

**Name:** Insufficient Sleep

**Short Description:** Percentage of adults reporting sleeping less than 7 hours on average (calculated as a crude prevalence).

**Data Source(s):**

- **Name:** The Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS), accessed via the PLACES Project Data Portal

**Link to Source:**

<https://chronicdata.cdc.gov/browse?category=500+Cities+%26+Places&sortBy=newest&utf8>

**Year(s):** 2020 (from 2022 Data Release)

**Source Geographic Level:** Zip Code Tabulation Area (ZCTA)

**Stratification:** Not available

**Selection Rationale:** Chronic sleep deficiency has been linked to various mental health conditions. This measure also contributes to measuring neighborhood-level social determinants of health linked to mental wellness such as neighborhood safety and environment.

**Strengths and Limitations**

- **Strengths:**
  - *[Importance]* Short sleep duration has been found to be associated with increased incidence of mental disorders and with a chronic trajectory of mental health symptoms.<sup>1,2</sup> Additionally, the prevalence of short sleep duration among working American adults is increasing over time.<sup>3</sup>
  - *[Relevance and Usability]* An adverse and unsafe neighborhood environment within a community has been linked with short sleep and low sleep efficiency, suggesting that environmental factors in a community can impact ability to achieve sufficient sleep.<sup>4</sup>

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<sup>1</sup> Seow, L. S. E., Tan, X. W., Chong, S. A., Vaingankar, J. A., Abdin, E., Shafie, S., Chua, B. Y., Heng, D., & Subramaniam, M. (2020). Independent and combined associations of sleep duration and sleep quality with common physical and mental disorders: Results from a multi-ethnic population-based study. *PLoS ONE*, 15(7), Article e0235816. <https://doi.org/10.1371/journal.pone.0235816>

<sup>2</sup> Biddle, D. J., Hermens, D. F., Lallukka, T., Aji, M., & Glozier, N. (2019). Insomnia symptoms and short sleep duration predict trajectory of mental health symptoms. *Sleep Medicine*, 54, 53–61. <https://doi.org/10.1016/j.sleep.2018.10.008>

<sup>3</sup> Khubchandani, J., & Price, J. H. (2019). Short sleep duration in working American adults, 2010–2018. *Journal of Community Health*, 45(2), 219–227. <https://doi.org/10.1007/s10900-019-00731-9>

<sup>4</sup> Simonelli, G., Dudley, K. A., Weng, J., Gallo, L. C., Perreira, K., Shah, N. A., Alcantara, C., Zee, P. C., Ramos, A. R., Llabre, M. M., Sotres-Alvarez, D., Wang, R., & Patel, S. R. (2017). Neighborhood factors as predictors of

- [Equity] This measure captures disparities experienced between population groups. Studies have found that rates of short sleep are higher among Black populations than among other racial and ethnic groups.<sup>5</sup>
- [Feasibility] The data are easily downloadable from PLACES and maintained by the CDC Division of Population Health, Epidemiology and Surveillance Branch.
- [Scientific Soundness] The methods used by the CDC to generate these small area estimates account for the associations between individual health outcomes, individual characteristics, and spatial contexts. CDC's internal and external validation studies confirm strong consistency between small area estimates and direct BRFSS survey estimates at state and county levels.<sup>6</sup>
- **Limitations:**
  - [Relevance and Usability] This measure provides only information about prevalence of short sleep duration and does not measure other sleep-related issues such as insomnia symptoms, poor sleep quality, or long sleep duration (which can also be linked to mental health illnesses such as depression<sup>7</sup>).
  - [Relevance and Usability] This measure is a model-based estimate,<sup>8</sup> so it may be difficult to interpret on its own.
  - [Scientific Soundness] This measure is self-reported and depends on the accuracy of the person surveyed.
  - [Scientific Soundness] Age-adjusted prevalence is not available at the census tract level, so these data are reported as a crude prevalence.

#### Calculation:

$$\text{Insufficient sleep} = \frac{\text{Respondents aged } \geq 18 \text{ years who report usually getting insufficient sleep}^*}{\text{Respondents aged } \geq 18 \text{ years who report 0 – 24 hours of sleep}^{**}} \times 100\%$$

\*Where insufficient sleep is defined as less than 7 hours, on average, during a 24-hour period.

\*\* Denominator excludes those who refused to answer, had a missing answer, or answered “don’t know/not sure.”<sup>9</sup>

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poor sleep in the Sueño Ancillary Study of the Hispanic Community Health Study/Study of Latinos. *Sleep*, 40(1). <https://doi.org/10.1093/sleep/zsw025>

<sup>5</sup> Kingsbury, J. H., Buxton, O. M., & Emmons, K. M. (2013). Sleep and its relationship to racial and ethnic disparities in cardiovascular disease. *Current Cardiovascular Risk Reports*, 7(5). <https://doi.org/10.1007/s12170-013-0330-0>

<sup>6</sup> Centers for Disease Control and Prevention. (2020a, December 8). *PLACES Methodology*. <https://www.cdc.gov/places/methodology/>

<sup>7</sup> Patel, S. R., Malhotra, A., Gottlieb, D. J., White, D. P., & Hu, F. B. (2006). Correlates of long sleep duration. *Sleep*, 29(7), 881–889. <https://doi.org/10.1093/sleep/29.7.881>

<sup>8</sup> Centers for Disease Control and Prevention. (2020a, December 8). *PLACES Methodology*. <https://www.cdc.gov/places/methodology/>

<sup>9</sup> Centers for Disease Control and Prevention. (2020b, December 8). *PLACES Measure Definitions*. <https://www.cdc.gov/places/measure-definitions>

Note - BRFSS estimates the crude prevalence based on self-reports using small area estimation and multilevel regression and poststratification, which links geocoded health surveys and high spatial resolution population demographic and socioeconomic data.<sup>10</sup>

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<sup>10</sup> Centers for Disease Control and Prevention. (2020a, December 8). *PLACES Methodology*.  
<https://www.cdc.gov/places/methodology/>