-0.80)	(0.85-0.94)	(0.54-0.82)	(0.59-0.77)	(0.53-0.67)	(0.80-0.90)	(0.30-0.50)

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit > 12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

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Table 3. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to Foreign-born non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=56,372)

• •	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$											
		Sleep Duration)									
	(reference:	recommended	(7-9 hours))		Sleep Quality ir	n the Past Weel	K					
				Trouble Falling	Trouble Staying	Non- restorative	Sleep Medication					
	Very Short	Short	Long	Asleep	Asleep	Sleep	Use					
	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)					
Group (n)	(n=4,115)	(n=14,048)	(n=1,586)	(n=3,431)	(n=3,520)	(n=7,734)	(n=1,073)					
(n=8,857)	Ret	Ref	Ret	Ret	Ref	Ref	Ret					
Mexican												
Overall	1.10	1.12	1.06	0.92	0.87	1.06	0.92					
(n=30,100)	(0.96-1.26)	(1.05-1.18)	(0.86-1.31)	(0.81-1.05)	(0.78-0.97)	(0.99-1.14)	(0.73-1.14)					
U.Sborn (yes)	1.17	1.19	1.04	1.00	0.97	1.07	0.98					
(n=14,282)	(1.02-1.34)	(1.12-1.26)	(0.84-1.29)	(0.87-1.14)	(0.86-1.10)	(0.99-1.15)	(0.78-1.23)					
U.Sborn (no)	0.89	0.98	1.05	0.78	0.72	1.02	0.68					
(n=15,818)	(0.73-1.08)	(0.90-1.06)	(0.81-1.36)	(0.66-0.94)	(0.62-0.84)	(0.93-1.12)	(0.48-0.96)					
Puerto Rican												
Overall	1.75	1.34	1.13	1.19	1.14	1.06	1.33					
(n=5,077)	(1.51-2.02)	(1.25-1.44)	(0.88-1.44)	(1.03-1.39)	(0.99-1.31)	(0.96-1.16)	(1.07-1.64)					
U.Sborn (yes)	1.85	1.39	1.33	1.20	1.22	1.06	1.32					
(n=2,544)	(1.54-2.22)	(1.27-1.51)	(0.95-1.85)	(0.99-1.46)	(1.02-1.46)	(0.95-1.18)	(1.01-1.73)					
U.Sborn (no)	1.58	1.27	1.02	1.22	1.09	1.06	1.41					
(n=2,533)	(1.32-1.90)	(1.16-1.39)	(0.77-1.35)	(1.01-1.46)	(0.91-1.30)	(0.94-1.20)	(1.09-1.83)					
Cuban												
Overall	0.97	0.98	0.69	0.92	0.93	1.03	1.09					
(n=2,518)	(0.76-1.22)	(0.88-1.10)	(0.49-0.97)	(0.70-1.20)	(0.76-1.15)	(0.90-1.18)	(0.77-1.55)					
U.Sborn (yes)	1.03	1.15	0.83	1.14	1.17	1.05	1.63					
(n=559)	(0.69-1.53)	(0.96-1.37)	(0.39-1.75)	(0.79-1.65)	(0.84-1.65)	(0.85-1.29)	(0.91-2.93)					
U.Sborn (no)	0.94	0.92	0.66	0.82	0.85	1.04	0.96					
(n=1,959)	(0.72-1.22)	(0.81-1.05)	(0.46-0.94)	(0.59-1.14)	(0.65-1.10)	(0.89-1.21)	(0.63-1.45)					
Dominican												
Overall	1.12	1.02	0.91	0.88	0.94	1.00	1.03					
(n=1,658)	(0.89-1.43)	(0.90-1.16)	(0.57-1.45)	(0.68-1.13)	(0.72-1.23)	(0.87-1.15)	(0.67-1.59)					
U.Sborn (yes)	1.40	1.24	1.80	0.82	1.25	1.01	0.97					
(n=264)	(0.82-2.41)	(0.97-1.60)	(0.68-4.79)	(0.51-1.31)	(0.81-1.93)	(0.78-1.32)	(0.42-2.20)					
U.Sborn (no)	1.06	0.96	0.73	0.88	0.87	0.99	1.02					
(n=1,394)	(0.84-1.34)	(0.84-1.10)	(0.45-1.20)	(0.68-1.16)	(0.65-1.18)	(0.84-1.18)	(0.64-1.63)					

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Overall	1.00	1.10	0.76	0.94	0.89	1.02	0.69
(n=8,162)	(0.86-1.17)	(1.02-1.17)	(0.57-1.02)	(0.78-1.13)	(0.76-1.04)	(0.95-1.11)	(0.51-0.91)
U.Sborn (yes)	1.42	1.30	1.02	1.27	1.14	1.08	0.95
(n=1,113)	(1.06-1.92)	(1.13-1.49)	(0.59-1.75)	(0.96-1.67)	(0.86-1.52)	(0.94-1.25)	(0.56-1.62)
U.Sborn (no)	0.92	1.05	0.77	0.84	0.84	1.00	0.64
(n=7,049)	(0.78-1.08)	(0.98-1.13)	(0.56-1.05)	(0.69-1.02)	(0.72-0.99)	(0.92-1.09)	(0.47-0.88)
Abbreviations: ref (reference)		· · ·		· · ·			
Adjusted for age (18-30, 31-49, 50-64, 6	5+ years), sex/gen	der (male, female), annual househ	old income (<\$35	,000, \$35,000-\$7	4,999, \$75,000+)	, educational att
(<high graduate,="" high="" school="" school,="" sor<="" td=""><td>ne college, ≥colleg</td><td>e), unemployed/n</td><td>ot in the labor for</td><td>ce (yes, no), occu</td><td>pational class (pr</td><td>ofessional/manag</td><td>gement, support</td></high>	ne college, ≥colleg	e), unemployed/n	ot in the labor for	ce (yes, no), occu	pational class (pr	ofessional/manag	gement, support
	· · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·			

laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/guit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017. er er er en ong

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Figure 1. Fully-Adjusted Prevalence Ratios of Sleep (a) Duration and (b) Quality* Characteristics for Hispanic/Latino Heritage Groups compared to non-Hispanic Whites by Language Acculturation Status**, National Health Interview Survey, 2004-2017 (N=245,812)



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* Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

** Language acculturation categories include high (English only interview), medium (English and Spanish interview), and low (Spanish only interview).

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence In the prior with the (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Certain associations were not estimable due to small sample sizes and are, therefore, not provided (e.g., long sleep duration among Central/South Americans with medium acculturation compared to non-Hispanic Whites).
Table 4. Summary of Sensitivity Analyses

Sensitivity Analysis Number	Purpose of Sensitivity Analysis	Method Employed	Summary of Results of Sensitivity Ana
1	To investigate how results would be affected if we did not consider nativity/birthplace as a modifier of racial/ethnic differences in sleep	We combined both US-born and foreign-born participants; we then compared sleep characteristics among Hispanic/Latino heritage groups versus NHWs.	Combining foreign-born and US-born participants across both Hispanic/Lati heritage groups and NHWs would hav missed important differences by nativi status (Supplemental Table S2). For instance, the lower prevalence of non- recommended sleep duration observe among foreign-born Mexicans vs. US- NHWs (Table 2) would either have be underestimated or not have been observed if participants were not strat by birthplace.
2	To investigate how results would be affected if we considered sex/gender and age as potential modifiers [40]	We stratified the original models by sex/gender (men, women) and by age category (18-30 years, 31-49 years, ≥50 years), separately. In models that were also stratified by language acculturation, we combined low and medium acculturation to increase sample sizes and improve statistical stability.	After stratification by sex/gender (Supplemental Table S3), point estimative were slightly stronger among men vs. women for sleep quality across comparisons with foreign-born NHWs for very short as well as short sleep at comparisons with non-US born Mexic Sex/gender did not modify the remain associations among Mexicans or Pue Ricans. The differences among both foreign-b NHWs and Mexicans compared to US born NHWs that were observed in the main analysis were greater among younger and middle vs. older aged ac (Supplemental Table S4). Across comparisons to non-US born NHWs, there was little variation by sex/gender for Mexicans and Puerto Ricans, but the differences were grea among younger vs. older aged adults (Supplemental Tables S5 and S6)

1 2 3 4 5 6 7 8				In analyses stratified by language acculturation, lower prevalence of shorter sleep duration among foreign-born Mexicans compared to NHWs was stronger for men vs. women and for younger vs. older adults (Supplemental Tables S7 and S8).
9 10 11 12 13 14 15	3	To investigate how results would be affected if we adjusted for time in the US in the comparisons between foreign-born Hispanic/Latino heritage groups to their NHW counterparts [9, 17, 30]	Across comparisons of foreign-born Hispanic/Latino heritage groups to their foreign-born NHW counterparts, we additionally adjusted for time in the US.	Results (Supplemental Table S9) were consistent with the main analysis (Table 3), which suggested that time spent in the US was not a strong confounder across comparisons between foreign-born Hispanic/Latino heritage groups and their NHW counterparts.
16 17 18 19 20 21 22	4	To investigate how results would be affected if we used a different measure of acculturation in models [9, 17]	We separated foreign-born NHWs and Hispanic/Latino heritage groups by a different metric of acculturation, time lived in the US (<15 years in the US, ≥15 years in the US) [9, 17, 30], when compared to US-born NHWs.	Results (Supplemental Table S10) were consistent with those of the language acculturation-stratified analyses (Figure 1).
22 23 24 25 26 27 28 29 30 31 32 33 34 35			ien on	



Supplemental Figure S1. Flow Chart Diagram of Final Analytic Sample

Supplemental Table S1. Global Region of Birth among Foreign-born Non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=8,857)

Region of Birth	n (%)
Mexico, Central American, Caribbean Islands	238 (2.7%)
South America	236 (2.7%)
Europe	4,670 (52.7%)
Russia	838 (9.5%)
Africa	368 (4.2%)
Middle East	895 (10.1%)
Indian Subcontinent	64 (0.7%)
Asia	177 (2.0%)
Southeast Asia	117 (1.3%)
Elsewhere	1,254 (14.2%)

 Note: Data are presented as absolute counts and age-standardized, weighted percentages.

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Supplemental Table S2. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to non-Hispanic Whites National Health Interview Survey 2004-2017 (N=254 669)

		Pre	valence Rati	o (95% Confid	dence Interva	I)	
	S	leep Duration					
	(reference: re	commended	(7-9 nours))		Sleep C	Quality ^a	
				Trouble	Trouble	Non-	Sleep
				Falling	Staying	restorative	Medication
	Very Short	Short	Long	Asleep	Asleep	Sleep	Use
Heritage Group Compared to non-	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)
Hispanic Whites, Overall (n=207,154)	(n=21,227)	(n=75,139)	(n=9,190)	(n=22,038)	(n=30,013)	(n=46,103)	(n=11,097)
Mexican	0.89	0.95	0.94	0.85	0.75	0.95	0.62
(n=30,100 Mexican)	(0.82-0.95)	(0.92-0.98)	(0.84-1.04)	(0.79-0.91)	(0.71-0.80)	(0.91-0.99)	(0.54-0.70)
Puerto Rican	1.41	1.21	1.05	1.10	1.02	1.01	1.10
(n=5,077)	(1.27-1.57)	(1.16-1.27)	(0.87-1.27)	(0.99-1.22)	(0.92-1.12)	(0.94-1.08)	(0.94-1.30)
Cuban	0.90	0.94	0.75	0.88	0.88	0.96	0.93
(n=2,518)	(0.75-1.07)	(0.86-1.04)	(0.58-0.97)	(0.71-1.09)	(0.74-1.05)	(0.87-1.07)	(0.70-1.23)
Dominican	0.95	0.96	0.79	0.82	0.84	0.98	1.04
(n=1,658)	(0.78-1.16)	(0.86-1.06)	(0.53-1.18)	(0.66-1.02)	(0.68-1.04)	(0.87-1.11)	(0.69-1.58)
Central/South American	0.89	1.01	0.75	0.88	0.83	0.95	0.57
(n=8 162)	(0 78-1 01)	(0.95 - 1.07)	(0.60 - 0.94)	(0.75 - 1.03)	(0 73-0 95)	(0.88-1.02)	(0 44-0 73)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (lifetime abstainer, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), and "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), cancer, and US nativity status/years lived in the US (US-born, 15+ years in the US, <15 years in the US).

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, awakening feeling rested, and sleep medication were measured during the survey years 2013-2017.

Supplemental Table S3. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (1) foreign-born non-Hispanic Whites and (2) Hispanic/Latino Heritage Groups compared to US-born non-Hispanic Whites, Stratified by Sex/Gender, National Health Interview Survey, 2004-2017 (N=254,669)

•						Prevalence	e Ratio (95%	% Confiden	ce Interval)					
		(referen	Sleep D ce: recomn	ouration) hours))				Slee	ep Quality ir	n the Past V	Veek		
Group <i>(n)</i>	Very (≤5-h (n=2∕	Short ours) I,227)	Sh (<7-h (n=75	ort ours) 5,139)	Lo (>9-h (n=9	ong iours) ,190)	Trouble Asl (≥3 n (n=22	e Falling eep ights) 2,038)	Trouble Asl (≥3 n (n=30	Staying eep ights) 0,013)	Non-res Sle (≥3 c (n=46	storative eep lays) 5,103)	Sleep Mo U (≥3 n (n=11	edication se ights) 1,097)
Sex/Gender	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
U.Sborn Non-Hispanic White (n=198,297)	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Foreign-born Non- Hispanic White (n=8,857)	1.12 (0.98-1.30)	0.94 (0.83-1.06)	1.07 (1.00-1.13)	1.00 (0.95-1.06)	1.18 (0.94-1.47)	1.00 (0.82-1.21)	1.08 (0.92-1.27)	1.09 (0.97-1.21)	1.31 (1.16-1.49)	1.22 (1.11-1.35)	1.11 (1.02-1.21)	1.01 (0.95-1.08)	1.44 (1.12-1.85)	1.28 (1.07-1.52)
Mexican														
Overall (n=30,100)	0.70 (0.63-0.77)	0.83 (0.76-0.91)	0.83 (0.79-0.86)	0.94 (0.90-0.97)	0.96 (0.84-1.10)	0.77 (0.68-0.87)	0.77 (0.73-0.82)	0.80 (0.74-0.86)	0.66 (0.62-0.70)	0.68 (0.63-0.73)	0.91 (0.87-0.94)	0.91 (0.87-0.95)	0.52 (0.46-0.59)	0.48 (0.41-0.56)
U.Sborn (yes) (n=14,282)	1.02 (0.91-1.14)	1.05 (0.96-1.15)	1.01 (0.96-1.07)	1.07 (1.03-1.12)	1.09 (0.91-1.31)	0.88 (0.75-1.03)	0.92 (0.85-0.99)	0.92 (0.84-1.00)	0.80 (0.74-0.86)	0.77 (0.71-0.85)	0.97 (0.93-1.01)	0.95 (0.90-1.00)	0.66 (0.58-0.76)	0.59 (0.50-0.70)
U.Sborn (no) (n=15,818)	0.47 (0.40-0.54)	0.60 (0.52-0.69)	0.66 (0.62-0.70)	0.77 (0.71-0.82)	0.83 (0.70-0.99)	0.65 (0.54-0.78)	0.60 (0.55-0.66)	0.64 (0.58-0.71)	0.51 (0.46-0.55)	0.55 (0.49-0.62)	0.82 (0.77-0.86)	0.85 (0.80-0.90)	0.36 (0.30-0.44)	0.34 (0.27-0.42)
Puerto Rican								1,						
Overall (n=5,077)	1.31 (1.13-1.53)	1.45 (1.29-1.63)	1.19 (1.11-1.28)	1.21 (1.14-1.28)	1.05 (0.82-1.34)	0.95 (0.74-1.21)	1.05 (0.94-1.16)	1.08 (0.96-1.22)	0.91 (0.83-1.00)	0.87 (0.78-0.97)	0.98 (0.91-1.05)	1.04 (0.97-1.12)	0.98 (0.84-1.15)	1.02 (0.84-1.23)
U.Sborn (yes) (n=2,544)	1.33 (1.08-1.63)	1.53 (1.30-1.81)	1.21 (1.11-1.33)	1.24 (1.15-1.35)	1.26 (0.89-1.77)	0.94 (0.66-1.33)	1.04 (0.90-1.21)	1.14 (0.98-1.33)	0.97 (0.85-1.11)	0.91 (0.78-1.05)	1.00 (0.92-1.09)	1.10 (1.01-1.20)	0.96 (0.76-1.19)	0.97 (0.73-1.30)
U.Sborn (no) (n=2,533)	1.29 (1.03-1.61)	1.36 (1.17-1.58)	1.15 (1.04-1.27)	1.16 (1.06-1.26)	0.89 (0.63-1.26)	0.96 (0.72-1.28)	1.05 (0.91-1.21)	1.01 (0.86-1.18)	0.84 (0.73-0.97)	0.82 (0.70-0.97)	0.95 (0.86-1.04)	0.96 (0.85-1.08)	1.01 (0.83-1.24)	1.08 (0.86-1.35)
Cuban Overall (n=2,518)	0.75 (0.59-0.96)	0.94 (0.75-1.18)	0.84 (0.74-0.95)	0.97 (0.87-1.09)	0.73 (0.54-0.99)	0.63 (0.42-0.93)	0.76 (0.61-0.94)	0.78 (0.60-1.01)	0.68 (0.57-0.81)	0.72 (0.57-0.91)	0.89 (0.81-0.99)	0.98 (0.85-1.14)	0.66 (0.51-0.87)	0.77 (0.55-1.06)
U.Sborn Cuban (yes) (n=559)	0.78 (0.44-1.39)	1.08 (0.74-1.58)	1.01 (0.81-1.25)	1.08 (0.89-1.31)	0.49 (0.18-1.29)	0.95 (0.39-2.31)	0.95 (0.70-1.28)	0.96 (0.66-1.39)	0.92 (0.69-1.23)	0.83 (0.53-1.31)	0.96 (0.80-1.16)	1.07 (0.86-1.34)	0.95 (0.54-1.66)	1.37 (0.78-2.42)
U.Sborn Cuban (no) (n=1,959)	0.75 (0.56-1.00)	0.90 (0.69-1.18)	0.78 (0.67-0.91)	0.94 (0.82-1.07)	0.78 (0.57-1.05)	0.55 (0.35-0.87)	0.69 (0.52-0.92)	0.71 (0.52-0.98)	0.61 (0.48-0.78)	0.68 (0.50-0.94)	0.87 (0.77-0.97)	0.95 (0.80-1.13)	0.59 (0.42-0.83)	0.60 (0.40-0.89)
Dominican														
Overall (n=1,658)	0.82 (0.60-1.11)	0.96 (0.79-1.16)	0.83 (0.71-0.97)	0.98 (0.88-1.10)	1.05 (0.68-1.61)	0.49 (0.24-1.00)	0.77 (0.63-0.94)	0.83 (0.66-1.03)	0.68 (0.56-0.84)	0.77 (0.61-0.97)	0.94 (0.83-1.06)	0.96 (0.84-1.09)	0.83 (0.55-1.23)	0.93 (0.60-1.45)
U.Sborn (yes)	1.13 (0.60-2.11)	1.02 (0.58-1.79)	0.86 (0.60-1.23)	1.32 (0.98-1.77)	0.96 (0.30-3.07)	1.35 (0.48-3.80)	0.73 (0.48-1.12)	0.62 (0.36-1.07)	0.97 (0.65-1.44)	0.91 (0.53-1.57)	0.99 (0.78-1.26)	0.93 (0.68-1.29)	0.64 (0.31-1.30)	0.57 (0.23-1.43)

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(n=264)														
U.Sborn (no)	0.74	0.95	0.82	0.92	1.08	0.29	0.78	0.88	0.62	0.74	0.92	0.96	0.86	1.00
(n=1,394)	(0.52-1.04)	(0.78-1.15)	(0.69-0.97)	(0.81-1.04)	(0.63-1.85)	(0.15-0.53)	(0.63-0.97)	(0.69-1.12)	(0.49-0.80)	(0.57-0.97)	(0.79-1.08)	(0.83-1.13)	(0.55-1.34)	(0.61-1.63)
Central/South American														
	0.71	0.87	0.93	0.94	0.66	0.70	0.78	0.83	0.65	0.73	0.89	0.96	0.43	0.46
Overall (<i>n</i> =8,162)	(0.61-0.83)	(0.76-0.99)	(0.87-0.99)	(0.88-1.01)	(0.48-0.91)	(0.56-0.89)	(0.68-0.88)	(0.71-0.97)	(0.58-0.73)	(0.63-0.86)	(0.84-0.95)	(0.89-1.04)	(0.34-0.54)	(0.35-0.61)
U.Sborn (yes)	1.31	1.31	1.25	1.10	0.64	0.95	1.21	1.40	0.97	1.13	1.05	1.13	0.64	0.47
(n=1,113)	(0.92-1.87)	(0.96-1.77)	(1.08-1.45)	(0.92-1.30)	(0.35-1.16)	(0.52-1.74)	(0.96-1.53)	(1.06-1.86)	(0.73-1.30)	(0.80-1.61)	(0.92-1.20)	(0.97-1.32)	(0.38-1.10)	(0.24-0.94)
U.Sborn	0.64	0.80	0.88	0.92	0.66	0.67	0.69	0.71	0.60	0.66	0.85	0.92	0.40	0.46
(no) (n=7,049)	(0.54-0.76)	(0.70-0.93)	(0.82-0.94)	(0.85-0.98)	(0.47-0.94)	(0.52-0.87)	(0.60-0.78)	(0.61-0.83)	(0.53-0.68)	(0.57-0.77)	(0.80-0.91)	(0.85-0.99)	(0.31-0.51)	(0.34-0.62)

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

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Supplemental Table S4. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (1) foreign-born non-Hispanic Whites and (2) Hispanic/Latino Heritage Groups compared to US-born non-Hispanic Whites, Stratified by Age Group, National Health Interview Survey, 2004-2017 (N=254,669)

						,		Pr	evalenc	e Ratio	(95% Co	onfidenc	e Interv	al)							
			(roforo)	Sle	ep Dura	tion	houro))				•			Sleep C	Quality in	n the Pa	st Week				
Group (n)	(i	/ery Sho ≤5-hours n=21,227	referen ort 5) 7)		Short ≤7-hours n=75,139	s)	nours))	Long >9-hours (n=9,190	5))	Tro (2	uble Fal Asleep ≥3 nights n=22,038	ling s) 3)	Troi	uble Sta Asleep ≥3 nights n=30,013	ying s) 3)	Nor (n-restora Sleep (≥3 days n=46,103	itive) 3)	Slee∣ (≧ (r	o Medica Use :3 nights n=11,097	ation s) 7)
Age (years) Group	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+
U.Sborn Non-Hispanic White (n=198,297)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Foreign-born Non-Hispanic White (n=8,857)	0.93 (0.71- 1.23)	1.33 (1.13- 1.56)	0.89 (0.80- 1.00)	1.08 (0.95- 1.22)	1.13 (1.05- 1.21)	0.96 (0.91- 1.01)	1.24 (0.80- 1.92)	1.12 (0.79- 1.59)	0.96 (0.82- 1.13)	0.98 (0.74- 1.31)	1.24 (1.06- 1.44)	1.04 (0.92- 1.17)	1.11 (0.79- 1.56)	1.44 (1.24- 1.68)	1.20 (1.10- 1.31)	1.02 (0.89- 1.16)	1.15 (1.07- 1.25)	1.00 (0.92- 1.08)	1.64 (0.95- 2.85)	1.64 (1.21- 2.22)	1.22 (1.03- 1.44)
Mexican																					
Overall (n=30,100)	0.78 (0.69- 0.89)	0.69 (0.62- 0.76)	0.98 (0.87- 1.10)	0.88 (0.83- 0.93)	0.87 (0.83- 0.90)	0.96 (0.91- 1.02)	0.96 (0.80- 1.15)	0.72 (0.61- 0.87)	0.86 (0.75- 0.98)	0.81 (0.76- 0.86)	0.66 (0.60- 0.73)	0.92 (0.83- 1.01)	0.65 (0.61- 0.69)	0.58 (0.53- 0.64)	0.71 (0.64- 0.78)	0.95 (0.92- 0.99)	0.88 (0.84- 0.92)	0.93 (0.87- 1.00)	0.50 (0.44- 0.56)	0.41 (0.33- 0.51)	0.61 (0.52- 0.72)
U.Sborn (yes) (n=14.282)	1.03 (0.90- 1.18)	1.03 (0.91- 1.15)	1.14 (1.01- 1.27)	1.00 (0.93- 1.06)	1.09 (1.03- 1.15)	1.06 (0.99- 1.13)	1.04 (0.85- 1.26)	0.85 (0.67- 1.09)	0.96 (0.81- 1.13)	0.96 (0.89- 1.03)	0.81 (0.73- 0.91)	1.01 (0.90- 1.15)	0.77 (0.71- 0.82)	0.73 (0.65- 0.82)	0.84 (0.75- 0.95)	1.02 (0.98- 1.06)	0.96 (0.91- 1.03)	1.00 (0.92- 1.09)	0.61 (0.53- 0.70)	0.64 (0.51- 0.80)	0.64 (0.54- 0.76)
U.Sborn (no) (<i>n</i> =15,818)	0.43 (0.34- 0.54)	0.48 (0.41- 0.55)	0.82 (0.68- 0.98)	0.67 (0.61- 0.74)	0.69 (0.65- 0.74)	0.86 (0.79- 0.93)	0.81 (0.62- 1.06)	0.65 (0.51- 0.82)	0.76 (0.63- 0.92)	0.63 (0.58- 0.69)	0.54 (0.46- 0.62)	0.80 (0.69- 0.93)	0.51 (0.47- 0.56)	0.46 (0.40- 0.52)	0.57 (0.50- 0.65)	0.86 (0.82- 0.91)	0.79 (0.74- 0.85)	0.85 (0.77- 0.94)	0.36 (0.29- 0.43)	0.22 (0.15- 0.32)	0.57 (0.44- 0.75)
Puerto Rican																					<u> </u>
Overall (n=5,077)	1.47 (1.17- 1.83)	1.30 (1.12- 1.51)	1.56 (1.36- 1.78)	1.26 (1.13- 1.39)	1.15 (1.07- 1.24)	1.27 (1.18- 1.36)	1.28 (0.94- 1.75)	0.88 (0.64-	0.88 (0.69- 1.14)	1.12 (1.01- 1.23)	0.93 (0.78- 1.11)	1.35 (1.18- 1.56)	0.92 (0.84-	0.92 (0.77-	0.92 (0.80- 1.07)	1.04 (0.97- 1.10)	0.97 (0.87- 1.07)	1.04 (0.93- 1.17)	0.98 (0.84- 1.15)	0.83 (0.62- 1.12)	1.15 (0.93- 1.40)
U.Sborn (yes) (n=2,544)	1.53 (1.19- 1.96)	1.47 (1.24- 1.74)	1.55 (1.17- 2.06)	1.26 (1.12- 1.42)	1.25 (1.15- 1.36)	1.28 (1.11- 1.48)	1.36 (0.97- 1.91)	1.00 (0.66- 1.54)	0.64 (0.35- 1.19)	1.14 (0.99- 1.31)	0.93 (0.75- 1.14)	1.49 (1.20- 1.86)	0.98 (0.85- 1.12)	1.02 (0.82- 1.25)	1.01 (0.79- 1.28)	1.08 (0.99- 1.18)	0.99 (0.87- 1.12)	1.11 (0.94- 1.31)	0.93 (0.74- 1.17)	0.79 (0.52- 1.19)	1.25 (0.92- 1.69)
U.Sborn (no) (<i>n</i> =2,533)	1.27 (0.86- 1.87)	1.08 (0.85- 1.38)	1.56 (1.34- 1.81)	1.23 (1.01- 1.51)	1.01 (0.90- 1.14)	1.26 (1.16- 1.37)	1.03 (0.53- 2.02)	0.75 (0.47- 1.18)	0.96 (0.74- 1.25)	1.09 (0.94- 1.25)	0.95 (0.73- 1.22)	1.27 (1.06- 1.51)	0.86 (0.75- 0.99)	0.77 (0.58- 1.02)	0.87 (0.73- 1.03)	0.98 (0.88- 1.08)	0.94 (0.80- 1.10)	1.00 (0.87- 1.14)	1.04 (0.85- 1.27)	0.90 (0.60- 1.35)	1.08 (0.85- 1.37)
Cuban																					
Overall (n=2,518)	0.69 (0.40- 1.17)	0.66 (0.50- 0.86)	1.08 (0.87- 1.34)	0.75 (0.59- 0.95)	0.79 (0.67- 0.93)	1.06 (0.96- 1.18)	0.64 (0.32- 1.26)	0.69 (0.42- 1.14)	0.71 (0.55- 0.93)	0.78 (0.63- 0.97)	0.72 (0.52- 1.00)	1.00 (0.79- 1.26)	0.70 (0.59- 0.84)	0.73 (0.56- 0.94)	0.73 (0.58- 0.91)	0.91 (0.83- 1.01)	0.81 (0.70- 0.94)	0.98 (0.84- 1.14)	0.69 (0.53- 0.90)	0.66 (0.43- 1.04 <u>)</u>	0.76 (0.56- 1.04)

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U.Sborn Cuban (yes) (n=559)	0.81 (0.47- 1.42)	0.83 (0.49- 1.41)	1.65 (0.93- 2.94)	0.98 (0.76- 1.26)	1.11 (0.91- 1.35)	1.04 (0.69- 1.57)	0.93 (0.39- 2.23)	0.45 (0.14- 1.41)	0.21 (0.03- 1.53)	1.05 (0.78- 1.41)	1.11 (0.72- 1.71)	1.54 (0.85- 2.78)	0.91 (0.68- 1.22)	1.02 (0.68- 1.53)	1.04 (0.62- 1.75)	1.05 (0.87- 1.26)	0.94 (0.72- 1.24)	0.99 (0.61- 1.63)	0.91 (0.52- 1.60)	1.53 (0.83- 2.80)	0.63 (0.26- 1.49)
U.Sborn Cuban (no) (n=1 959)	0.59 (0.24- 1.43)	0.61 (0.44- 0.84)	1.03 (0.81- 1.31)	0.48 (0.31- 0.75)	0.67 (0.53- 0.83)	1.06 (0.95- 1.18)	0.32 (0.08- 1.34)	0.75 (0.42- 1.34)	0.74 (0.56- 0.96)	0.70 (0.53- 0.93)	0.57 (0.35- 0.95)	0.94 (0.74- 1.20)	0.64 (0.50- 0.81)	0.61 (0.41- 0.90)	0.69 (0.54- 0.89)	0.87 (0.78- 0.97)	0.76 (0.64- 0.89)	0.98 (0.83- 1.16)	0.62 (0.44- 0.88)	0.30 (0.13- 0.66)	0.77 (0.56- 1.07)
Dominican																					
Overall (<i>n</i> =1,658)	0.64 (0.41- 0.99)	0.90 (0.68- 1.19)	1.18 (0.95- 1.46)	0.81 (0.62- 1.05)	0.94 (0.82- 1.08)	1.02 (0.89- 1.17)	1.32 (0.73- 2.36)	0.48 (0.22- 1.03)	0.42 (0.21- 0.84)	0.80 (0.66- 0.97)	0.69 (0.47- 1.01)	0.90 (0.68- 1.18)	0.68 (0.55- 0.83)	0.51 (0.33- 0.77)	0.71 (0.53- 0.96)	0.98 (0.86- 1.11)	0.79 (0.65- 0.97)	1.12 (0.94- 1.34)	0.79 (0.53- 1.18)	0.37 (0.20- 0.69)	1.31 (0.82- 2.07)
U.Sborn (yes) (n=264)	0.63 (0.31- 1.30)	2.17 (1.33- 3.55)	1.65 (0.41- 6.68)	0.87 (0.58- 1.31)	1.62 (1.30- 2.02)	0.98 (0.43- 2.20)	1.32 (0.52- 3.33)	2.50 (0.76- 8.25)	NE	0.78 (0.50- 1.21)	0.88 (0.44- 1.76)	0.82 (0.12- 5.75)	0.85 (0.56- 1.28)	1.05 (0.55- 2.02)	0.46 (0.07- 3.02)	1.06 (0.82- 1.36)	1.05 (0.77- 1.42)	1.60 (0.70- 3.67)	0.50 (0.24- 1.02)	1.26 (0.52- 3.02)	0.69 (0.08- 5.75)
U.Sborn (no) (<i>n</i> =1,394)	0.63 (0.37- 1.08)	0.76 (0.55- 1.04)	1.16 (0.94- 1.44)	0.75 (0.55- 1.03)	0.84 (0.72- 0.99)	1.02 (0.89- 1.17)	1.31 (0.64- 2.68)	0.33 (0.12- 0.87)	0.44 (0.22- 0.87)	0.80 (0.65- 0.99)	0.66 (0.44- 0.97)	0.90 (0.69- 1.18)	0.63 (0.50- 0.81)	0.41 (0.26- 0.64)	0.72 (0.54- 0.96)	0.96 (0.82- 1.12)	0.75 (0.59- 0.94)	1.11 (0.91- 1.35)	0.87 (0.56- 1.35)	0.20 (0.09- 0.47)	1.33 (0.84- 2.12)
Central/South American																					
Overall (<i>n</i> =8,162)	0.90 (0.72- 1.12)	0.72 (0.62- 0.84)	0.92 (0.78- 1.09)	0.97 (0.87- 1.08)	0.92 (0.86- 0.99)	0.99 (0.91- 1.07)	0.90 (0.63- 1.27)	0.63 (0.45- 0.87)	0.51 (0.36- 0.72)	0.81 (0.71- 0.92)	0.70 (0.58- 0.85)	0.85 (0.71- 1.02)	0.65 (0.58- 0.73)	0.55 (0.46- 0.66)	0.66 (0.55- 0.79)	0.93 (0.88- 0.99)	0.85 (0.79- 0.93)	0.91 (0.81- 1.02)	0.41 (0.33- 0.52)	0.33 (0.21- 0.51)	0.50 (0.38- 0.67)
U.Sborn Central/South American (yes) (<i>n</i> =1,113)	1.31 (0.94- 1.82)	1.52 (1.07- 2.16)	0.98 (0.43- 2.25)	1.19 (1.02- 1.40)	1.23 (1.04- 1.45)	1.02 (0.65- 1.58)	0.82 (0.48- 1.40)	0.96 (0.34- 2.74)	0.36 (0.08- 1.54)	1.26 (1.01- 1.55)	1.28 (0.90- 1.83)	1.66 (1.01- 2.73)	0.87 (0.65- 1.15)	0.73 (0.53- 1.03)	0.93 (0.53- 1.63)	1.10 (0.97- 1.25)	1.02 (0.84- 1.23)	0.80 (0.46- 1.41)	0.52 (0.30- 0.89)	0.23 (0.11- 0.49)	1.41 (0.67- 2.95)
U.Sborn Central/South American (no) (n=7,049)	0.73 (0.56- 0.96)	0.65 (0.55- 0.77)	0.92 (0.77- 1.09)	0.86 (0.76- 0.98)	0.89 (0.83- 0.96)	0.99 (0.91- 1.07)	0.93 (0.61- 1.41)	0.61 (0.44- 0.85)	0.51 (0.36- 0.73)	0.72 (0.63- 0.82)	0.63 (0.51- 0.78)	0.83 (0.69- 0.99)	0.61 (0.54- 0.69)	0.53 (0.43- 0.65)	0.65 (0.54- 0.78)	0.90 (0.84- 0.96)	0.83 (0.76- 0.91)	0.91 (0.81- 1.03)	0.40 (0.31- 0.51)	0.34 (0.22- 0.55)	0.47 (0.35- 0.64)

Abbreviations: ref (reference)

Adjusted for sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, <college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Supplemental Table S5. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to foreign-born non-Hispanic Whites, Stratified by Sex/Gender, National Health Interview Survey, 2004-2017 (N=56,372)

			,		1	Prevalence	e Ratio (95%	% Confiden	ce Interval)					
			Sleep D	Juration					Slee	p Quality ir	n the Past V	Veek		
		(referen	ce: recomn	nended (7-9	hours))									
							Trouble	e Falling	Trouble	Staying	Non-res	storative	Sleep Me	edication
	Very	Short	Sh	ort	Lo	ng	Asl	eep	Asl	eep	Sle	ер	U	se
	(≤5-h	ours)	(<7-h	ours)	(>9-h	ours)	(≥3 n	ights)	(≥3 n	ights)	(≥3 c	days)	(≥3 n	ights)
Group (n)	(n=4	,115)	(n=14	1,048)	(n=1	,586)	(n=3	,431)	(n=3	,520)	(n=7	,734)	(n=1	,073)
Sex/Gender	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Hispanic White (n=8,857)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref						
Mexican														
Overall (n=30,100)	1.23 (1.00-1.51)	1.00 (0.84-1.19)	1.14 (1.05-1.24)	1.09 (1.02-1.18)	1.26 (0.92-1.73)	0.90 (0.68-1.19)	0.87 (0.69-1.09)	0.97 (0.84-1.12)	0.85 (0.70-1.02)	0.87 (0.76-1.01)	1.15 (1.03-1.29)	0.99 (0.91-1.08)	1.03 (0.72-1.47)	0.85 (0.65-1.13)
U.Sborn (yes) (n=14,282)	1.31 (1.06-1.61)	1.06 (0.88-1.26)	1.23 (1.12-1.35)	1.15 (1.06-1.24)	1.20 (0.86-1.68)	0.91 (0.69-1.20)	1.00 (0.79-1.27)	1.00 (0.85-1.17)	1.03 (0.84-1.27)	0.92 (0.78-1.08)	1.17 (1.04-1.31)	0.99 (0.90-1.09)	1.06 (0.75-1.50)	0.91 (0.69-1.22)
U.Sborn (no) (n=15 818)	0.99 (0.73-1.34)	0.80	1.00 (0.89-1.12)	0.96 (0.87-1.07)	1.20 (0.82-1.76)	0.92	0.71 (0.52-0.96)	0.86 (0.71-1.05)	0.62 (0.48-0.79)	0.80 (0.66-0.98)	1.07 (0.92-1.24)	0.97 (0.87-1.08)	0.80	0.64 (0.42-0.99)
Puerto Rican	,	· · · ·					, , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , ,		, ,	,	, ,	· · · · · · · · · · · · · · · · · · ·	, , , , , , , , , , , , , , , , , , ,
	1.84	1.64	1.39	1.29	1.27	0.97	1.13	1.24	1.26	1.04	1.02	1.08	1.62	1.19
Overall (n=5,077)	(1.46-2.30)	(1.36-1.99)	(1.26-1.54)	(1.17-1.42)	(0.90-1.81)	(0.71-1.33)	(0.88-1.47)	(1.05-1.47)	(0.99-1.60)	(0.88-1.22)	(0.88-1.18)	(0.97-1.20)	(1.11-2.37)	(0.92-1.56)
U.Sborn (yes)	1.83	1.79	1.43	1.32	1.63	1.11	1.05	1.32	1.36	1.08	0.96	1.12	1.68	1.12
(n=2,544)	(1.37-2.45)	(1.39-2.29)	(1.26-1.62)	(1.19-1.49)	(0.99-2.70)	(0.74-1.66)	(0.75-1.47)	(1.07-1.62)	(1.00-1.85)	(0.88-1.33)	(0.80-1.16)	(0.99-1.26)	(1.08-2.63)	(0.81-1.55)
U.Sborn (no)	1.77	1.44	1.33	1.20	1.07	0.92	1.24	1.20	1.15	1.02	1.10	1.02	1.74	1.31
(n=2,533)	(1.31-2.37)	(1.15-1.81)	(1.17-1.51)	(1.07-1.35)	(0.70-1.65)	(0.64-1.34)	(0.91-1.68)	(0.97-1.48)	(0.85-1.55)	(0.83-1.26)	(0.91-1.33)	(0.89-1.18)	(1.06-2.83)	(0.95-1.81)
Cuban	1.01	0.02	0.05	1.02	0.91	050	0.01	0.06	0.00	0.07	1.02	1.07	0.08	1 1 2
Overall (n=2,518)	(0.71-1.45)	(0.68-1.26)	(0.81-1.12)	(0.88-1.17)	(0.47-1.39)	(0.35-0.91)	(0.65-1.36)	(0.72-1.30)	(0.66-1.22)	(0.74-1.28)	(0.83-1.24)	(0.88-1.28)	(0.57-1.70)	(0.75-1.69)
U.Sborn Cuban (yes)	0.93	1.11	1.12	1.16	0.59	1.05	1.14	1.18	1.28	1.04	0.98	1.13	0.85	2.09
(n=559)	(0.48-1.80)	(0.71-1.74)	(0.88-1.43)	(0.93-1.44)	(0.19-1.85)	(0.43-2.52)	(0.64-2.02)	(0.76-1.83)	(0.79-2.09)	(0.63-1.73)	(0.72-1.35)	(0.86-1.49)	(0.24-2.99)	(1.08-4.01)
U.Sborn Cuban (no) (n=1.959)	1.04 (0.70-1.57)	0.85 (0.59-1.22)	0.89 (0.74-1.08)	0.96 (0.81-1.13)	0.85 (0.49-1.49)	0.47 (0.27-0.80)	0.83 (0.52-1.32)	0.86 (0.60-1.23)	0.76 (0.54-1.07)	0.94 (0.66-1.35)	1.02 (0.81-1.29)	1.05 (0.85-1.31)	1.01 (0.55-1.85)	0.87 (0.55-1.38)
Dominican														
	1.21	1.07	1.00	1.03	1.39	0.61	0.76	0.97	0.77	0.99	1.01	0.98	1.11	0.94
Overall (<i>n</i> =1,658)	(0.81-1.78)	(0.79-1.43)	(0.83-1.21)	(0.87-1.21)	(0.81-2.40)	(0.27-1.38)	(0.47-1.23)	(0.73-1.29)	(0.47-1.27)	(0.72-1.36)	(0.80-1.26)	(0.82-1.17)	(0.54-2.29)	(0.59-1.51)
U.Sborn (yes)	1.61		1.05	1.42	1.40	2.40	1.06	0.72	1.30	1.18	1.10	0.97	1.88	0.68
$\frac{(11=204)}{115}$	(0.70-3.30)	(0.00-2.20)	(0.73-1.52)	(1.04-1.95)	(0.32-0.12)	(0.03-0.93)	(0.02-2.17)	(0.40-1.31)	(0.01-0.04)	(0.04-2.16)	(0.72-1.07)	(0.00-1.37)	(0.07-0.19)	(0.23-1.90)
0.3DOFN (NO) (n=1 304)	1.09	1.04 (0.77_1.30)	0.99	0.92 (0.78_1.00)	1.42 (0.79-2.54)	0.34	0.67	1.03	0.65	0.96	0.99	0.98	0.96	0.98
(II-1,394) Central/South American	(0.72-1.04)	(0.77-1.00)	(0.01-1.21)	(0.70-1.03)	(0.75-2.54)	(0.10-0.72)	(0.00-1.10)	(0.70-1.40)	(0.00-1.17)	(0.00-1.00)	(0.7 - 1.32)	(0.01-1.13)	(0.70-2.14)	(0.00-1.00)
	1									•				

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	1.12	0.91	1.17	1.02	0.92	0.68	0.86	1.01	0.77	0.99	1.02	1.03	0.62	0.73
Overall (<i>n</i> =8,162)	(0.87-1.45)	(0.76-1.10)	(1.06-1.30)	(0.93-1.12)	(0.56-1.51)	(0.48-0.94)	(0.63-1.16)	(0.83-1.24)	(0.59-1.01)	(0.81-1.21)	(0.89-1.16)	(0.93-1.14)	(0.39-0.99)	(0.51-1.06)
U.Sborn Central/South	4.00	4.00	4.45	4 4 5	0.70	4.00	4.04	4 47	0.00	4.40	4.05	4.44	4.50	0.07
American (yes)	1.62	1.20	1.45	1.15	0.76	1.22		1.47		1.43	1.05		1.50	
(n=1,113)	(1.03-2.54)	(0.86-1.84)	(1.21-1.74)	(0.95-1.38)	(0.34-1.70)	(0.64-2.30)	(0.01-1.07)	(1.09-1.99)	(0.51-1.30)	(1.03-1.99)	(0.83-1.33)	(0.93-1.31)	(0.72-3.38)	(0.31-1.45)
U.Sborn Central/South	1.02	0.84	1.13	0.99	0.98	0.65	0.79	0.90	0.77	0.90	1.00	1.01	0.48	0.74
American (no) (n=7,049)	(0.78-1.35)	(0.69-1.04)	(1.02-1.25)	(0.89-1.09)	(0.58-1.67)	(0.45-0.93)	(0.57-1.09)	(0.72-1.11)	(0.58-1.02)	(0.74-1.11)	(0.86-1.15)	(0.91-1.12)	(0.29-0.79)	(0.50-1.10)

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Supplemental Table S6. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to foreign-born non-Hispanic Whites, Stratified by Age Group, National Health Interview Survey, 2004-2017 (N=56,372)

					•••	· · · ·		Pr	evalenc	e Ratio	(95% Co	onfidenc	ce Interv	al)							
			(refere	Sle	ep Durat	ion	houre))							Sleep C	Quality in	n the Pa	st Week				
Group (n)	(/ery Sho ≤5-hours (n=4,115	ort S)	(Short <7-hours	5)	(3	Long >9-hours	5)	Tro (2	uble Fal Asleep ≥3 nights (n=3 431	ling s)	Tro	uble Sta Asleep ≥3 nights (n=3.520	ying s)	Nor	n-restora Sleep (≥3 days (n=7,734	itive)	Slee (2	p Medica Use ≥3 nights n=1.073	ation s)
Age (years) Group	18-30	31-49	, 50+	18-30	31-49	50+	18-30	31-49	, 50+	18-30	31-49	, 50+	18-30	31-49	, 50+	18-30	31-49	, 50+	18-30	31-49	50+
Foreign-born Non-Hispanic White (n=8,857)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref										
Mexican Overall	1.04 (0.76-	1.26 (1.00-	0.99 (0.83-	1.15 (0.99-	1.17 (1.08-	1.03 (0.94-	1.51 (0.96-	1.02 (0.65-	0.79 (0.60-	0.97 (0.71-	0.81 (0.67-	1.01 (0.84-	0.97 (0.67-	0.82 (0.67-	0.90 (0.78-	1.09 (0.93-	1.10 (0.99-	1.04 (0.93-	1.17 (0.59-	0.81 (0.51-	0.89 (0.70-
(<i>n=30,100</i>) U.Sborn (yes) (<i>n=14,282</i>)	1.44) 1.12 (0.80- 1.58)	1.58) 1.43 (1.14- 1.81)	1.19) 1.02 (0.86- 1.21)	1.33) 1.19 (1.02- 1.39)	1.28) 1.31 (1.20- 1.43)	1.13) 1.07 (0.97- 1.17)	2.38) 1.45 (0.93- 2.26)	1.61) 1.06 (0.64- 1.75)	1.04) 0.81 (0.61- 1.07)	1.32) 1.07 (0.77- 1.48)	0.98) 0.93 (0.75- 1.15)	1.21) 1.02 (0.84- 1.25)	1.40) 1.08 (0.73- 1.60)	1.01) 0.94 (0.75- 1.17)	1.04) 0.98 (0.84- 1.16)	1.27) 1.06 (0.90- 1.24)	1.21) 1.13 (1.01- 1.26)	1.17) 1.04 (0.92- 1.18)	2.32) 1.44 (0.70- 2.95)	1.28) 1.02 (0.63- 1.63)	1.15) 0.85 (0.66- 1.11)
(n-1+2,2,2) U.Sborn (no) (n=15,818)	0.84 (0.54- 1.29)	0.97 (0.72- 1.30)	0.87 (0.64- 1.17)	0.96 (0.77- 1.20)	1.03 (0.92- 1.16)	0.94 (0.83- 1.07)	1.67 (0.99- 2.82)	1.04 (0.62- 1.74)	0.67 (0.47- 0.94)	0.76 (0.53- 1.10)	0.71 (0.54- 0.92)	0.91 (0.72- 1.15)	0.85 (0.54- 1.32)	0.65 (0.50- 0.85)	0.76 (0.62- 0.93)	1.12 (0.92- 1.37)	1.01 (0.89- 1.15)	1.01 (0.87- 1.19)	NE	0.41 (0.22- 0.76)	0.91 (0.60- 1.39)
Puerto Rican																					
Overall (n=5,077)	1.87 (1.24- 2.81)	1.92 (1.49- 2.47)	1.58 (1.32- 1.90)	1.44 (1.20- 1.73)	1.37 (1.22- 1.53)	1.27 (1.15- 1.40)	1.67 (0.92- 3.02)	1.30 (0.78- 2.14)	0.80 (0.59- 1.09)	1.01 (0.71- 1.45)	1.07 (0.82- 1.39)	1.45 (1.18- 1.78)	1.05 (0.67- 1.64)	1.21 (0.92- 1.58)	1.14 (0.95- 1.37)	1.03 (0.85- 1.25)	1.07 (0.92- 1.25)	1.13 (0.98- 1.32)	1.61 (0.87- 2.96)	1.20 (0.78- 1.86)	1.30 (1.00- 1.68)
U.Sborn (yes) (n=2,544)	1.88 (1.22- 2.90)	2.08 (1.59- 2.72)	1.56 (1.14- 2.13)	1.40 (1.15- 1.70)	1.43 (1.27- 1.62)	1.27 (1.08- 1.49)	1.71 (0.91- 3.19)	1.51 (0.85- 2.68)	0.58 (0.31- 1.07)	1.11 (0.76- 1.63)	1.01 (0.75- 1.35)	1.61 (1.23- 2.11)	1.02 (0.62- 1.67)	1.28 (0.94- 1.75)	1.25 (0.95- 1.65)	1.06 (0.87- 1.29)	1.07 (0.90- 1.27)	1.17 (0.97- 1.42)	1.33 (0.66- 2.69)	0.99 (0.65- 1.51)	1.34 (0.95- 1.91)
U.Sborn (no) (n=2,533)	1.69 (0.99- 2.88)	1.51 (1.04- 2.20)	1.61 (1.31- 1.97)	1.38 (1.05- 1.79)	1.20 (1.02- 1.42)	1.27 (1.14- 1.42)	0.77 (0.37- 1.58)	1.25 (0.68- 2.32)	0.87 (0.63- 1.21)	0.87 (0.49- 1.53)	1.22 (0.87- 1.71)	1.40 (1.11- 1.78)	1.17 (0.62- 2.22)	1.08 (0.76- 1.53)	1.09 (0.88- 1.33)	1.01 (0.75- 1.37)	1.08 (0.89- 1.32)	1.12 (0.94- 1.33)	NE	1.59 (0.90- 2.84)	1.27 (0.93- 1.73)
Cuban	0.77	0.00	4.00	0.77	1.01	1.00		0.00		0.40	1.00	4.40	0.50	1.05	0.00	0.00	0.07			4.50	1.00
Overall (n=2,518)	0.77 (0.37- 1.58)	0.99 (0.67- 1.47)	1.02 (0.74- 1.40)	0.77 (0.56- 1.04)	(0.84- 1.21)	(0.90- 1.19)	NE	0.92 (0.42- 2.03)	0.55 (0.37- 0.81)	0.42 (0.21- 0.85)	(0.67- 1.51)	1.10 (0.81- 1.50)	0.58 (0.26- 1.31)	(0.75- 1.47)	0.98 (0.76- 1.27)	0.99 (0.73- 1.34)	0.97 (0.80- 1.18)	(0.91- 1.34)	NE	(0.77- 3.23)	(0.71- 1.58)
U.Sborn Cuban (yes) (<i>n=559</i>)	0.70 (0.34- 1.44)	1.11 (0.61- 2.00)	1.45 (0.81- 2.59)	0.97 (0.71- 1.33)	1.28 (1.03- 1.58)	0.97 (0.64- 1.48)	NE	0.59 (0.14- 2.51)	0.16 (0.02- 1.23)	0.73 (0.38- 1.40)	1.39 (0.85- 2.27)	1.64 (0.88- 3.08)	0.90 (0.42- 1.91)	1.37 (0.84- 2.22)	1.27 (0.76- 2.11)	1.08 (0.78- 1.50)	1.05 (0.79- 1.38)	0.98 (0.57- 1.68)	NE	2.92 (1.39- 6.12)	0.75 (0.31- 1.83)

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oorn0.8n (no)(0.2059)2.2	1.060.570.080.791.040.150.890.950.87(0.43-(0.39-(0.01-(0.44-(0.76-(0.03-(0.55-(0.71-(0.55-2.64)0.84)0.61)1.39)1.43)0.72)1.44)1.27)1.36)	1.14 (0.93- 1.40)0.75 (0.25- 2.23)1.10 (0.72- 1.69)
ninican		
0.8 (0.4 (0.4 (0.4) (0.4)	0.92 0.41 0.80 0.92 1.00 1.22 0.74 1.00 0.96 (0.36- (0.19- (0.46- (0.58- (0.72- (0.63- (0.44- (0.72- (0.72- 2.39 0.85 1.39 1.44 1.39 2.35 1.24 1.39 1.29	1.25 0.58 1.33 (1.01- NE (0.28- (0.79- 1.56) 1.23) 2.23)
0.8 (0.3 (0.3 (0.3	4.28 (1.23- 14.91) 0.81 (0.41- 1.63) 1.09 (0.52- 2.33) 0.91 (0.14- 6.03) 1.22 (0.62- 2.39) 1.53 (0.62- 3.03) 0.60 (0.77- 3.03) 0.93 (0.84- 4.34) 4.28 1.63) 2.33) 6.03) 2.39) 3.03) 4.34) 1.37)	1.74 (0.73- 4.13)2.01 NE0.69 (0.76- 5.34)1.74 (0.76- 5.34)0.69 (0.08- 6.05)
90rn 0.7 (0.4 (0.4) (0.4) (0.4)	0.59 0.43 0.77 0.86 1.00 1.16 0.60 1.01 1.04 (0.20- (0.20- (0.37- (0.53- (0.72- (0.41- (0.34- (0.73- (0.70- 1.76) 0.90) 1.63) 1.39) 1.39) 3.31) 1.06) 1.41) 1.54)	1.24 (0.98- 1.57) 0.31 (0.13- 0.73) 1.36 (0.80- 2.30)
al/South erican		
1.0 (0.6 (62) 1.5	0.91 0.42 0.83 1.04 0.94 1.07 0.84 0.83 1.06 (0.54- (0.26- (0.59- (0.78- (0.75- (0.72- (0.65- (0.67- (0.89- 1.54) 0.67) 1.17) 1.39) 1.17) 1.59) 1.09) 1.02) 1.25)	1.02 0.65 0.65 (0.88- NE (0.38- (0.46- 1.18) 1.12) 0.90)
oorn al/South 1.2 ican (0.7 1.9	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.81 (0.47- 1.40) 0.31 NE 1.79 (0.13- 0.69) 0.31 1.79 (0.86- 3.70)
oorn al/South 0.8 (0.5 (0.5 1.4 n=7,049)	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.03 (0.89- 1.19) NE 0.75 (0.41- 1.38) 0.60 (0.42- 0.84)
13) orn al/South ican n=7,049) iations: ref (ref	0.92 0.42 0.67 0.94 0.90 0.95 0.83 0.81 1.00 (0.53- (0.26- (0.44- (0.68- (0.71- (0.59- (0.62- (0.65- (0.81- 1.61) 0.68) 1.03) 1.32) 1.13) 1.52) 1.11) 1.01) 1.24)	1.03 (0.89- NE 1.19)

Abbreviations: ref (reference)

Adjusted for sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (>2 drinks/day for women and >3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score >13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

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Supplemental Table S7. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to US-born non-Hispanic Whites by Language Acculturation Status*, Stratified by Sex/Gender, National Health Interview Survey, 2004-2017 (N=245,812)

· · · · · · · · · · · · · · · · · · ·						Prevalence	e Ratio (95%	, % Confiden	ce Interval)						
			Sleep D	Juration					Slee	p Quality ir	n the Past V	Veek			
		(referen	ce: recomm	nended (7-9	hours))				1				1		
							Trouble	e Falling	Trouble	Staying	Non-res	storative	Sleep Me	edication	
	Very	Short	Sh	ort	Lo	ng	Asl	еер	Asl	eep	Sle	ep			
	(≤5-h	ours)	(<7-h	ours)	(>9-h	ours)	(≥3 n	ights)	(≥3 n	ights)	(≥3 c	days)	(≥3 nights)		
Group (n)	(n=1/	(,112)	(n=61	1,091)	(n=/	,604)	(n=18	3,607)	(n=26	5,493)	(n=38	3,369)	(n=10,024)		
Sex/Gender	Men	women	Men	women	Men	women	Men	women	Men	women	Men	women	Men	women	
U.Sborn Non-Hispanic	, c		c											<i>c</i>	
	ret	ret	ret	ret	ret	ret	ret	ret	ret	ret	ret	ret	ret	ret	
(n=198,297)															
Mexican															
U.Sborn (yes)	1.02			1.07	1.09	0.88		0.92	0.80	0.77		0.95	0.66	0.59	
(n=14,282)	(0.91-1.14)	(0.90-1.13)	(0.90-1.07)	(1.03-1.12)	(0.91-1.31)	(0.75-1.03)	(0.65-0.99)	(0.84-1.00)	(0.74-0.86)	(0.71-0.85)	(0.93-1.01)	(0.90-1.00)	(0.56-0.76)	(0.50-0.70)	
(n=13,075)	1.05	1.08	1.04 (0.98-1.10)	1.09 (1.05-1.14)	1.12	0.86	0.94	0.95	0.86	0.80	1.01	0.97	0.78	0.63 (0.53-0.75)	
(1=13,073) Modium/Low	(0.00 1.10)	(0.00 1.10)	(0.00 1.10)	(1.00 1.14)	(0.00 1.00)		(0.01 1.00)			(0.10 0.00)	(0.00 1.00)	(0.02 1.02)	(0.02 0.00)		
Acculturation	0.75	0.79	0.71	0.84	0.89	0.97	0.63	0.59	0.46	0.43	0.82	0.75	0.56	0.15	
(n=1 188)	(0.56-1.01)	(0.58-1.09)	(0.60-0.85)	(0.70-1.00)	(0.58-1.38)	(0.60-1.59)	(0.40-1.00)	(0.43-0.83)	(0.28-0.74)	(0.29-0.64)	(0.64-1.04)	(0.61-0.92)	(0.29-1.08)	(0.06-0.40)	
U.Sborn (no)	0.47	0.60	0.66	0.77	0.83	0.65	0.60	0.64	0.51	0.55	0.82	0.85	0.36	0.34	
(n=15,818)	(0.40-0.54)	(0.52-0.69)	(0.62-0.70)	(0.71-0.82)	(0.70-0.99)	(0.54-0.78)	(0.55-0.66)	(0.58-0.71)	(0.46-0.55)	(0.49-0.62)	(0.77-0.86)	(0.80-0.90)	(0.30-0.44)	(0.27-0.42)	
High Acculturation	0.59	0.69	0.76	0.81	0.88	0.69	0.57	0.70	0.47	0.59	0.83	0.90	0.30	0.40	
(n=6,141)	(0.50-0.70)	(0.58-0.83)	(0.71-0.82)	(0.74-0.88)	(0.68-1.14)	(0.52-0.91)	(0.46-0.69)	(0.61-0.81)	(0.39-0.58)	(0.50-0.69)	(0.75-0.92)	(0.83-0.98)	(0.19-0.47)	(0.29-0.57)	
Medium/Low	0.38	0.54	0.57	0.73	0.81	0.61	0.53	0.58	0.44	0.52	0.71	0.78	0.45	0.29	
Acculturation	(0.31-0.46)	(0.45-0.64)	(0.53-0.62)	(0.66-0.80)	(0.66-1.00)	(0.49-0.75)	(0.43-0.66)	(0.50-0.67)	(0.36-0.53)	(0.44-0.60)	(0.64-0.79)	(0.72-0.85)	(0.31-0.67)	(0.21-0.39)	
(n=9,666)	, , , , , , , , , , , , , , , , , , ,	, ,	· · ·	, ,	, ,	, ,	· ,	· · ·		, ,	, ,	· · · ·	· · ·	, ,	
Puerto Rican															
U.Sborn (yes)	1.33	1.53	1.21	1.24	1.26	0.94	1.04	1.14	0.97	0.91	1.00	1.10	0.96	0.97	
(n=2,544)	(1.08-1.63)	(1.30-1.81)	(1.11-1.33)	(1.15-1.35)	(0.89-1.77)	(0.66-1.33)	(0.90-1.21)	(0.98-1.33)	(0.85-1.11)	(0.78-1.05)	(0.92-1.09)	(1.01-1.20)	(0.76-1.19)	(0.73-1.30)	
High Acculturation	1.36	1.59	1.22	1.26	1.32	0.98	0.93	1.17	1.08	0.92	0.92	1.11	1.00	1.00	
(n=2,359)	(1.11-1.00)	(1.34-1.69)	(1.11-1.34)	(1.10-1.37)	(0.93-1.66)	(0.00-1.40)	(0.72-1.21)	(1.00-1.36)	(0.64-1.39)	(0.79-1.07)	(0.79-1.06)	(1.02-1.22)	(0.69-1.44)	(0.74-1.35)	
Medium/Low	0.79	0.89	1.17	1.01	0.48	0.51	0.72	0.61	0.74	0.75	0.36	0.87	0.52	0.60	
	(0.36-1.74)	(0.56-1.42)	(0.83-1.65)	(0.73-1.40)	(0.10-2.30)	(0.19-1.31)	(0.32-1.66)	(0.32-1.16)	(0.35-1.54)	(0.39-1.44)	(0.16-0.81)	(0.55-1.39)	(0.10-2.77)	(0.17-2.10)	
(11-104)	4.00	4.00	4.45	4.40	0.00	0.00	1.05	1.01	0.04	0.00	0.05	0.00	1.01	1.00	
(n=2,533)	1.29 (1.03-1.61)	1.36	1.15 (1.04-1.27)	1.16	(0.63-1.26)	(0.72-1.28)	(0.91-1.21)	(0.86-1.18)	0.84 (0.73-0.97)	(0.70-0.97)	(0.86-1.04)	0.96 (0.85-1.08)	(0.83-1.24)	(0.86-1.35)	
High Acculturation	1,48	1.37	1,14	1.20	1.06	0.97	1.14	1.06	0.98	0.87	1.02	1.00	0.97	1.14	
(n=1,773)	(1.16-1.90)	(1.14-1.64)	(1.00-1.30)	(1.09-1.33)	(0.72-1.57)	(0.69-1.37)	(0.85-1.52)	(0.88-1.28)	(0.76-1.26)	(0.72-1.05)	(0.88-1.20)	(0.87-1.14)	(0.62-1.52)	(0.88-1.48)	
(n=1,773)	(1.16-1.90)	(1.14-1.64)	(1.00-1.30)	(1.09-1.33)	(0.72-1.57)	(0.69-1.37)	(0.85-1.52)	(0.88-1.28)	(0.76-1.26)	(0.72-1.05)	(0.88-1.20)	(0.87-1.14)	(0.62-1.52)	(0.88-1.48)	

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Medium/Low Acculturation (n=755)	0.81 (0.48-1.37)	1.32 (1.07-1.64)	1.15 (0.95-1.40)	1.05 (0.91-1.22)	0.57 (0.30-1.07)	0.96 (0.60-1.53)	1.16 (0.76-1.77)	0.86 (0.64-1.16)	0.60 (0.38-0.95)	0.69 (0.50-0.95)	0.73 (0.53-1.01)	0.84 (0.69-1.02)	0.87 (0.41-1.86)	0.92 (0.63-1.36)
	0.70	4.00	4.04	1.00	0.40	0.05	0.05	0.00	0.00	0.00	0.00	1.07	0.05	4.07
(n=559)	(0.44-1.39)	(0.74-1.58)	(0.81-1.25)	(0.89-1.31)	0.49 (0.18-1.29)	(0.39-2.31)	(0.70-1.28)	(0.66-1.39)	(0.69-1.23)	(0.53-1.31)	(0.80-1.16)	(0.86-1.34)	0.95 (0.54-1.66)	(0.78-2.42)
High Acculturation	0.89	1 16	1.08	1.05	0.29	1.06	1.34	1 17	1 24	0.84	0.93	1.03	0.53	1.30
(n=440)	(0.49-1.62)	(0.79-1.71)	(0.86-1.35)	(0.85-1.30)	(0.09-0.96)	(0.38-2.97)	(0.85-2.10)	(0.82-1.67)	(0.82-1.88)	(0.54-1.29)	(0.68-1.28)	(0.78-1.36)	(0.17-1.64)	(0.71-2.38)
Medium/Low Acculturation (n=119)	0.37 (0.11-1.22)	0.72 (0.21-2.46)	0.69 (0.40-1.20)	1.21 (0.71-2.06)	0.88 (0.20-3.91)	0.63 (0.16-2.51)	NE	0.27 (0.06-1.23)	0.28 (0.06-1.40)	0.82 (0.29-2.28)	0.76 (0.38-1.51)	1.21 (0.90-1.62)	0.25 (0.03-1.90)	1.65 (0.39-6.94)
U.Sborn Cuban (no) (n=1,959)	0.75 (0.56-1.00)	0.90 (0.69-1.18)	0.78 (0.67-0.91)	0.94 (0.82-1.07)	0.78 (0.57-1.05)	0.55 (0.35-0.87)	0.69 (0.52-0.92)	0.71 (0.52-0.98)	0.61 (0.48-0.78)	0.68 (0.50-0.94)	0.87 (0.77-0.97)	0.95 (0.80-1.13)	0.59 (0.42-0.83)	0.60 (0.40-0.89)
High Acculturation (n=571)	0.90 (0.54-1.51)	1.13 (0.70-1.82)	0.91 (0.68-1.22)	1.09 (0.89-1.34)	0.87 (0.48-1.58)	0.63 (0.30-1.34)	1.08 (0.64-1.82)	1.04 (0.68-1.59)	0.58 (0.36-0.91)	0.95 (0.62-1.46)	0.75 (0.53-1.04)	0.89 (0.65-1.23)	0.93 (0.43-2.01)	0.61 (0.30-1.25)
Medium/Low Acculturation (n=1,386)	0.68 (0.50-0.93)	0.82 (0.58-1.16)	0.71 (0.61-0.84)	0.87 (0.74-1.03)	0.71 (0.49-1.01)	0.53 (0.30-0.94)	0.52 (0.31-0.89)	0.64 (0.42-0.95)	0.56 (0.39-0.80)	0.61 (0.40-0.92)	0.84 (0.68-1.04)	1.00 (0.84-1.21)	0.46 (0.26-0.80)	0.60 (0.37-0.98)
Dominican														
U.Sborn (yes) (n=264)	1.13 (0.60-2.11)	1.02 (0.58-1.79)	0.86 (0.60-1.23)	1.32 (0.98-1.77)	0.96 (0.30-3.07)	1.35 (0.48-3.80)	0.73 (0.48-1.12)	0.62 (0.36-1.07)	0.97 (0.65-1.44)	0.91 (0.53-1.57)	0.99 (0.78-1.26)	0.93 (0.68-1.29)	0.64 (0.31-1.30)	0.57 (0.23-1.43)
High Acculturation (n=208)	1.30 (0.67-2.55)	1.00 (0.54-1.08)	0.94 (0.64-1.38)	1.38 (1.00-1.90)	1.32 (0.40-4.36)	1.36 (0.42-4.40)	1.01 (0.58-1.76)	0.62 (0.34-1.15)	1.12 (0.47-2.67)	0.79 (0.41-1.50)	1.10 (0.76-1.60)	0.90 (0.63-1.30)	0.80 (0.26-2.47)	0.56 (0.20-1.56)
Medium/Low Acculturation (n=56)	0.63 (0.12-3.25)	1.11 (0.34-3.57)	0.58 (0.23-1.47)	1.05 (0.56-1.97)	0.23 (0.03-1.74)	1.30 (0.19-8.81)	NE	0.62 (0.22-1.79)	NE	1.42 (0.69-2.94)	0.47 (0.11-1.96)	1.06 (0.61-1.84)	NE	0.62 (0.08-4.72)
U.Sborn (no) (n=1,394)	0.74 (0.52-1.04)	0.95 (0.78-1.15)	0.82 (0.69-0.97)	0.92 (0.81-1.04)	1.08 (0.63-1.85)	0.29 (0.15-0.53)	0.78 (0.63-0.97)	0.88 (0.69-1.12)	0.62 (0.49-0.80)	0.74 (0.57-0.97)	0.92 (0.79-1.08)	0.96 (0.83-1.13)	0.86 (0.55-1.34)	1.00 (0.61-1.63)
High Acculturation (n=594)	0.89 (0.56-1.39)	0.88 (0.63-1.24)	0.94 (0.75-1.18)	0.92 (0.76-1.11)	1.51 (0.67-3.40)	0.15 (0.06-0.35)	0.79 (0.44-1.40)	0.81 (0.54-1.22)	0.62 (0.31-1.21)	0.73 (0.48-1.11)	0.72 (0.51-1.00)	0.96 (0.75-1.23)	0.67 (0.21-2.10)	0.85 (0.43-1.70)
Medium/Low Acculturation (n=800)	0.63 (0.38-1.03)	0.98 (0.76-1.26)	0.72 (0.55-0.93)	0.91 (0.79-1.06)	0.90 (0.41-1.94)	0.36 (0.17-0.74)	0.34 (0.18-0.65)	0.94 (0.71-1.25)	0.22 (0.11-0.44)	0.76 (0.56-1.03)	0.96 (0.67-1.37)	0.97 (0.78-1.21)	0.38 (0.12-1.13)	1.13 (0.60-2.11)
Central/South American														
U.Sborn (yes) (n=1,113)	1.31 (0.92-1.87)	1.31 (0.96-1.77)	1.25 (1.08-1.45)	1.10 (0.92-1.30)	0.64 (0.35-1.16)	0.95 (0.52-1.74)	1.21 (0.96-1.53)	1.40 (1.06-1.86)	0.97 (0.73-1.30)	1.13 (0.80-1.61)	1.05 (0.92-1.20)	1.13 (0.97-1.32)	0.64 (0.38-1.10)	0.47 (0.24-0.94)
High Acculturation (n=994)	1.40 (0.97-2.04)	1.42 (1.04-1.94)	1.30 (1.11-1.51)	1.15 (0.97-1.36)	0.48 (0.22-1.07)	1.03 (0.53-2.00)	0.97 (0.64-1.47)	1.30 (1.04-1.63)	0.71 (0.46-1.10)	1.06 (0.82-1.37)	0.99 (0.80-1.23)	1.14 (1.00-1.30)	1.01 (0.45-2.27)	0.44 (0.21-0.90)
Medium/Low Acculturation	0.73 (0.29-1.83)	0.61 (0.22-1.69)	0.92 (0.51-1.64)	0.74 (0.36-1.52)	1.26 (0.51-3.12)	0.52 (0.11-2.62)	0.86 (0.27-2.75)	1.90 (0.87-4.12)	0.89 (0.24-3.25)	1.50 (0.48-4.75)	0.60 (0.28-1.32)	1.07 (0.61-1.87)	0.43 (0.06-3.19)	0.66 (0.11-3.91)

(n=119)														
U.Sborn	0.64	0.80	0.88	0.92	0.66	0.67	0.69	0.71	0.60	0.66	0.85	0.92	0.40	0.46
(no) (n=7,049)	(0.54-0.76)	(0.70-0.93)	(0.82-0.94)	(0.85-0.98)	(0.47-0.94)	(0.52-0.87)	(0.60-0.78)	(0.61-0.83)	(0.53-0.68)	(0.57-0.77)	(0.80-0.91)	(0.85-0.99)	(0.31-0.51)	(0.34-0.62)
High Acculturation	0.72	0.79	0.94	0.91	0.77	0.76	0.66	0.80	0.57	0.74	0.75	0.96	0.38	0.52
(n=3,366)	(0.57-0.91)	(0.63-0.98)	(0.85-1.04)	(0.82-1.02)	(0.50-1.17)	(0.53-1.11)	(0.50-0.88)	(0.64-0.98	(0.42-0.76)	(0.61-0.89)	(0.65-0.86)	(0.87-1.06)	(0.22-0.67)	(0.36-0.76)
Medium/Low	0.50	0.92	0.90	0.02	0.59	0.50	0.60	0.62	0.44	0.50	0.90	0.97	0.40	0.40
Acculturation	0.56	0.82	(0.72-0.89)	(0.84-1.00)	0.58	0.59	(0.60	0.63	0.44	0.59	(0.67-0.94)	0.87	(0.09-0.38)	(0.26-0.63)
(n=3,664)	(0.40-0.72)	(0.00-0.00)	(0.1.2-0.00)		(0.04-0.00)	(0.42-0.04)		(0.01-0.70)	(0.02-0.01)			(0.1.1-0.07)	(0.00-0.00)	(0.20-0.00)

Abbreviations: ref (reference); NE (non-estimable)

 * Language acculturation categories include high (English only interview) and medium/low (English and Spanish interview or Spanish only interview).

Adjusted for age (18-30, 31-49, 50-64, 65+ years), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years
 2013-2017.

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			<u>e.e.p</u> ;	Hutton				Pre	valence	e Ratio	95% Co	onfiden	ce Inter	val)							
				Sle	ep Dura	tion							;	Sleep Q	uality in	the Pa	st Weel	(
			(referen	ce: rec	ommen	ded (7-9) hours)		Tue	uble Fel		Tues		!	Nan		41	01.00	. Madia	
Group (n)	V (: (1	Very Short Short Long As (≤5-hours) (<7-hours) (>9-hours) (≥3 m (n=17,112) (n=61,091) (n=7,604) (n=1									Asleep Asleep (≥3 nights) (≥3 nights) (n=18,607) (n=26.493)					Non ((r	-restora Sleep ≥3 days ì=38,36	ative ;) 9)	Use (≥3 nights) (n=10,024)		
Age (years) Group	18- 30	31- 49	50+	18- 30	31- 49	50+	18- 30	31- 49	50+	18- 30	31- 49	50+	18- 30	31- 49	50+	18- 30	31- 49	50+	18- 30	31- 49	50+
U.Sborn Non-					-10								00						00		
Hispanic White (n=198,297)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Mexican																					
U.Sborn (yes) (n=14.282)	1.03 (0.90- 1.18)	1.03 (0.91- 1.15)	1.14 (1.01- 1.27)	1.00 (0.93- 1.06)	1.09 (1.03- 1.15)	1.06 (0.99- 1.13)	1.04 (0.85- 1.26)	0.85 (0.67- 1.09)	0.96 (0.81-	0.96 (0.89- 1.03)	0.81 (0.73- 0.91)	1.01 (0.90- 1.15)	0.77 (0.71- 0.82)	0.73 (0.65- 0.82)	0.84 (0.75- 0.95)	1.02 (0.98- 1.06)	0.96 (0.91- 1.03)	1.00 (0.92- 1.09)	0.61 (0.53- 0.70)	0.64 (0.51- 0.80)	0.64 (0.54 0.76)
High Acculturation	1.07 (0.93- 1.23)	1.03 (0.92- 1.16)	1.18 (1.05- 1.33)	1.04 (0.97- 1.11)	1.09 (1.04- 1.15)	1.09 (1.02- 1.17)	1.03 (0.84- 1.27)	0.86 (0.67- 1.10)	0.98 (0.82- 1 17)	1.02 (0.89- 1.17)	0.83 (0.74- 0.94)	1.03 (0.91- 1.17)	0.89 (0.76- 1.04)	0.76 (0.67- 0.85)	0.87 (0.77- 0.97)	1.02 (0.94- 1.09)	0.97 (0.91- 1.03)	1.03 (0.94- 1.13)	0.87 (0.60- 1.25)	0.65 (0.52- 0.83)	0.65 (0.54 0.77)
Medium/Low Acculturation (n=1 188)	0.77 (0.54- 1.10)	0.95 (0.67- 1.35)	0.69 (0.42- 1.14)	0.72 (0.59- 0.88)	1.00 (0.83- 1.21)	0.64 (0.49- 0.86)	1.00 (0.62- 1.60)	0.79 (0.30- 2.11)	0.83 (0.59- 1.15)	0.64 (0.41- 0.99)	0.49 (0.28- 0.88)	0.78 (0.51- 1.18)	0.47 (0.27- 0.81)	0.31 (0.16- 0.59)	0.57 (0.38- 0.84)	0.82 (0.67- 1.01)	0.88 (0.71- 1.09)	0.61 (0.41- 0.89)	0.08 (0.01- 0.60)	0.38 (0.12- 1.19)	0.58 (0.30 1.10)
U.Sborn (no)	0.43 (0.34-	0.48 (0.41-	0.82 (0.68-	0.67 (0.61-	0.69 (0.65-	0.86 (0.79-	0.81 (0.62-	0.65 (0.51-	0.76 (0.63-	0.63 (0.58-	0.54 (0.46-	0.80	0.51 (0.47-	0.46 (0.40-	0.57 (0.50-	0.86 (0.82-	0.79 (0.74-	0.85 (0.77-	0.36 (0.29-	0.22 (0.15-	0.57
High Acculturation	0.62 (0.48-0.81)	0.55 (0.46-	0.98 (0.76-	0.79 (0.70- 0.90)	0.76 (0.70-0.81)	0.92 (0.82-	0.80 (0.57-	0.65 (0.46-	0.91 (0.66-	0.63 (0.50- 0.80)	0.57 (0.47-	0.86 (0.69-	0.68 (0.52-0.90)	0.48 (0.40-	0.57 (0.46-	1.06 (0.94- 1.20)	0.83	0.86 (0.74-	0.43)	0.26 (0.17- 0.41)	0.58
Medium/Low Acculturation	0.29 (0.20- 0.41)	0.41 (0.34- 0.49)	0.74 (0.58- 0.94)	0.56 (0.48- 0.65)	0.62 (0.56- 0.68)	0.82 (0.74- 0.91)	0.80 (0.58- 1.10)	0.64 (0.49- 0.83)	0.69 (0.55- 0.87)	0.45 (0.32- 0.64)	0.50 (0.41- 0.60)	0.77 (0.64- 0.93)	0.46 (0.32- 0.68)	0.44 (0.37- 0.52)	0.57 (0.48- 0.67)	0.79 (0.66- 0.96)	0.75 (0.68- 0.82)	0.84 (0.74- 0.95)	0.27 (0.07- 1.02)	0.19 (0.12- 0.31)	0.56 (0.40 0.80)
Puerto Rican	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	, ,
U.Sborn (yes) (n=2.544)	1.53 (1.19- 1.96)	1.47 (1.24- 1.74)	1.55 (1.17- 2.06)	1.26 (1.12- 1.42)	1.25 (1.15- 1.36)	1.28 (1.11- 1.48)	1.36 (0.97- 1.91)	1.00 (0.66- 1.54)	0.64 (0.35- 1.19)	1.14 (0.99- 1.31)	0.93 (0.75- 1.14)	1.49 (1.20- 1.86)	0.98 (0.85- 1.12)	1.02 (0.82- 1.25)	1.01 (0.79- 1.28)	1.08 (0.99- 1.18)	0.99 (0.87- 1.12)	1.11 (0.94- 1.31)	0.93 (0.74- 1.17)	0.79 (0.52- 1.19)	1.25 (0.92- 1.69)
High Acculturation (n=2,359)	1.50 (1.17- 1.94)	1.52 (1.28- 1.81)	1.71 (1.28- 2.30)	1.25 (1.10- 1.42)	1.25 (1.14- 1.36)	1.35 (1.17- 1.55)	1.40 (0.99- 1.97)	1.03 (0.66- 1.61)	0.73 (0.40- 1.34)	1.02 (0.78- 1.33)	0.94 (0.75- 1.17)	1.58 (1.27- 1.97)	0.89 (0.62- 1.28)	1.01 (0.81- 1.26)	1.07 (0.84- 1.36)	1.04 (0.91- 1.20)	1.01 (0.89- 1.14)	1.17 (0.99- 1.38)	0.81 (0.41- 1.60)	0.81 (0.53- 1.23)	1.32 (0.97 1.78)
Medium/Low Acculturation	1.88 (1.07- 3.31)	0.64 (0.27-	0.55 (0.25-	1.38 (0.93- 2.05)	1.25 (0.93- 1.68)	0.71 (0.34-	0.78 (0.24-	0.75 (0.25- 2.24)	NE	NE	0.73 (0.36- 1 49)	0.80 (0.35- 1.84)	0.44 (0.06-	1.08 (0.58- 2.01)	0.54 (0.23- 1.23)	0.36 (0.07-	0.68 (0.38- 1.23)	0.67 (0.33- 1.38)	NE	0.45 (0.09-	0.67
US-born (no)	1.27	1.08	1.56	1.23	1.00	1.26	1.03	0.75	0.96	1 09	0.95	1 27	0.86	0.77	0.87	0.98	0.94	1.00	1 04	0.90	1.08

Supplemental Table S8. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to non-Hispanic Whites by Language Acculturation Status*, Stratified by Age Group, National Health Interview Survey, 2004-2017 (N=245,812)

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(n=2,533)	(0.86- 1.87)	(0.85- 1.38)	(1.34- 1.81)	(1.01- 1.51)	(0.90- 1.14)	(1.16- 1.37)	(0.53- 2.02)	(0.47- 1.18)	(0.74- 1.25)	(0.94- 1.25)	(0.73- 1.22)	(1.06- 1.51)	(0.75- 0.99)	(0.58- 1.02)	(0.73- 1.03)	(0.88- 1.08)	(0.80- 1.10)	(0.87- 1.14)	(0.85- 1.27)	(0.60- 1.35)	(0.85- 1.37)
High Acculturation (n=1,773)	1.25 (0.82- 1.91)	1.05 (0.78- 1.42)	1.85 (1.56- 2.19)	1.20 (0.94- 1.53)	0.99 (0.86- 1.14)	1.35 (1.23- 1.48)	0.87 (0.35- 2.21)	0.91 (0.57- 1.43)	1.09 (0.79- 1.52)	0.51 (0.28- 0.93)	0.95 (0.72- 1.24)	1.41 (1.14- 1.74)	0.99 (0.63- 1.56)	0.82 (0.60- 1.12)	0.98 (0.81- 1.18)	0.98 (0.71- 1.35)	1.05 (0.91- 1.22)	1.01 (0.86- 1.20)	0.73 (0.21- 2.53)	1.06 (0.69- 1.64)	1.09 (0.82- 1.46)
Medium/Low Acculturation (n=755)	1.31 (0.62- 2.79)	1.16 (0.78- 1.72)	1.04 (0.84- 1.29)	1.33 (0.99- 1.78)	1.08 (0.87- 1.32)	1.08 (0.92- 1.27)	1.48 (0.66- 3.36)	0.28 (0.08- 0.94)	0.76 (0.48- 1.20)	1.25 (0.60- 2.60)	0.93 (0.51- 1.68)	0.97 (0.70- 1.36)	1.19 (0.46- 3.13)	0.62 (0.35- 1.12)	0.61 (0.43- 0.86)	0.74 (0.35- 1.60)	0.62 (0.42- 0.91)	0.95 (0.76- 1.19)	2.05 (0.61- 6.90)	0.41 (0.19- 0.86)	1.05 (0.66- 1.67)
Cuban																					
U.Sborn Cuban (yes) (n=559)	0.81 (0.47-1.42)	0.83 (0.49- 1.41)	1.65 (0.93- 2.94)	0.98 (0.76- 1.26)	1.11 (0.91- 1.35)	1.04 (0.69- 1.57)	0.93 (0.39- 2.23)	0.45 (0.14- 1.41)	0.21 (0.03- 1.53)	1.05 (0.78- 1.41)	1.11 (0.72- 1.71)	1.54 (0.85- 2.78)	0.91 (0.68- 1.22)	1.02 (0.68- 1.53)	1.04 (0.62- 1.75)	1.05 (0.87- 1.26)	0.94 (0.72- 1.24)	0.99 (0.61- 1.63)	0.91 (0.52- 1.60)	1.53 (0.83- 2.80)	0.63 (0.26- 1.49)
High Acculturation	1.00 (0.56- 1.77)	0.84 (0.47- 1.50)	1.69 (0.92- 3.10)	1.01 (0.78- 1.32)	1.12 (0.90- 1.39)	1.06 (0.68- 1.63)	1.06 (0.37- 3.04)	0.30 (0.07- 1.21)	0.25 (0.04- 1.82)	0.92 (0.55- 1.53)	1.32 (0.86- 2.03)	1.66 (0.90- 3.06)	1.04 (0.57- 1.90)	0.97 (0.62- 1.54)	1.11 (0.64- 1.90)	1.05 (0.80- 1.40)	0.92 (0.67- 1.26)	1.00 (0.59- 1.70)	0.10 (0.01- 0.76)	1.45 (0.78- 2.69)	0.63 (0.24- 1.64)
Medium/Low Acculturation (n=119)	0.22 (0.03- 1.53)	0.81 (0.30- 2.19)	1.13 (0.26- 4.86)	0.87 (0.42- 1.82)	1.06 (0.69- 1.61)	0.85 (0.25- 2.91)	0.73 (0.17- 3.17)	1.02 (0.23- 4.51)	NE	NE	0.30 (0.05- 1.92)	0.50 (0.11- 2.21)	NE	1.18 (0.51- 2.74)	0.36 (0.07- 2.00)	1.10 (0.63- 1.93)	1.03 (0.66- 1.63)	0.88 (0.27- 2.90)	NE	1.84 (0.48- 7.11)	0.64 (0.14- 2.89)
U.Sborn Cuban (no) (n=1.959)	0.59 (0.24- 1.43)	0.61 (0.44- 0.84)	1.03 (0.81- 1.31)	0.48 (0.31- 0.75)	0.67 (0.53- 0.83)	1.06 (0.95- 1.18)	0.32 (0.08- 1.34)	0.75 (0.42- 1.34)	0.74 (0.56- 0.96)	0.70 (0.53- 0.93)	0.57 (0.35- 0.95)	0.94 (0.74- 1.20)	0.64 (0.50- 0.81)	0.61 (0.41- 0.90)	0.69 (0.54- 0.89)	0.87 (0.78- 0.97)	0.76 (0.64- 0.89)	0.98 (0.83- 1.16)	0.62 (0.44- 0.88)	0.30 (0.13- 0.66)	0.77 (0.56- 1.07)
High Acculturation (n=571)	0.55 (0.16- 1.91)	0.75 (0.44- 1.28)	1.31 (0.82- 2.09)	0.55 (0.27- 1.12)	0.87 (0.67- 1.11)	1.18 (0.95- 1.47)	0.91 (0.21- 4.01)	0.76 (0.21- 2.83)	0.75 (0.45- 1.26)	NE	0.38 (0.14- 0.98)	1.66 (1.20- 2.30)	0.20 (0.03- 1.47)	0.58 (0.25- 1.37)	0.85 (0.61- 1.19)	0.66 (0.31- 1.40)	0.65 (0.41- 1.04)	0.95 (0.70- 1.28)	NE	0.16 (0.02- 1.11)	1.03 (0.58- 1.85)
Medium/Low Acculturation (n=1,386)	0.62 (0.20- 1.92)	0.55 (0.37- 0.82)	0.92 (0.71- 1.19)	0.47 (0.27- 0.83)	0.57 (0.41- 0.78)	1.00 (0.90- 1.12)	0.13 (0.01- 1.08)	0.75 (0.40- 1.41)	0.69 (0.49- 0.99)	0.11 (0.02- 0.74)	0.64 (0.36- 1.12))	0.62 (0.45- 0.86)	0.12 (0.02- 0.85)	0.62 (0.40- 0.96)	0.62 (0.43- 0.89)	1.01 (0.63- 1.64)	0.79 (0.68- 0.92)	1.00 (0.83- 1.20)	NE	0.33 (0.14- 0.82)	0.66 (0.47- 0.94)
Dominican																					
U.Sborn (yes) (n=264)	0.63 (0.31- 1.30)	2.17 (1.33- 3.55)	1.65 (0.41- 6.68)	0.87 (0.58- 1.31)	1.62 (1.30- 2.02)	0.98 (0.43- 2.20)	1.32 (0.52- 3.33)	2.50 (0.76- 8.25)	NE	0.78 (0.50- 1.21)	0.88 (0.44- 1.76)	0.82 (0.12- 5.75)	0.85 (0.56- 1.28)	1.05 (0.55- 2.02)	0.46 (0.07- 3.02)	1.06 (0.82- 1.36)	1.05 (0.77- 1.42)	1.60 (0.70- 3.67)	0.50 (0.24- 1.02)	1.26 (0.52- 3.02)	0.69 (0.08- 5.75)
High Acculturation (n=208)	0.68 (0.31- 1.51)	2.15 (1.25- 3.69)	1.85 (0.46- 7.43)	0.99 (0.64- 1.51)	1.60 (1.27- 2.02)	1.05 (0.46- 2.44)	1.45 (0.52- 4.00)	3.32 (1.11- 9.93)	NE	0.77 (0.41- 1.45)	1.04 (0.54- 2.02)	0.82 (0.12- 5.75)	1.15 (0.59- 2.27)	0.83 (0.35- 1.99)	0.46 (0.07- 3.02)	0.97 (0.66- 1.43)	1.06 (0.77- 1.46)	1.60 (0.70- 3.67)	0.23 (0.03- 1.62)	1.45 (0.57- 3.66)	0.69 (0.08- 5.75)
Medium/Low Acculturation (n=56)	0.49 (0.11- 2.16)	2.28 (0.86- 6.06)	NE	0.44 (0.18- 1.09)	1.72 (1.11- 2.67)	0.38 (0.05- 2.93)	0.97 (0.22- 4.36)	NE	NE	0.44 (0.20- 1.01)	0.52 (0.10- 2.59)	NE	0.62 (0.25- 1.50)	1.63 (0.74- 3.57)	NE	0.99 (0.45- 2.17)	1.00 (0.48- 2.10)	NE	NE	0.78 (0.10- 6.23)	NE
U.Sborn (no) (n=1,394)	0.63 (0.37- 1.08)	0.76 (0.55- 1.04)	1.16 (0.94- 1.44)	0.75 (0.55- 1.03)	0.84 (0.72- 0.99)	1.02 (0.89- 1.17)	1.31 (0.64- 2.68)	0.33 (0.12- 0.87)	0.44 (0.22- 0.87)	0.80 (0.65- 0.99)	0.66 (0.44- 0.97)	0.90 (0.69- 1.18)	0.63 (0.50- 0.81)	0.41 (0.26- 0.64)	0.72 (0.54- 0.96)	0.96 (0.82- 1.12)	0.75 (0.59- 0.94)	1.11 (0.91- 1.35)	0.87 (0.56- 1.35)	0.20 (0.09- 0.47)	1.33 (0.84- 2.12)
High Acculturation (n=594)	1.08 (0.61- 1.92)	0.72 (0.45- 1.14)	1.23 (0.81- 1.88)	1.04 (0.75- 1.46)	0.90 (0.74- 1.09)	1.00 (0.78- 1.27)	1.12 (0.41- 3.04)	0.26 (0.05- 1.41)	0.72 (0.22- 2.40)	0.99 (0.47- 2.10)	0.77 (0.47- 1.27)	0.87 (0.48- 1.56)	1.41 (0.64- 3.10)	0.37 (0.21- 0.67)	0.93 (0.57- 1.54)	1.11 (0.80- 1.55)	0.65 (0.48- 0.89)	1.18 (0.84- 1.65)	0.06 (0.01- 0.54)	0.10 (0.03- 0.32)	1.65 (0.91- 2.99)
Medium/Low Acculturation (n=800)	0.21 (0.08- 0.56)	0.79 (0.54- 1.15)	1.14 (0.85- 1.51)	0.43 (0.25- 0.75)	0.78 (0.63- 0.97)	1.03 (0.87- 1.21)	1.42 (0.56- 3.61)	0.38 (0.12- 1.25)	0.34 (0.15- 0.76)	0.43 (0.16- 1.11)	0.51 (0.27- 0.95)	0.92 (0.67- 1.25)	0.53 (0.18- 1.56)	0.46 (0.25- 0.83)	0.60 (0.41- 0.90)	0.92 (0.41- 2.04)	0.87 (0.62- 1.23)	1.07 (0.85- 1.33)	0.28 (0.04- 1.91)	0.34 (0.13- 0.93)	1.16 (0.60- 2.26)

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Central/South American																					
U.Sborn (yes) (n=1,113)	1.31 (0.94- 1.82)	1.52 (1.07- 2.16)	0.98 (0.43- 2.25)	1.19 (1.02- 1.40)	1.23 (1.04- 1.45)	1.02 (0.65- 1.58)	0.82 (0.48- 1.40)	0.96 (0.34- 2.74)	0.36 (0.08- 1.54)	1.26 (1.01- 1.55)	1.28 (0.90- 1.83)	1.66 (1.01- 2.73)	0.87 (0.65- 1.15)	0.73 (0.53- 1.03)	0.93 (0.53- 1.63)	1.10 (0.97- 1.25)	1.02 (0.84- 1.23)	0.80 (0.46- 1.41)	0.52 (0.30- 0.89)	0.23 (0.11- 0.49)	1.41 (0.67- 2.95)
High Acculturation (n=994)	1.43 (1.02- 2.02)	1.59 (1.10- 2.30)	1.08 (0.47- 2.45)	1.28 (1.09- 1.49)	1.24 (1.05- 1.45)	1.04 (0.66- 1.64)	0.81 (0.42- 1.57)	1.04 (0.36- 2.98)	0.45 (0.11- 1.86)	1.08 (0.81- 1.46)	1.30 (0.91- 1.84)	1.47 (0.85- 2.55)	1.01 (0.72- 1.42)	0.80 (0.57- 1.12)	1.08 (0.64- 1.81)	1.10 (0.94- 1.29)	1.07 (0.89- 1.29)	0.91 (0.53- 1.56)	0.96 (0.43- 2.13)	0.24 (0.11- 0.53)	1.00 (0.43- 2.34)
Medium/Low Acculturation (n=119)	0.74 (0.32- 1.72)	0.67 (0.16- 2.90)	NE	0.74 (0.45- 1.22)	1.15 (0.46- 2.85)	0.77 (0.16- 3.66)	0.85 (0.36- 1.99)	NE	NE	1.52 (0.69- 3.34)	1.12 (0.18- 7.07)	2.78 (1.47- 5.24)	1.87 (0.86- 4.05)	NE	NE	1.06 (0.66- 1.70)	0.46 (0.11- 1.83)	NE	0.19 (0.02- 1.49)	NE	3.59 (2.21- 5.82)
U.Sborn (no) (<i>n</i> =7,049)	0.73 (0.56- 0.96)	0.65 (0.55- 0.77)	0.92 (0.77- 1.09)	0.86 (0.76- 0.98)	0.89 (0.83- 0.96)	0.99 (0.91- 1.07)	0.93 (0.61- 1.41)	0.61 (0.44- 0.85)	0.51 (0.36- 0.73)	0.72 (0.63- 0.82)	0.63 (0.51- 0.78)	0.83 (0.69- 0.99)	0.61 (0.54- 0.69)	0.53 (0.43- 0.65)	0.65 (0.54- 0.78)	0.90 (0.84- 0.96)	0.83 (0.76- 0.91)	0.91 (0.81- 1.03)	0.40 (0.31- 0.51)	0.34 (0.22- 0.55)	0.47 (0.35- 0.64)
High Acculturation (n=3,366)	0.75 (0.50- 1.12)	0.70 (0.55- 0.88)	0.92 (0.70- 1.20)	1.00 (0.85- 1.18)	0.92 (0.84- 1.01)	0.94 (0.82- 1.07)	1.11 (0.72- 1.70)	0.74 (0.49- 1.11)	0.56 (0.33- 0.94)	0.75 (0.51- 1.11)	0.68 (0.51- 0.90)	0.87 (0.64- 1.18)	1.12 (0.80- 1.56)	0.59 (0.46- 0.76)	0.62 (0.46- 0.83)	0.96 (0.80- 1.16)	0.82 (0.74- 0.92)	0.91 (0.76- 1.09)	0.44 (0.16- 1.21)	0.39 (0.22- 0.68)	0.56 (0.37- 0.85)
Medium/Low Acculturation (n=3,664)	0.71 (0.49- 1.03)	0.60 (0.48- 0.75)	0.91 (0.73- 1.12)	0.70 (0.57- 0.87)	0.84 (0.76- 0.93)	1.04 (0.94- 1.15)	0.79 (0.41- 1.52)	0.51 (0.32- 0.81)	0.47 (0.30- 0.75)	0.47 (0.28- 0.79)	0.57 (0.42- 0.79)	0.80 (0.63- 1.02)	0.40 (0.21- 0.74)	0.44 (0.31- 0.61)	0.68 (0.55- 0.86)	0.86 (0.67- 1.11)	0.84 (0.73- 0.95)	0.91 (0.77- 1.07)	0.09 (0.02- 0.46)	0.29 (0.14- 0.60)	0.39 (0.25- 0.60)

Abbreviations: ref (reference); NE (not estimable)

* Language acculturation categories include high (English only interview) and medium/low (English and Spanish interview or Spanish only interview).

Adjusted for sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Supplemental Table S9. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (a) US-Born Hispanic/Latino Heritage Groups and (b) Foreign-born Hispanic/Latino Heritage Groups With and Without Adjustment for Time in the US Compared Foreign-born non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=56,372)

· · · · ·		F	Prevalence Ra	tio (95% Confi	idence Interva	l)	
		Sleep Duration	1				
	(reference:	recommended	(7-9 hours))		Sleep	Quality	
				Trouble	Trouble	Non-	Sleep
			_	Falling	Staying	restorative	Medication
Group (n)	Very Short	Short	Long	Asleep	Asleep	Sleep	Use
Compared to Foreign-born Non-	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)
Hispanic Whites (n=8,857)	(n=4,115)	(n=14,048)	(n=1,586)	(n=3,431)	(n=3,520)	(n=7,734)	(n=1,073)
(<i>n</i> =8,857)	ref	ref	ref	ref	ref	ref	ref
Mexican							
	1.09	1.14	1.00	0.92	0.87	0.97	0.92
Overall (n=30,100)	(0.96-1.25)	(1.06-1.22)	(0.88-1.13)	(0.81-1.05)	(0.78-0.97)	(0.92-1.01)	(0.73-1.14)
US-born (yes)	1.17	1.23	1.01	1.00	0.97	0.96	0.98
(n=14,282)	(1.02-1.33)	(1.14-1.33)	(0.88-1.15)	(0.87-1.14)	(0.86-1.10)	(0.91-1.01)	(0.78-1.23)
US-born (no) (n=15,818)							
	0.88	1.00	1.00	0.78	0.72	0.98	0.68
Not Adjusted for Time in the US	(0.73-1.07)	(0.91-1.10)	(0.86-1.17)	(0.66-0.94)	(0.62-0.84)	(0.93-1.04)	(0.48-0.96)
	0.88	0.97	1.05	0.79	0.72	1.03	0.69
Adjusted for Time in the US	(0.73-1.06)	(0.90-1.06)	(0.81-1.36)	(0.66-0.94)	(0.62-0.84)	(0.94-1.13)	(0.49-0.97)
Puerto Rican	. = -						
	1.73	1.30	1.06	1.19	1.14	0.95	1.33
Overall (<i>n</i> =5,077)	(1.49-2.00)	(1.19-1.41)	(0.89-1.25)	(1.03-1.39)	(0.99-1.31)	(0.90-1.01)	(1.07-1.64)
US-born (yes)		1.33	1.04	1.20	1.22	0.94	1.32
(n=2,544)	(1.51-2.17)	(1.19-1.48)	(0.82-1.33)	(0.99-1.46)	(1.02-1.46)	(0.87-1.02)	(1.01-1.73)
(n=2,533)							
	1.58	1.23	1.11	1.22	1.09	0.95	1.41
Not Adjusted for Time in the US	(1.32-1.89)	(1.10-1.38)	(0.92-1.33)	(1.01-1.46)	(0.91-1.30)	(0.88-1.02)	(1.09-1.83)
	1.56	1.26	1.02	1.24	1.11	1.07	1.40
Adjusted for Time in the US	(1.20-1.88)	(1.15-1.38)	(0.77-1.36)	(1.04-1.50)	(0.93-1.33)	(0.95-1.21)	(1.08-1.82)
Cuban	0.05	0.00	0.70	0.00	0.00	0.07	4.00
	0.95	0.99	0.76	0.92	0.93	0.97	
	(0.75-1.20)	(0.86-1.14)	(0.60-0.98)	(0.70-1.20)	(0.76-1.15)	(0.90-1.04)	(0.77-1.55)
US-born Cuban (yes)		1.20	0.79			0.91	
(//=009)	(0.07-1.51)	(0.98-1.47)	(0.47-1.33)	(0.79-1.65)	(0.84-1.65)	(0.78-1.06)	(0.91-2.93)
US-born Cuban (no)							

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0.92	0.90	0.76	0.82	0.85	0.99	0.96
(0.71-1.20)	(0.77-1.06)	(0.58-1.00)	(0.59-1.14)	(0.65-1.10)	(0.91-1.06)	(0.63-1.45)
0.99	0.95	0.69	0.88	0.90	1.05	1.03
(0.76-1.28)	(0.84-1.08)	(0.48-0.99)	(0.64-1.22)	(0.69-1.17)	(0.90-1.23)	(0.68-1.57)
1.11	0.98	0.91	0.88	0.94	1.02	1.03
(0.88-1.41)	(0.83-1.16)	(0.64-1.28)	(0.68-1.13)	(0.72-1.23)	(0.94-1.12)	(0.67-1.59)
1.38	1.21	0.98	0.82	1.25	0.92	0.97
(0.80-2.38)	(0.88-1.67)	(0.49-1.99)	(0.51-1.31)	(0.81-1.93)	(0.75-1.13)	(0.42-2.20)
1.05	0.92	0.89	0.88	0.87	1.05	1.02
(0.84-1.33)	(0.76-1.10)	(0.60-1.32)	(0.68-1.16)	(0.65-1.18)	(0.95-1.17)	(0.64-1.63)
1.07	0.96	0.74	0.90	0.89	1.00	1.05
(0.85-1.34)	(0.84-1.10)	(0.45-1.20)	(0.69-1.19)	(0.66-1.21)	(0.84-1.19)	(0.65-1.68)
· · · (
0.99	1.13	0.81	0.94	0.89	0.98	0.69
(0.85-1.15)	(1.04-1.23)	(0.69-0.96)	(0.78-1.13)	(0.76-1.04)	(0.94-1.03)	(0.51-0.91)
1.41	1.30	0.85	1.27	1.14	0.95	0.95
(1.05-1.90)	(1.10-1.53)	(0.60-1.20)	(0.96-1.67)	(0.86-1.52)	(0.85-1.06)	(0.56-1.62)
0.91	1.10	0.83	0.84	0.84	0.99	0.64
(0.77-1.07)	(1.01-1.20)	(0.70-1.00)	(0.69-1.02)	(0.72-0.99)	(0.94-1.04)	(0.47-0.88)
0.94	1.07	0.78	0.86	0.87	1.01	0.66
(0.80-1.11)	(1.00-1.15)	(0.57-1.06)	(0.71-1.05)	(0.74-1.02)	(0.93-1.10)	(0.48-0.90)
	0.92 (0.71-1.20) 0.99 (0.76-1.28) 1.11 (0.88-1.41) 1.38 (0.80-2.38) 1.05 (0.84-1.33) 1.07 (0.85-1.34) 0.99 (0.85-1.15) 1.41 (1.05-1.90) 0.91 (0.77-1.07) 0.94 (0.80-1.11)	$\begin{array}{c ccccc} 0.92 & 0.90 \\ (0.71-1.20) & (0.77-1.06) \\ 0.99 & 0.95 \\ (0.76-1.28) & (0.84-1.08) \\ \hline \\ 1.11 & 0.98 \\ (0.88-1.41) & (0.83-1.16) \\ 1.38 & 1.21 \\ (0.80-2.38) & (0.88-1.67) \\ \hline \\ 1.05 & 0.92 \\ (0.84-1.33) & (0.76-1.10) \\ 1.07 & 0.96 \\ (0.85-1.34) & (0.84-1.10) \\ \hline \\ 0.99 & 1.13 \\ (0.85-1.15) & (1.04-1.23) \\ \hline \\ 1.05 & (1.05-1.90) & (1.10-1.53) \\ \hline \\ 0.94 & 1.07 \\ (0.80-1.11) & (1.00-1.15) \\ \hline \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, nonrestorative sleep, and sleep medication were measured during the survey years 2013-2017. Time in the US was defined as 15 years, 15+ years.

Supplemental Table S10. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (a) Foreign-born Whites Stratified by Time in the US, (b) US-Born Hispanic/Latino Heritage Groups, and (c) Foreign-born Hispanic/Latino Heritage Groups Stratified by Time in the US Compared to US-born non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=254,669)

			Prevalence F	e Ratio (95% Confidence Interval)				
	Sleep Duration							
	(reference:	recommende	d (7-9 hours))		Sleep	Quality		
				Trouble	Trouble	Non-	Sleep	
	Very			Falling	Staying	restorative	Medication	
	Short	Short	Long	Asleep	Asleep	Sleep	Use	
	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)	
Group (<i>n</i>)	(n=21,227)	(n=75,139)	(n=9,190)	(n=22,038)	(n=30,013)	(n=46,103)	(n=11,097)	
US-born Non-Hispanic Whites (n=198,297)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	
Foreign-born Non-Hispanic White	1.03	1.05	1.11	1.09	1.27	0.96	1.34	
(n=8,857)	(0.94-1.14)	(1.00-1.11)	(1.01-1.21)	(0.99-1.19)	(1.17-1.37)	(0.93-0.99)	(1.16-1.55)	
	0.70	0.80	0.69	0.76	0.76	0.92	0.72	
Time in the US (<15 years) (n=2,169)	(0.54-0.91)	(0.71-0.90)	(0.43-1.12)	(0.58-0.98)	(0.59-0.98)	(0.81-1.06)	(0.46-1.13)	
	1.42	1.25	1.44	1.32	1.31	1.08	1.38	
Time in the US (15+ years) (n=6,657)	(1.09-1.85)	(1.11-1.40)	(0.90-2.33)	(1.02-1.71)	(1.02-1.68)	(0.94-1.24)	(0.88-2.16)	
Mexican								
	0.75	0.88	0.87	0.77	0.65	1.08	0.52	
Overall (<i>n</i> =30,100)	(0.71-0.80)	(0.85-0.92)	(0.81-0.93)	(0.72-0.82)	(0.62-0.69)	(1.05-1.11)	(0.46-0.58)	
US-born (yes)	1.04	1.04	0.95	0.92	0.80	1.02	0.66	
(n=14,282)	(0.97-1.12)	(0.99-1.09)	(0.87-1.03)	(0.85-0.99)	(0.74-0.85)	(0.98-1.05)	(0.58-0.76)	
US-born (no)	0.52	0.72	0.79	0.59	0.50	1.17	0.36	
(n=15,818)	(0.47-0.57)	(0.68-0.76)	(0.72-0.86)	(0.54-0.65)	(0.46-0.55)	(1.13-1.21)	(0.29-0.43)	
	0.31	0.56	0.81	0.42	0.39	0.80	0.25	
Time in the US (<15 years) (<i>n</i> =5,739)	(0.27-0.37)	(0.52-0.60)	(0.68-0.98)	(0.36-0.50)	(0.32-0.47)	(0.74-0.87)	(0.15-0.42)	
	0.63	0.77	0.70	0.65	0.53	0.81	0.39	
Time in the US (15+ years) (<i>n</i> =9,919)	(0.56-0.70)	(0.73-0.81)	(0.60-0.81)	(0.59-0.72)	(0.49-0.59)	(0.76-0.86)	(0.32-0.48)	
Puerto Rican								
	1.37	1.15	0.92	1.05	0.91	1.01	0.99	
Overall (<i>n</i> =5,077)	(1.24-1.51)	(1.08-1.22)	(0.81-1.03)	(0.95-1.17)	(0.83-1.00)	(0.96-1.07)	(0.85-1.15)	
US-born (yes)	1.41	1.19	0.87	1.05	0.97		0.96	
(n=2,544)	(1.24-1.60)	(1.09-1.29)	(0.73-1.04)	(0.91-1.21)	(0.85-1.12)	(0.93-1.07)	(0.77-1.21)	
US-born (no)	1.31	1.11	0.97	1.06	0.84	1.03	1.02	
(n=2,533)	(1.15-1.49)	(1.01-1.21)	(0.83-1.12)	(0.92-1.22)	(0.73-0.97)	(0.96-1.10)	(0.83-1.25)	
			1.16	0.77	0.61	0.82	0.98	
Time in the US (<15 years) $(n=550)$	(0.91-1.76)	(1.01-1.35)	(0.73-1.83)	(0.54-1.08)	(0.40-0.94)	(0.66-1.02)	(0.64-1.52)	
Time in the US (15+ years) $(n=1,969)$	1.33	1.15	0.89	1.17	0.92	1.01	1.01	

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	(1.16-1.52)	(1.06-1.23)	(0.69-1.14)	(1.02-1.36)	(0.80-1.06)	(0.91-1.12)	(0.80-1.26)
Cuban							
	0.81	0.88	0.68	0.78	0.70	1.06	0.68
Overall (<i>n</i> =2,518)	(0.68-0.96)	(0.78-1.00)	(0.56-0.82)	(0.62-0.97)	(0.58-0.83)	(1.00-1.12)	(0.53-0.89)
US-born Cuban (yes)	0.90	1.07	0.66	0.97	0.94	0.97	0.98
(n=559)	(0.64-1.27)	(0.89-1.29)	(0.40-1.09)	(0.72-1.31)	(0.70-1.26)	(0.84-1.12)	(0.57-1.69)
US-born Cuban (no)	0.79	0.82	0.68	0.71	0.63	1.09	0.61
(n=1,959)	(0.65-0.96)	(0.71-0.94)	(0.55-0.85)	(0.53-0.95)	(0.49-0.79)	(1.03-1.15)	(0.43-0.85)
	0.56	0.61	0.57	0.46	0.45	0.75	0.17
Time in the US (<15 years) (n=634)	(0.37-0.83)	(0.51-0.74)	(0.36-0.92)	(0.26-0.81)	(0.29-0.69)	(0.61-0.93)	(0.08-0.38)
	1.00	1.00	0.74	0.92	0.75	0.97	0.85
Time in the US (15+ years) (n=1,319)	(0.80-1.26)	(0.89-1.12)	(0.55-1.00)	(0.72-1.19)	(0.59-0.95)	(0.85-1.10)	(0.59-1.21)
Dominican							
	0.89	0.88	0.73	0.76	0.67	1.09	0.81
Overall (<i>n</i> =1,658)	(0.75-1.06)	(0.77-1.01)	(0.54-0.98)	(0.62-0.92)	(0.55-0.83)	(1.00-1.20)	(0.54-1.20)
US-born (yes)	1.08	1.06	0.77	0.73	0.97	0.97	0.64
(n=264)	(0.68-1.73)	(0.78-1.46)	(0.40-1.48)	(0.47-1.13)	(0.65-1.43)	(0.79-1.20)	(0.31-1.31)
US-born (no)	0.85	0.84	0.72	0.76	0.61	1.13	0.84
(n=1,394)	(0.72-1.01)	(0.72-0.97)	(0.50-1.03)	(0.62-0.95)	(0.48-0.78)	(1.01-1.25)	(0.54-1.30)
	0.59	0.65	0.60	0.71	0.54	0.79	0.49
Time in the US (<15 years) (n=426)	(0.40-0.88)	(0.51-0.82)	(0.29-1.24)	(0.50-1.01)	(0.34-0.85)	(0.57-1.11)	(0.18-1.29)
	1.00	0.99	0.60	0.79	0.64	0.98	0.97
Time in the US (15+ years) (n=962)	(0.84-1.20)	(0.89-1.10)	(0.35-1.04)	(0.59-1.04)	(0.49-0.84)	(0.84-1.15)	(0.62-1.51)
Central/South American							
	0.78	0.96	0.73	0.76	0.65	1.09	0.42
Overall (<i>n</i> =8,162)	(0.70-0.86)	(0.90-1.02)	(0.64-0.82)	(0.67-0.87)	(0.58-0.73)	(1.05-1.13)	(0.34-0.53)
US-born (yes)	1.29	1.15	0.74	1.21	0.98	0.99	0.64
(n=1,113)	(1.02-1.63)	(1.00-1.33)	(0.55-0.99)	(0.96-1.51)	(0.73-1.30)	(0.89-1.11)	(0.38-1.10)
US-born (no)	0.71	0.93	0.72	0.68	0.59	1.11	0.39
(n=7,049)	(0.64-0.79)	(0.87-0.98)	(0.64-0.82)	(0.59-0.77)	(0.53-0.67)	(1.07-1.16)	(0.30-0.50)
	0.55	0.80	0.74	0.54	0.43	0.79	0.30
Time in the US (<15 years) (n=3,032)	(0.46-0.67)	(0.73-0.87)	(0.53-1.03)	(0.42-0.69)	(0.34-0.55)	(0.70-0.89	(0.16-0.58 <u>)</u>
	0.85	0.96	0.60	0.75	0.67	0.87	0.43
Time in the US (15+ years) (n=3,989)	(0.74-0.96)	(0.91-1.02)	(0.47-0.78)	(0.64-0.87)	(0.58-0.77)	(0.80-0.95)	(0.33-0.55)

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, <college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale

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score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, nonrestorative sleep, and sleep in the set of the set medication were measured during the survey years 2013-2017.

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	Item	
	No	Kecommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract
		(b) Provide in the abstract an informative and balanced summary of what was done
		and what was found
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Objectives	3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment
		exposure, follow-up, and data collection
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of
		participants
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect
		modifiers. Give diagnostic criteria, if applicable
Data sources/	8*	For each variable of interest, give sources of data and details of methods of
measurement		assessment (measurement). Describe comparability of assessment methods if there
		more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable,
		describe which groupings were chosen and why
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding
		(b) Describe any methods used to examine subgroups and interactions
		(c) Explain how missing data were addressed
		(<i>d</i>) If applicable, describe analytical methods taking account of sampling strategy
		(<u>e</u>) Describe any sensitivity analyses
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially
		eligible, examined for eligibility, confirmed eligible, included in the study.
		completing follow-up, and analysed
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic clinical social) and
		information on exposures and potential confounders
		(b) Indicate number of participants with missing data for each variable of interest
Outcome data	15*	Report numbers of outcome events or summary measures
Main results	16	(a) Give unadjusted estimates and if applicable confounder-adjusted estimates and
Wall results	10	their precision (eg. 95% confidence interval). Make clear which confounders were
		adjusted for and why they were included
		(b) Report category boundaries when continuous variables were categorized
		(c) If relevant consider translating estimates of relative risk into absolute risk for a
		meaningful time period
	17	Denot other and the denotes a second second second interactions and
Other analyzan	1.1	Report other analyses done an analyses of allographic and interactions and

Discussion		
Key results	18	Summarise key results with reference to study objectives
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or
		imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations,
		multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if
		applicable, for the original study on which the present article is based

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Disparities in Multiple Sleep Characteristics among Non-Hispanic Whites and Hispanic/Latino Heritage Groups by Birthplace and Language Preference: Cross-sectional Results from the United States National Health Interview Survey

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8	7	Disparities in Multiple Sleep Characteristics among Non-Hispanic Whites and
9	8	Hispanic/Latino Heritage Groups by Birthplace and Language Preference: Cross-
10	9	sectional Results from the United States National Health Interview Survey
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55 CONFLICT OF INTEREST:

56 The authors declare they have no conflict of interest.

57

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58 DATA SHARING STATEMENT:

59 The data are publicly available at https://nhis.ipums.org/nhis/. No additional data are available.

60

61 RESEARCH ETHICS APPROVAL: HUMAN PARTICIPANTS

62 Research approval is not required for the analysis of de-identified, publicly available data. This

63 was an analysis of secondary data collected by the National Center for Health Statistics.

64 National Health Interview Survey recruitment and data collection protocols were approved by

65 the National Center for Health Statistics Review Board. All participants gave informed consent.

66

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2 3	67	ABSTRACT
4 5	68	Objective: To investigate whether sleep disparities vary by birthplace among adult non-
6 7	69	Hispanic Whites (NHWs) and Hispanic/Latino heritage groups in the United States (US) and to
8 9 10	70	investigate language preference as an effect modifier.
10 11 12	71	
12 13	72	Design: Cross-sectional
14 15 16	73	
10 17 19	73	Satting: United States
19 20	74	Setting. Onited States
20 21 22	75	
22	76	Participants: 254,699 men and women
24 25 26	77	
26 27	78	Methods: We used pooled 2004-2017 National Health Interview Survey data. Adjusting for
28 29	79	sociodemographic and behavioral/clinical characteristics, survey-weighted Poisson regressions
30 31	80	with robust variance estimated prevalence ratios (PRs) and 95% confidence intervals (CIs) of
32 33	81	self-reported sleep characteristics (e.g., sleep duration, trouble and staying asleep) among (1)
34 35	82	foreign-born NHWs and Hispanic/Latino heritage groups vs. US-born NHWs and (2)
36 37	83	Hispanic/Latino heritage groups vs. foreign-born NHWs. We further stratified by language
38 39	84	preference in comparisons of Hispanic/Latino heritage groups to US-born NHWs.
40 41	85	
42 43 44	86	Results: Among 254,699 participants with a mean age±standard error 47±0.9 years, 81% self-
44 45 46	87	identified as NHW, 12% Mexican, 2% Puerto Rican, 1% Cuban, 1% Dominican, and 3%
47	88	Central/South American. Compared to US-born NHWs, foreign-born NHWs were more likely to
49 50	89	report poor sleep quality (e.g., PR _{trouble staying asleep} =1.27 [95% CI:1.17-1.37]), and US-born
50 51 52	90	Mexicans were no more likely to report non-recommended sleep duration while foreign-born
53 54	91	Mexicans were less likely (e.g., PR _{<5-bours} =0.52 [0.47-0.57]). Overall, Mexicans had lower
55 56	92	prevalence of poor sleep quality vs. US-born NHWs, and PRs were lowest for foreign-born
57 58		
59 60		Page 4 of 36 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

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3 4	93	Mexicans. US-born Mexicans were more likely than foreign-born NHWs to report shorter sleep
5 6	94	duration. Regardless of birthplace, Puerto Ricans were more likely to report shorter sleep
7 8	95	durations vs. NHWs. Generally, sleep duration and quality were better among Cubans and
9 10	96	Dominicans vs. US-born NHWs but were similar vs. foreign-born NHWs. Despite imprecision in
11 12	97	certain estimates, Spanish language preference was generally associated with increasingly
13 14	98	better sleep among Hispanic/Latino heritage groups compared to US-born NHWs.
15 16	99	
17 18 10	100	Conclusion: Sleep disparities varied by birthplace, Hispanic/Latino heritage, and language
19 20 21	101	preference, and each characteristic should be considered in sleep disparities research.
22 23 24	102 103	Keywords: Sleep; Emigrants and Immigrants; Hispanic Americans; European Continental
25 26	104	Ancestry Group; Health Status Disparities; Acculturation
27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 9 50 51 52 53 54 55 56 57 58 59	105	Page 5 of 36
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_ 3 ⊿	106	
5	107	Strengths and limitations of this study
0 7 8	108	Although limited by the cross-sectional study design, the use of recent nationally
9 10	109	representative data consisting of a large sample size allowed for robust stratification by
11 12	110	race/ethnicity, birthplace, and language preference in this timely investigation of sleep
13 14	111	disparities.
15 16 17	112	• Data limitations included use of self-reports, use of a unidimensional proxy measure of
17 18 19	113	language acculturation, and potential for residual confounding
20 21	114	However, study strengths included the assessment of several important sleep health
22 23	115	dimensions and adjustment for multiple relevant confounders.
24 25 26 27 28 29 30 31 32 33 43 5 36 37 38 39 40 41 42 43 44 55 67 56 57 58	116	ier iew. Nony
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117 INTRODUCTION

Over one-third of United States (US) adults report insufficient sleep duration (<7 hours/night), and 50-70 million adults have a sleep disorder [1, 2]. Related to the high prevalence of poor sleep as well as its association with an increased risk of a variety of poor mental and physical health outcomes, poor sleep is recognized as a public health problem by the Institute of Medicine [1]. In addition to being a burden in the overall US population, poor sleep health has been shown to vary by social determinants of health with disadvantaged populations being more likely have worse objective and subjective sleep compared to populations with greater social advantages [3, 4].

Poor sleep disproportionately affects certain racial/ethnic minority groups compared to non-Hispanic Whites (NHWs) [3] and may partially explain racial/ethnic disparities in poor health indicators like obesity [5-7]. However, studies of racial/ethnic disparities in sleep to date may be limited by imprecise measurement of characteristics related to the social construct of race/ethnicity. For instance, evidence suggests that certain Hispanic/Latino heritage groups (e.g., Puerto Ricans) but not others (e.g., Mexicans) are more likely to report worse sleep compared to NHWs [4]. However, heterogenous heritage groups within the Hispanic/Latino community are often combined into one category [4, 8-10]. Further, the reference group of NHWs is also heterogenous and usually comprises both US-born and foreign-born NHWs despite evidence of sleep differences between the two groups [9, 11]. These studies suggested a lower unadjusted prevalence of habitual sleep duration of <7 hours among foreign-born compared to US-born NHWs [9] and that in the overall population of US adults, foreign-born individuals had higher odds of self-reported 7-8 hours of habitual sleep duration than US-born individuals after adjustment for sociodemographic characteristics, health behaviors, and clinical characteristics [11]. However, studies comparing other dimensions of sleep health by nativity among NHWs are sparse.

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142 As illustrated by the socioecological framework, both an individual's characteristics and social context should be considered to better understand health behaviors and outcomes [12]. 143 144 Therefore, in addition to individual characteristics like birthplace, ethnicity, and cultural 145 background, consideration of the social environment related to culture (e.g., language spoken 146 with friends) in studies of racial/ethnic disparities is important. For instance, language 147 acculturation is a strong indicator of overall acculturation that is hypothesized to influence 148 disparities in health behaviors [13, 14], and has been widely used as a proxy for overall 149 acculturation [15]. However, results regarding acculturation are mixed and generally suggest 150 negative associations for certain health outcomes (e.g., diet) but protective associations with 151 other outcomes (e.g., sleep) [13, 14]. Relatedly, the lack of sleep disparities observed among 152 Mexican Latinos compared to NHWs is hypothesized as due to lack of acculturation (e.g., being 153 born in Mexico and speaking Spanish at home) among Mexican adults [14]. These findings 154 relate to the "Hispanic Paradox" that was originally observed in the cardiovascular disease 155 (CVD) literature in which adults of Mexican origin in the US were likely to have risk factors for 156 CVD yet were less likely to have CVD compared to their NHW counterparts. It has been 157 hypothesized that acculturative factors like use of the Spanish language, of which the linguistic 158 intricacies promote emotional identification and connection may limit cumulative stress thus 159 tempering the impact of risk factors on CVD outcomes [16]. This exemplifies the "Hispanic 160 Paradox" which suggests that cultural characteristics shape perceptions and response to 161 stressors, which may also be true in relation to sleep, and investigation is necessary. 162 Recent studies using nationally representative data have not yet simultaneously 163 considered immigration status/birthplace, heterogeneity in heritage, and language preference as 164 modifying factors of racial/ethnic disparities in multiple sleep health characteristics among 165 Hispanics/Latinos compared to NHWs [4, 9, 11, 17-19]. Although a recent study used National 166 Health Interview Survey (NHIS) data and reported variation in Hispanic/Latino-NHW differences 167 in sleep duration by Hispanic/Latino heritage [20], the study lacked information regarding other

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168	important sleep quality characteristics and did not compare the sleep of foreign-born and US-
169	born NHWs [19]. Further, studies that compared sleep among foreign-born and US-born NHWs
170	either combined NHWs with other racial/ethnic groups [11] or provided unadjusted prevalence of
171	sleep duration [9]. Additional research inclusive of other sleep health dimensions and with
172	adjustment for relevant confounders is warranted. To address important research gaps, we
173	used the most recent data from a large, nationally representative sample of the US adult
174	population of Hispanics/Latinos and NHWs to disentangle immigration status (birthplace) and
175	heritage as contributors to sleep disparities. We sought to determine whether multiple sleep
176	characteristics differed between (1) foreign-born and US-born NHWs and (2) both foreign-born
177	and US-born Hispanic/Latino heritage groups compared to NHWs. We hypothesized better
178	sleep among foreign-born vs. US-born NHWs and that Hispanic/Latino-NHW sleep disparities
179	would vary by both nativity (i.e., US-born vs. foreign-born) and birthplace (e.g., Mexico, Puerto
180	Rico). In a secondary aim, we investigated language preference, a marker of acculturation, as a
181	modifier. We hypothesized that Hispanic/Latino-NHW sleep disparities would be greater if
182	Hispanic/Latino adults completed surveys in English vs. Spanish.
183	
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183 184 185	METHODS
183 184 185 186	METHODS NHIS
183 184 185 186 187	METHODS NHIS The NHIS is the largest annually administered cross-sectional, in-person household
183 184 185 186 187 188	METHODS NHIS The NHIS is the largest annually administered cross-sectional, in-person household survey in the US. NHIS survey protocols are described in detail elsewhere [21]. Briefly, NHIS
183 184 185 186 187 188 189	METHODS MHIS The NHIS is the largest annually administered cross-sectional, in-person household survey in the US. NHIS survey protocols are described in detail elsewhere [21]. Briefly, NHIS uses a multistage probability sampling design to obtain a nationally representative sample of the
183 184 185 186 187 188 189 190	METHODS NHIS The NHIS is the largest annually administered cross-sectional, in-person household survey in the US. NHIS survey protocols are described in detail elsewhere [21]. Briefly, NHIS uses a multistage probability sampling design to obtain a nationally representative sample of the non-institutionalized civilian population of children and adults in the US. After recruitment,
183 184 185 186 187 188 189 190 191	METHODS NHIS The NHIS is the largest annually administered cross-sectional, in-person household survey in the US. NHIS survey protocols are described in detail elsewhere [21]. Briefly, NHIS uses a multistage probability sampling design to obtain a nationally representative sample of the non-institutionalized civilian population of children and adults in the US. After recruitment, trained interviewers used computer-assisted personal interviewing to obtain health-related data
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5 6	195	Study Population				
7 8 9 10 11 12	196	We pooled self-reported NHIS data collected from survey years 2004 to 2017, which				
	197	were merged by the Integrated Health Interview Series [22]. The overall response rate was 80%				
	198	for adults (range: 74.2% in 2008 - 83.8% in 2004). Eligible participants were aged ≥18 years				
13 14	199	and self-identified as either NHW alone or Hispanic/Latino of any race. In this analysis, we				
15 16	200	focused on NHW and Hispanic/Latino of any race participants because they represent the				
17 18	201	majority and largest ethnic minority populations in the US. Of 329,279 participants, ineligible				
19 20 21	202	participants were excluded, sequentially, if data were missing or implausible for sleep duration				
21 22 23	203	(≤2 or ≥23 hours; 2.2%) or birthplace (0.1%) or were currently pregnant (0.9%) (Supplemental				
23 24 25	204	Figure S1). Hispanic/Latino participants who reported "other" or multiple ethnicities (1.4%) were				
26 27	205	excluded because study objectives were to distinguish between Hispanic/Latino heritage				
28 29	206	groups. After excluding participants with missing data on potential confounders (18.1%), the				
30 31	207	final analytic sample comprised 254,699 participants.				
32 33	208					
34 35	209	Patient and Public Involvement				
36 37	210	Patients and the public were not involved in the development and design of this study.				
38 39	211					
40 41	212	Measures				
42 43	213	Race/ethnicity				
44 45	214	Participants were asked, 'What race do you consider yourself to be?' with response				
40 47 48	215	options that met the Office of Management Budget Race and Ethnic Standards for Federal				
49 50	216	Statistics and Administrative Reporting [23]. Participants provided a 'yes' or 'no' response to 'Do				
51 52	217	you consider yourself to be Hispanic or Latino?'. Participants who self-identified as White race				
53 54	218	alone and non-Hispanic were categorized as NHW. Only region of birth (e.g., Europe) was				
55 56 57	219	available among NHW participants (Supplemental Table S1), which prevented measurement of				
58 59 60		Page 10 of 36 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml				

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2 3 4	220	national heritage among NHWs. Participants of any race who self-identified as Hispanic/Latino							
5 6	221	were asked to provide Hispanic origin, ancestry, or heritage with response options of Puerto							
7 8	222	Rican, Cuban, Dominican, Mexican, and Central/South American.							
9 10 11	223								
12	224	Multiple Sleep Characteristics							
13 14 15	225	We defined sleep characteristics categorically based on evidence so that results could							
15 16 17	226	serve as potential intervention targets. Participants responded to the following question: 'On							
18 19	227	average, how many hours of sleep do you get in a 24-hour period?". Reported values ≥30							
20 21	228	minutes were rounded up to the nearest hour and values of <30 minutes were rounded down to							
22 23	229	the nearest hour; NHIS provided average sleep duration in whole numbers [21]. Using							
24 25	230	evidence-based recommendations [24], we defined two non-mutually exclusive levels of short							
26 27	231	sleep duration: very short (≤5-hours) and short (<7-hours). Long sleep duration may be							
28 29	232	associated with worse health or be an artifact of poor health; therefore, we defined long sleep as							
30 31 32	233	>9-hours and recommended sleep as 7-9-hours [25].							
32 33 34	234	During survey years 2013 to 2017, participants reported the number of times/week they							
35 36	235	had trouble falling asleep, trouble staying asleep, nonrestorative sleep (awoke not feeling							
37 38	236	rested), and sleep medication during the week prior to the interview. We defined frequent							
39 40	237	trouble falling asleep, trouble staying asleep, nonrestorative sleep, and sleep medication use as							
41 42	238	reports of ≥3 nights (or days) per week versus <3 nights (or days) per week.							
43 44	239								
45 46	240	Birthplace							
47 48	241	Participants were asked "Where were you born?". Birthplace included dichotomous							
49 50 51	242	categories of US-born (born in a US state or the District of Colombia [D.C.]) or foreign-							
52 53	243	born/island-born (not born in a US state or D.C., born in a US territory [including Puerto Rico], or							
55 54 55 56 57	244	born outside of the US and US territories).							
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3 4	245						
5 6	246	Language of Interview					
7 8	247	Language is an important dimension of acculturation associated with health behaviors					
9 10 11 12 13	248	(e.g., smoking) among Hispanics/Latinos [13]. Participants selected the language in which they					
	249	wanted to complete the NHIS interview. Language of interview was the assumed language					
13 14 15	250	preference, and we derived a proxy three-level language acculturation variable: English (high					
15 16 17	251	acculturation), English and Spanish (medium acculturation), or Spanish (low acculturation).					
17 18 19	252						
20 21	253	Potential Confounders					
22 23	254	Parameterizations of each potential confounder are listed in Table 1. Sociodemograph					
24 25	255	characteristics included age category, sex/gender, annual household income, educational					
26 27	256	attainment, unemployed/not in the labor force, 2000 Standard Occupational Classification					
28 29	257	categories for longest held occupation, marital/cohabitating status, time in the US, and Census					
30 31 32 33 34 35 36 37 38 39 40	258	region of residence. Health behaviors included smoking status, physical activity based on the					
	259	Guidelines for Americans [26], and alcohol consumption. Clinical characteristics included body					
	260	mass index (BMI) category calculated from self-reported height and weight [27], serious					
	261	psychological distress [28], and self-report of physician-diagnosed dyslipidemia (available for					
	262	survey years 2011-2017), hypertension, prediabetes or diabetes, and cancer. We additionally					
41 42	263	adjusted for "ideal" cardiovascular health (yes vs. no), a dichotomized version of the American					
43 44	264	Heart Association's metric that includes meeting all of the following criteria: never smoker/quit					
45 46	265	smoking in the prior 12 months, normal BMI, and no report of physician diagnosis of					
47 48 40	266	dyslipidemia, hypertension, or prediabetes/diabetes [29].					
49 50 51	267						
52 53	268	Statistical Analysis					
54 55	269	All analyses accounted for the NHIS complex survey design using survey weights to					
56 57 58	270	account for non-response and oversampling of certain groups (e.g., racial/ethnic minorities,					
59 60		Page 12 of 36 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml					

older adults). We applied direct age standardization using the 2010 Census as the reference population to estimate descriptive statistics (Tables 1, 2, and 3). Poisson regressions with robust variance estimated prevalence ratios (PRs) and 95% confidence intervals (CIs) for each sleep characteristic among foreign-born NHWs and both US-born and foreign-born Hispanic/Latino heritage groups, separately, compared to US-born NHWs (Table 4). With the same approach, we estimated PRs and 95% CIs for each sleep characteristic among each US-born and foreign-born Hispanic/Latino heritage group, separately, compared to foreign-born NHWs (Table 5).

Models were adjusted for a priori potential confounders based on prior literature: age category, sex/gender, annual household income, educational attainment, employment status, occupational class, marital status, region of residence, alcohol consumption, serious psychological distress, "ideal" cardiovascular health, and cancer [2, 4, 9, 11, 19, 30-34]. Lastly, in a secondary analysis, we further stratified by language of interview (English, English and Spanish, and Spanish) as a proxy measure of language acculturation and compared sleep characteristics for each Hispanic/Latino heritage group to US-born NHWs (Figures 1 and 2). Five separate sensitivity analyses, including adjustment for multiple comparisons using the false discovery rate in all models are described in Table 6. We performed all analyses using Stata/SE 15. A two-sided p-value of 0.05 was used to determine statistical significance.

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- 291 RESULTS
- 292 Study Population Characteristics

Among 254,669 participants, mean age ± standard error was 47±0.9 years (Table 1). Most participants self-identified as NHW (81%) and the remainder as Hispanic/Latino of the following heritage: Mexican (12%), Puerto Rican (2%), Cuban (1%), Dominican (1%), Central/South American (3%). Most (96%) NHW and approximately half of Mexican (47%) and

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3 4	297	Puerto Rican (50%) participants were US-born. Most Cubans (78%), Dominicans (84%), and					
5 6	298	Central/South Americans (86%) were foreign-born. We present but do not interpret results for					
7 8	299	Central/South Americans because of within-group heritage heterogeneity.					
9 10 11 12	300	The prevalence of health behavior and clinical characteristics are presented in Tables 2					
	301	and 3. The prevalence of short sleep was highest among adults of Puerto Rican descent (39%).					
13 14	302	Although similar to the prevalence of short sleep among NHWs (29%) who showed little					
15 16	303	variation by nativity (28%- US-born vs. 27% foreign-born), short sleep prevalence was lowest					
17 18	304	among adults of Mexican descent (28%). Each Hispanic/Latino heritage group except adults of					
19 20 21	305	Puerto Rican descent were less likely than NHWs to report poor sleep quality indicators (e.g.,					
21 22 23	306	trouble falling asleep) except nonrestorative sleep. The prevalence of ideal cardiovascular					
23 24 25	307	health, although low overall, was higher among NHWs compared to other racial/ethnic/heritage					
26 27	308	groups, and prevalence varied by nativity status.					
28 29	309						
30 31	310	Foreign-born NHWs Compared to US-born NHWs					
32 33	311	Compared to US-born NHWs, foreign-born NHWs were not more likely to report non-					
34 35 36 37	312	recommended sleep duration (Table 4), but were more likely to report trouble staying asleep					
	313	(PR=1.27 [1.17-1.37]), nonrestorative sleep (PR=1.06 [1.00-1.12]), and sleep medication use					
38 39	314	(PR=1.34 [1.16-1.55]). Results were robust after applying the false discovery rate multiple					
40 41 42	315	comparison procedure (Table 6 and Supplemental Material).					
42 43 44	316						
45 46	317	US-born and foreign-born Hispanic/Latino Heritage Groups Compared to US-born NHWs					
47 48	318	Compared to US-born NHWs, US-born Mexicans were as likely to report non-					
49 50	319	recommended sleep duration; however, foreign-born Mexicans were less likely to report non-					
51 52	320	recommended sleep duration (PR _{very short} =0.52 [0.47-0.57], PR _{short} =0.70 [0.67-0.73], PR _{long} =0.75					
53 54	321	[0.66-0.85]). Overall, Mexicans were less likely to report trouble falling, trouble staying asleep,					
55 56 57	322	nonrestorative sleep, and sleep medication use compared to US-born NHWs; however,					
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1 2						
3 4	323	racial/ethnic differences were larger across comparisons between foreign-born Mexicans and				
5 6 7 8	324	US-born NHWs. Results remained statistically significant after applying the false discovery rate				
	325	multiple comparison procedure (Table 6 and Supplemental Material).				
9 10	326	Overall, both US-born and foreign-born/island-born Puerto Ricans were more likely than				
11 12	327	US-born NHWs to report very short sleep (PR 1.39 [1.26-1.53]) and short sleep (PR= 1.20				
13 14	328	[1.14-1.25]) with little variation by nativity/birthplace. Similarly, there was negligible variation by				
15 16	329	birthplace for sleep quality characteristics among US-born and foreign-born/island-born Puerto				
17 18	330	Ricans who were marginally less likely to report trouble staying asleep (PR=0.91 [0.83-1.00])				
19 20 21	331	and no more likely to report other poor sleep quality characteristics compared to US-born				
21 22 23	332	NHWs. Statistical significance remained after applying the false discovery rate multiple				
23 24 25	333	comparison procedure (Table 6 and Supplemental Material).				
26 27	334	Small sample sizes resulted in wide confidence intervals for US-born and foreign-born				
28 29 30 31 32 33	335	Cubans and Dominicans. Adults of Cuban heritage, overall, were less likely to report non-				
	336	recommended sleep duration and poor sleep quality characteristics compared to US-born				
	337	NHWs. However, only non-US born Cubans had lower prevalence of short sleep and poor sleep				
34 35	338	quality characteristics. Generally, Dominicans were less likely to report trouble falling asleep				
36 37 38 39 40	339	and no more likely to report non-restorative sleep or sleep medication use compared to US-born				
	340	NHWs. However, only foreign-born Dominicans were less likely to report short sleep and trouble				
40 41 42	341	staying asleep.				
43 44	342					
44 45 46 47	343 344	US-born and foreign-born Hispanic/Latino Heritage Groups Compared to foreign-born NHWs				
48 49	345	Compared to foreign-born NHWs, US-born Mexicans were more likely to report short				
50 51	346	sleep duration (PR=1.19 [1.12-1.26]) but foreign-born Mexicans were no more likely. US-born				
52 53	347	Mexicans were no more likely to report trouble staying asleep compared to foreign-born NHWs				
54 55 56	348	(PR=0.97 [0.86-1.10]); however, foreign-born Mexicans were less likely to report trouble staying				
57 58						
60		Page 15 of 36 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml				

1 2						
3 4	349	asleep (PR= 0.72 [0.62-0.84]; Table 5). Overall, Puerto Rican adults were more likely to report				
5 6	350	very short and short sleep duration, trouble falling asleep, trouble staying asleep, and sleep				
7 8	351	medication use compared to foreign-born NHWs with little evidence of variation by birthplace.				
9 10	352	Statistical significance for sleep duration results remained after false discovery rate correction				
11 12	353	for multiple comparisons. Small sample sizes of US-born Cubans and Dominicans resulted in				
13 14	354	wide, often overlapping confidence intervals limiting the ability to examine differences by				
15 16	355	birthplace.				
17 18 10	356					
20 21 22 23	357 358	Hispanic/Latino-Heritage Groups Compared to US-born NHWs: Modification by Language of Interview				
23 24	359	Prevalence of non-recommended sleep duration among foreign-born Mexicans				
25 26 27 28 29 30	360	compared to US-born NHWs were lowest among subpopulations of foreign-born Mexicans with				
	361	English/Spanish and Spanish versus English interviews (Figure 1). Additionally, among				
	362	Mexicans, overall, those with Spanish interviews had the lowest prevalence of poor sleep quality				
31 32	363	compared to US-born NHWs (Figure 2). Among Puerto Ricans, overall, those with Spanish				
33 34 25	364	interviews had similar prevalence of shorter sleep durations and suggestively better sleep				
35 36 37	365	quality characteristics compared to US-born NHWs. Among Cubans and Dominicans, albeit				
38 39 40 41	366	imprecise, patterns of variation by language of interview were similar to those among Mexicans.				
	367	Results of the remaining sensitivity analyses are provided in Table 6.				
42 43	368					
44 45	369					
46 47	370	DISCUSSION				
48 49	371	In a nationally representative sample of NHW and Hispanic/Latino adults, we found				
50 51	372	sleep disparities between foreign-born and US-born NHWs, and differences in sleep				
52 53	373	characteristics varied by Hispanic/Latino heritage, birthplace/nativity, and language of interview				
54 55 56	374	among Hispanics/Latinos compared to NHWs. Although results among NHWs were counter to				
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our hypothesis, results for Latinos were congruent with our hypothesis. Compared to US-born NHWs, foreign-born NHWs had a higher prevalence of poor sleep quality indicators. Although habitual sleep duration was similar between US-born Mexicans and their NHW counterparts, foreign-born Mexican adults reported better sleep duration than US-born NHWs. Better sleep quality among foreign-born Mexican adults compared to US-born NHWs was of greater magnitude than the better sleep quality reported by US-born Mexicans compared to US-born NHWs. Puerto Rican adults generally reported worse sleep duration compared to NHWs. Acknowledging small sample sizes, foreign-born Cubans and Dominicans may generally had even better sleep duration and quality compared to US-born NHWs than US-born Cubans and Dominicans. Overall, Spanish language preference may be associated with increasingly better sleep among Hispanic/Latino heritage groups. Our results are consistent with prior studies that suggest differences in sleep by birthplace and language preference. Most studies report better subjective sleep among foreign-born compared to US-born adults [10, 11, 17, 18], and our results were generally in agreement across each Hispanic/Latino heritage group except Puerto Ricans. Further, our results suggesting that birthplace is a modifier of sleep duration are congruent with findings of both an earlier study of NHIS data and the multisite Study of Women's Health Across the Nation (SWAN) where short sleep duration and sleep complaints were more often reported by US-born adults versus their foreign-born counterparts [10, 17]. Results of SWAN also suggested that language acculturation may mediate differences in sleep complaints, and similarly, completion of interviews in English versus Spanish were positively associated with probably clinically significant insomnia in a separate study of pregnant Latina women in San Diego [10, 35]. Like our study, a different nationally-representative sample found no differences in short sleep duration among US-born Mexicans compared to US-born NHWs but lower odds of short sleep duration among foreign-born Mexicans compared to NHWs [4]. Prior studies either comprised solely individuals of Mexican heritage or used a heterogenous Hispanic/Latino category [4, 10,

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401 17, 18, 35]. Importantly, our study extended this literature by illustrating heterogeneity across
402 Hispanic/Latino heritage groups [36].

403 Differences in study populations, the grouping of Hispanics/Latinos, and sleep 404 assessments likely contribute differences between results of our and some prior studies. 405 Among Mexican women aged 21-40 years in Northern California, birthplace and language 406 preference were not associated with sleep disturbances [37]. In a prior study using 2012 NHIS 407 data, short sleep was more prevalent among US-born Hispanics/Latinos compared to US-born 408 NHWs, and there were no differences in sleep duration between foreign-born Hispanics/Latinos 409 and NHWs [9]. However, all individuals of Hispanic/Latino heritage were combined. In a recent 410 study using 2004-2017 NHIS data, investigators reported higher odds of short sleep among all 411 Hispanic/Latino heritage groups except US-born Cubans compared to NHWs [19]. Our 412 conflicting results are likely due to differences in categorization of sleep duration (e.g., ≤6 hours 413 and ≥ 9 hours versus 7-8 hours), adjustment sets, and modeling approaches [19, 25, 38]. Unlike 414 our study, a multidimensional language acculturation measure was not associated with self-415 reported sleep problems among middle-aged Puerto Rican, Cuban, and Dominican women in 416 New Jersey [36].

417 Several environmental and cultural factors that influence sleep behaviors and sleep 418 health likely explain our findings. The negative acculturation effect, which has been observed as 419 associated with sleep, posits that adoption of Western lifestyles leads to unhealthy behavior 420 practices and declines in health [39]. Negative acculturation coupled with stress related to 421 immigration status likely drive the unexpected disparity in sleep quality among foreign-born 422 NHWs compared to US-born NHWs . Replication and further investigation of this possibility is 423 warranted. The "Hispanic Paradox" likely explains our observations among all Latino heritage 424 groups except for Puerto Rican adults in which all remaining heritage groups tended to have 425 better sleep than NHWs, and Spanish language preference, a proxy measure for low language 426 acculturation, appeared as a protective factor related to sleep health [14, 16]. The likely

mechanism may be the greater ability to express emotions and reduce stress, which carries positive health impacts, when using the Spanish versus the English language [16]. Further, variation in sleep by birthplace and Hispanic/Latino heritage is likely due to differentially experienced environments and unique cultural backgrounds that influence health and coping behaviors. Risk factors for poor sleep including, for instance, low socioeconomic housing environments, color-related stigma and discrimination, social (including acculturation) stressors, structural barriers, and health behaviors like smoking vary by Hispanic/Latino heritage groups with individuals of Puerto Rican descent usually more negatively affected compared to other heritage groups, which may manifest as differences in sleep health [13, 40-46]. There are several study limitations. First, the cross-sectional study design precluded our ability to make causal assumptions about birthplace as a predictor of sleep health. Secondly, all data were self-reported; however, misclassification of individuals into categories of race/ethnicity, sleep duration and quality, birthplace/nativity, language preference/acculturation, and covariates is likely non-differential [47]. Third, sleep disorders such as insomnia and sleep apnea were not measured by the NHIS; however, these disorders may explain our results. Further study inclusive of sleep disorders is warranted. Fourth, our unidimensional, proxy measure of language acculturation did not capture the full breadth of acculturation [39], and data was not available for NHWs; however, psychometric analyses have shown language explains most of the variance in acculturation scales [13]. Nonetheless, future studies would benefit from using multidimensional measures of acculturation. Fifth, the observational nature of the study fosters potential for residual confounding. Sixth, small sample sizes upon stratification (e.g., Dominicans) and within group heterogeneity (e.g., birthplace for NHWs and Central/South Americans) limited interpretability of results for certain heritage groups. Lastly, we tested for many associations and did not adjust for multiple comparisons due to the novelty of our study and our interest in identifying potential associations that may warrant further investigation.

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3 4	452	Study strengths included the use of the most recently available data collected from a					
5 6	453	nationally representative and large sample that allowed for robust stratification by birthplace,					
7 8	454	race/ethnicity, Hispanic/Latino heritage, and language preference/acculturation as well as					
9 10 11 12 13 14	455	adjustment for multiple confounders. Further, we used evidence-based categories of sleep					
	456	duration, assessed multiple important sleep dimensions, and directly estimated prevalence					
	457	ratios [20, 25, 38]. Our study extended prior literature as one of the few using national data to					
15 16	458	compare sleep health between US-born and foreign-born NHWs as well as between foreign-					
17 18	459	born Hispanic/Latinos and their NHW counterparts [9, 11].					
19 20 21	460	In conclusion, consideration of variation in birthplace/nativity, heritage, language, and					
21 22 23	461	other cultural factors in future studies of racial/ethnic disparities in sleep health is important.					
24 25	462	Sleep disparities studies in the US often consider NHWs as the reference group despite					
26 27 28 29 30 31	463	heterogeneity in birthplace, which may lead to inaccurate conclusions about racial/ethnic					
	464	disparities in sleep health. Studies also often combine Hispanic/Latino heritage groups despite					
	465	cultural heterogeneity. Future studies should consider within group heterogeneity and					
32 33	466	disentangle cultural contributors in the social environment that influence sleep health and sleep					
34 35	467	health behaviors. Findings from such studies have the potential to inform culturally tailored					
36 37	468	public health interventions designed to improve sleep health among racial/ethnic					
38 39 40	469	subpopulations. Further, coupling culturally tailored interventions with structural changes related					
40 41 42	470	to environmental justice such as equitable social, economic, and housing policies may further					
43 44	471	improve sleep health while reducing sleep health disparities.					
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AUTHOR CONTRIBUTIONS

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- Acquisition of data: CL. Jackson.
- Statistical Analysis: J. McGrath, WB. Jackson II.
- Interpretation of data: SA. Gaston, EE. Martinez-Miller, J. McGrath, WB. Jackson II, A. Nápoles,
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- Drafting of the manuscript: SA. Gaston, EE. Martinez-Miller.
- Critical revision of the manuscript for important intellectual content: SA. Gaston, EE. Martinez-
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- Administrative, technical, and material support: CL. Jackson.
- Obtaining funding and study supervision: CL. Jackson.
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Page 27 of 71 Table 1. Age-standardized Sociodemographic Characteristics among non-Hispanic White and Hispanic/Latino Adults, National Health Interview Survey, 2004-2017 (N=254,669) a

Race/Ethnicity and Heritage	White Overall (n=207,154)		Mexican (n=30 100)		Puerto Rican (n=5.077)		Cuban (n=2.518) D			Do	minican (n=1 f	\$58)	Central/ South American (n=8.162)						
	Overall		US-born	US-born		US-born	US-born		US-born	US-born		US-born	US-born		US-born	US-born	- Central C	US-born	US-born
2 Nativity		All 207.154	(yes) 198.297	(no) 8.857	All 30,100	(yes) 14.282	(no) 15.818	All 5.077	(yes) 2.544	(no) 2.533	All 2.518	(yes) 559	(no) 1.959	All 1.658	(yes) 264	(no) 1.394	All 8.162	(yes) 1.113	(no) 7.049
n (%)	254,699	(81%)	(96%)	(4%)	(12%)	(47%)	(53%)	(2%)	(50%)	(50%)	(1%)	(22%)	(78%)	(1%)	(16%)	(84%)	(3%)	(14%)	(86%)
Characteristics																			
Age, mean ± SE (years)	46.8±0.9	48.0±0.1	47.9±0.1	48.7±0.2	39.4±0.2	38.1±0.2	40.5±0.2	43.0±0.3	37.6±0.3	49.2±0.5	47.8±0.4	35.8±0.8	51.9±0.5	41.8±0.5	30.8±0.9	44.6±0.5	40.4±0.2	30.1±0.4	42.2±0.2
Female (%)	49	50	50	49	45	49	40	48	47	48	44	42	44	56	53	57	49	55	48
Annual Household Income																			
10 <\$35.000	30	28	28	27	11	37	51	46	35	52	12	25	45	54	36	56	13	24	44
\$35.000-\$74.999	22	20	20	21	24	25	24	20	21	31	- +2	20	40	20	20	20	40	24	24
12 ≥\$75.000	<u> </u>	32	32	29	34	30	- 34	30	22	17	32	29			30	30	34	39	
4 Educational Attainment	57	40	40	44	21	29	15	24	33	17	20	40	21	10	20	14	23	37	21
15 <high school<="" td=""><td>44</td><td>0</td><td>0</td><td></td><td>10</td><td></td><td></td><td>05</td><td>10</td><td></td><td></td><td>4</td><td>45</td><td></td><td>10</td><td>00</td><td>07</td><td>-7</td><td></td></high>	44	0	0		10			05	10			4	45		10	00	07	-7	
6 High school graduate	- 11	8	8	7	40	19	60	25	13	30	14	4	15	30	10	38	27	1	29
8 Some college	29	28	29	22	28	34	22	30	31	29	32	18	36	25	16	27	27	18	27
9 > College	30	31	31	26	22	33	12	21	35	23	26	39	22	23	55	20	23	36	22
0 Unemployed/Not in the	30	33	32	45	10	14	6	18	22	18	29	39	26	16	20	14	23	39	22
Labor Force (%)	38	38	38	36	38	40	36	46	43	49	37	33	37	40	47	39	33	27	33
Occupational Class (%)																			
24 management	21	22	22	27	9	13	5	12	17	9	18	32	15	9	20	7	11	24	10
25 Support Services	35	46	46	45	31	44	19	41	45	39	40	49	37	39	52	37	34	54	32
26 Laborers	45	31	32	28	60	43	76	47	38	52	42	19	48	53	28	55	55	22	58
Marital/Co-habiting Status												h							
29 Married/living with partner																			
0 or cohabitating Divorced/widowed/no live-	65	65	65	68	64	58	70	55	56	56	65	69	67	51	43	52	60	51	62
In partner	21	20	20	20	21	23	20	26	23	28	22	12	23	32	37	33	24	25	24
Single/no live-in partner	14	14	14	12	14	18	11	19	21	16	14	19	10	17	20	14	16	24	14
(%)																			
35 English 36	95	100	100	99	64	91	39	81	91	73	45	85	36	45	88	40	54	88	51
English and Spanish	2	0	0	0	15	6	23	9	6	11	10	8	11	14	9	14	16	7	16
38 Spanish	3	0	0	0	21	2	38	11	3	16	45	7	54	42	3	46	30	5	33
³⁹ Time in the US (states) (%)																			
+0 ≥15 years	24	22	100	78	77	100	77	80	100	80	66	100	66	75	100	75	70	100	70
12 <15 years	76	78	0	22	23	0	23	20	0	20	34	0	34	25	0	25	30	0	30

			1	1	1	1	1	E	3MJ Open	T		1	1	1	1	1	1	1	_ Page 28 of 7
Region of Residence (%)									· ·										
Northeast	18	19	19	29	2	1	3	50	46	49	9	12	8	75	54	77	23	13	23
Midwest	25	28	29	17	10	10	10	9	9	9	4	12	2	2	3	1	5	5	5
South	34	34	34	26	35	40	31	32	31	36	82	68	85	21	38	20	43	37	44
West	22	20	19	29	53	49	56	8	14	6	5	8	4	2	5	2	30	45	28
							00		e										

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Table 2	Age-standardized Health Behavior Characteristics among non-Hispanic White and Hispanic/Latino Adults, National Health In	nterview Survey, 2	2004-2017 (N=	=254,669) a

	Race/Ethnicity and Heritage	White Overall (n=207,154)			Mexican (n=30,100)			Puerto Rican (n=5.077)		Cuban (n=2,518)			Dominican (n=1,658)			Central/ South American (n=8.162)				
1	Netivity	Overall		US-born	US-born		US-born	US-born	• • •	US-born	US-born		US-born	US-born		US-born	US-born		US-born	US-born
2 3			All 207,154	(yes) 198,297	(no) 8,857	All 30,100	(yes) 14,282	(no) 15,818	All 5,077	(yes) 2,544	(no) 2,533	All 2,518	(yes) 559	(no) 1,959	All 1,658	(yes) 264	(no) 1,394	All 8,162	(yes) 1,113	(no) 7,049
4	п (%)	254,699	(81%)	(96%)	(4%)	(12%)	(47%)	(53%)	(2%)	(50%)	(50%)	(1%)	(22%)	(78%)	(1%)	(16%)	(84%)	(3%)	(14%)	(86%)
5	Health Behaviors																			
6	Sleep duration (%) ^b																			
7	≤5 hours	8	8	8	7	8	9	7	15	14	15	8	11	8	13	12	13	8	8	8
8 9	<7 hours	29	29	28	27	28	31	25	39	39	39	29	30	28	34	31	34	31	30	31
10	7-9 hours	67	67	67	69	67	64	70	56	57	57	68	69	69	63	67	64	67	68	67
11	>9 hours	4	4	4	3	4	5	5	4	4	5	3	1	3	3	2	3	2	2	2
12	Sleep Characteristics																			
14	(%) Trouble falling asleep																			
15	(≥3 nights)	20	21	21	17	19	22	17	27	26	27	18	30	16	19	15	19	18	31	16
16	Trouble Staying Asleep (≥3 nights)	29	30	30	23	22	26	18	29	29	28	20	33	19	21	18	21	20	28	19
17	Sleep Medication Use																			
18	(≥3 nights) Nonrestorative Sleen:	11	11	11	8	7	8	6	12	13	12	8	7	7	10	6	10	5	14	5
19 20	Did not wake feeling																			
20 21	rested (>3 days)	64	63	63	66	65	63	67	61	63	61	66	55	67	63	52	64	67	71	67
22	Smoking status (%)	04	00	00	00	00	00	01				0		01	00	52		07		
23	Never/ quit >12 months																			
24	prior *	80	79	79	83	86	84	88	81	79	81	84	88	84	93	92	93	91	86	91
25	Quit ≤12 months ago	2	2	2	1	1	1	1	2	2	1	1	1	1	1	0	1	1	2	1
26 27	Current	18	20	20	15	13	15	11	18	19	17	15	11	15	6	8	6	9	12	8
27 28	Leisure-time Physical Activity (%)												h1.							
29	Never/unable	33	32	32	31	44	39	48	47	39	52	52	35	56	59	57	60	43	30	45
30 31	Does not meet PA auidelines	19	19	19	18	18	18	18	17	18	16	12	9	12	14	12	14	18	20	17
32	Meets PA guidelines ^c *	47	49	49	51	38	43	34	37	43	32	36	56	31	27	30	26	30	50	38
33	Alcohol Consumption	1									02				21		20			
34	(%)																			
35	Lifetime abstainer	16	14	14	18	25	19	30	26	20	30	30	18	32	35	21	36	29	15	30
36 27-	Former	16	16	16	10	18	17	19	18	15	19	10	8	11	13	17	13	16	9	17
37 38	Current	68	70	70	72	57	64	51	56	65	51	60	74	57	52	62	50	55	75	53
آر	Note. Data is presented as perc	entages or r	means ± sta	ndard errors.	All estimates	s are weighte	d for the sur	vey's comple	x sampling de	esign. All estir	nates except f	for age are a	age-standardi	zed to the US	6 2010 popu	lation.		SE=stand	ard error	

39^a Data are presented as percentages or means ± standard errors. All estimates are weighted for the survey's complex sampling design. All estimates except for age are age-standardized to the US 2010 population. 39^a Data are presented as unweighted n's and weighted percentages. Percentages may not sum to 100 due to missing values or rounding. 40^b Short sleep duration categories of ≤5 hours and <7 hours are non-mutually exclusive.

41° Meets PA guidelines defined as \geq 150 minutes/week of moderate intensity or \geq 75 minutes/week of vigorous intensity or \geq 150 minutes/week of moderate + vigorous intensity physical activity. 42^{*} Indicator of "ideal" cardiovascular health

Race/Ethnicity and Heritage	Overall		White (n=207,154)			Mexican (n=30,100)			Puerto Rican (n=5,077)			uban (n=2,51	8)	Do	minican (n=1,	658)	Central/	South America	<u>in (n=8,162)</u>
Nativity		All	US-born (yes)	US-born (no)	All	US-born (yes)	US-born (no)	All	US-born (yes)	US-born (no)	All	US-born (yes)	US-born (no)	All	US-born (yes)	US-born (no)	All	US-born (yes)	US-born (no)
n (%)	254,699	207,154 (81%)	198,297 (96%)	8,857 (4%)	30,100 (12%)	14,282 (47%)	15,818 (53%)	5,077 (2%)	2,544 (50%)	2,533 (50%)	2,518 (1%)	559 (22%)	1,959 (78%)	1,658 (1%)	264 (16%)	1,394 (84%)	8,162 (3%)	1,113 (14%)	7,049 (86%)
Clinical Characteristics (%)																			
Body Mass Index (BMI)																			
Normal (BMI 18.5 - <24.9 kg/m ²) *	34	35	35	40	24	24	24	26	22	27	33	40	31	30	17	32	31	33	31
Overweight (BMI 25.0-29.9 kg/m ²)	37	36	36	39	41	37	44	39	40	39	41	29	44	44	49	43	45	38	45
Obese (BMI ≥30.0 kg/m²)	29	29	29	21	35	38	32	36	38	34	26	31	25	26	34	25	25	30	24
Serious Psychological Distress ^b (% yes)	3	3	3	3	4	4	4	5	4	5	4	3	4	6	2	6	3	3	3
Dyslipidemia (% yes) c*	52	52	52	52	51	49	53	56	60	52	52	58	53	54	45	54	51	49	52
Hypertension (% yes) *	34	34	35	30	34	37	32	37	35	39	33	23	35	37	41	37	28	27	29
Prediabetes/diabetes (% yes) *	15	14	14	12	24	25	23	23	21	24	14	19	15	20	29	20	15	12	16
"Ideal" Cardiovascular Health d (% ves)	12	12	12	15	7	8	6	6	7	5	7	13	6	6	8	5	9	13	9
Cancer (% yes)	12	12	12	10	5	7	4	8	11	7	6	7	6	3	7	3	5	8	5

20 Note. Data is presented as percentages or means ± standard errors. All estimates are weighted for the survey's complex sampling design. All estimates except for age are age-standardized to the US 2010 population.

SE=standard error

 2^{a} Data are presented as unweighted n's and weighted percentages. Percentages may not sum to 100 due to missing values or rounding. 23^{b} Kessler-6 psychological distress scale score ≥ 13 23^{c} Dyslipidemia defined as high cholesterol in the 12 months prior to interview. Available for survey years 2011-2017. 24^{d} "Ideal" cardiovascular health includes never smoking/quit >12 months prior to interview, BMI 18.5 - <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes.

25* Indicator of "ideal" cardiovascular health

Table 4. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Foreign-born non-Hispanic Whites and Hispanic/Latino Heritage Groups
compared to U.Sborn non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=254,669)

	Prevalence Ratio (95% Confidence Interval)									
		Sleep Duratior	1							
	(reference: r	ecommended	<u>(7-9 hours))</u>	S	leep Quality in	<u>the Past Wee</u>	k			
				Trouble	Trouble	Non-	Sleep			
				Falling	Staying	restorative	Medication			
	Very Short	Short	Long	Asleep	Asleep	Sleep	Use			
	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)			
Group (n)	(n=21,227)	(n=75,139)	(n=9,190)	(n=22,038)	(n=30,013)	(n=46,103)	(n=11,097)			
U.Sborn Non-Hispanic White	Ref	Ref	Ref	Ref	Ref	Ref	Ref			
(n=198,297)										
Foreign-born Non-Hispanic White	1.03	1.03	1.07	1.09	1.27	1.06	1.34			
(n=8,857)	(0.93-1.13)	(0.99-1.08)	(0.92-1.24)	(0.99-1.19)	(1.17-1.37)	(1.00-1.12)	(1.16-1.55)			
Mexican										
Overall	0.76	0.87	0.87	0.77	0.65	0.90	0.52			
(n=30,100)	(0.71-0.81)	(0.85-0.90)	(0.79-0.96)	(0.72-0.82)	(0.62-0.69)	(0.87-0.94)	(0.46-0.58)			
U.Sborn (yes)	1.04	1.04	0.98	0.92	0.80	0.97	0.66			
(n=14,282)	(0.97-1.12)	(1.00-1.08)	(0.87-1.11)	(0.85-0.99)	(0.74-0.85)	(0.93-1.01)	(0.58-0.76)			
U.Sborn (no)	0.52	0.70	0.75	0.59	0.50	0.81	0.36			
(n=15,818)	(0.47-0.57)	(0.67-0.73)	(0.66-0.85)	(0.54-0.65)	(0.46-0.55)	(0.77-0.85)	(0.29-0.43)			
Puerto Rican										
Overall	1.39	1.20	1.00	1.05	0.91	0.98	0.99			
(n=5,077)	(1.26-1.53)	(1.14-1.25)	(0.84-1.20)	(0.95-1.17)	(0.83-1.00)	(0.92-1.05)	(0.85-1.15)			
U.Sborn (yes)	1.44	1.23	1.08 🛛 🌽	1.05	0.97	1.00	0.96			
(n=2,544)	(1.27-1.64)	(1.16-1.31)	(0.84-1.37)	(0.91-1.21)	(0.85-1.12)	(0.92-1.09)	(0.77-1.21)			
U.Sborn (no)	1.32	1.15	0.94	1.06	0.84	0.95	1.02			
(n=2,533)	(1.16-1.51)	(1.08-1.24)	(0.74-1.19)	(0.92-1.22)	(0.73-0.97)	(0.86-1.05)	(0.83-1.25)			
Cuban										
Overall	0.83	0.89	0.69	0.78	0.70	0.90	0.68			
(n=2,518)	(0.70-0.99)	(0.81-0.98)	(0.55-0.87)	(0.62-0.97)	(0.58-0.83)	(0.82-1.00)	(0.53-0.89)			
U.Sborn (yes)	0.93	1.04	0.71	0.97	0.94	0.98	0.98			
(n=559)	(0.66-1.29)	(0.89-1.21)	(0.34-1.47)	(0.72-1.31)	(0.70-1.26)	(0.82-1.17)	(0.57-1.69)			
U.Sborn (no)	0.81	0.85	0.69	0.71	0.63	0.87	0.61			
(n=1,959)	(0.66-0.99)	(0.76-0.95)	(0.54-0.88)	(0.53-0.95)	(0.49-0.79)	(0.78-0.98)	(0.43-0.85)			
Dominican										
Overall	0.90	0.92	0.72	0.76	0.67	0.93	0.81			
(n=1,658)	(0.76-1.08)	(0.83-1.01)	(0.49-1.05)	(0.62-0.92)	(0.55-0.83)	(0.82-1.05)	(0.54-1.20)			
U.Sborn (yes)	1.09	1.09	1.15	0.73	0.97	0.98	0.64			
(n=264)	(0.68-1.74)	(0.85-1.40)	(0 49-2 73)	(0 47-1 13)	(0.65-1.43)	(0 77-1 26)	(0.31-1.31)			

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U.Sborn (no)	0.87	0.88	0.60	0.76	0.61	0.92	0.84
(n=1,394)	(0.73-1.03)	(0.79-0.98)	(0.38-0.93)	(0.62-0.95)	(0.48-0.78)	(0.79-1.07)	(0.54-1.30)
Central/South American							
Overall	0.78	0.93	0.68	0.76	0.65	0.89	0.42
(n=8,162)	(0.71-0.87)	(0.89-0.98)	(0.56-0.83)	(0.67-0.87)	(0.58-0.73)	(0.83-0.94)	(0.34-0.53)
U.Sborn (yes)	1.30 (1.03-1.65)	1.18 (1.04-1.33)	0.82 (0.51-1.30)	1.21 (0.96-1.51)	0.98 (0.73-1.30)	1.05 (0.93-1.19)	0.64 (0.38-1.10)
U.Sborn (no)	0.72	0.89	0.66	0.68	0.59	0.85	0.39
(n=7,049)	(0.64-0.80)	(0.85-0.94)	(0.54-0.82)	(0.59-0.77)	(0.53-0.67)	(0.80-0.90)	(0.30-0.50)

Abbreviations: ref (reference)

 Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Very short and short sleep are non-mutually exclusive sleep duration categories. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

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Table 5. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to Foreign-born
non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=56,372)

-	Prevalence Ratio (95% Confidence Interval)											
		Sleep Duration										
	(reference:	recommended	(7-9 hours))	Ģ	Sleep Quality ir	h the Past Weel	<u>k</u>					
				Trouble	Trouble	Non-	Sleep					
				Falling	Staying	restorative	Medication					
	Very Short	Short	Long	Asleep	Asleep	Sleep	Use					
	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)					
Group <i>(n)</i>	(n=4,115)	(n=14,048)	(n=1,586)	(n=3,431)	(n=3,520)	(n=7,734)	(n=1,073)					
Foreign-born Non-Hispanic White	Ref	Ref	Ref	Ref	Ref	Ref	Ref					
(n=8,857)												
Mexican												
Overall	1.10	1.12	1.06	0.92	0.87	1.06	0.92					
(n=30,100)	(0.96-1.26)	(1.05-1.18)	(0.86-1.31)	(0.81-1.05)	(0.78-0.97)	(0.99-1.14)	(0.73-1.14)					
J.Sborn (yes)	1.17	1.19	1.04	1.00	0.97	1.07	0.98					
(n=14,282)	(1.02-1.34)	(1.12-1.26)	(0.84-1.29)	(0.87-1.14)	(0.86-1.10)	(0.99-1.15)	(0.78-1.23)					
J.Sborn (no)	0.89	0.98	1.05	0.78	0.72	1.02	0.68					
(n=15,818)	(0.73-1.08)	(0.90-1.06)	(0.81-1.36)	(0.66-0.94)	(0.62-0.84)	(0.93-1.12)	(0.48-0.96)					
Puerto Rican												
Dverall	1.75	1.34	1.13	1.19	1.14	1.06	1.33					
(n=5,077)	(1.51-2.02)	(1.25-1.44)	(0.88-1.44)	(1.03-1.39)	(0.99-1.31)	(0.96-1.16)	(1.07-1.64)					
J.Sborn (yes)	1.85	1.39	1.33	1.20	1.22	1.06	1.32					
n=2,544)	(1.54-2.22)	(1.27-1.51)	(0.95-1.85)	(0.99-1.46)	(1.02-1.46)	(0.95-1.18)	(1.01-1.73)					
J.Sborn (no)	1.58	1.27	1.02	1.22	1.09	1.06	1.41					
(n=2,533)	(1.32-1.90)	(1.16-1.39)	(0.77-1.35)	(1.01-1.46)	(0.91-1.30)	(0.94-1.20)	(1.09-1.83)					
Cuban												
Overall	0.97	0.98	0.69	0.92	0.93	1.03	1.09					
(n=2,518)	(0.76-1.22)	(0.88-1.10)	(0.49-0.97)	(0.70-1.20)	(0.76-1.15)	(0.90-1.18)	(0.77-1.55)					
U.Sborn (yes)	1.03	1.15	0.83	1.14	1.17	1.05	1.63					
(n=559)	(0.69-1.53)	(0.96-1.37)	(0.39-1.75)	(0.79-1.65)	(0.84-1.65)	(0.85-1.29)	(0.91-2.93)					
U.Sborn (no)	0.94	0.92	0.66	0.82	0.85	1.04	0.96					
(n=1,959)	(0.72-1.22)	(0.81-1.05)	(0.46-0.94)	(0.59-1.14)	(0.65-1.10)	(0.89-1.21)	(0.63-1.45)					
Dominican												
Overall	1.12	1.02	0.91	0.88	0.94	1.00	1.03					
(n=1,658)	(0.89-1.43)	(0.90-1.16)	(0.57-1.45)	(0.68-1.13)	(0.72-1.23)	(0.87-1.15)	(0.67-1.59)					
U.Sborn (yes)	1.40	1.24	1.80	0.82	1.25	1.01	0.97					
(n=264)	(0.82-2.41)	(0.97-1.60)	(0.68-4.79)	(0.51-1.31)	(0.81-1.93)	(0.78-1.32)	(0.42-2.20)					
U.Sborn (no)	1.06	0.96	0.73	0.88	0.87	0.99	1.02					
(n=1,394)	(0.84-1.34)	(0.84-1.10)	(0.45-1.20)	(0.68-1.16)	(0.65-1.18)	(0.84-1.18)	(0.64-1.63)					

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Central/South American							
Overall	1.00	1.10	0.76	0.94	0.89	1.02	0.69
(n=8,162)	(0.86-1.17)	(1.02-1.17)	(0.57-1.02)	(0.78-1.13)	(0.76-1.04)	(0.95-1.11)	(0.51-0.91)
U.Sborn (yes)	1.42	1.30	1.02	1.27	1.14	1.08	0.95
(n=1,113)	(1.06-1.92)	(1.13-1.49)	(0.59-1.75)	(0.96-1.67)	(0.86-1.52)	(0.94-1.25)	(0.56-1.62)
U.Sborn (no)	0.92	1.05	0.77	0.84	0.84	1.00	0.64
(n=7,049)	(0.78-1.08)	(0.98-1.13)	(0.56-1.05)	(0.69-1.02)	(0.72-0.99)	(0.92-1.09)	(0.47-0.88)

Abbreviations: ref (reference)

 Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class

(professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast,
 Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal"
 cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of
 dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

relien only

Note. All estimates are weighted for the survey's complex sampling design. Very short and short sleep are non-mutually exclusive sleep duration categories. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Table 6. Summary of Sensitivity Analyses

Sensitivity Analysis Number	Purpose of Sensitivity Analysis	Method Employed	Summary of Results of Sensitivity Analy
1	To adjust for multiple comparisons	When re-estimating the models in Tables 4 and 5 and well as Figures 1 and 2, we employed false discovery rate procedures.	In total, there were 427 p-values in whic 159 were significant in the original analysis. After the false discovery p-valu correction 127 of the 159 significant p- values (80%) remained statistically significant (Supplemental Tables S2 & S and Supplemental Figure S2). Results were robust for comparisons between foreign-born and US-born NHV and for most results for comparisons wit adults of Mexican and Puerto Rican descent compared to NHWs.
2	To investigate how results would be affected if we did not consider nativity/birthplace as a modifier of racial/ethnic differences in sleep	We combined both US-born and foreign-born participants; we then compared sleep characteristics among Hispanic/Latino heritage groups versus NHWs.	Combining foreign-born and US-born participants across both Hispanic/Latino heritage groups and NHWs would have missed important differences by nativity status (Supplemental Table S2). For instance, the lower prevalence of non- recommended sleep duration observed among foreign-born Mexicans vs. US-bo NHWs (Table 2) would either have been underestimated or not have been observed if participants were not stratifie by birthplace.
3	To investigate how results would be affected if we considered sex/gender and age as potential modifiers [39]	We stratified the original models by sex/gender (men, women) and by age category (18-30 years, 31-49 years, ≥50 years), separately. In models that were also stratified by language acculturation, we combined low and medium acculturation to increase sample sizes and improve statistical stability.	After stratification by sex/gender (Supplemental Table S3), point estimate were slightly stronger among men vs. women for sleep quality across comparisons with foreign-born NHWs ar for very short as well as short sleep acro comparisons with non-US born Mexican Sex/gender did not modify the remaining associations among Mexicans or Puerto Ricans.

			The differences among both foreign-born NHWs and Mexicans compared to US- born NHWs that were observed in the main analysis were greater among younger and middle vs. older aged adults (Supplemental Table S4).
			Across comparisons to non-US born NHWs, there was little variation by sex/gender for Mexicans and Puerto Ricans, but the differences were greater among younger vs. older aged adults (Supplemental Tables S5 and S6).
	00	97 r.	In analyses stratified by language acculturation, lower prevalence of shorter sleep duration among foreign-born Mexicans compared to NHWs was stronger for men vs. women and for younger vs. older adults (Supplemental Tables S7 and S8).
4	To investigate how results would be affected if we adjusted for time in the US in the comparisons between foreign-born Hispanic/Latino heritage groups to their NHW counterparts [9, 19, 37]	Across comparisons of foreign-born Hispanic/Latino heritage groups to their foreign-born NHW counterparts, we additionally adjusted for time in the US.	Results (Supplemental Table S9) were consistent with the main analysis (Table 3), which suggested that time spent in the US was not a strong confounder across comparisons between foreign-born Hispanic/Latino heritage groups and their NHW counterparts.
5	To investigate how results would be affected if we used a different measure of acculturation in models [9, 19]	We separated foreign-born NHWs and Hispanic/Latino heritage groups by a different metric of acculturation, time lived in the US (<15 years in the US, ≥15 years in the US) [9, 19, 37], when compared to US-born NHWs.	Results (Supplemental Table S10) were consistent with those of the language acculturation-stratified analyses (Figure 1).

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1 2	Figure 1. Fully-Adjusted Prevalence Ratios of Sleep Duration and Characteristics for Hispanic/Latino Heritage Groups compared to non- Hispanic Whites by Language Acculturation Status**, National Health Interview Survey, 2004-2017
3 4	** Language acculturation categories include high (English only interview), medium (English and Spanish interview), and low (Spanish only interview).
5 6 7 8 9 10 11	Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high "ideal"="" (kessler-6="" (married="" (never="" (never,="" (northeast,="" (professional="" (yes,="" alcohol="" cardiovascular="" class="" cohabitating="" cohabitating,="" college,="" consumption="" current),="" distress="" divorced="" force="" former,="" graduate,="" health="" high="" in="" labor="" laborers),="" management,="" marital="" midwest,="" no),="" not="" occupational="" of="" psychological="" quit="" region="" residence="" scale="" school="" school,="" score="" serious="" services,="" single),="" smoking="" some="" south,="" status="" support="" the="" unemployed="" west),="" widowed,="" ≥13),="" ≥college),="">12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.</high>
12 13 14 15	Note. All estimates are weighted for the survey's complex sampling design. Certain associations were not estimable due to small sample sizes and are, therefore, not provided (e.g., long sleep duration among Central/South Americans with medium acculturation compared to non-Hispanic Whites).
16 17 18	Figure 2. Fully-Adjusted Prevalence Ratios of Sleep Quality* Characteristics for Hispanic/Latino Heritage Groups compared to non- Hispanic Whites by Language Acculturation Status**, National Health Interview Survey, 2004-2017
19 20 21	 * Trouble falling asleep, trouble staying asleep, sleep medication use, and non-restorative sleep were measured during the survey years 2013-2017. ** Language acculturation categories include high (English only interview), medium (English and Spanish interview), and low (Spanish only interview).
22 23 24 25 26 27	Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high "ideal"="" (kessler-6="" (married="" (never="" (never,="" (northeast,="" (professional="" (yes,="" alcohol="" cardiovascular="" class="" cohabitating="" cohabitating,="" college,="" consumption="" current),="" distress="" divorced="" force="" former,="" graduate,="" health="" high="" in="" labor="" laborers),="" management,="" marital="" midwest,="" no),="" not="" occupational="" of="" psychological="" quit="" region="" residence="" scale="" school="" school,="" score="" serious="" services,="" single),="" smoking="" some="" south,="" status="" support="" the="" unemployed="" west),="" widowed,="" ≥13),="" ≥college),="">12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.</high>
28 29 30 31 32 33	Note. All estimates are weighted for the survey's complex sampling design. Certain associations were not estimable due to small sample sizes and are, therefore, not provided (e.g., long sleep duration among Central/South Americans with medium acculturation compared to non-Hispanic Whites).
34 35 36	
37 38 39 40	
41 42 43	
44 45 46 47	Page 36 of 36 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml



	Mexican	Puerto Rican	Cuban	Dominican	Central/South American
US-born - Spanish Only – US-born - English and Spanish – US-born - English Only –	0.23 0.82 0.95	0.54 0.76 1.08	0.37	0.74	0.73 1.78 1.15
Foreign-born - Spanish Only – Foreign-born - English and Spanish – Foreign-born - English Only –	•0.55 •0.55 •0.63	0.98 0.99 1.09	0.66 0.18 1.06	0.69 0.85 0.81	
US-born - Spanish Only – US-born - English and Spanish – US-born - English Only –	• 0.25 • 0.54 • 0.83	0.48	1.39 1.02	0.92	↓ 0.74 ↓ 1.57 ↓ 0.92
Foreign-born - Spanish Only – Foreign-born - English and Spanish – Foreign-born - English Only –	• 0.48 • 0.46 • 0.53	● 0.61 ● 0.72 ● 0.92	• 0.58 • 0.64 • 0.73	• 0.49 • 0.76 • 0.69	 ↓ 0.49 ↓ 0.58 ↓ 0.66

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PR and 95% CI







Supplemental Figure S1. Flow Chart Diagram of Final Analytic Sample



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^a Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017. ^b Language acculturation categories include high (English only interview), medium (English and Spanish interview), and low (Spanish only interview). Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/guit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer. Note. All estimates are weighted for the survey's complex sampling design. Certain associations were not estimable due to small sample sizes and are, therefore, cans. ses but became statistic. not provided (e.g., long sleep duration among Central/South Americans with medium acculturation compared to non-Hispanic Whites). * Results were statistically significant in original analyses but became statistically non-significant after applying false discovery rate p-values.

Supplemental Table S1. Global Region of Birth among Foreign-born Non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=8,857)

Region of Birth	n (%)
Mexico, Central American, Caribbean Islands	238 (2.7%)
South America	236 (2.7%)
Europe	4,670 (52.7%)
Russia	838 (9.5%)
Africa	368 (4.2%)
Middle East	895 (10.1%)
Indian Subcontinent	64 (0.7%)
Asia	177 (2.0%)
Southeast Asia	117 (1.3%)
Elsewhere	1,254 (14.2%)

 Note: Data are presented as absolute counts and age-standardized, weighted percentages.

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Supplemental Table S2. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Foreign-born non-Hispanic Whites and Hispanic/Latino Heritage Groups compared to U.S.-born non-Hispanic Whites: Results after False Discovery Rate Correction, National Health Interview Survey, 2004-2017 (N=254.669)

	Prevalence Ratio (95% Confidence Interval)							
		Sleep Duration						
	(reference: I	recommended	(7-9 hours))	Sleep Quality in the Past Week				
				Trouble	Trouble	Non-	Sleep	
	Verse Object	Object		Falling	Staying	restorative	Medicatio	
	very Short	Short	Long	Asleep	Asleep	Sieep		
	(≥5-nours)	(-nours)</th <th>(>9-nours)</th> <th>$(\geq 3 \text{ nights})$</th> <th>$(\geq 3 \text{ nights})$</th> <th>(23 days)</th> <th></th>	(>9-nours)	$(\geq 3 \text{ nights})$	$(\geq 3 \text{ nights})$	(23 days)		
Group (<i>II)</i>	(n=21,227)	(n=75,139)	(n=9,190)	(n=22,038)	(n=30,013)	(n=46,103)	(n=11,09)	
(n=198,297)	Rei	Rei	Rei	Rei	Rei	Rei	Rei	
Foreign-born Non-Hispanic White	1.03	1.03	1.07	1.09	1.27	1.06	1.34	
(n=8,857)	(0.93-1.13)	(0.99-1.08)	(0.92-1.24)	(0.99-1.19)	(1.17-1.37)	(1.00-1.12)	(1.16-1.5	
Mexican								
Overall	0.76	0.87	0.87	0.77	0.65	0.90	0.52	
(n=30,100)	(0.71-0.81)	(0.85-0.90)	(0.79-0.96)	(0.72-0.82)	(0.62-0.69)	(0.87-0.94)	(0.46-0.58	
U.Sborn (yes)	1.04	1.04	0.98	0.92	0.80	0.97	0.66	
(n=14,282)	(0.97-1.12)	(1.00-1.08)	(0.87-1.11)	(0.85-0.99)	(0.74-0.85)	(0.93-1.01)	(0.58-0.76	
U.Sborn (no)	0.52	0.70	0.75	0.59	0.50	0.81	0.36	
(n=15,818)	(0.47-0.57)	(0.67-0.73)	(0.66-0.85)	(0.54-0.65)	(0.46-0.55)	(0.77-0.85)	(0.29-0.43	
Puerto Rican								
Overall	1.39	1.20	1.00	1.05	0.91	0.98	0.99	
(n=5,077)	(1.26-1.53)	(1.14-1.25)	(0.84-1.20)	(0.95-1.17)	(0.83-1.00)	(0.92-1.05)	(0.85-1.15	
U.Sborn (yes)	1.44	1.23	1.08	1.05	0.97	1.00	0.96	
(n=2,544)	(1.27-1.64)	(1.16-1.31)	(0.84-1.37)	(0.91-1.21)	(0.85-1.12)	(0.92-1.09)	(0.77-1.21	
U.Sborn (no)	1.32	1.15	0.94	1.06	0.84	0.95	1.02	
(n=2,533)	(1.16-1.51)	(1.08-1.24)	(0.74-1.19)	(0.92-1.22)	(0.73-0.97)	(0.86-1.05)	(0.83-1.25	
Cuban								
Overall (n=2,518)	0.83 (0.70-0.99)	0.89 (0.81-0.98)	0.69 (0.55-0.87)	0.78 (0.62-0.97)	0.70 (0.58-0.83)	0.90 (0.82-1.00)	0.68 (0.53-0.89	
U.Sborn (yes)	0.93	1.04	0.71	0.97	0.94	0.98	0.98	
(n=559)	(0.66-1.29)	(0.89-1.21)	(0.34-1.47)	(0.72-1.31)	(0.70-1.26)	(0.82-1.17)	(0.57-1.69	
U.Sborn (no)	0.81	0.85	0.69	0.71	0.63	0.87	0.61	
(n=1,959)	(0.66-0.99)	(0.76-0.95)	(0.54-0.88)	(0.53-0.95)	(0.49-0.79)	(0.78-0.98)	(0.43-0.8	
Dominican								
Overall	0.90	0.92	0.72	0.76	0.67	0.93	0.81	
(n=1,658)	(0.76-1.08)	(0.83-1.01)	(0.49-1.05)	(0.62-0.92)	(0.55-0.83)	(0.82-1.05)	(0.54-1.20	
J.Sborn (yes)	1.09	1.09	1.15	0.73	0.97	0.98	0.64	
(n=264)	(0.68-1.74)	(0.85-1.40)	(0.49-2.73)	(0.47-1.13)	(0.65-1.43)	(0.77-1.26)	(0.31-1.31)	
------------------------	-------------	-------------	-------------	-------------	-------------	-------------	-------------	
U.Sborn (no)	0.87	0.88	0.60	0.76	0.61	0.92	0.84	
(n=1,394)	(0.73-1.03)	(0.79-0.98)	(0.38-0.93)	(0.62-0.95)	(0.48-0.78)	(0.79-1.07)	(0.54-1.30)	
Central/South American								
Overall	0.78	0.93	0.68	0.76	0.65	0.89	0.42	
(n=8,162)	(0.71-0.87)	(0.89-0.98)	(0.56-0.83)	(0.67-0.87)	(0.58-0.73)	(0.83-0.94)	(0.34-0.53)	
IIS -born (ves)	1.30	1.18	0.82	1.21	0.98	1.05	0.64	
(n=1,113)	(1.03-1.65)	(1.04-1.33)	(0.51-1.30)	(0.96-1.51)	(0.73-1.30)	(0.93-1.19)	(0.38-1.10)	
U.Sborn (no)	0.72	0.89	0.66	0.68	0.59	0.85	0.39	
(n=7,049)	(0.64-0.80)	(0.85-0.94)	(0.54-0.82)	(0.59-0.77)	(0.53-0.67)	(0.80-0.90)	(0.30-0.50)	

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex/gender (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Very short and short sleep are non-mutually exclusive sleep duration categories. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Italicized results indicate results that were statistically significant in original analyses but became statistically non-significant after applying false discovery rate p-values.

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			Prevalence Ra	tio (95% Confid	dence Interval)		
		Sleep Duratior	1				
	(reference:	recommended	(7-9 hours))	S	Sleep Quality in	n the Past Wee	k
Group (n)	Very Short (≤5-hours) (n=4.115)	Short (<7-hours) (n=14.048)	Long (>9-hours) (n=1.586)	Trouble Falling Asleep (≥3 nights) (n=3.431)	Trouble Staying Asleep (≥3 nights) (n=3.520)	Non- restorative Sleep (≥3 days) (n=7.734)	Sle Medic Us (≥3 nic (n=1.
Foreign-born Non-Hispanic White (n=8,857)	Ref	Ref	Ref	Ref	Ref	Ref	Re
Mexican							
Overall	1.10	1.12	1.06	0.92	0.87	1.06	0.9
(n=30,100)	(0.96-1.26)	(1.05-1.18)	(0.86-1.31)	(0.81-1.05)	(0.78-0.97)	(0.99-1.14)	(0.73-
U.Sborn (yes)	1.17	1.19	1.04	1.00	0.97	1.07	0.9
(n=14,282)	(1.02-1.34)	(1.12-1.26)	(0.84-1.29)	(0.87-1.14)	(0.86-1.10)	(0.99-1.15)	(0.78-
U.Sborn (no) (n=15,818)	0.89 (0.73-1.08)	0.98 (0.90-1.06)	1.05 (0.81-1.36)	0.78 (0.66-0.94)	0.72 (0.62-0.84)	1.02 (0.93-1.12)	0.6 (0.48-
Puerto Rican	, , , , , , , , , , , , , , , , , , ,				· · · ·		
Overall	1.75	1.34	1.13	1.19	1.14	1.06	1.3
(n=5,077)	(1.51-2.02)	(1.25-1.44)	(0.88-1.44)	(1.03-1.39)	(0.99-1.31)	(0.96-1.16)	(1.07-
U.Sborn (yes)	1.85	1.39	1.33	1.20	1.22	1.06	1.3
(n=2,544)	(1.54-2.22)	(1.27-1.51)	(0.95-1.85)	(0.99-1.46)	(1.02-1.46)	(0.95-1.18)	(1.01-
U.Sborn (no)	1.58	1.27	1.02	1.22	1.09	1.06	1.4
(n=2,533)	(1.32-1.90)	(1.16-1.39)	(0.77-1.35)	(1.01-1.46)	(0.91-1.30)	(0.94-1.20)	(1.09-
Cuban							
Overall	0.97	0.98	0.69	0.92	0.93	1.03	1.0
(n=2,518)	(0.76-1.22)	(0.88-1.10)	(0.49-0.97)	(0.70-1.20)	(0.76-1.15)	(0.90-1.18)	(0.77-
U.Sborn (yes)	1.03	1.15	0.83	1.14	1.17	1.05	1.6
(n=559)	(0.69-1.53)	(0.96-1.37)	(0.39-1.75)	(0.79-1.65)	(0.84-1.65)	(0.85-1.29)	(0.91-2
U.Sborn (no)	0.94	0.92	0.66	0.82	0.85	1.04	0.9
(n=1,959) Deminiser	(0.72-1.22)	(0.81-1.05)	(0.46-0.94)	(0.59-1.14)	(0.65-1.10)	(0.89-1.21)	(0.63-
Dominican	1 10	1.00	0.01	0.00	0.04	1.00	1.0
0verall (n=1.658)	1.1Z (0.90,1.42)				0.94 (0.70.4.00)		
[1-1,000]	1 10	1 24	1 20	0.00-1.13)	1 25	1 01	(0.07-
(n=264)	1.40 (0.82-2.41)	1.24 (0.07_1.60)	(0.68-1.70)	0.02 (0.51-1.31)	1.20 (0.81-1.03)	(0.78₋1.32)	(0.9
$IIS_{\text{-born}}(n_0)$	1.06	0.07-1.00)	0.00-4.73	0.88	0.87		1 0
(n-4, 20, 4)			(0.45.1.20)	(0.69.1.16)	0.07 (0.65 4 40)		

Overall (n=8,162) U.Sborn (yes) (n=1,113) U.Sborn (no) (n=7,049) Abbreviations: ref (reference) Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">(professional/management, support services (Northeast, Midwest, South, West), alcohol of 'ideal'' cardiovascular health (never smoking dyslipidemia, hypertension, or diabetes/pred</high>	1.00 (0.86-1.17) 1.42 (1.06-1.92) 0.92 (0.78-1.08) rears), sex/generate, some colle , laborers), ma	1.10 (1.02-1.17) 1.30 (1.13-1.49) 1.05 (0.98-1.13) der (male, female ge, ≥college), une	0.76 (0.57-1.02) 1.02 (0.59-1.75) 0.77 (0.56-1.05)), annual househ	0.94 (0.78-1.13) 1.27 (0.96-1.67) 0.84 (0.69-1.02)	0.89 (0.76-1.04) 1.14 (0.86-1.52) 0.84 (0.72-0.99)	1.02 (0.95-1.11) 1.08 (0.94-1.25) 1.00 (0.92-1.09)	0.69 (0.51-0.91 0.95 (0.56-1.62 0.64 (0.47-0.88
(n=8,162) U.Sborn (yes) (n=1,113) U.Sborn (no) (n=7,049) Abbreviations: ref (reference) Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">professional/management, support services Northeast, Midwest, South, West), alcohol of ideal" cardiovascular health (never smoking dyslipidemia, hypertension, or diabetes/pred</high>	(0.86-1.17) 1.42 (1.06-1.92) 0.92 (0.78-1.08) rears), sex/generate, some colle , laborers), ma	(1.02-1.17) 1.30 (1.13-1.49) 1.05 (0.98-1.13) der (male, female ge, ≥college), une	(0.57-1.02) 1.02 (0.59-1.75) 0.77 (0.56-1.05)), annual househ	(0.78-1.13) 1.27 (0.96-1.67) 0.84 (0.69-1.02)	(0.76-1.04) 1.14 (0.86-1.52) 0.84 (0.72-0.99)	(0.95-1.11) 1.08 (0.94-1.25) 1.00 (0.92-1.09)	(0.51-0.9 0.95 (0.56-1.62 0.64 (0.47-0.88
U.Sborn (yes) (n=1,113) U.Sborn (no) (n=7,049) Abbreviations: ref (reference) Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">professional/management, support services Northeast, Midwest, South, West), alcohol of ideal" cardiovascular health (never smoking dyslipidemia, hypertension, or diabetes/pred</high>	1.42 (1.06-1.92) 0.92 (0.78-1.08) ears), sex/generate, some colle , laborers), ma	1.30 (1.13-1.49) 1.05 (0.98-1.13) der (male, female ge, ≥college), une	1.02 (0.59-1.75) 0.77 (0.56-1.05)), annual househ	1.27 (0.96-1.67) 0.84 (0.69-1.02)	1.14 (0.86-1.52) 0.84 (0.72-0.99)	1.08 (0.94-1.25) 1.00 (0.92-1.09)	0.95 (0.56-1.62 0.64 (0.47-0.88
(n=1,113) U.Sborn (no) (n=7,049) Abbreviations: ref (reference) Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">professional/management, support services Northeast, Midwest, South, West), alcohol of ideal" cardiovascular health (never smoking dyslipidemia, hypertension, or diabetes/pred</high>	(1.06-1.92) 0.92 (0.78-1.08) ears), sex/generate, some colle , laborers), ma	(1.13-1.49) 1.05 (0.98-1.13) der (male, female ge, ≥college), une	(0.59-1.75) 0.77 (0.56-1.05)), annual househ	(0.96-1.67) 0.84 (0.69-1.02)	(0.86-1.52) 0.84 (0.72-0.99)	(0.94-1.25) 1.00 (0.92-1.09)	(0.56-1.62 0.64 (0.47-0.8 8
U.Sborn (no) (<i>n</i> =7,049) Abbreviations: ref (reference) Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">professional/management, support services Northeast, Midwest, South, West), alcohol o ideal" cardiovascular health (never smoking dyslipidemia, hypertension, or diabetes/pred</high>	0.92 (0.78-1.08) rears), sex/generate, some colle , laborers), ma	1.05 (0.98-1.13) der (male, female ge, ≥college), une	0.77 (0.56-1.05)), annual househ	0.84 (0.69-1.02)	0.84 (0.72-0.99)	1.00 (0.92-1.09)	0.64 (0.47-0.8
(n=7,049) Abbreviations: ref (reference) Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">professional/management, support services Northeast, Midwest, South, West), alcohol o ideal" cardiovascular health (never smoking tyslipidemia, hypertension, or diabetes/pred</high>	(0.78-1.08) rears), sex/generate, some colle , laborers), ma	(0.98-1.13) der (male, female ge, ≥college), une	(0.56-1.05)), annual househ	(0.69-1.02)	(0.72-0.99)	(0.92-1.09)	(0.47-0.8
Abbreviations: ref (reference) Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">professional/management, support services Northeast, Midwest, South, West), alcohol o ideal" cardiovascular health (never smoking lyslipidemia, hypertension, or diabetes/pred</high>	ears), sex/gen ate, some colle , laborers), ma	der (male, female ge, ≥college), une), annual househ				
Adjusted for age (18-30, 31-49, 50-64, 65+ y attainment (<high gradua<br="" high="" school="" school,="">professional/management, support services Northeast, Midwest, South, West), alcohol o ideal" cardiovascular health (never smoking dyslipidemia, hypertension, or diabetes/pred</high>	ears), sex/gen ate, some colle , laborers), ma	der (male, female ge, ≥college), une), annual househ				
Note. All estimates are weighted for the surv Trouble falling asleep, trouble staying asleep Italicized results indicate results that were st values.	/quit >12 montl iabetes), and c ey's complex s o, sleep medica atistically signif	rital/cohabitating s ever, former, curr ns prior to intervie ancer. ampling design. \ tion use, and rest icant in original a	employed/not in the status (married/co ent), serious psyc ew, BMI <25 kg/m /ery short and sho corative sleep wer nalyses but becar	old income (<\$35 he labor force (yes ohabitating, divord chological distress 2, meeting physic ort sleep are non- re measured durin me statistically no	n-significant after	4,999, \$75,000+), al class gle), region of resi hological distress hes, and no prior e sleep duration o rs 2013-2017.	dence scale score a diagnosis of categories.

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Supplemental Table S4. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to non-Hispanic Whites National Health Interview Survey 2004-2017 (N=254 669)

		Dro	yalanaa Bati	$\sim (0.5\%)/Confid$	/ donao Intonyo	N	
-			valence Ratio		dence interva	1)	
	S S	leep Duration					
	(reference: re	commended	(7-9 hours))		Sleep G	Quality ^a	1
				Trouble	Trouble	Non-	Sleep
				Falling	Staying	restorative	Medication
	Very Short	Short	Long	Asleep	Asleep	Sleep	Use
Heritage Group Compared to non-	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)
Hispanic Whites, Overall (n=207,154)	(n=21,227)	(n=75,139)	(n=9,190)	(n=22,038)	(n=30,013)	(n=46,103)	(n=11,097)
Mexican	0.89	0.95	0.94	0.85	0.75	0.95	0.62
(n=30,100 Mexican)	(0.82-0.95)	(0.92-0.98)	(0.84-1.04)	(0.79-0.91)	(0.71-0.80)	(0.91-0.99)	(0.54-0.70)
Puerto Rican	1.41	1.21	1.05	1.10	1.02	1.01	1.10
(n=5,077)	(1.27-1.57)	(1.16-1.27)	(0.87-1.27)	(0.99-1.22)	(0.92-1.12)	(0.94-1.08)	(0.94-1.30)
Cuban	0.90	0.94	0.75	0.88	0.88	0.96	0.93
(n=2,518)	(0.75-1.07)	(0.86-1.04)	(0.58-0.97)	(0.71-1.09)	(0.74-1.05)	(0.87-1.07)	(0.70-1.23)
Dominican	0.95	0.96	0.79	0.82	0.84	0.98	1.04
(n=1,658)	(0.78-1.16)	(0.86-1.06)	(0.53-1.18)	(0.66-1.02)	(0.68-1.04)	(0.87-1.11)	(0.69-1.58)
Central/South American	0.89	1.01	0.75	0.88	0.83	0.95	0.57
(n=8 162)	(0 78-1 01)	(0.95 - 1.07)	(0 60-0 94)	(0.75 - 1.03)	(0 73-0 95)	(0.88-1.02)	(0 44-0 73)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (lifetime abstainer, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), and "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), cancer, and US nativity status/years lived in the US (US-born, 15+ years in the US, <15 years in the US).

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, awakening feeling rested, and sleep medication were measured during the survey years 2013-2017.

Supplemental Table S5. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (1) foreign-born non-Hispanic Whites and (2) Hispanic/Latino Heritage Groups compared to US-born non-Hispanic Whites, Stratified by Sex/Gender, National Health Interview Survey, 2004-2017 (N=254,669)

•						Prevalence	e Ratio (95%	6 Confiden	ce Interval)					
		(referen	Sleep D ce: recomn	ouration nended (7-9) hours))				Slee	ep Quality ir	the Past V	Veek		
Group <i>(n)</i>	Very (≤5-h (n=21	Short ours) I,227)	Sh (<7-h (n=75	ort ours) 5,139)	Lo (>9-h (n=9	ong ours) ,190)	Trouble Asl (≥3 n (n=22	e Falling eep ights) 2,038)	Trouble Asl (≥3 ni (n=30	Staying eep ights)),013)	Non-res Sle (≥3 c (n=46	torative eep lays) 5,103)	Sleep Mo U (≥3 n (n=1∕	edication se ights) 1,097)
Sex/Gender	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
U.Sborn Non-Hispanic White (n=198,297)	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Foreign-born Non- Hispanic White (n=8,857)	1.12 (0.98-1.30)	0.94 (0.83-1.06)	1.07 (1.00-1.13)	1.00 (0.95-1.06)	1.18 (0.94-1.47)	1.00 (0.82-1.21)	1.08 (0.92-1.27)	1.09 (0.97-1.21)	1.31 (1.16-1.49)	1.22 (1.11-1.35)	1.11 (1.02-1.21)	1.01 (0.95-1.08)	1.44 (1.12-1.85)	1.28 (1.07-1.52)
Mexican					'N_									
Overall (n=30,100)	0.70 (0.63-0.77)	0.83 (0.76-0.91)	0.83 (0.79-0.86)	0.94 (0.90-0.97)	0.96 (0.84-1.10)	0.77 (0.68-0.87)	0.77 (0.73-0.82)	0.80 (0.74-0.86)	0.66 (0.62-0.70)	0.68 (0.63-0.73)	0.91 (0.87-0.94)	0.91 (0.87-0.95)	0.52 (0.46-0.59)	0.48 (0.41-0.56)
U.Sborn (yes) (n=14,282)	1.02 (0.91-1.14)	1.05 (0.96-1.15)	1.01 (0.96-1.07)	1.07 (1.03-1.12)	1.09 (0.91-1.31)	0.88 (0.75-1.03)	0.92 (0.85-0.99)	0.92 (0.84-1.00)	0.80 (0.74-0.86)	0.77 (0.71-0.85)	0.97 (0.93-1.01)	0.95 (0.90-1.00)	0.66 (0.58-0.76)	0.59 (0.50-0.70)
U.Sborn (no) (n=15,818)	0.47 (0.40-0.54)	0.60 (0.52-0.69)	0.66 (0.62-0.70)	0.77 (0.71-0.82)	0.83 (0.70-0.99)	0.65 (0.54-0.78)	0.60 (0.55-0.66)	0.64 (0.58-0.71)	0.51 (0.46-0.55)	0.55 (0.49-0.62)	0.82 (0.77-0.86)	0.85 (0.80-0.90)	0.36 (0.30-0.44)	0.34 (0.27-0.42)
Puerto Rican								1,						
Overall (n=5,077)	1.31 (1.13-1.53)	1.45 (1.29-1.63)	1.19 (1.11-1.28)	1.21 (1.14-1.28)	1.05 (0.82-1.34)	0.95 (0.74-1.21)	1.05 (0.94-1.16)	1.08 (0.96-1.22)	0.91 (0.83-1.00)	0.87 (0.78-0.97)	0.98 (0.91-1.05)	1.04 (0.97-1.12)	0.98 (0.84-1.15)	1.02 (0.84-1.23)
U.Sborn (yes) (n=2,544)	1.33 (1.08-1.63)	1.53 (1.30-1.81)	1.21 (1.11-1.33)	1.24 (1.15-1.35)	1.26 (0.89-1.77)	0.94 (0.66-1.33)	1.04 (0.90-1.21)	1.14 (0.98-1.33)	0.97 (0.85-1.11)	0.91 (0.78-1.05)	1.00 (0.92-1.09)	1.10 (1.01-1.20)	0.96 (0.76-1.19)	0.97 (0.73-1.30)
U.Sborn (no) (<i>n</i> =2,533)	1.29 (1.03-1.61)	1.36 (1.17-1.58)	1.15 (1.04-1.27)	1.16 (1.06-1.26)	0.89 (0.63-1.26)	0.96 (0.72-1.28)	1.05 (0.91-1.21)	1.01 (0.86-1.18)	0.84 (0.73-0.97)	0.82 (0.70-0.97)	0.95 (0.86-1.04)	0.96 (0.85-1.08)	1.01 (0.83-1.24)	1.08 (0.86-1.35)
Cuban Overall (n=2,518)	0.75 (0.59-0.96)	0.94 (0.75-1.18)	0.84 (0.74-0.95)	0.97 (0.87-1.09)	0.73 (0.54-0.99)	0.63 (0.42-0.93)	0.76 (0.61-0.94)	0.78 (0.60-1.01)	0.68 (0.57-0.81)	0.72 (0.57-0.91)	0.89 (0.81-0.99)	0.98 (0.85-1.14)	0.66 (0.51-0.87)	0.77 (0.55-1.06)
U.Sborn Cuban (yes) (n=559)	0.78 (0.44-1.39)	1.08 (0.74-1.58)	1.01 (0.81-1.25)	1.08 (0.89-1.31)	0.49 (0.18-1.29)	0.95 (0.39-2.31)	0.95 (0.70-1.28)	0.96 (0.66-1.39)	0.92 (0.69-1.23)	0.83 (0.53-1.31)	0.96 (0.80-1.16)	1.07 (0.86-1.34)	0.95 (0.54-1.66)	1.37 (0.78-2.42)
U.Sborn Cuban (no) (<i>n</i> =1,959)	0.75 (0.56-1.00)	0.90 (0.69-1.18)	0.78 (0.67-0.91)	0.94 (0.82-1.07)	0.78 (0.57-1.05)	0.55 (0.35-0.87)	0.69 (0.52-0.92)	0.71 (0.52-0.98)	0.61 (0.48-0.78)	0.68 (0.50-0.94)	0.87 (0.77-0.97)	0.95 (0.80-1.13)	0.59 (0.42-0.83)	0.60 (0.40-0.89)
Dominican														
Overall (n=1,658)	0.82 (0.60-1.11)	0.96 (0.79-1.16)	0.83 (0.71-0.97)	0.98 (0.88-1.10)	1.05 (0.68-1.61)	0.49 (0.24-1.00)	0.77 (0.63-0.94)	0.83 (0.66-1.03)	0.68 (0.56-0.84)	0.77 (0.61-0.97)	0.94 (0.83-1.06)	0.96 (0.84-1.09)	0.83 (0.55-1.23)	0.93 (0.60-1.45)
U.Sborn (yes)	(0.60-2.11)	(0.58-1.79)	0.86 (0.60-1.23)	1.32 (0.98-1.77)	(0.30-3.07)	(0.48-3.80)	0.73 (0.48-1.12)	(0.36-1.07)	0.97 (0.65-1.44)	(0.53-1.57)	0.99 (0.78-1.26)	0.93 (0.68-1.29)	0.64 (0.31-1.30)	0.57 (0.23-1.43)

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(n=264)														
U.Sborn (no)	0.74	0.95	0.82	0.92	1.08	0.29	0.78	0.88	0.62	0.74	0.92	0.96	0.86	1.00
(n=1,394)	(0.52-1.04)	(0.78-1.15)	(0.69-0.97)	(0.81-1.04)	(0.63-1.85)	(0.15-0.53)	(0.63-0.97)	(0.69-1.12)	(0.49-0.80)	(0.57-0.97)	(0.79-1.08)	(0.83-1.13)	(0.55-1.34)	(0.61-1.63)
Central/South American														
	0.71	0.87	0.93	0.94	0.66	0.70	0.78	0.83	0.65	0.73	0.89	0.96	0.43	0.46
Overall (<i>n</i> =8,162)	(0.61-0.83)	(0.76-0.99)	(0.87-0.99)	(0.88-1.01)	(0.48-0.91)	(0.56-0.89)	(0.68-0.88)	(0.71-0.97)	(0.58-0.73)	(0.63-0.86)	(0.84-0.95)	(0.89-1.04)	(0.34-0.54)	(0.35-0.61)
U.Sborn (yes)	1.31	1.31	1.25	1.10	0.64	0.95	1.21	1.40	0.97	1.13	1.05	1.13	0.64	0.47
(n=1,113)	(0.92-1.87)	(0.96-1.77)	(1.08-1.45)	(0.92-1.30)	(0.35-1.16)	(0.52-1.74)	(0.96-1.53)	(1.06-1.86)	(0.73-1.30)	(0.80-1.61)	(0.92-1.20)	(0.97-1.32)	(0.38-1.10)	(0.24-0.94)
U.Sborn	0.64	0.80	0.88	0.92	0.66	0.67	0.69	0.71	0.60	0.66	0.85	0.92	0.40	0.46
(no) (n=7,049)	(0.54-0.76)	(0.70-0.93)	(0.82-0.94)	(0.85-0.98)	(0.47-0.94)	(0.52-0.87)	(0.60-0.78)	(0.61-0.83)	(0.53-0.68)	(0.57-0.77)	(0.80-0.91)	(0.85-0.99)	(0.31-0.51)	(0.34-0.62)

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

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Supplemental Table S6. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (1) foreign-born non-Hispanic Whites and (2) Hispanic/Latino Heritage Groups compared to US-born non-Hispanic Whites, Stratified by Age Group, National Health Interview Survey, 2004-2017 (N=254.669)

2							,		Pr	evalenc	e Ratio	(95% Co	onfidenc	e Interv	al)							
3 4				(refere	Sle nce: rec	ep Dura ommeno	tion ded (7-9	hours))							Sleep Q	uality ir	n the Pas	st Week				
5 5 7 8 9	Group <i>(n)</i>	V (<u>1</u>	/ery Sho ≤5-hours 1=21,227	ort S) 7)	(:	Short ≤7-hours n=75,139	s) 9)	()	Long >9-hours n=9,190	s))	Tro (2 (۱	uble Fal Asleep 3 nights 1=22,038	ling s) 3)	Trou (2 (1	uble Stay Asleep 3 nights 1=30,013	ying s) 3)	Non (l-restora Sleep ≥3 days n=46,103	ntive) 3)	Slee∣ (≥ (r	o Medica Use 3 nights n=11,097	ation s) 7)
10 11	Age (years) Group	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+	18-30	31-49	50+
12 13 14 15	U.Sborn Non-Hispanic White (n=198,297)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
16 17 18 19	Foreign-born Non-Hispanic White (n=8,857)	0.93 (0.71- 1.23)	1.33 (1.13- 1.56)	0.89 (0.80- 1.00)	1.08 (0.95- 1.22)	1.13 (1.05- 1.21)	0.96 (0.91- 1.01)	1.24 (0.80- 1.92)	1.12 (0.79- 1.59)	0.96 (0.82- 1.13)	0.98 (0.74- 1.31)	1.24 (1.06- 1.44)	1.04 (0.92- 1.17)	1.11 (0.79- 1.56)	1.44 (1.24- 1.68)	1.20 (1.10- 1.31)	1.02 (0.89- 1.16)	1.15 (1.07- 1.25)	1.00 (0.92- 1.08)	1.64 (0.95- 2.85)	1.64 (1.21- 2.22)	1.22 (1.03- 1.44)
20 21	Mexican																					
22 23	Overall (n=30,100)	0.78 (0.69- 0.89)	0.69 (0.62- 0.76)	0.98 (0.87- 1.10)	0.88 (0.83- 0.93)	0.87 (0.83- 0.90)	0.96 (0.91- 1.02)	0.96 (0.80- 1.15)	0.72 (0.61- 0.87)	0.86 // (0.75- 0.98)	0.81 (0.76- 0.86)	0.66 (0.60- 0.73)	0.92 (0.83- 1.01)	0.65 (0.61- 0.69)	0.58 (0.53- 0.64)	0.71 (0.64- 0.78)	0.95 (0.92- 0.99)	0.88 (0.84- 0.92)	0.93 (0.87- 1.00)	0.50 (0.44- 0.56)	0.41 (0.33- 0.51)	0.61 (0.52- 0.72)
24 25 26	U.Sborn (yes) (n=14.282)	1.03 (0.90- 1.18)	1.03 (0.91- 1.15)	1.14 (1.01- 1.27)	1.00 (0.93- 1.06)	1.09 (1.03- 1.15)	1.06 (0.99- 1.13)	1.04 (0.85- 1.26)	0.85 (0.67- 1.09)	0.96 (0.81- 1.13)	0.96 (0.89- 1.03)	0.81 (0.73- 0.91)	1.01 (0.90- 1.15)	0.77 (0.71- 0.82)	0.73 (0.65- 0.82)	0.84 (0.75- 0.95)	1.02 (0.98- 1.06)	0.96 (0.91- 1.03)	1.00 (0.92- 1.09)	0.61 (0.53- 0.70)	0.64 (0.51- 0.80)	0.64 (0.54- 0.76)
27 28 29	U.Sborn (no) (<i>n</i> =15,818)	0.43 (0.34- 0.54)	0.48 (0.41- 0.55)	0.82 (0.68- 0.98)	0.67 (0.61- 0.74)	0.69 (0.65- 0.74)	0.86 (0.79- 0.93)	0.81 (0.62- 1.06)	0.65 (0.51- 0.82)	0.76 (0.63- 0.92)	0.63 (0.58- 0.69)	0.54 (0.46- 0.62)	0.80 (0.69- 0.93)	0.51 (0.47- 0.56)	0.46 (0.40- 0.52)	0.57 (0.50- 0.65)	0.86 (0.82- 0.91)	0.79 (0.74- 0.85)	0.85 (0.77- 0.94)	0.36 (0.29- 0.43)	0.22 (0.15- 0.32)	0.57 (0.44- 0.75)
30	Puerto Rican																					
31 32 33	Overall (n=5,077)	1.47 (1.17- 1.83)	1.30 (1.12- 1.51)	1.56 (1.36- 1.78)	1.26 (1.13- 1.39)	1.15 (1.07- 1.24)	1.27 (1.18- 1.36)	1.28 (0.94- 1.75)	0.88 (0.64- 1.20)	0.88 (0.69- 1.14)	1.12 (1.01- 1.23)	0.93 (0.78- 1.11)	1.35 (1.18- 1.56)	0.92 (0.84- 1.02)	0.92 (0.77- 1.09)	0.92 (0.80- 1.07)	1.04 (0.97- 1.10)	0.97 (0.87- 1.07)	1.04 (0.93- 1.17)	0.98 (0.84- 1.15)	0.83 (0.62- 1.12)	1.15 (0.93- 1.40)
34 35 36	U.Sborn (yes) (n=2,544)	1.53 (1.19- 1.96)	1.47 (1.24- 1.74)	1.55 (1.17- 2.06)	1.26 (1.12- 1.42)	1.25 (1.15- 1.36)	1.28 (1.11- 1.48)	1.36 (0.97- 1.91)	1.00 (0.66- 1.54)	0.64 (0.35- 1.19)	1.14 (0.99- 1.31)	0.93 (0.75- 1.14)	1.49 (1.20- 1.86)	0.98 (0.85- 1.12)	1.02 (0.82- 1.25)	1.01 (0.79- 1.28)	1.08 (0.99- 1.18)	0.99 (0.87- 1.12)	1.11 (0.94- 1.31)	0.93 (0.74- 1.17)	0.79 (0.52- 1.19)	1.25 (0.92- 1.69)
37 38 39	U.Sborn (no) (<i>n</i> =2,533)	1.27 (0.86- 1.87)	1.08 (0.85- 1.38)	1.56 (1.34- 1.81)	1.23 (1.01- 1.51)	1.01 (0.90- 1.14)	1.26 (1.16- 1.37)	1.03 (0.53- 2.02)	0.75 (0.47- 1.18)	0.96 (0.74- 1.25)	1.09 (0.94- 1.25)	0.95 (0.73- 1.22)	1.27 (1.06- 1.51)	0.86 (0.75- 0.99)	0.77 (0.58- 1.02)	0.87 (0.73- 1.03)	0.98 (0.88- 1.08)	0.94 (0.80- 1.10)	1.00 (0.87- 1.14)	1.04 (0.85- 1.27)	0.90 (0.60- 1.35)	1.08 (0.85- 1.37)
40	Cuban																					
41 42	Overall (n=2,518)	0.69 (0.40- 1.17)	0.66 (0.50- 0.86)	1.08 (0.87- 1.34)	0.75 (0.59- 0.95)	0.79 (0.67- 0.93)	1.06 (0.96- 1.18)	0.64 (0.32- 1.26)	0.69 (0.42- 1.14)	0.71 (0.55- 0.93)	0.78 (0.63- 0.97)	0.72 (0.52- 1.00)	1.00 (0.79- 1.26)	0.70 (0.59- 0.84)	0.73 (0.56- 0.94)	0.73 (0.58- 0.91)	0.91 (0.83- 1.01)	0.81 (0.70- 0.94)	0.98 (0.84- 1.14)	0.69 (0.53- 0.90)	0.66 (0.43- 1.04)	0.76 (0.56- 1.04)

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1 2	U.Sborn Cuban (yes) (n=559)	0.81 (0.47- 1.42)	0.83 (0.49- 1.41)	1.65 (0.93- 2.94)	0.98 (0.76- 1.26)	1.11 (0.91- 1.35)	1.04 (0.69- 1.57)	0.93 (0.39- 2.23)	0.45 (0.14- 1.41)	0.21 (0.03- 1.53)	1.05 (0.78- 1.41)	1.11 (0.72- 1.71)	1.54 (0.85- 2.78)	0.91 (0.68- 1.22)	1.02 (0.68- 1.53)	1.04 (0.62- 1.75)	1.05 (0.87- 1.26)	0.94 (0.72- 1.24)	0.99 (0.61- 1.63)	0.91 (0.52- 1.60)	1.53 (0.83- 2.80)	0.63 (0.26- 1.49)
3 4 5 6	U.Sborn Cuban (no) (n=1,959)	0.59 (0.24- 1.43)	0.61 (0.44- 0.84)	1.03 (0.81- 1.31)	0.48 (0.31- 0.75)	0.67 (0.53- 0.83)	1.06 (0.95- 1.18)	0.32 (0.08- 1.34)	0.75 (0.42- 1.34)	0.74 (0.56- 0.96)	0.70 (0.53- 0.93)	0.57 (0.35- 0.95)	0.94 (0.74- 1.20)	0.64 (0.50- 0.81)	0.61 (0.41- 0.90)	0.69 (0.54- 0.89)	0.87 (0.78- 0.97)	0.76 (0.64- 0.89)	0.98 (0.83- 1.16)	0.62 (0.44- 0.88)	0.30 (0.13- 0.66)	0.77 (0.56- 1.07)
7	Dominican																					
, 8 9	Overall (<i>n</i> =1,658)	0.64 (0.41- 0.99)	0.90 (0.68- 1.19)	1.18 (0.95- 1.46)	0.81 (0.62- 1.05)	0.94 (0.82- 1.08)	1.02 (0.89- 1.17)	1.32 (0.73- 2.36)	0.48 (0.22- 1.03)	0.42 (0.21- 0.84)	0.80 (0.66- 0.97)	0.69 (0.47- 1.01)	0.90 (0.68- 1.18)	0.68 (0.55- 0.83)	0.51 (0.33- 0.77)	0.71 (0.53- 0.96)	0.98 (0.86- 1.11)	0.79 (0.65- 0.97)	1.12 (0.94- 1.34)	0.79 (0.53- 1.18)	0.37 (0.20- 0.69)	1.31 (0.82- 2.07)
10 11 12 12	U.Sborn (yes) (n=264)	0.63 (0.31- 1.30)	2.17 (1.33- 3.55)	1.65 (0.41- 6.68)	0.87 (0.58- 1.31)	1.62 (1.30- 2.02)	0.98 (0.43- 2.20)	1.32 (0.52- 3.33)	2.50 (0.76- 8.25)	NE	0.78 (0.50- 1.21)	0.88 (0.44- 1.76)	0.82 (0.12- 5.75)	0.85 (0.56- 1.28)	1.05 (0.55- 2.02)	0.46 (0.07- 3.02)	1.06 (0.82- 1.36)	1.05 (0.77- 1.42)	1.60 (0.70- 3.67)	0.50 (0.24- 1.02)	1.26 (0.52- 3.02)	0.69 (0.08- 5.75)
15 14 15	U.Sborn (no) (<i>n</i> =1,394)	0.63 (0.37- 1.08)	0.76 (0.55- 1.04)	1.16 (0.94- 1.44)	0.75 (0.55- 1.03)	0.84 (0.72- 0.99)	1.02 (0.89- 1.17)	1.31 (0.64- 2.68)	0.33 (0.12- 0.87)	0.44 (0.22- 0.87)	0.80 (0.65- 0.99)	0.66 (0.44- 0.97)	0.90 (0.69- 1.18)	0.63 (0.50- 0.81)	0.41 (0.26- 0.64)	0.72 (0.54- 0.96)	0.96 (0.82- 1.12)	0.75 (0.59- 0.94)	1.11 (0.91- 1.35)	0.87 (0.56- 1.35)	0.20 (0.09- 0.47)	1.33 (0.84- 2.12)
16 17	Central/South American																					
18 19 20	Overall (n=8,162)	0.90 (0.72- 1.12)	0.72 (0.62- 0.84)	0.92 (0.78- 1.09)	0.97 (0.87- 1.08)	0.92 (0.86- 0.99)	0.99 (0.91- 1.07)	0.90 (0.63- 1.27)	0.63 (0.45- 0.87)	0.51 (0.36- 0.72)	0.81 (0.71- 0.92)	0.70 (0.58- 0.85)	0.85 (0.71- 1.02)	0.65 (0.58- 0.73)	0.55 (0.46- 0.66)	0.66 (0.55- 0.79)	0.93 (0.88- 0.99)	0.85 (0.79- 0.93)	0.91 (0.81- 1.02)	0.41 (0.33- 0.52)	0.33 (0.21- 0.51)	0.50 (0.38- 0.67)
21 22 23 24	U.Sborn Central/South American (yes) (<i>n</i> =1,113)	1.31 (0.94- 1.82)	1.52 (1.07- 2.16)	0.98 (0.43- 2.25)	1.19 (1.02- 1.40)	1.23 (1.04- 1.45)	1.02 (0.65- 1.58)	0.82 (0.48- 1.40)	0.96 (0.34- 2.74)	0.36 (0.08- 1.54)	1.26 (1.01- 1.55)	1.28 (0.90- 1.83)	1.66 (1.01- 2.73)	0.87 (0.65- 1.15)	0.73 (0.53- 1.03)	0.93 (0.53- 1.63)	1.10 (0.97- 1.25)	1.02 (0.84- 1.23)	0.80 (0.46- 1.41)	0.52 (0.30- 0.89)	0.23 (0.11- 0.49)	1.41 (0.67- 2.95)
25 26 27 28 29	U.Sborn Central/South American (no) (n=7,049)	0.73 (0.56- 0.96)	0.65 (0.55- 0.77)	0.92 (0.77- 1.09)	0.86 (0.76- 0.98)	0.89 (0.83- 0.96)	0.99 (0.91- 1.07)	0.93 (0.61- 1.41)	0.61 (0.44- 0.85)	0.51 (0.36- 0.73)	0.72 (0.63- 0.82)	0.63 (0.51- 0.78)	0.83 (0.69- 0.99)	0.61 (0.54- 0.69)	0.53 (0.43- 0.65)	0.65 (0.54- 0.78)	0.90 (0.84- 0.96)	0.83 (0.76- 0.91)	0.91 (0.81- 1.03)	0.40 (0.31- 0.51)	0.34 (0.22- 0.55)	0.47 (0.35- 0.64)
20 29	(n=7,049)				/	,	- /	,	,	/	,	/	,				· · · · /	,	,	,	,	

Abbreviations: ref (reference)

Adjusted for sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Supplemental Table S7. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to foreign-born non-Hispanic Whites, Stratified by Sex/Gender, National Health Interview Survey, 2004-2017 (N=56,372)

			,		1	Prevalence	e Ratio (95%	6 Confiden	ce Interval)					
			Sleep D	Juration					Slee	p Quality ir	n the Past V	Veek		
		(referen	ce: recomn	nended (7-9	hours))					•				
	N.	0					Trouble	Falling	Trouble	Staying	Non-res	storative	Sleep Mo	edication
	Very	Short	Sn	ort	LO	ong	ASI	eep	Asi	eep		ep		Se
	(≤5-n	ours)	(-n</th <th>ours)</th> <th>(>9-n</th> <th>ours)</th> <th>(≥3 n</th> <th>ignts)</th> <th>(≥3 n</th> <th>ignts)</th> <th>(≥3 C</th> <th>1ays)</th> <th>(≥3 n</th> <th>ignts)</th>	ours)	(>9-n	ours)	(≥3 n	ignts)	(≥3 n	ignts)	(≥3 C	1ays)	(≥3 n	ignts)
Sox/Gondor	(II-4 Mon	Womon	(II-12 Mon	4,040) Womon	(II-I) Mon	,500) Womon	(II-3 Mon	,431) Womon	(II-3 Mon	,520) Womon	Mon	,734) Womon	(II-I Mon	,073) Womon
Foreign-born Non-	INIGII	women	INIGII	women	INIGH	Women	INICII	women	INIGH	women	INICII	women	INIGH	women
Hispanic White	Ref	Ref	Ref 📐	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
(n=8,857)														
Mexican														
	1.23	1.00	1.14	1.09	1.26	0.90	0.87	0.97	0.85	0.87	1.15	0.99	1.03	0.85
Overall (<i>n</i> =30,100)	(1.00-1.51)	(0.84-1.19)	(1.05-1.24)	(1.02-1.18)	(0.92-1.73)	(0.68-1.19)	(0.69-1.09)	(0.84-1.12)	(0.70-1.02)	(0.76-1.01)	(1.03-1.29)	(0.91-1.08)	(0.72-1.47)	(0.65-1.13)
U.Sborn (yes) $(p=14, 282)$	1.31	1.06	1.23	1.15	1.20	0.91	1.00 (0.79 - 1.27)	1.00 (0.85-1.17)	1.03	0.92	1.17 (1.04-1.31)	0.99	1.06	0.91
(1) = 14,202		(0.00 1.20)	1.00	0.06	(0.00 1.00)		0.71	0.96	(0.01 1.27)		1.07	(0.00 1.00)		(0.00 1.22)
(n=15,818)	(0.73-1.34)	(0.62-1.02)	(0.89-1.12)	(0.87-1.07)	(0.82-1.76)	(0.63-1.34)	(0.52-0.96)	(0.71-1.05)	(0.48-0.79)	(0.66-0.98)	(0.92-1.24)	(0.87-1.08)	(0.45-1.40)	(0.42-0.99)
Puerto Rican	,	,	,	,			, , , , , , , , , , , , , , , , , , ,	,	,	,	,	,	,	, ,
	1.84	1.64	1.39	1.29	1.27	0.97	1.13	1.24	1.26	1.04	1.02	1.08	1.62	1.19
Overall (<i>n</i> =5,077)	(1.46-2.30)	(1.36-1.99)	(1.26-1.54)	(1.17-1.42)	(0.90-1.81)	(0.71-1.33)	(0.88-1.47)	(1.05-1.47)	(0.99-1.60)	(0.88-1.22)	(0.88-1.18)	(0.97-1.20)	(1.11-2.37)	(0.92-1.56)
U.Sborn (yes)	1.83	1.79	1.43	1.32	1.63	1.11	1.05	1.32	1.36	1.08	0.96	1.12	1.68	1.12
(n=2,544)	(1.37-2.45)	(1.39-2.29)	(1.26-1.62)	(1.19-1.49)	(0.99-2.70)	(0.74-1.66)	(0.75-1.47)	(1.07-1.62)	(1.00-1.85)	(0.88-1.33)	(0.80-1.16)	(0.99-1.26)	(1.08-2.63)	(0.81-1.55)
U.Sborn (no)	1.77	1.44	1.33	1.20	1.07	0.92	1.24	1.20	1.15	1.02	1.10	1.02	1.74	1.31
(n=2,533)	(1.31-2.37)	(1.15-1.61)	(1.17-1.51)	(1.07-1.33)	(0.70-1.03)	(0.04-1.34)	(0.91-1.08)	(0.97-1.48)	(0.85-1.55)	(0.03-1.20)	(0.91-1.33)	(0.89-1.18)	(1.00-2.83)	(0.93-1.81)
Cuball	1 01	0.92	0.95	1.02	0.81	056	0.91	0.96	0.90	0.97	1.02	1.07	0.98	1 13
Overall (n=2,518)	(0.71-1.45)	(0.68-1.26)	(0.81-1.12)	(0.88-1.17)	(0.47-1.39)	(0.35-0.91)	(0.65-1.36)	(0.72-1.30)	(0.66-1.22)	(0.74-1.28)	(0.83-1.24)	(0.88-1.28)	(0.57-1.70)	(0.75-1.69)
U.Sborn Cuban (yes)	0.93	1.11	1.12	1.16	0.59	1.05	1.14	1.18	1.28	1.04	0.98	1.13	0.85	2.09
(n=559)	(0.48-1.80)	(0.71-1.74)	(0.88-1.43)	(0.93-1.44)	(0.19-1.85)	(0.43-2.52)	(0.64-2.02)	(0.76-1.83)	(0.79-2.09)	(0.63-1.73)	(0.72-1.35)	(0.86-1.49)	(0.24-2.99)	(1.08-4.01)
U.Sborn Cuban (no)	1.04	0.85	0.89	0.96	0.85	0.47	0.83	0.86	0.76	0.94	1.02	1.05	1.01	0.87
(n=1,959)	(0.70-1.57)	(0.59-1.22)	(0.74-1.08)	(0.81-1.13)	(0.49-1.49)	(0.27-0.80)	(0.52-1.32)	(0.60-1.23)	(0.54-1.07)	(0.66-1.35)	(0.81-1.29)	(0.85-1.31)	(0.55-1.85)	(0.55-1.38)
Dominican	1.01	4.07	4.00	1.00	1.00	0.01	0.70	0.07	0.77	0.00	1.01	0.00		0.04
Overall (n=1,658)	(0.81-1.78)	(0.79-1.43)	(0.83-1.21)	(0.87-1.21)	(0.81-2.40)	(0.27-1.38)	0.76	0.97	(0.47-1.27)	0.99	(0.80-1.26)	0.98	(0.54-2.29)	0.94
U.Sborn (yes)	1.61	1.15	1.05	1.42	1.40	2.40	1.06	0.72	1.30	1.18	1.10	0.97	1.88	0.68
(n=264)	(0.78-3.30)	(0.58-2.26)	(0.73-1.52)	(1.04-1.95)	(0.32-6.12)	(0.83-6.95)	(0.52-2.17)	(0.40-1.31)	(0.51-3.34)	(0.64-2.18)	(0.72-1.67)	(0.68-1.37)	(0.57-6.19)	(0.23-1.98)
U.Sborn (no)	1.09	1.04	0.99	0.92	1.42	0.34	0.67	1.03	0.65	0.96	0.99	0.98	0.96	0.98
(n=1,394)	(0.72-1.64)	(0.77-1.39)	(0.81-1.21)	(0.78-1.09)	(0.79-2.54)	(0.16-0.72)	(0.39-1.15)	(0.76-1.40)	(0.36-1.17)	(0.68-1.35)	(0.74-1.32)	(0.81-1.19)	(0.43-2.14)	(0.58-1.65)
Central/South American														
										15				

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Number Network 1.12 0.91 1.17 1.02 0.92 0.68 0.86 1.01 0.77 0.99 1.02 1.03 0.62 0.73 Overall (n=8,162) (0.87-1.45) (0.76-1.10) (1.06-1.30) (0.93-1.12) (0.56-1.51) (0.48-0.94) (0.63-1.16) (0.83-1.24) (0.59-1.01) (0.81-1.21) (0.89-1.16) (0.93-1.14) (0.39-0.99) (0.51-1.00) U.Sborn Central/South American (yes) 1.62 1.26 1.45 1.15 0.76 1.22 1.01 1.47 0.83 1.43 1.05 1.11 1.56 0.67 (1.11) (0.86-1.84) (1.21-1.74) (0.95-1.38) (0.34-1.70) (0.64-2.30) (0.61-1.67) (1.09-1.99) (0.51-1.36) (1.03-1.99) (0.83-1.33) (0.93-1.31) (0.72-3.38) (0.31-1.4)															
U.Sborn Central/South American (yes) 1.62 (1.03-2.54) 1.26 (0.86-1.84) 1.15 (0.95-1.38) 0.76 (0.34-1.70) 1.22 (0.64-2.30) 1.01 (0.64-2.30) 1.43 (0.51-1.36) 1.05 (1.03-1.99) 1.11 1.56 (0.93-1.31) 0.67 (0.72-3.38)	Overall (n=8 162)	1.12 (0 87-1 45)	0.91	1.17 (1.06-1.30)	1.02	0.92	0.68 (0.48-0.94)	0.86	1.01 (0 83-1 24)	0.77	0.99	1.02 (0.89-1.16)	1.03 (0.93-1.14)	0.62 (0.39-0.99)	0.73
	U.Sborn Central/South American (yes) (n=1,113)	1.62 (1.03-2.54)	1.26 (0.86-1.84)	1.45 (1.21-1.74)	1.15 (0.95-1.38)	0.76 (0.34-1.70)	1.22 (0.64-2.30)	1.01 (0.61-1.67)	1.47 (1.09-1.99)	0.83 (0.51-1.36)	1.43 (1.03-1.99)	1.05 (0.83-1.33)	1.11 (0.93-1.31)	1.56 (0.72-3.38)	0.67 (0.31-1.45)
Image: (n=1,113) Image: (n=1,113) <th< th=""><th>U.Sborn Central/South American (no) (<i>n</i>=7,049)</th><th>1.02 (0.78-1.35)</th><th>0.84 (0.69-1.04)</th><th>1.13 (1.02-1.25)</th><th>0.99 (0.89-1.09)</th><th>0.98 (0.58-1.67)</th><th>0.65 (0.45-0.93)</th><th>0.79 (0.57-1.09)</th><th>0.90 (0.72-1.11)</th><th>0.77 (0.58-1.02)</th><th>0.90 (0.74-1.11)</th><th>1.00 (0.86-1.15)</th><th>1.01 (0.91-1.12)</th><th>0.48 (0.29-0.79)</th><th>0.74 (0.50-1.10)</th></th<>	U.Sborn Central/South American (no) (<i>n</i> =7,049)	1.02 (0.78-1.35)	0.84 (0.69-1.04)	1.13 (1.02-1.25)	0.99 (0.89-1.09)	0.98 (0.58-1.67)	0.65 (0.45-0.93)	0.79 (0.57-1.09)	0.90 (0.72-1.11)	0.77 (0.58-1.02)	0.90 (0.74-1.11)	1.00 (0.86-1.15)	1.01 (0.91-1.12)	0.48 (0.29-0.79)	0.74 (0.50-1.10)

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Supplemental Table S8. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to foreign-born non-Hispanic Whites, Stratified by Age Group, National Health Interview Survey, 2004-2017 (N=56,372)

						\		Pr	evalenc	e Ratio	(95% Co	nfidenc	e Interv	al)							
			(roforo	Sle	ep Durat	ion	houro))							Sleep C	uality ir	n the Pa	st Week				
	(/ery Sho ≤5-hours	(retere ort s)		Short	s)	<u>nours))</u> (;	Long >9-hours	5)	Tro (2	uble Fall Asleep ≥3 nights	ling s)	Troi	uble Sta Asleep ≥3 nights	ying s)	Nor	i-restora Sleep (≥3 days	tive)	Slee (2	p Medica Use ≥3 nights	ation s)
Age (years)	18-30	(n=4,115 31-49) 50+	18-30	31-49	50+	18-30	n=1,586 31-49) 50+	18-30	n=3,431 31-49) 50+	18-30	n=3,520 31-49) 50+	18-30	n=7,734 31-49) 50+	18-30	31-49) 50+
Foreign-born Non-Hispanic White (n=8.857)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref										
Mexican																					
Overall (n=30,100)	1.04 (0.76- 1.44)	1.26 (1.00- 1.58)	0.99 (0.83- 1.19)	1.15 (0.99- 1.33)	1.17 (1.08- 1.28)	1.03 (0.94- 1.13)	1.51 (0.96- 2.38)	1.02 (0.65- 1.61)	0.79 (0.60- 1.04)	0.97 (0.71- 1.32)	0.81 (0.67- 0.98)	1.01 (0.84- 1.21)	0.97 (0.67- 1.40)	0.82 (0.67- 1.01)	0.90 (0.78- 1.04)	1.09 (0.93- 1.27)	1.10 (0.99- 1.21)	1.04 (0.93- 1.17)	1.17 (0.59- 2.32)	0.81 (0.51- 1.28)	0.89 (0.70- 1.15)
U.Sborn (yes) (n=14,282)	1.12 (0.80- 1.58)	1.43 (1.14- 1.81)	1.02 (0.86- 1.21)	1.19 (1.02- 1.39)	1.31 (1.20- 1.43)	1.07 (0.97- 1.17)	1.45 (0.93- 2.26)	1.06 (0.64- 1.75)	0.81 (0.61- 1.07)	1.07 (0.77- 1.48)	0.93 (0.75- 1.15)	1.02 (0.84- 1.25)	1.08 (0.73- 1.60)	0.94 (0.75- 1.17)	0.98 (0.84- 1.16)	1.06 (0.90- 1.24)	1.13 (1.01- 1.26)	1.04 (0.92- 1.18)	1.44 (0.70- 2.95)	1.02 (0.63- 1.63)	0.85 (0.66- 1.11)
U.Sborn (no) (n=15.818)	0.84 (0.54- 1.29)	0.97 (0.72- 1.30)	0.87 (0.64- 1.17)	0.96 (0.77- 1.20)	1.03 (0.92- 1.16)	0.94 (0.83- 1.07)	1.67 (0.99- 2.82)	1.04 (0.62- 1.74)	0.67 (0.47- 0.94)	0.76 (0.53- 1.10)	0.71 (0.54- 0.92)	0.91 (0.72- 1.15)	0.85 (0.54- 1.32)	0.65 (0.50- 0.85)	0.76 (0.62- 0.93)	1.12 (0.92- 1.37)	1.01 (0.89- 1.15)	1.01 (0.87- 1.19)	NE	0.41 (0.22- 0.76)	0.91 (0.60- 1.39)
Puerto Rican																					
Overall (n=5,077)	1.87 (1.24- 2.81)	1.92 (1.49- 2.47)	1.58 (1.32- 1.90)	1.44 (1.20- 1.73)	1.37 (1.22- 1.53)	1.27 (1.15- 1.40)	1.67 (0.92- 3.02)	1.30 (0.78- 2.14)	0.80 (0.59- 1.09)	1.01 (0.71- 1.45)	1.07 (0.82- 1.39)	1.45 (1.18- 1.78)	1.05 (0.67- 1.64)	1.21 (0.92- 1.58)	1.14 (0.95- 1.37)	1.03 (0.85- 1.25)	1.07 (0.92- 1.25)	1.13 (0.98- 1.32)	1.61 (0.87- 2.96)	1.20 (0.78- 1.86)	1.30 (1.00- 1.68)
U.Sborn (yes) (n=2,544)	1.88 (1.22- 2.90)	2.08 (1.59- 2.72)	1.56 (1.14- 2.13)	1.40 (1.15- 1.70)	1.43 (1.27- 1.62)	1.27 (1.08- 1.49)	1.71 (0.91- 3.19)	1.51 (0.85- 2.68)	0.58 (0.31- 1.07)	1.11 (0.76- 1.63)	1.01 (0.75- 1.35)	1.61 (1.23- 2.11)	1.02 (0.62- 1.67)	1.28 (0.94- 1.75)	1.25 (0.95- 1.65)	1.06 (0.87- 1.29)	1.07 (0.90- 1.27)	1.17 (0.97- 1.42)	1.33 (0.66- 2.69)	0.99 (0.65- 1.51)	1.34 (0.95- 1.91)
U.Sborn (no) (n=2,533)	1.69 (0.99- 2.88)	1.51 (1.04- 2.20)	1.61 (1.31- 1.97)	1.38 (1.05- 1.79)	1.20 (1.02- 1.42)	1.27 (1.14- 1.42)	0.77 (0.37- 1.58)	1.25 (0.68- 2.32)	0.87 (0.63- 1.21)	0.87 (0.49- 1.53)	1.22 (0.87- 1.71)	1.40 (1.11- 1.78)	1.17 (0.62- 2.22)	1.08 (0.76- 1.53)	1.09 (0.88- 1.33)	1.01 (0.75- 1.37)	1.08 (0.89- 1.32)	1.12 (0.94- 1.33)	NE	1.59 (0.90- 2.84)	1.27 (0.93- 1.73)
Cuban						4.65					4.63										
Overall (n=2,518)	0.77 (0.37- 1.58)	0.99 (0.67- 1.47)	1.02 (0.74- 1.40)	0.77 (0.56- 1.04)	1.01 (0.84- 1.21)	1.03 (0.90- 1.19)	NE	0.92 (0.42- 2.03)	0.55 (0.37- 0.81)	0.42 (0.21- 0.85)	1.00 (0.67- 1.51)	1.10 (0.81- 1.50)	0.58 (0.26- 1.31)	1.05 (0.75- 1.47)	0.98 (0.76- 1.27)	0.99 (0.73- 1.34)	0.97 (0.80- 1.18)	1.11 (0.91- 1.34)	NE	1.58 (0.77- 3.23)	1.06 (0.71- 1.58)
U.Sborn Cuban (yes) (n=559)	0.70 (0.34- 1.44)	1.11 (0.61- 2.00)	1.45 (0.81- 2.59)	0.97 (0.71- 1.33)	1.28 (1.03- 1.58)	0.97 (0.64- 1.48)	NE	0.59 (0.14- 2.51)	0.16 (0.02- 1.23)	0.73 (0.38- 1.40)	1.39 (0.85- 2.27)	1.64 (0.88- 3.08)	0.90 (0.42- 1.91)	1.37 (0.84- 2.22)	1.27 (0.76- 2.11)	1.08 (0.78- 1.50)	1.05 (0.79- 1.38)	0.98 (0.57- 1.68)	NE	2.92 (1.39- 6.12)	0.75 (0.31- 1.83)

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1 2	U.Sborn Cuban (no) (n=1,959)	0.80 (0.28- 2.27)	0.94 (0.60- 1.49)	0.97 (0.69- 1.37)	0.49 (0.29- 0.82)	0.88 (0.68- 1.13)	1.04 (0.90- 1.20)	NE	1.06 (0.43- 2.64)	0.57 (0.39- 0.84)	0.08 (0.01- 0.61)	0.79 (0.44- 1.39)	1.04 (0.76- 1.43)	0.15 (0.03- 0.72)	0.89 (0.55- 1.44)	0.95 (0.71- 1.27)	0.87 (0.55- 1.36)	0.93 (0.74- 1.18)	1.14 (0.93- 1.40)	NE	0.75 (0.25- 2.23)	1.10 (0.72- 1.69)
3 ⊿	Dominican																					
4 5 6	Overall (<i>n</i> =1,658)	0.81 (0.44- 1.48)	1.18 (0.77- 1.79)	1.29 (0.98- 1.70)	0.96 (0.69- 1.34)	1.08 (0.89- 1.32)	1.02 (0.87- 1.21)	NE	0.92 (0.36- 2.39)	0.41 (0.19- 0.85)	0.80 (0.46- 1.39)	0.92 (0.58- 1.44)	1.00 (0.72- 1.39)	1.22 (0.63- 2.35)	0.74 (0.44- 1.24)	1.00 (0.72- 1.39)	0.96 (0.72- 1.29)	0.86 (0.68- 1.08)	1.25 (1.01- 1.56)	NE	0.58 (0.28- 1.23)	1.33 (0.79- 2.23)
7 8 9	U.Sborn (yes) (n=264)	0.80 (0.35- 1.84)	2.84 (1.64- 4.93)	1.80 (0.42- 7.78)	0.98 (0.65- 1.49)	1.70 (1.34- 2.16)	0.97 (0.43- 2.17)	NE	4.28 (1.23- 14.91)	NE	0.81 (0.41- 1.63)	1.09 (0.52- 2.33)	0.91 (0.14- 6.03)	1.22 (0.62- 2.39)	1.53 (0.77- 3.03)	0.60 (0.84- 4.34)	0.93 (0.64- 1.37)	1.11 (0.79- 1.57)	1.74 (0.73- 4.13)	NE	2.01 (0.76- 5.34)	0.69 (0.08- 6.05)
10 11 12 12	U.Sborn (no) (n=1,394)	0.78 (0.40- 1.54)	0.95 (0.59- 1.51)	1.28 (0.97- 1.68)	0.86 (0.57- 1.29)	0.96 (0.76- 1.21)	1.03 (0.87- 1.21)	NE	0.59 (0.20- 1.76)	0.43 (0.20- 0.90)	0.77 (0.37- 1.63)	0.86 (0.53- 1.39)	1.00 (0.72- 1.39)	1.16 (0.41- 3.31)	0.60 (0.34- 1.06)	1.01 (0.73- 1.41)	1.04 (0.70- 1.54)	0.80 (0.62- 1.04)	1.24 (0.98- 1.57)	NE	0.31 (0.13- 0.73)	1.36 (0.80- 2.30)
13 14 15	Central/South American						\sim															
16 17	Overall (n=8,162)	1.02 (0.69- 1.51)	1.12 (0.87- 1.46)	0.88 (0.71- 1.10)	1.13 (0.94- 1.36)	1.17 (1.06- 1.29)	0.98 (0.89- 1.10)	1.44 (0.84- 2.46)	0.91 (0.54- 1.54)	0.42 (0.26- 0.67)	0.83 (0.59- 1.17)	1.04 (0.78- 1.39)	0.94 (0.75- 1.17)	1.07 (0.72- 1.59)	0.84 (0.65- 1.09)	0.83 (0.67- 1.02)	1.06 (0.89- 1.25)	1.03 (0.92- 1.15)	1.02 (0.88- 1.18)	NE	0.65 (0.38- 1.12)	0.65 (0.46- 0.90)
18 19 20 21 22 23	U.Sborn Central/South American (yes) (n=1,113)	1.25 (0.79- 1.98)	1.80 (1.22- 2.65)	0.86 (0.37- 1.97)	1.28 (1.03- 1.59)	1.33 (1.11- 1.58)	0.96 (0.62- 1.49)	1.22 (0.67- 2.23)	1.14 (0.38- 3.41)	0.28 (0.06- 1.27)	1.04 (0.71- 1.52)	1.40 (0.97- 2.04)	1.65 (1.03- 2.64)	1.21 (0.77- 1.90)	0.99 (0.68- 1.44)	1.10 (0.65- 1.87)	1.08 (0.90- 1.31)	1.10 (0.90- 1.33)	0.81 (0.47- 1.40)	NE	0.31 (0.13- 0.69)	1.79 (0.86- 3.70)
24 25 26 27	U.Sborn Central/South American (no) (n=7,049)	0.89 (0.57- 1.40)	1.00 (0.75- 1.33)	0.88 (0.71- 1.10)	1.02 (0.82- 1.26)	1.14 (1.02- 1.27)	0.98 (0.88- 1.09)	NE	0.92 (0.53- 1.61)	0.42 (0.26- 0.68)	0.67 (0.44- 1.03)	0.94 (0.68- 1.32)	0.90 (0.71- 1.13)	0.95 (0.59- 1.52)	0.83 (0.62- 1.11)	0.81 (0.65- 1.01)	1.00 (0.81- 1.24)	1.01 (0.90- 1.13)	1.03 (0.89- 1.19)	NE	0.75 (0.41- 1.38)	0.60 (0.42- 0.84)
28	Abbreviations: re	et (retere	nce)																			

Abbreviations: ref (reference)

Adjusted for sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

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Supplemental Table S9. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to US-born non-Hispanic Whites by Language Acculturation Status*, Stratified by Sex/Gender, National Health Interview Survey, 2004-2017 (N=245,812)

,	Prevalence Ratio (95% Confidence Interval) Sleep Duration													
			Sleep D	uration					Slee	p Quality ir	n the Past V	Veek		
		(referen	<u>ce: recomm</u>	nended (7-9	hours))									
							Trouble	Falling	Trouble	Staying	Non-res	storative	Sleep Me	edication
	Very	Short	Sh	ort	Lo	ng	Asl	eep	Asl	eep	Sle	ер	U	se
	(≤5-h	ours)	(<7-h	ours)	(>9-h	ours)	(≥3 ni	ights)	(≥3 n	ights)	(≥3 c	days)	(≥3 ni	ights)
Group (n)	(n=17	(,112)	(n=61	,091)	(n=7	,604)	(n=18	3,607)	(n=26	5,493)	(n=38	3,369)	(n=10),024)
Sex/Gender	Men	women	wen	women	Men	women	wen	women	wen	women	wen	women	Men	women
U.Sborn Non-Hispanic	n o f		f	f	f								f	
	rer	rer	rer	rer	rer	rer	rer	rer	rer	rer	rer	rer	rer	rer
(<i>11=196,297</i>)														
	4.00	4.05	1.01		1.00	0.00		0.00			0.07	0.05		0.50
(n = 14, 282)	1.02	1.05	1.01 (0.96-1.07)	1.07	1.09 (0.91-1.31)	0.88	0.92 (0.85-0.99)	0.92	0.80	0.77	0.97	0.95	0.66 (0.58-0.76)	0.59
High Acculturation	(0.31-1.14)	(0.30-1.13)	(0.30-1.07)	(1.05-1.12)	(0.91-1.91)	(0.75-1.03)	(0.05-0.05)	(0.04-1.00)	(0.74=0.00)	(0.71=0.03)	(0.35-1.01)	(0.30-1.00)	(0.30-0.70)	(0.30-0.70)
(n=13,075)	(0.93-1.19)	(0.98-1.19)	(0.98-1.10)	(1.05-1.14)	(0.93-1.36)	(0.74-1.01)	0.94 (0.84-1.06)	0.95 (0.87-1.03)	(0.76-0.97)	(0.73-0.88)	(0.95-1.08)	(0.92-1.02)	(0.62-0.99)	(0.53-0.75)
Medium/Low	0.75	0.70	0.74	0.04	0.00	0.07	0.02	0.50	0.40	0.42	0.00	0.75	0.50	0.45
Acculturation	0.75	(0.58-1.09)	0.71	0.84 (0.70-1.00)	0.89	(0.60-1.59)	0.63	0.59	0.46	0.43 (0.29-0.64)	0.82	0.75	0.56	0.15
(n=1,188)	(0.00-1.01)	(0.00-1.00)	(0.00-0.00)	(0.70-1.00)	(0.00-1.00)	(0.00-1.00)	(0.40-1.00)	(0.40-0.00)	(0.20-0.74)	(0.20-0.04)	(0.0+-1.0+)	(0.01-0.02)	(0.23-1.00)	(0.00-0.40)
U.Sborn (no)	0.47	0.60	0.66	0.77	0.83	0.65	0.60	0.64	0.51	0.55	0.82	0.85	0.36	0.34
(n=15,818)	(0.40-0.54)	(0.52-0.69)	(0.62-0.70)	(0.71-0.82)	(0.70-0.99)	(0.54-0.78)	(0.55-0.66)	(0.58-0.71)	(0.46-0.55)	(0.49-0.62)	(0.77-0.86)	(0.80-0.90)	(0.30-0.44)	(0.27-0.42)
High Acculturation	0.59 (0.50-0.70)	0.69 (0.58-0.83)	0.76 (0.71-0.82)	0.81 (0.74-0.88)	0.88 (0.68-1.14)	0.69 (0.52-0.91)	0.57 (0.46-0.69)	0.70 (0.61-0.81)	0.47 (0.39-0.58)	0.59 (0.50-0.69)	0.83 (0.75-0.92)	0.90 (0.83-0.98)	0.30 (0.19-0.47)	0.40 (0.29-0.57)
		(0.00 0.00)	(0.11 0.02)	(0.1 + 0.00)	(0.00 1.11)	(0.02 0.01)	(0.40 0.00)		(0.00 0.00)	(0.00 0.00)	(0.10 0.02)	(0.00 0.00)	(0.10 0.41)	(0.20 0.07)
Acculturation	0.38	0.54	0.57	0.73	0.81	0.61	0.53	0.58	0.44	0.52	0.71	0.78	0.45	0.29
(n=9.666)	(0.31-0.46)	(0.45-0.64)	(0.53-0.62)	(0.66-0.80)	(0.66-1.00)	(0.49-0.75)	(0.43-0.66)	(0.50-0.67)	(0.36-0.53)	(0.44-0.60)	(0.64-0.79)	(0.72-0.85)	(0.31-0.67)	(0.21-0.39)
Puerto Rican														
U.Sborn (yes)	1.33	1.53	1.21	1.24	1.26	0.94	1.04	1.14	0.97	0.91	1.00	1.10	0.96	0.97
(n=2,544)	(1.08-1.63)	(1.30-1.81)	(1.11-1.33)	(1.15-1.35)	(0.89-1.77)	(0.66-1.33)	(0.90-1.21)	(0.98-1.33)	(0.85-1.11)	(0.78-1.05)	(0.92-1.09)	(1.01-1.20)	(0.76-1.19)	(0.73-1.30)
High Acculturation	1.36	1.59	1.22	1.26	1.32	0.98	0.93	1.17	1.08	0.92	0.92	1.11	1.00	1.00
(n=2,359)	(1.11-1.68)	(1.34-1.89)	(1.11-1.34)	(1.16-1.37)	(0.93-1.86)	(0.68-1.40)	(0.72-1.21)	(1.00-1.38)	(0.84-1.39)	(0.79-1.07)	(0.79-1.06)	(1.02-1.22)	(0.69-1.44)	(0.74-1.35)
Medium/Low	0.70	0.00	4.47	4.04	0.40	0.54	0.70	0.04	0.74	0.75	0.00	0.07	0.50	0.00
Acculturation	0.79 (0.36-1.74)	0.89	1.17 (0.83-1.65)	1.01 (0.73-1.40)	0.48	0.51	0.72	0.61	0.74	0.75 (0.39-1.44)	0.36	0.87	0.52	0.60
(n=184)	(0.00-1.74)	(0.00-1.72)	(0.00-1.00)	(07.1-1.0)	(0.10-2.00)	(0.10-1.01)	(0.02-1.00)	(0.02-1.10)	(0.00-1.0+)	(0.00-1)	(0.10-0.01)	(0.00-1.00)	(0.10-2.11)	(0.17-2.10)
U.Sborn (no)	1.29	1.36	1.15	1.16	0.89	0.96	1.05	1.01	0.84	0.82	0.95	0.96	1.01	1.08
(n=2,533)	(1.03-1.61)	(1.17-1.58)	(1.04-1.27)	(1.06-1.26)	(0.63-1.26)	(0.72-1.28)	(0.91-1.21)	(0.86-1.18)	(0.73-0.97)	(0.70-0.97)	(0.86-1.04)	(0.85-1.08)	(0.83-1.24)	(0.86-1.35)
High Acculturation	1.48	1.37	1.14	1.20	1.06	0.97	1.14	1.06	0.98	0.87	1.02	1.00	0.97	1.14
(n=1,773)	(1.16-1.90)	(1.14-1.64)	(1.00-1.30)	(1.09-1.33)	(0.72-1.57)	(0.69-1.37)	(0.85-1.52)	(0.88-1.28)	(0.76-1.26)	(0.72-1.05)	(0.88-1.20)	(0.87-1.14)	(0.62-1.52)	(0.88-1.48)

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1 2	Medium/Low Acculturation (n=755)	0.81 (0.48-1.37)	1.32 (1.07-1.64)	1.15 (0.95-1.40)	1.05 (0.91-1.22)	0.57 (0.30-1.07)	0.96 (0.60-1.53)	1.16 (0.76-1.77)	0.86 (0.64-1.16)	0.60 (0.38-0.95)	0.69 (0.50-0.95)	0.73 (0.53-1.01)	0.84 (0.69-1.02)	0.87 (0.41-1.86)	0.92 (0.63-1.36)
5 4	Cuban														
5	U.Sborn Cuban (yes) (n=559)	0.78 (0.44-1.39)	1.08 (0.74-1.58)	1.01 (0.81-1.25)	1.08 (0.89-1.31)	0.49 (0.18-1.29)	0.95 (0.39-2.31)	0.95 (0.70-1.28)	0.96 (0.66-1.39)	0.92 (0.69-1.23)	0.83 (0.53-1.31)	0.96 (0.80-1.16)	1.07 (0.86-1.34)	0.95 (0.54-1.66)	1.37 (0.78-2.42)
0 7 8	High Acculturation (n=440)	0.89 (0.49-1.62)	1.16 (0.79-1.71)	1.08 (0.86-1.35)	1.05 (0.85-1.30)	0.29 (0.09-0.96)	1.06 (0.38-2.97)	1.34 (0.85-2.10)	1.17 (0.82-1.67)	1.24 (0.82-1.88)	0.84 (0.54-1.29)	0.93 (0.68-1.28)	1.03 (0.78-1.36)	0.53 (0.17-1.64)	1.30 (0.71-2.38)
9 10 11	Medium/Low Acculturation (n=119)	0.37 (0.11-1.22)	0.72 (0.21-2.46)	0.69 (0.40-1.20)	1.21 (0.71-2.06)	0.88 (0.20-3.91)	0.63 (0.16-2.51)	NE	0.27 (0.06-1.23)	0.28 (0.06-1.40)	0.82 (0.29-2.28)	0.76 (0.38-1.51)	1.21 (0.90-1.62)	0.25 (0.03-1.90)	1.65 (0.39-6.94)
12 13	U.Sborn Cuban (no) (n=1,959)	0.75 (0.56-1.00)	0.90 (0.69-1.18)	0.78 (0.67-0.91)	0.94 (0.82-1.07)	0.78 (0.57-1.05)	0.55 (0.35-0.87)	0.69 (0.52-0.92)	0.71 (0.52-0.98)	0.61 (0.48-0.78)	0.68 (0.50-0.94)	0.87 (0.77-0.97)	0.95 (0.80-1.13)	0.59 (0.42-0.83)	0.60 (0.40-0.89)
14 15	High Acculturation (n=571)	0.90 (0.54-1.51)	1.13 (0.70-1.82)	0.91 (0.68-1.22)	1.09 (0.89-1.34)	0.87 (0.48-1.58)	0.63 (0.30-1.34)	1.08 (0.64-1.82)	1.04 (0.68-1.59)	0.58 (0.36-0.91)	0.95 (0.62-1.46)	0.75 (0.53-1.04)	0.89 (0.65-1.23)	0.93 (0.43-2.01)	0.61 (0.30-1.25)
16 17 18	Medium/Low Acculturation (n=1,386)	0.68 (0.50-0.93)	0.82 (0.58-1.16)	0.71 (0.61-0.84)	0.87 (0.74-1.03)	0.71 (0.49-1.01)	0.53 (0.30-0.94)	0.52 (0.31-0.89)	0.64 (0.42-0.95)	0.56 (0.39-0.80)	0.61 (0.40-0.92)	0.84 (0.68-1.04)	1.00 (0.84-1.21)	0.46 (0.26-0.80)	0.60 (0.37-0.98)
19 20	Dominican														
20 21 22	U.Sborn (yes) (n=264)	1.13 (0.60-2.11)	1.02 (0.58-1.79)	0.86 (0.60-1.23)	1.32 (0.98-1.77)	0.96 (0.30-3.07)	1.35 (0.48-3.80)	0.73 (0.48-1.12)	0.62 (0.36-1.07)	0.97 (0.65-1.44)	0.91 (0.53-1.57)	0.99 (0.78-1.26)	0.93 (0.68-1.29)	0.64 (0.31-1.30)	0.57 (0.23-1.43)
23 24	High Acculturation (n=208)	1.30 (0.67-2.55)	1.00 (0.54-1.08)	0.94 (0.64-1.38)	1.38 (1.00-1.90)	1.32 (0.40-4.36)	1.36 (0.42-4.40)	1.01 (0.58-1.76)	0.62 (0.34-1.15)	1.12 (0.47-2.67)	0.79 (0.41-1.50)	1.10 (0.76-1.60)	0.90 (0.63-1.30)	0.80 (0.26-2.47)	0.56 (0.20-1.56)
25 26 27	Medium/Low Acculturation (n=56)	0.63 (0.12-3.25)	1.11 (0.34-3.57)	0.58 (0.23-1.47)	1.05 (0.56-1.97)	0.23 (0.03-1.74)	1.30 (0.19-8.81)	NE	0.62 (0.22-1.79)	NE	1.42 (0.69-2.94)	0.47 (0.11-1.96)	1.06 (0.61-1.84)	NE	0.62 (0.08-4.72)
28 29	U.Sborn (no) (n=1,394)	0.74 (0.52-1.04)	0.95 (0.78-1.15)	0.82 (0.69-0.97)	0.92 (0.81-1.04)	1.08 (0.63-1.85)	0.29 (0.15-0.53)	0.78 (0.63-0.97)	0.88 (0.69-1.12)	0.62 (0.49-0.80)	0.74 (0.57-0.97)	0.92 (0.79-1.08)	0.96 (0.83-1.13)	0.86 (0.55-1.34)	1.00 (0.61-1.63)
30 31 22	High Acculturation (n=594)	0.89 (0.56-1.39)	0.88 (0.63-1.24)	0.94 (0.75-1.18)	0.92 (0.76-1.11)	1.51 (0.67-3.40)	0.15 (0.06-0.35)	0.79 (0.44-1.40)	0.81 (0.54-1.22)	0.62 (0.31-1.21)	0.73 (0.48-1.11)	0.72 (0.51-1.00)	0.96 (0.75-1.23)	0.67 (0.21-2.10)	0.85 (0.43-1.70)
32 33 34 35	Medium/Low Acculturation (n=800)	0.63 (0.38-1.03)	0.98 (0.76-1.26)	0.72 (0.55-0.93)	0.91 (0.79-1.06)	0.90 (0.41-1.94)	0.36 (0.17-0.74)	0.34 (0.18-0.65)	0.94 (0.71-1.25)	0.22 (0.11-0.44)	0.76 (0.56-1.03)	0.96 (0.67-1.37)	0.97 (0.78-1.21)	0.38 (0.12-1.13)	1.13 (0.60-2.11)
36	Central/South American														
37 38	U.Sborn (yes) (n=1,113)	1.31 (0.92-1.87)	1.31 (0.96-1.77)	1.25 (1.08-1.45)	1.10 (0.92-1.30)	0.64 (0.35-1.16)	0.95 (0.52-1.74)	1.21 (0.96-1.53)	1.40 (1.06-1.86)	0.97 (0.73-1.30)	1.13 (0.80-1.61)	1.05 (0.92-1.20)	1.13 (0.97-1.32)	0.64 (0.38-1.10)	0.47 (0.24-0.94)
39 40	High Acculturation (n=994)	1.40 (0.97-2.04)	1.42 (1.04-1.94)	1.30 (1.11-1.51)	1.15 (0.97-1.36)	0.48 (0.22-1.07)	1.03 (0.53-2.00)	0.97 (0.64-1.47)	1.30 (1.04-1.63)	0.71 (0.46-1.10)	1.06 (0.82-1.37)	0.99 (0.80-1.23)	1.14 (1.00-1.30)	1.01 (0.45-2.27)	0.44 (0.21-0.90)
41 42	Medium/Low Acculturation	0.73 (0.29-1.83)	0.61 (0.22-1.69)	0.92 (0.51-1.64)	0.74 (0.36-1.52)	1.26 (0.51-3.12)	0.52 (0.11-2.62)	0.86 (0.27-2.75)	1.90 (0.87-4.12)	0.89 (0.24-3.25)	1.50 (0.48-4.75)	0.60 (0.28-1.32)	1.07 (0.61-1.87)	0.43 (0.06-3.19)	0.66 (0.11-3.91)

(n=119)														
U.Sborn	0.64	0.80	0.88	0.92	0.66	0.67	0.69	0.71	0.60	0.66	0.85	0.92	0.40	0.46
(no) (<i>n</i> =7,049)	(0.54-0.76)	(0.70-0.93)	(0.82-0.94)	(0.85-0.98)	(0.47-0.94)	(0.52-0.87)	(0.60-0.78)	(0.61-0.83)	(0.53-0.68)	(0.57-0.77)	(0.80-0.91)	(0.85-0.99)	(0.31-0.51)	(0.34-0.62)
High Acculturation	0.72	0.79	0.94	0.91	0.77	0.76	0.66	0.80	0.57	0.74	0.75	0.96	0.38	0.52
(n=3,366)	(0.57-0.91)	(0.63-0.98)	(0.85-1.04)	(0.82-1.02)	(0.50-1.17)	(0.53-1.11)	(0.50-0.88)	(0.64-0.98	(0.42-0.76)	(0.61-0.89)	(0.65-0.86)	(0.87-1.06)	(0.22-0.67)	(0.36-0.76)
Medium/Low	0.50			0.00	0.50	0.50		0.00	0.44	0.50		0.07	0.10	0.40
Acculturation	0.56 (0.45-0.72)	0.82 (0.68-0.98)	0.80 (0.72-0.89)	0.92 (0.84 - 1.00)	0.58 (0.34-0.98)	0.59 (0.42-0.84)	0.60 (0.43-0.84)	0.63 (0.51-0.79)	0.44 (0.32-0.61)	0.59 (0.47-0.74)	0.80 (0.67-0.94)	0.87 (0.77-0.97)	0.19 (0.09-0.38)	0.40 (0.26-0.63)
(n=3,664)	(0.40-0.72)	(0.00-0.00)	(0.72-0.00)	(0.04-1.00)	(0.04-0.00)	(0.42-0.04)	(0.40-0.04)	(0.01-0.70)	(0.02-0.01)	(0.47-0.74)	(0.07-0.04)	(0.77-0.07)	(0.00-0.00)	(0.20-0.00)

Abbreviations: ref (reference); NE (non-estimable)

 * Language acculturation categories include high (English only interview) and medium/low (English and Spanish interview or Spanish only interview).

Adjusted for age (18-30, 31-49, 50-64, 65+ years), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years
 2013-2017.

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Supplemental Table S10. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for Hispanic/Latino Heritage Groups compared to non-Hispanic Whites by Language Acculturation Status*, Stratified by Age Group, National Health Interview Survey, 2004-2017 (N=245,812)

								Pre	evalence	e Ratio	(95% Co	onfiden	ce Inter	val)							
				Sle	ep Dura	ition							:	Sleep Q	uality ir	the Pa	st Weel	۲			
Group <i>(n)</i>	V (<u></u>	(ery Sho ≤5-hour n=17,11	referen ort s) 2)	(• (1)	Short Short<7-hour1=61,09	<u>aea (7-s</u> s) 1)	9 nours (i	/) Long >9-hour (n=7,604	rs) 4)	Tro (2 (1	uble Fa Asleep ≥3 night n=18,60	lling s) 7)	Troi (2 (1	uble Sta Asleep ≥3 night n=26,49	ying s) 3)	Non (l-restora Sleep ≥3 days n=38,36	ative 5) 9)	Slee (2 (1	p Medic Use ≥3 night n=10,02	ation :s) :4)
Ago (voars) Group	18-	31-	50+	18-	31-	50+	18-	31-	50+	18-	31-	50+	18-	31-	50+	18-	31-	50+	18-	31-	50+
LLS -born Non-	30	43		30	43		30	43		- 30	43		30	43		30	43		30	43	
Hispanic White (<i>n</i> =198.297)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Mexican						Ir															
U.Sborn (yes) (n=14.282)	1.03 (0.90- 1.18)	1.03 (0.91- 1.15)	1.14 (1.01- 1.27)	1.00 (0.93- 1.06)	1.09 (1.03- 1.15)	1.06 (0.99- 1.13)	1.04 (0.85- 1.26)	0.85 (0.67- 1.09)	0.96 (0.81- 1.13)	0.96 (0.89- 1.03)	0.81 (0.73- 0.91)	1.01 (0.90- 1.15)	0.77 (0.71- 0.82)	0.73 (0.65- 0.82)	0.84 (0.75- 0.95)	1.02 (0.98- 1.06)	0.96 (0.91- 1.03)	1.00 (0.92- 1.09)	0.61 (0.53- 0.70)	0.64 (0.51- 0.80)	0.64 (0.54- 0.76)
High Acculturation (n=13.075)	1.07 (0.93- 1.23)	1.03 (0.92- 1.16)	1.18 (1.05- 1.33)	1.04 (0.97- 1.11)	1.09 (1.04- 1.15)	1.09 (1.02- 1.17)	1.03 (0.84- 1.27)	0.86 (0.67- 1.10)	0.98 (0.82- 1.17)	1.02 (0.89- 1.17)	0.83 (0.74- 0.94)	1.03 (0.91- 1.17)	0.89 (0.76- 1.04)	0.76 (0.67- 0.85)	0.87 (0.77- 0.97)	1.02 (0.94- 1.09)	0.97 (0.91- 1.03)	1.03 (0.94- 1.13)	0.87 (0.60- 1.25)	0.65 (0.52- 0.83)	0.65 (0.54- 0.77)
Medium/Low Acculturation (n=1,188)	0.77 (0.54- 1.10)	0.95 (0.67- 1.35)	0.69 (0.42- 1.14)	0.72 (0.59- 0.88)	1.00 (0.83- 1.21)	0.64 (0.49- 0.86)	1.00 (0.62- 1.60)	0.79 (0.30- 2.11)	0.83 (0.59- 1.15)	0.64 (0.41- 0.99)	0.49 (0.28- 0.88)	0.78 (0.51- 1.18)	0.47 (0.27- 0.81)	0.31 (0.16- 0.59)	0.57 (0.38- 0.84)	0.82 (0.67- 1.01)	0.88 (0.71- 1.09)	0.61 (0.41- 0.89)	0.08 (0.01- 0.60)	0.38 (0.12- 1.19)	0.58 (0.30- 1.10)
U.Sborn (no) (n=15,818)	0.43 (0.34- 0.54)	0.48 (0.41- 0.55)	0.82 (0.68- 0.98)	0.67 (0.61- 0.74)	0.69 (0.65- 0.74)	0.86 (0.79- 0.93)	0.81 (0.62- 1.06)	0.65 (0.51- 0.82)	0.76 (0.63- 0.92)	0.63 (0.58- 0.69)	0.54 (0.46- 0.62)	0.80 (0.69- 0.93)	0.51 (0.47- 0.56)	0.46 (0.40- 0.52)	0.57 (0.50- 0.65)	0.86 (0.82- 0.91)	0.79 (0.74- 0.85)	0.85 (0.77- 0.94)	0.36 (0.29- 0.43)	0.22 (0.15- 0.32)	0.57 (0.44- 0.75)
High Acculturation (n=6,141)	0.62 (0.48- 0.81)	0.55 (0.46- 0.65)	0.98 (0.76- 1.25)	0.79 (0.70- 0.90)	0.76 (0.70- 0.81)	0.92 (0.82- 1.03)	0.80 (0.57- 1.13)	0.65 (0.46- 0.92)	0.91 (0.66- 1.25)	0.63 (0.50- 0.80)	0.57 (0.47- 0.69)	0.86 (0.69- 1.08)	0.68 (0.52- 0.90)	0.48 (0.40- 0.57)	0.57 (0.46- 0.69)	1.06 (0.94- 1.20)	0.83 (0.76- 0.90)	0.86 (0.74- 1.00)	0.22 (0.08- 0.60)	0.26 (0.17- 0.41)	0.58 (0.40- 0.84)
Medium/Low Acculturation (n=9,666)	0.29 (0.20- 0.41)	0.41 (0.34- 0.49)	0.74 (0.58- 0.94)	0.56 (0.48- 0.65)	0.62 (0.56- 0.68)	0.82 (0.74- 0.91)	0.80 (0.58- 1.10)	0.64 (0.49- 0.83)	0.69 (0.55- 0.87)	0.45 (0.32- 0.64)	0.50 (0.41- 0.60)	0.77 (0.64- 0.93)	0.46 (0.32- 0.68)	0.44 (0.37- 0.52)	0.57 (0.48- 0.67)	0.79 (0.66- 0.96)	0.75 (0.68- 0.82)	0.84 (0.74- 0.95)	0.27 (0.07- 1.02)	0.19 (0.12- 0.31)	0.56 (0.40- 0.80)
Puerto Rican																					
U.Sborn (yes) (n=2,544)	1.53 (1.19- 1.96)	1.47 (1.24- 1.74)	1.55 (1.17- 2.06)	1.26 (1.12- 1.42)	1.25 (1.15- 1.36)	1.28 (1.11- 1.48)	1.36 (0.97- 1.91)	1.00 (0.66- 1.54)	0.64 (0.35- 1.19)	1.14 (0.99- 1.31)	0.93 (0.75- 1.14)	1.49 (1.20- 1.86)	0.98 (0.85- 1.12)	1.02 (0.82- 1.25)	1.01 (0.79- 1.28)	1.08 (0.99- 1.18)	0.99 (0.87- 1.12)	1.11 (0.94- 1.31)	0.93 (0.74- 1.17)	0.79 (0.52- 1.19)	1.25 (0.92- 1.69)
High Acculturation (n=2,359)	1.50 (1.17- 1.94)	1.52 (1.28- 1.81)	1.71 (1.28- 2.30)	1.25 (1.10- 1.42)	1.25 (1.14- 1.36)	1.35 (1.17- 1.55)	1.40 (0.99- 1.97)	1.03 (0.66- 1.61)	0.73 (0.40- 1.34)	1.02 (0.78- 1.33)	0.94 (0.75- 1.17)	1.58 (1.27- 1.97)	0.89 (0.62- 1.28)	1.01 (0.81- 1.26)	1.07 (0.84- 1.36)	1.04 (0.91- 1.20)	1.01 (0.89- 1.14)	1.17 (0.99- 1.38)	0.81 (0.41- 1.60)	0.81 (0.53- 1.23)	1.32 (0.97- 1.78)
Medium/Low Acculturation (n=184)	1.88 (1.07- 3.31)	0.64 (0.27- 1.51)	0.55 (0.25- 1.18)	1.38 (0.93- 2.05)	1.25 (0.93- 1.68)	0.71 (0.34- 1.47)	0.78 (0.24- 2.52)	0.75 (0.25- 2.24)	NE	NE	0.73 (0.36- 1.49)	0.80 (0.35- 1.84)	0.44 (0.06- 3.38)	1.08 (0.58- 2.01)	0.54 (0.23- 1.23)	0.36 (0.07- 1.79)	0.68 (0.38- 1.23)	0.67 (0.33- 1.38)	NE	0.45 (0.09- 2.24)	0.67 (0.18- 2.52)
U.Sborn (no)	1.27	1.08	1.56	1.23	1.01	1.26	1.03	0.75	0.96	1.09	0.95	1.27	0.86	0.77	0.87	0.98	0.94	1.00	1.04	0.90	1.08

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(n=2,533)	(0.86-	(0.85-	(1.34-	(1.01-	(0.90-	(1.16- 1.37)	(0.53-2.02)	(0.47-	(0.74- 1.25)	(0.94-	(0.73-	(1.06- 1.51)	(0.75- 0.99)	(0.58-	(0.73-	(0.88-	(0.80-	(0.87-	(0.85-	(0.60-	(0.85-
High Acculturation (n=1,773)	1.25 (0.82- 1.91)	1.05 (0.78- 1.42)	1.85 (1.56- 2.19)	1.20 (0.94- 1.53)	0.99 (0.86- 1.14)	1.35 (1.23- 1.48)	0.87 (0.35- 2.21)	0.91 (0.57- 1.43)	1.09 (0.79- 1.52)	0.51 (0.28- 0.93)	0.95 (0.72- 1.24)	1.41 (1.14- 1.74)	0.99 (0.63- 1.56)	0.82 (0.60-	0.98 (0.81- 1.18)	0.98 (0.71- 1.35)	1.05 (0.91- 1.22)	1.01 (0.86- 1.20)	0.73 (0.21- 2.53)	1.06 (0.69- 1.64)	1.09 (0.82- 1.46)
Medium/Low Acculturation (n=755)	1.31 (0.62- 2.79)	1.16 (0.78- 1.72)	1.04 (0.84- 1.29)	1.33 (0.99- 1.78)	1.08 (0.87- 1.32)	1.08 (0.92- 1.27)	1.48 (0.66- 3.36)	0.28 (0.08- 0.94)	0.76 (0.48- 1.20)	1.25 (0.60- 2.60)	0.93 (0.51- 1.68)	0.97 (0.70- 1.36)	1.19 (0.46- 3.13)	0.62 (0.35- 1.12)	0.61 (0.43- 0.86)	0.74 (0.35- 1.60)	0.62 (0.42- 0.91)	0.95 (0.76- 1.19)	2.05 (0.61- 6.90)	0.41 (0.19- 0.86)	1.05 (0.66- 1.67)
Cuban																					
U.Sborn Cuban (yes) (n=559)	0.81 (0.47- 1.42)	0.83 (0.49- 1.41)	1.65 (0.93- 2.94)	0.98 (0.76- 1.26)	1.11 (0.91- 1.35)	1.04 (0.69- 1.57)	0.93 (0.39- 2.23)	0.45 (0.14- 1.41)	0.21 (0.03- 1.53)	1.05 (0.78- 1.41)	1.11 (0.72- 1.71)	1.54 (0.85- 2.78)	0.91 (0.68- 1.22)	1.02 (0.68- 1.53)	1.04 (0.62- 1.75)	1.05 (0.87- 1.26)	0.94 (0.72- 1.24)	0.99 (0.61- 1.63)	0.91 (0.52- 1.60)	1.53 (0.83- 2.80)	0.63 (0.26- 1.49)
High Acculturation (n=440)	1.00 (0.56- 1.77)	0.84 (0.47- 1.50)	1.69 (0.92- 3.10)	1.01 (0.78- 1.32)	1.12 (0.90- 1.39)	1.06 (0.68- 1.63)	1.06 (0.37- 3.04)	0.30 (0.07- 1.21)	0.25 (0.04- 1.82)	0.92 (0.55- 1.53)	1.32 (0.86- 2.03)	1.66 (0.90- 3.06)	1.04 (0.57- 1.90)	0.97 (0.62- 1.54)	1.11 (0.64- 1.90)	1.05 (0.80- 1.40)	0.92 (0.67- 1.26)	1.00 (0.59- 1.70)	0.10 (0.01- 0.76)	1.45 (0.78- 2.69)	0.63 (0.24- 1.64)
Medium/Low Acculturation (n=119)	0.22 (0.03- 1.53)	0.81 (0.30- 2.19)	1.13 (0.26- 4.86)	0.87 (0.42- 1.82)	1.06 (0.69- 1.61)	0.85 (0.25- 2.91)	0.73 (0.17- 3.17)	1.02 (0.23- 4.51)	NE	NE	0.30 (0.05- 1.92)	0.50 (0.11- 2.21)	NE	1.18 (0.51- 2.74)	0.36 (0.07- 2.00)	1.10 (0.63- 1.93)	1.03 (0.66- 1.63)	0.88 (0.27- 2.90)	NE	1.84 (0.48- 7.11)	0.64 (0.14- 2.89)
U.Sborn Cuban (no) (n=1,959)	0.59 (0.24- 1.43)	0.61 (0.44- 0.84)	1.03 (0.81- 1.31)	0.48 (0.31- 0.75)	0.67 (0.53- 0.83)	1.06 (0.95- 1.18)	0.32 (0.08- 1.34)	0.75 (0.42- 1.34)	0.74 (0.56- 0.96)	0.70 (0.53- 0.93)	0.57 (0.35- 0.95)	0.94 (0.74- 1.20)	0.64 (0.50- 0.81)	0.61 (0.41- 0.90)	0.69 (0.54- 0.89)	0.87 (0.78- 0.97)	0.76 (0.64- 0.89)	0.98 (0.83- 1.16)	0.62 (0.44- 0.88)	0.30 (0.13- 0.66)	0.77 (0.56- 1.07)
High Acculturation (n=571)	0.55 (0.16- 1.91)	0.75 (0.44- 1.28)	1.31 (0.82- 2.09)	0.55 (0.27- 1.12)	0.87 (0.67- 1.11)	1.18 (0.95- 1.47)	0.91 (0.21- 4.01)	0.76 (0.21- 2.83)	0.75 (0.45- 1.26)	NE	0.38 (0.14- 0.98)	1.66 (1.20- 2.30)	0.20 (0.03- 1.47)	0.58 (0.25- 1.37)	0.85 (0.61- 1.19)	0.66 (0.31- 1.40)	0.65 (0.41- 1.04)	0.95 (0.70- 1.28)	NE	0.16 (0.02- 1.11)	1.03 (0.58- 1.85)
Medium/Low Acculturation (n=1,386)	0.62 (0.20- 1.92)	0.55 (0.37- 0.82)	0.92 (0.71- 1.19)	0.47 (0.27- 0.83)	0.57 (0.41- 0.78)	1.00 (0.90- 1.12)	0.13 (0.01- 1.08)	0.75 (0.40- 1.41)	0.69 (0.49- 0.99)	0.11 (0.02- 0.74)	0.64 (0.36- 1.12))	0.62 (0.45- 0.86)	0.12 (0.02- 0.85)	0.62 (0.40- 0.96)	0.62 (0.43- 0.89)	1.01 (0.63- 1.64)	0.79 (0.68- 0.92)	1.00 (0.83- 1.20)	NE	0.33 (0.14- 0.82)	0.66 (0.47- 0.94)
Dominican																					
U.Sborn (yes) (n=264)	0.63 (0.31- 1.30)	2.17 (1.33- 3.55)	1.65 (0.41- 6.68)	0.87 (0.58- 1.31)	1.62 (1.30- 2.02)	0.98 (0.43- 2.20)	1.32 (0.52- 3.33)	2.50 (0.76- 8.25)	NE	0.78 (0.50- 1.21)	0.88 (0.44- 1.76)	0.82 (0.12- 5.75)	0.85 (0.56- 1.28)	1.05 (0.55- 2.02)	0.46 (0.07- 3.02)	1.06 (0.82- 1.36)	1.05 (0.77- 1.42)	1.60 (0.70- 3.67)	0.50 (0.24- 1.02)	1.26 (0.52- 3.02)	0.69 (0.08- 5.75)
High Acculturation (n=208)	0.68 (0.31- 1.51)	2.15 (1.25- 3.69)	1.85 (0.46- 7.43)	0.99 (0.64- 1.51)	1.60 (1.27- 2.02)	1.05 (0.46- 2.44)	1.45 (0.52- 4.00)	3.32 (1.11- 9.93)	NE	0.77 (0.41- 1.45)	1.04 (0.54- 2.02)	0.82 (0.12- 5.75)	1.15 (0.59- 2.27)	0.83 (0.35- 1.99)	0.46 (0.07- 3.02)	0.97 (0.66- 1.43)	1.06 (0.77- 1.46)	1.60 (0.70- 3.67)	0.23 (0.03- 1.62)	1.45 (0.57- 3.66)	0.69 (0.08- 5.75)
Medium/Low Acculturation (n=56)	0.49 (0.11- 2.16)	2.28 (0.86- 6.06)	NE	0.44 (0.18- 1.09)	1.72 (1.11- 2.67)	0.38 (0.05- 2.93)	0.97 (0.22- 4.36)	NE	NE	0.44 (0.20- 1.01)	0.52 (0.10- 2.59)	NE	0.62 (0.25- 1.50)	1.63 (0.74- 3.57)	NE	0.99 (0.45- 2.17)	1.00 (0.48- 2.10)	NE	NE	0.78 (0.10- 6.23)	NE
U.Sborn (no) (n=1,394)	0.63 (0.37- 1.08)	0.76 (0.55- 1.04)	1.16 (0.94- 1.44)	0.75 (0.55- 1.03)	0.84 (0.72- 0.99)	1.02 (0.89- 1.17)	1.31 (0.64- 2.68)	0.33 (0.12- 0.87)	0.44 (0.22- 0.87)	0.80 (0.65- 0.99)	0.66 (0.44- 0.97)	0.90 (0.69- 1.18)	0.63 (0.50- 0.81)	0.41 (0.26- 0.64)	0.72 (0.54- 0.96)	0.96 (0.82- 1.12)	0.75 (0.59- 0.94)	1.11 (0.91- 1.35)	0.87 (0.56- 1.35)	0.20 (0.09- 0.47)	1.33 (0.84- 2.12)
High Acculturation (n=594)	(0.61- 1.92)	0.72 (0.45- 1.14)	(0.81- 1.88)	(0.75- 1.46)	(0.74- 1.09)	(0.78- 1.27)	(0.41- 3.04)	0.26 (0.05- 1.41)	(0.22- (2.40)	(0.99 (0.47- 2.10)	(0.47- 1.27)	(0.48- 1.56)	(0.64- 3.10)	0.37 (0.21- 0.67)	0.93 (0.57- 1.54)	(0.80- 1.55)	0.65 (0.48- 0.89)	(0.84- 1.65)	(0.06 (0.01- 0.54)	(0.03- 0.32)	(0.91- 2.99)
Medium/Low Acculturation (n=800)	0.21 (0.08- 0.56)	0.79 (0.54- 1.15)	1.14 (0.85- 1.51)	0.43 (0.25- 0.75)	0.78 (0.63- 0.97)	1.03 (0.87- 1.21)	1.42 (0.56- 3.61)	0.38 (0.12- 1.25)	0.34 (0.15- 0.76)	0.43 (0.16- 1.11)	0.51 (0.27- 0.95)	0.92 (0.67- 1.25)	0.53 (0.18- 1.56)	0.46 (0.25- 0.83)	0.60 (0.41- 0.90)	0.92 (0.41- 2.04)	0.87 (0.62- 1.23)	1.07 (0.85- 1.33)	0.28 (0.04- 1.91)	0.34 (0.13- 0.93)	1.16 (0.60- 2.26)

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Central/South American																					
U.Sborn (yes) (n=1,113)	1.31 (0.94- 1.82)	1.52 (1.07- 2.16)	0.98 (0.43- 2.25)	1.19 (1.02- 1.40)	1.23 (1.04- 1.45)	1.02 (0.65- 1.58)	0.82 (0.48- 1.40)	0.96 (0.34- 2.74)	0.36 (0.08- 1.54)	1.26 (1.01- 1.55)	1.28 (0.90- 1.83)	1.66 (1.01- 2.73)	0.87 (0.65- 1.15)	0.73 (0.53- 1.03)	0.93 (0.53- 1.63)	1.10 (0.97- 1.25)	1.02 (0.84- 1.23)	0.80 (0.46- 1.41)	0.52 (0.30- 0.89)	0.23 (0.11- 0.49)	1.41 (0.67- 2.95)
High Acculturation (n=994)	1.43 (1.02- 2.02)	1.59 (1.10- 2.30)	1.08 (0.47- 2.45)	1.28 (1.09- 1.49)	1.24 (1.05- 1.45)	1.04 (0.66- 1.64)	0.81 (0.42- 1.57)	1.04 (0.36- 2.98)	0.45 (0.11- 1.86)	1.08 (0.81- 1.46)	1.30 (0.91- 1.84)	1.47 (0.85- 2.55)	1.01 (0.72- 1.42)	0.80 (0.57- 1.12)	1.08 (0.64- 1.81)	1.10 (0.94- 1.29)	1.07 (0.89- 1.29)	0.91 (0.53- 1.56)	0.96 (0.43- 2.13)	0.24 (0.11- 0.53)	1.00 (0.43- 2.34)
Medium/Low Acculturation (n=119)	0.74 (0.32- 1.72)	0.67 (0.16- 2.90)	NE	0.74 (0.45- 1.22)	1.15 (0.46- 2.85)	0.77 (0.16- 3.66)	0.85 (0.36- 1.99)	NE	NE	1.52 (0.69- 3.34)	1.12 (0.18- 7.07)	2.78 (1.47- 5.24)	1.87 (0.86- 4.05)	NE	NE	1.06 (0.66- 1.70)	0.46 (0.11- 1.83)	NE	0.19 (0.02- 1.49)	NE	3.59 (2.21- 5.82)
U.Sborn (no) (n=7,049)	0.73 (0.56- 0.96)	0.65 (0.55- 0.77)	0.92 (0.77- 1.09)	0.86 (0.76- 0.98)	0.89 (0.83- 0.96)	0.99 (0.91- 1.07)	0.93 (0.61- 1.41)	0.61 (0.44- 0.85)	0.51 (0.36- 0.73)	0.72 (0.63- 0.82)	0.63 (0.51- 0.78)	0.83 (0.69- 0.99)	0.61 (0.54- 0.69)	0.53 (0.43- 0.65)	0.65 (0.54- 0.78)	0.90 (0.84- 0.96)	0.83 (0.76- 0.91)	0.91 (0.81- 1.03)	0.40 (0.31- 0.51)	0.34 (0.22- 0.55)	0.47 (0.35- 0.64)
High Acculturation (n=3,366)	0.75 (0.50- 1.12)	0.70 (0.55- 0.88)	0.92 (0.70- 1.20)	1.00 (0.85- 1.18)	0.92 (0.84- 1.01)	0.94 (0.82- 1.07)	1.11 (0.72- 1.70)	0.74 (0.49- 1.11)	0.56 (0.33- 0.94)	0.75 (0.51- 1.11)	0.68 (0.51- 0.90)	0.87 (0.64- 1.18)	1.12 (0.80- 1.56)	0.59 (0.46- 0.76)	0.62 (0.46- 0.83)	0.96 (0.80- 1.16)	0.82 (0.74- 0.92)	0.91 (0.76- 1.09)	0.44 (0.16- 1.21)	0.39 (0.22- 0.68)	0.56 (0.37- 0.85)
Medium/Low Acculturation (n=3,664)	0.71 (0.49- 1.03)	0.60 (0.48- 0.75)	0.91 (0.73- 1.12)	0.70 (0.57- 0.87)	0.84 (0.76- 0.93)	1.04 (0.94- 1.15)	0.79 (0.41- 1.52)	0.51 (0.32- 0.81)	0.47 (0.30- 0.75)	0.47 (0.28- 0.79)	0.57 (0.42- 0.79)	0.80 (0.63- 1.02)	0.40 (0.21- 0.74)	0.44 (0.31- 0.61)	0.68 (0.55- 0.86)	0.86 (0.67- 1.11)	0.84 (0.73- 0.95)	0.91 (0.77- 1.07)	0.09 (0.02- 0.46)	0.29 (0.14- 0.60)	0.39 (0.25- 0.60)

Abbreviations: ref (reference); NE (not estimable)

* Language acculturation categories include high (English only interview) and medium/low (English and Spanish interview or Spanish only interview).

Adjusted for sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), heavy alcohol consumption (≥2 drinks/day for women and ≥3 drinks/day for men), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m2, meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, sleep medication use, and restorative sleep were measured during the survey years 2013-2017.

Supplemental Table S11. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (a) US-Born Hispanic/Latino Heritage Groups and (b) Foreign-born Hispanic/Latino Heritage Groups With and Without Adjustment for Time in the US Compared Foreign-born non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=56,372)

		F	Prevalence Ra	tio (95% Conf	idence Interva	I)	
		Sleep Duratior	ו				
	(reference:	recommended	(7-9 hours))		Sleep	Quality	1
				Trouble	Trouble	Non-	Sleep
				Falling	Staying	restorative	Medication
Group <i>(n)</i>	Very Short	Short	Long	Asleep	Asleep	Sleep	Use
Compared to Foreign-born Non-	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)
Hispanic Whites (n=8,857)	(n=4,115)	(n=14,048)	(n=1,586)	(n=3,431)	(n=3,520)	(n=7,734)	(n=1,073)
Foreign-born Non-Hispanic Whites	ref	ref	ref	ref	ref	ref	ref
Mexican							
	1.09	1.14	1.00	0.92	0.87	0.97	0.92
Overall (n=30,100)	(0.96-1.25)	(1.06-1.22)	(0.88-1.13)	(0.81-1.05)	(0.78-0.97)	(0.92-1.01)	(0.73-1.14)
US-born (yes)	1.17	1.23	1.01	1.00	0.97	0.96	0.98
(n=14,282)	(1.02-1.33)	(1.14-1.33)	(0.88-1.15)	(0.87-1.14)	(0.86-1.10)	(0.91-1.01)	(0.78-1.23)
US-born (no) (n=15,818)							
	0.88	1.00	1.00	0.78	0.72	0.98	0.68
Not Adjusted for Time in the US	(0.73-1.07)	(0.91-1.10)	(0.86-1.17)	(0.66-0.94)	(0.62-0.84)	(0.93-1.04)	(0.48-0.96)
	0.88	0.97	1.05	0.79	0.72	1.03	0.69
Adjusted for Time in the US	(0.73-1.06)	(0.90-1.06)	(0.81-1.36)	(0.66-0.94)	(0.62-0.84)	(0.94-1.13)	(0.49-0.97)
Puerto Rican							
	1.73	1.30	1.06	1.19	1.14	0.95	1.33
Overall (<i>n</i> =5,077)	(1.49-2.00)	(1.19-1.41)	(0.89-1.25)	(1.03-1.39)	(0.99-1.31)	(0.90-1.01)	(1.07-1.64)
US-born (yes)	1.81	1.33	1.04	1.20	1.22	0.94	1.32
(n=2,544)	(1.51-2.17)	(1.19-1.48)	(0.82-1.33)	(0.99-1.46)	(1.02-1.46)	(0.87-1.02)	(1.01-1.73)
US-born (no) (n=2,533)							
	1.58	1.23	1.11	1.22	1.09	0.95	1.41
Not Adjusted for Time in the US	(1.32-1.89)	(1.10-1.38)	(0.92-1.33)	(1.01-1.46)	(0.91-1.30)	(0.88-1.02)	(1.09-1.83)
	1.56	1.26	1.02	1.24	1.11	1.07	1.40
Adjusted for Time in the US	(1.20-1.88)	(1.15-1.38)	(0.77-1.36)	(1.04-1.50)	(0.93-1.33)	(0.95-1.21)	(1.08-1.82)
Cuban							
	0.95	0.99	0.76	0.92	0.93	0.97	1.09
Overall (<i>n</i> =2,518)	(0.75-1.20)	(0.86-1.14)	(0.60-0.98)	(0.70-1.20)	(0.76-1.15)	(0.90-1.04)	(0.77-1.55)
US-born Cuban (yes)			0.79			0.91	1.63
(<i>n</i> =559)	(0.67-1.51)	(0.98-1.47)	(0.47-1.33)	(0.79-1.65)	(0.84-1.65)	(0.78-1.06)	(0.91-2.93)
US-born Cuban (no)							

0.92	0.90	0.76	0.82	0.85	0.99	0.96
(0.71-1.20)	(0.77-1.06)	(0.58-1.00)	(0.59-1.14)	(0.65-1.10)	(0.91-1.06)	(0.63-1.45)
0.99	0.95	0.69	0.88	0.90	1.05	1.03
(0.76-1.28)	(0.84-1.08)	(0.48-0.99)	(0.64-1.22)	(0.69-1.17)	(0.90-1.23)	(0.68-1.57)
1.11	0.98	0.91	0.88	0.94	1.02	1.03
(0.88-1.41)	(0.83-1.16)	(0.64-1.28)	(0.68-1.13)	(0.72-1.23)	(0.94-1.12)	(0.67-1.59)
1.38	1.21	0.98	0.82	1.25	0.92	0.97
(0.80-2.38)	(0.88-1.67)	(0.49-1.99)	(0.51-1.31)	(0.81-1.93)	(0.75-1.13)	(0.42-2.20)
1.05	0.02	0.90	0.00	0.97	1.05	1.02
(0.94, 1.32)	0.92		0.00	0.07		1.02
(0.04-1.33)	0.06	0.74	0.00	0.03-1.10)	1.00	(0.04-1.03)
(0.85, 1.34)	(0.84 ± 1.10)	(0.74)	(0.60 1.10)	(0 66 1 21)	(0.84,1.10)	(0.65.1.68)
(0.03-1.34)	(0.04-1.10)	(0.45-1.20)	(0.09-1.19)	(0.00-1.21)	(0.04-1.19)	(0.03-1.00)
0.00	1 1 2	0.91	0.04	0.80	0.08	0.69
(0.85-1.15)	(1.04-1.23)	(0.69-0.96)	(0.78-1.13)	(0.76-1.04)	(0.94-1.03)	(0.51-0.91)
1.41	1.30	0.85	1.27	1.14	0.95	0.95
(1.05-1.90)	(1.10-1.53)	(0.60-1.20)	(0.96-1.67)	(0.86-1.52)	(0.85-1.06)	(0.56-1.62)
			· · · · ·	, , , , , , , , , , , , , , , , , , ,	<i>, , , , , , ,</i>	
0.91	1.10	0.83	0.84	0.84	0.99	0.64
(0.77-1.07)	(1.01-1.20)	(0.70-1.00)	(0.69-1.02)	(0.72-0.99)	(0.94-1.04)	(0.47-0.88)
0.94	1.07	0.78	0.86	0.87	1.01	0.66
(0.80-1.11)	(1.00-1.15)	(0.57-1.06)	(0.71-1.05)	(0.74-1.02)	(0.93-1.10)	(0.48-0.90)
	0.92 (0.71-1.20) 0.99 (0.76-1.28) 1.11 (0.88-1.41) 1.38 (0.80-2.38) 1.07 (0.84-1.33) 1.07 (0.85-1.34) 0.99 (0.85-1.15) 1.41 (1.05-1.90) 0.91 (0.77-1.07) 0.94 (0.80-1.11)	$\begin{array}{c ccccc} 0.92 & 0.90 \\ (0.71-1.20) & (0.77-1.06) \\ 0.99 & 0.95 \\ (0.76-1.28) & (0.84-1.08) \\ \hline \\ 1.11 & 0.98 \\ (0.88-1.41) & (0.83-1.16) \\ 1.38 & 1.21 \\ (0.80-2.38) & (0.88-1.67) \\ \hline \\ 1.05 & 0.92 \\ (0.84-1.33) & (0.76-1.10) \\ 1.07 & 0.96 \\ (0.85-1.34) & (0.84-1.10) \\ \hline \\ 0.99 & 1.13 \\ (0.85-1.15) & (1.04-1.23) \\ \hline \\ 1.41 & 1.30 \\ (1.05-1.90) & (1.10-1.53) \\ \hline \\ 0.94 & 1.07 \\ (0.80-1.11) & (1.00-1.15) \\ \hline \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence (Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, nonrestorative sleep, and sleep medication were measured during the survey years 2013-2017. Time in the US was defined as 15 years, 15+ years.

Supplemental Table S12. Fully-Adjusted Prevalence Ratios of Sleep Characteristics for (a) Foreign-born Whites Stratified by Time in the US, (b) US-Born Hispanic/Latino Heritage Groups, and (c) Foreign-born Hispanic/Latino Heritage Groups Stratified by Time in the US Compared to US-born non-Hispanic Whites, National Health Interview Survey, 2004-2017 (N=254,669)

	Prevalence Ratio (95% Confidence Interval)							
		Sleep Duratio	on					
	(reference:	recommende	d (7-9 hours))	Sleep Quality				
				Trouble	Trouble	Non-	Sleep	
	Very			Falling	Staying	restorative	Medication	
	Short	Short	Long	Asleep	Asleep	Sleep	Use	
	(≤5-hours)	(<7-hours)	(>9-hours)	(≥3 nights)	(≥3 nights)	(≥3 days)	(≥3 nights)	
Group (n)	(n=21,227)	(n=75,139)	(n=9,190)	(n=22,038)	(n=30,013)	(n=46,103)	(n=11,097)	
(n=198,297)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	
Foreign-born Non-Hispanic White	1.03	1.05	1.11	1.09	1.27	0.96	1.34	
(n=8,857)	(0.94-1.14)	(1.00-1.11)	(1.01-1.21)	(0.99-1.19)	(1.17-1.37)	(0.93-0.99)	(1.16-1.55)	
	0.70	0.80	0.69	0.76	0.76	0.92	0.72	
Time in the US (<15 years) (n=2,169)	(0.54-0.91)	(0.71-0.90)	(0.43-1.12)	(0.58-0.98)	(0.59-0.98)	(0.81-1.06)	(0.46-1.13)	
	1.42	1.25	1.44	1.32	1.31	1.08	1.38	
Time in the US (15+ years) (n=6,657)	(1.09-1.85)	(1.11-1.40)	(0.90-2.33)	(1.02-1.71)	(1.02-1.68)	(0.94-1.24)	(0.88-2.16)	
Mexican								
	0.75	0.88	0.87	0.77	0.65	1.08	0.52	
Overall (<i>n</i> =30,100)	(0.71-0.80)	(0.85-0.92)	(0.81-0.93)	(0.72-0.82)	(0.62-0.69)	(1.05-1.11)	(0.46-0.58)	
US-born (yes)	1.04	1.04	0.95	0.92	0.80	1.02	0.66	
(n=14,282)	(0.97-1.12)	(0.99-1.09)	(0.87-1.03)	(0.85-0.99)	(0.74-0.85)	(0.98-1.05)	(0.58-0.76)	
US-born (no)	0.52	0.72	0.79	0.59	0.50	1.17	0.36	
(n=15,818)	(0.47-0.57)	(0.68-0.76)	(0.72-0.86)	(0.54-0.65)	(0.46-0.55)	(1.13-1.21)	(0.29-0.43)	
	0.31	0.56	0.81	0.42	0.39	0.80	0.25	
Time in the US (<15 years) $(n=5,739)$	(0.27-0.37)	(0.52-0.60)	(0.68-0.98)	(0.36-0.50)	(0.32-0.47)	(0.74-0.87)	(0.15-0.42)	
	0.63	0.77	0.70	0.65	0.53	0.81	0.39	
Time in the US (15+ years) $(n=9,919)$	(0.56-0.70)	(0.73-0.81)	(0.60-0.81)	(0.59-0.72)	(0.49-0.59)	(0.76-0.86)	(0.32-0.48)	
Puerto Rican				4.05	0.04	4.04		
0	1.37	1.15	0.92	1.05	0.91		0.99	
	(1.24-1.51)	(1.08-1.22)	(0.81-1.03)	(0.95-1.17)	(0.83-1.00)	(0.96-1.07)	(0.85-1.15)	
US-DORN (Yes)	1.41	1.19	0.87	1.05	0.97	1.00	0.96	
(n=2,344)	(1.24-1.60)	(1.09-1.29)	(0.73-1.04)	(0.91-1.21)	(0.85-1.12)	(0.93-1.07)	(0.77-1.21)	
	1.31		0.97		U.84	1.03	1.02	
(11=2,033)	(1.15-1.49)	(1.01-1.21)	(0.83-1.12)	(0.92-1.22)	(0.73-0.97)	(0.96-1.10)	(0.83-1.25)	
Time in the US (<15 years) ($r=550$)	1.20	1.1/	1.10	0.11	U.61	0.82	U.98 (0.64, 1.50)	
Time in the US (<15 years) $(n=550)$	(0.91-1.76)	(1.01-1.35)	(0.73 - 1.83)	(0.54-1.08)	<u>(0.40-0.94)</u>	(0.00-1.02)	(0.04-1.52)	
1 Ime in the US (15+ years) (n=1,969)	1.33	1.15	0.89	1.17	0.92	1.01	1.01	

	(1.16-1.52)	(1.06-1.23)	(0.69-1.14)	(1.02-1.36)	(0.80-1.06)	(0.91-1.12)	(0.80-1.26)
Cuban							
	0.81	0.88	0.68	0.78	0.70	1.06	0.68
Overall (<i>n</i> =2,518)	(0.68-0.96)	(0.78-1.00)	(0.56-0.82)	(0.62-0.97)	(0.58-0.83)	(1.00-1.12)	(0.53-0.89)
US-born Cuban (yes)	0.90	1.07	0.66	0.97	0.94	0.97	0.98
(n=559)	(0.64-1.27)	(0.89-1.29)	(0.40-1.09)	(0.72-1.31)	(0.70-1.26)	(0.84-1.12)	(0.57-1.69)
US-born Cuban (no)	0.79	0.82	0.68	0.71	0.63	1.09	0.61
(n=1,959)	(0.65-0.96)	(0.71-0.94)	(0.55-0.85)	(0.53-0.95)	(0.49-0.79)	(1.03-1.15)	(0.43-0.85)
	0.56	0.61	0.57	0.46	0.45	0.75	0.17
Time in the US (<15 years) (n=634)	(0.37-0.83)	(0.51-0.74)	(0.36-0.92)	(0.26-0.81)	(0.29-0.69)	(0.61-0.93)	(0.08-0.38)
	1.00	1.00	0.74	0.92	0.75	0.97	0.85
Time in the US (15+ years) (n=1,319)	(0.80-1.26)	(0.89-1.12)	(0.55-1.00)	(0.72-1.19)	(0.59-0.95)	(0.85-1.10)	(0.59-1.21)
Dominican							
	0.89	0.88	0.73	0.76	0.67	1.09	0.81
Overall (<i>n</i> =1,658)	(0.75-1.06)	(0.77-1.01)	(0.54-0.98)	(0.62-0.92)	(0.55-0.83)	(1.00-1.20)	(0.54-1.20)
US-born (yes)	1.08	1.06	0.77	0.73	0.97	0.97	0.64
(n=264)	(0.68-1.73)	(0.78-1.46)	(0.40-1.48)	(0.47-1.13)	(0.65-1.43)	(0.79-1.20)	(0.31-1.31)
US-born (no)	0.85	0.84	0.72	0.76	0.61	1.13	0.84
(n=1,394)	(0.72-1.01)	(0.72-0.97)	(0.50-1.03)	(0.62-0.95)	(0.48-0.78)	(1.01-1.25)	(0.54-1.30)
	0.59	0.65	0.60	0.71	0.54	0.79	0.49
Time in the US (<15 years) (n=426)	(0.40-0.88)	(0.51-0.82)	(0.29-1.24)	(0.50-1.01)	(0.34-0.85)	(0.57-1.11)	(0.18-1.29)
	1.00	0.99	0.60	0.79	0.64	0.98	0.97
Time in the US (15+ years) (n=962)	(0.84-1.20)	(0.89-1.10)	(0.35-1.04)	(0.59-1.04)	(0.49-0.84)	(0.84-1.15)	(0.62-1.51)
Central/South American							
	0.78	0.96	0.73	0.76	0.65	1.09	0.42
Overall (<i>n</i> =8,162)	(0.70-0.86)	(0.90-1.02)	(0.64-0.82)	(0.67-0.87)	(0.58-0.73)	(1.05-1.13)	(0.34-0.53)
US-born (yes)	1.29	1.15	0.74	1.21	0.98	0.99	0.64
(n=1,113)	(1.02-1.63)	(1.00-1.33)	(0.55-0.99)	(0.96-1.51)	(0.73-1.30)	(0.89-1.11)	(0.38-1.10)
US-born (no)	0.71	0.93	0.72	0.68	0.59	1.11	0.39
(n=7,049)	(0.64-0.79)	(0.87-0.98)	(0.64-0.82)	(0.59-0.77)	(0.53-0.67)	(1.07-1.16)	(0.30-0.50)
	0.55	0.80	0.74	0.54	0.43	0.79	0.30
Time in the US (<15 years) (n=3,032)	(0.46-0.67)	(0.73-0.87)	(0.53-1.03)	(0.42-0.69)	(0.34-0.55)	(0.70-0.89	(0.16-0.58)
	0.85	0.96	0.60	0.75	0.67	0.87	0.43
Time in the US (15+ years) (n=3,989)	(0.74-0.96)	(0.91-1.02)	(0.47-0.78)	(0.64-0.87)	(0.58-0.77)	(0.80-0.95)	(0.33-0.55)

Abbreviations: ref (reference)

Adjusted for age (18-30, 31-49, 50-64, 65+ years), sex (male, female), annual household income (<\$35,000, \$35,000-\$74,999, \$75,000+), educational attainment (<high school, high school graduate, some college, ≥college), unemployed/not in the labor force (yes, no), occupational class (professional/management, support services, laborers), marital/cohabitating status (married/cohabitating, divorced/widowed, single), region of residence

(Northeast, Midwest, South, West), alcohol consumption (never, former, current), serious psychological distress (Kessler-6 psychological distress scale

score ≥13), "ideal" cardiovascular health (never smoking/quit >12 months prior to interview, BMI <25 kg/m², meeting physical activity guidelines, and no prior diagnosis of dyslipidemia, hypertension, or diabetes/prediabetes), and cancer.

, « Tro. Note. All estimates are weighted for the survey's complex sampling design. Trouble falling asleep, trouble staying asleep, nonrestorative sleep, and sleep medication were measured during the survey years 2013-2017.

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STROBE Statement-checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract
		Page 2. Lines 7-9
		(b) Provide in the abstract an informative and balanced summary of what was done
		and what was found
		Pages 4-5. Lines 67-101
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Daekground/rationale	2	Pages 7-9 Lines 117-172
Objectives	3	State specific objectives, including any prespecified hypotheses
objectives	9	Page 9. Lines 172-182
Methods	(
Study design	4	Present key elements of study design early in the paper
Study design	•	Pages 9 Lines 186-193
Setting	5	Describe the setting locations and relevant dates including periods of recruitment
betting	5	exposure follow-up and data collection
		Pages 9 Lines 186-193
Particinants	6	(a) Cohort study—Give the eligibility criteria, and the sources and methods of
1 articipants	0	selection of participants. Describe methods of follow-up
		Case control study. Give the eligibility criteria, and the sources and methods of
		<i>Cuse-control study</i> —Give the englosity criteria, and the sources and methods of
		case ascertainment and control selection. Give the rationale for the choice of cases
		Cross sectional study. Cive the elicibility eviterie and the sources and methods of
		cross-sectional study—Give the englotinty criteria, and the sources and methods of
		Bage 10 Lines 105 207
		(1) C l + (, l = Example 1 d d d d d d d d d d d d d d d d d d
		(b) Conort study—For matched studies, give matching criteria and number of
		exposed and unexposed $C_{\rm rest} = \frac{1}{2} \left[\frac{1}{2} + \frac{1}{2} \right]$
		<i>Case-control study</i> —For matched studies, give matching criteria and the number of
		controls per case
x 7 ' 1 1		
Variables	1	Clearly define all outcomes, exposures, predictors, potential confounders, and effec
		modifiers. Give diagnostic criteria, il applicable
		Pages 10-12, Lines 212-266
Data sources/	8*	For each variable of interest, give sources of data and details of methods of
measurement		assessment (measurement). Describe comparability of assessment methods if there
		is more than one group
		Pages 10-12, Lines 212-266
Bias	9	Describe any efforts to address potential sources of bias
		Pages 10-12, Lines 212-266 and Table 6
Study size	10	Explain how the study size was arrived at
		Page 10, Lines 198-207
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable,
		describe which groupings were chosen and why
		Pages 10-12, Lines 212-266

	Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding
Ļ			Pages 12-13, Lines 268-288 and Table 6
			(b) Describe any methods used to examine subgroups and interactions
) 7			Page 13, Lines 2/2-2/8 and Lines 282-285
3			(c) Explain how missing data were addressed
)			Page 10, Lines 206-207
0			(d) Cohort study—If applicable, explain how loss to follow-up was addressed
1 2			<i>Case-control study</i> —If applicable, explain how matching of cases and controls was
3			addressed
4			<i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of
5			sampling strategy
6 7			Pages 12-13, Lines 269-271
8			(\underline{e}) Describe any sensitivity analyses
9			Page 13, Lines 285-287 and Table 6
20	Continued on next page		
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Results	1.0.*	
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible,
		examined for eligibility, confirmed eligible, included in the study, completing follow-up, and
		analysed
		Page 13, Line 293
		(b) Give reasons for non-participation at each stage
		Not applicable
		(c) Consider use of a flow diagram
		Supplemental Figure S1
Descriptive	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and informatio
data		on exposures and potential confounders
		Pages 13-14, Lines 292-308 and Tables 1-3
		(b) Indicate number of participants with missing data for each variable of interest
		Tables 1-3
		(c) Cohort study—Summarise follow-up time (eg, average and total amount)
<u> </u>	1.5.4	Not applicable
Outcome data	15*	Cohort study—Report numbers of outcome events or summary measures over time
		Not applicable
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of
		exposure
		Not applicable
		Cross-sectional study—Report numbers of outcome events or summary measures
	1.6	Page 14, Lines 300-308 and Table 2
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their
		precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and
		why they were included
		Table 2, Tables 4-5 and Figures 1-2; Pages 14-16, Lines 310-367
		(b) Report category boundaries when continuous variables were categorized
		Tables 4-5, Figures 1-2
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningf
		time period
		Not applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity
		analyses
		Table 6, Supplemental Material
Discussion		
Key results	18	Summarise key results with reference to study objectives
		Pages 16-17, Lines 370-385
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision.
		Discuss both direction and magnitude of any potential bias
		Pages 19-20, Lines 436-451
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplici
		of analyses, results from similar studies, and other relevant evidence
		Page 17-19, Lines 386-435
Generalisability	21	Discuss the generalisability (external validity) of the study results

Other information Funding 22

Funding

Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based **Page 3, Lines 50-53**

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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