

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

- |                                     |  |
|-------------------------------------|--|
| n/a                                 | Confirmed  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> The exact sample size ( <i>n</i> ) for each experimental group/condition, given as a discrete number and unit of measurement   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> The statistical test(s) used AND whether they are one- or two-sided<br><i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i>   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> A description of all covariates tested   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals) |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> For null hypothesis testing, the test statistic (e.g. <i>F</i> , <i>t</i> , <i>r</i> ) with confidence intervals, effect sizes, degrees of freedom and <i>P</i> value noted<br><i>Give P values as exact values whenever suitable.</i>                     |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Estimates of effect sizes (e.g. Cohen's <i>d</i> , Pearson's <i>r</i> ), indicating how they were calculated  |

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection	Tract-level average real incomes were calculated by down-allocating the 2015 US GNI PPP (constant 2011 international dollars) reported by the UN Statistics Division using total tract incomes from the American Community Survey (ACS) for 2010-2015. These were then adjusted to create real incomes based on regional purchasing power parities reported by the US Bureau of Economic Analysis. Non-metro tracts were adjusted for real incomes using state level, non-metro PPP. Population estimates, school enrollment, and educational attainment for the population 25 years and older were taken from the ACS 5-year estimates for 2010-2015. Life expectancy data was taken from the US Small-area Life Expectancy Estimates Project (USALEEP). Tracts where life expectancy data was not reported received county-level life expectancy values from 2014. Tracts that do not have residents in every age cohort also were filled in using county-level values for education. These make up 3.05% of the cases. For the five census tracts located in counties that also had incomplete age cohorts, only Mean Years of Schooling was used to calculate the Education Index. Social disadvantage metrics in Figure 3 were obtained from the Opportunity Atlas, the American Community Survey (ACS) 5-year estimates for 2015-2019 and the CDC PLACES database. Data and code is provided online at <a href="https://github.com/mansueto-institute/local-hdi">https://github.com/mansueto-institute/local-hdi</a> .
Data analysis	The code used to aggregate and generate the data underlying the article is available at <a href="https://github.com/mansueto-institute/local-hdi">https://github.com/mansueto-institute/local-hdi</a> .

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

## Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

The code used to aggregate and generate the data underlying this article is available at <https://github.com/mansueto-institute/local-hdi>. Data sources can be found in the Methods section.

## Human research participants

Policy information about [studies involving human research participants and Sex and Gender in Research](#).

Reporting on sex and gender	N/A
Population characteristics	N/A
Recruitment	N/A
Ethics oversight	N/A

Note that full information on the approval of the study protocol must also be provided in the manuscript.

## Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

## Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	Quantitative study
Research sample	Tract-level average real incomes were calculated by down-allocating the 2015 US GNI PPP (constant 2011 international dollars) reported by the UN Statistics Division using total tract incomes from the American Community Survey (ACS) for 2010-2015. These were then adjusted to create real incomes based on regional purchasing power parities reported by the US Bureau of Economic Analysis. Non-metro tracts were adjusted for real incomes using state level, non-metro PPP. Population estimates, school enrollment, and educational attainment for the population 25 years and older were taken from the ACS 5-year estimates for 2010-2015. Life expectancy data was taken from the US Small-area Life Expectancy Estimates Project (USALEEP). Tracts where life expectancy data was not reported received county-level life expectancy values from 2014 reported by the Institute for Health Metrics and Evaluation. Tracts that do not have residents in every age cohort also were filled in using ACS county-level values for education. These make up 3.05% of the cases. For the five census tracts located in counties that also had incomplete age cohorts, only Mean Years of Schooling was used to calculate the Education Index. Social disadvantage metrics in Figure 3 were obtained from the Opportunity Atlas, the American Community Survey (ACS) 5-year estimates for 2015-2019 and the CDC PLACES database.
Sampling strategy	Please refer to the data sources for relevant information.
Data collection	Please refer to the data sources for relevant information.
Timing	Please refer to the data sources for relevant information.
Data exclusions	Please refer to the data sources for relevant information.
Non-participation	Please refer to the data sources for relevant information.
Randomization	Please refer to the data sources for relevant information.

# Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

## Materials & experimental systems

n/a	Involved in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> Antibodies
<input checked="" type="checkbox"/>	<input type="checkbox"/> Eukaryotic cell lines
<input checked="" type="checkbox"/>	<input type="checkbox"/> Palaeontology and archaeology
<input checked="" type="checkbox"/>	<input type="checkbox"/> Animals and other organisms
<input checked="" type="checkbox"/>	<input type="checkbox"/> Clinical data
<input checked="" type="checkbox"/>	<input type="checkbox"/> Dual use research of concern

## Methods

n/a	Involved in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> ChIP-seq
<input checked="" type="checkbox"/>	<input type="checkbox"/> Flow cytometry
<input checked="" type="checkbox"/>	<input type="checkbox"/> MRI-based neuroimaging