City Health Dashboard Technical Document

Version 12.0: Updated June 1, 2021

Contents

SECTION 1: Overview

The City Health Dashboard (the Dashboard) is a one-stop resource allowing users to view and compare data from multiple sources on health and the factors that shape health to guide local solutions. Through a vigorous selection process, the City Health Dashboard selected 36 metrics spanning 5 domains — clinical care, health behaviors, health outcomes, physical environment and social and economic factors — to quantify health, health determinants, and equity at the city level and, where available, census tract level.

Metrics are derived from both private and publicly available data sources, with some data sources contributing several metrics and others contributing only a single metric.

Document Mission

This document is written for an audience interested in the technical attributes of the Dashboard. It provides details on which data sources, sub-tables, variables, and formulas were used to operationalize all Dashboard metrics and explains the rationale for analytic decisions.

Users are invited to contact the Dashboard (info@cityhealthdashboard.com) with general feedback or questions not addressed below.

Measure Selection Criteria

The following metric inclusion criteria were used to compile accurate, consistent, and comparable data across 5 overarching domains for cities:

- Rigorous methods underlying the original data collection
- Feasible data acquisition by the Dashboard analytic team
- Evidence of importance and validity in academic literature
- Metrics that are amenable to city-level intervention
- Time lag between the Dashboard release and data collection ≤ 5 years
- Updated regularly, preferably at least every 2 years
- Balanced across the 5 domains (clinical care, health behaviors, health outcomes, physical environment and social and economic factors)
- When possible:
    - Aligned with other existent population health reporting frameworks (e.g., County Health Rankings & Roadmaps, Vital Signs, Culture of Health)
    - Disaggregated by census tracts or demographics
    - Available for 100% of cities included in CDC's 500 Cities, PLACES projects
    - Aligned with city preferences based on input from the Dashboard pilot cities and City Advisory Board

City and Tract Selection Criteria

The Dashboard reports data for select Census Incorporated Places (cities) and their associated census tracts.[1] City Health Dashboard selects cities and tracts for inclusion using the following methods:

1) Cities included in the Center for Disease Control and Prevention's 500 Cities Project.[2]
- 500 cities were added to City Health Dashboard at the Dashboard's launch in May 2018
- The Dashboard selected place and tract FIPS codes from shapefiles released by the 500 Cities Project.[3] Boundaries represent 2010 Census boundaries.

2) Select New Jersey cities, with financial support provided by New Jersey Health Initiatives.[4]
- 10 New Jersey cities (Burlington, Clayton, Egg Harbor City, Glassboro, Hammonton, Lawnside, Millville, Penns Grove, Pleasantville, Salem) were added to City Health Dashboard in January 2020

- The Dashboard uses 2010 place FIPS and geographic boundaries. 2010 Census blocks are used to assign Census tracts to places. If at least one tract's block resides within a place boundary, then the tract is assigned to the place. Therefore, tracts may be assigned to multiple places. Website maps represent the portion of the tract within the place boundary, not the entire tract.

3) Cities with populations greater than 50,000 and not already included in 500 Cities, from an NYU analysis and report[5] on small and midsize cities, with financial support provided by the Robert Wood Johnson Foundation. 256 cities were added to the Dashboard in April 2020.

- The Dashboard uses 2010 place FIPS and geographic boundaries, except for cities created post-2010, where 2017 boundaries are used. 2010 Census blocks are used to assign Census tracts to places. If at least one tract's block resides within a place boundary, then the tract is assigned to the place. Therefore, tracts may be assigned to multiple places. Website maps represent the portion of the tract within the place boundary, not the entire tract.

NOTE: See the "Federal Information Processing Standards (FIPS) codes" section and Appendix D ("Detailed Notes on Selection of City and Tract FIPS Codes") below for more detail. Contact info@cityhealthdashboard.com with any questions.

Updates to Technical Documentation

This technical document is updated iteratively as needed. Please note that the date of the most recent update of this document is noted on its first page and footer.

Please see Appendix H: Updates Summary for an outline of changes made to each version of this document.

Multi-year Data: Appropriate Usage for Evaluating Trends Over Time

The Dashboard displays multiple years of data for many of its metrics. Before evaluating trends over time, users should be aware of the caveats associated with multi-year data from specific data sources.

Please refer to https://www.cityhealthdashboard.com/multi-year-data for caveats associated with specific metrics and data sources.

City Health Dashboard Team

Samantha Breslin, MPA	Senior Project Coordinator, City Health Dashboard
Alexander Chen, MPH	Data Analyst, City Health Dashboard
Marc Gourevitch, MD, MPH	Senior Co-Principal Investigator, City Health Dashboard Muriel and George Singer Professor of Population Health and Chair, Department of Population Health, NYU Langone Health
Farhana Haque, MPH	Associate Research Analyst, City Health Dashboard
Peggy Hsieh, MPH	Data Analyst, City Health Dashboard
Neil Kleiman, PhD	City Policy/Partnerships Co-Principal Investigator, City Health Dashboard Clinical Assistant Professor of Public Service, NYU Wagner Graduate School of Public Service
Taylor Lampe, MPH	Senior Data Analyst, City Health Dashboard
Shoshanna Levine, DrPH, MPH	Program Director, City Health Dashboard
Yuruo Li, PhD, MPH	Senior Data Analyst, City Health Dashboard
Becky Ofrane, MPH	Manager, Engagement and Partnerships, City Health Dashboard
Ben Spoer, PhD, MPH	Manager, Data and Analytics, City Health Dashboard
Lorna Thorpe, PhD	Methods Co-Principal Investigator, City Health Dashboard Professor of Epidemiology, NYU School of Medicine Director of the Division of Epidemiology, NYU School of Medicine Vice Chair of Strategy and Planning, Department of Population Health, NYU Langone Health

Downloading Dashboard Data

Users should note that much of the data outlined in this document is available for free download at www.cityhealthdashboard.com/data-downloads.

Users should consult the Downloadable Data Codebook, available at www.cityhealthdashboard.com/data-downloads, for more detail.

Please contact the Dashboard at info@cityhealthdashboard.com with any questions or concerns.

Citing Dashboard Data and Technical Document

City Health Dashboard should be cited when the data or graphics are used, including in published presentations, articles, research, blogs, policy documents, and other print or digital media.

We encourage use of Dashboard data and visualizations, and suggest the following citation:

> Department of Population Health, NYU Langone Health. City Health Dashboard. https://www.cityhealthdashboard.com/. Accessed [INSERT DATE OF ACCESS].

To cite our Technical Document, we suggest the following citation:

> Gofine M, Wilson A, Lampe T, Hsieh P, Ford S, Chen A, Kum S, Levine S, Athens J, Spoer B. *City Health Dashboard Technical Document*. New York: City Health Dashboard; 2021. Available at www.cityhealthdashboard.com/technical-documentation. Accessed [INSERT DATE OF ACCESS].

Feedback or Errors

Users are encouraged to contact the Dashboard with comments or questions regarding cityhealthdashboard.com and any documents available for download from it, including this Technical Document, at info@cityhealthdashboard.com.

Measure Overview

The Dashboard presents measures in one of three different formats: percentage, rate, or index. The type of measure is determined by the data that are analyzed to derive each estimate. All measures are calculated at the city level; measures are also calculated by demographic subgroups or at the tract level if the underlying data allow for such disaggregation.

Domain	Metric (Short Name)	Metric (Long Name)	Data Source	Tract level	Race/ ethnicity subgroups	Gender subgroups	Multi-year	Most current year
Clinical Care	Dental care	Visits to dentist or dental clinic in the previous year among adults aged ≥18 years (%)	(2018 forward) PLACES Project, Centers for Disease Control and Prevention (2014-2016) 500 Cities Project, Centers for Disease Control and Prevention	✓			✓	2018, 1 Year Modeled Estimate
	Prenatal care	Births for which prenatal care began in the first trimester (%)	Natality Data, National Vital Statistics System (NVSS), National Center for Health Statistics (NCHS)		✓		✓	2015-2017
	Preventive services, 65+	Adults aged ≥65 years who are up to date on a core set of clinical preventive services (%)	(2018 forward) PLACES Project, CDC (2014-2016) 500 Cities Project, CDC	✓		✓	✓	2018, 1 Year Modeled Estimate
	Uninsured	Current lack of health insurance among people aged 0–64 years (%)	American Community Survey (ACS)	✓	✓	✓	✓	2019, 5 Year Estimate
Health Behaviors	Binge drinking	Binge drinking among adults aged ≥ 18 years (%)	(2018 forward) PLACES Project, CDC (2014-2017) 500 Cities Project, CDC	✓			✓	2018, 1 Year Modeled Estimate
	Physical inactivity	No leisure-time physical activity in past month among adults aged ≥18 years (%)	(2018 forward) PLACES Project, CDC (2014-2017) 500 Cities Project, CDC	✓			✓	2018, 1 Year Modeled Estimate
	Smoking	Current smoking among adults aged ≥18 years (%)	(2018 forward) PLACES Project, CDC (2014-2017) 500 Cities Project, CDC	✓			✓	2018, 1 Year Modeled Estimate
	Teen births	Births to mothers aged 15-19 (per 1,000 females in that age group)	Natality Data, NVSS, NCHS		✓		✓	2015-2017
Health Outcomes	Breast cancer deaths	Deaths due to breast cancer in females (per 100,000 female population)	Multiple Cause of Death Data, NVSS, NCHS		✓		✓	2015-2017
	Colorectal cancer deaths	Deaths due to colorectal cancer (per 100,000 population)	Multiple Cause of Death Data, NVSS, NCHS		✓	✓	✓	2015-2017
	Cardiovascular disease deaths	Deaths due to cardiovascular disease (per 100,000 population)	Multiple Cause of Death Data, NVSS, NCHS		✓	✓	✓	2015-2017
	COVID Local Risk Index	Neighborhood-level COVID risk index, reflecting social and economic factors and health outcomes relative to other neighborhoods on the Dashboard	City Health Dashboard, incorporating data from the American Community Survey and the Centers for Disease Control and Prevention's PLACES Project & Social Vulnerability Index	✓				March 2021, Using Data from 2018 and 2014-2018 Estimates
	Diabetes	Diabetes among adults aged ≥18 years (%)	(2018 forward) PLACES Project, CDC (2014-2017) 500 Cities Project, CDC	✓			✓	2018, 1 Year Modeled Estimate
	Frequent mental distress	Mental health not good for ≥14 days during the past 30 days among adults aged ≥18 years (%)	(2018 forward) PLACES Project, CDC (2014-2017) 500 Cities Project, CDC	✓			✓	2018, 1 Year Modeled Estimate
	Frequent physical distress	Physical health not good for ≥14 days during the past 30 days among adults aged ≥18 years (%)	(2018 forward) PLACES Project, CDC (2014-2017) 500 Cities Project, CDC	✓			✓	2018, 1 Year Modeled Estimate
	High blood pressure	High blood pressure among adults aged ≥18 years (%)	(2017 forward) PLACES Project, CDC (2013-2015) 500 Cities Project, CDC	✓			✓	2017, 1 Year Modeled Estimate
	Life expectancy	Life expectancy at birth (average)	U.S. Small-area Life Expectancy Estimates Project Data (USALEEP), NCHS	✓				2010-2015, 6 Year Modeled Estimate
	Low birthweight	Live births with low birthweight <2500 grams (%)	Natality Data, NVSS, NCHS		✓		✓	2015-2017
	Obesity	Adult obesity among adults aged ≥18 years (%)	(2018 forward) PLACES Project, CDC (2014-2017) 500 Cities Project, CDC	✓			✓	2018, 1 Year Modeled Estimate
	Opioid overdose deaths	Deaths due to opioid overdose (per 100,000 population)	Multiple Cause of Death Data, NVSS, NCHS				✓	2015-2017
	Premature deaths (all causes)	Years of potential life lost before age 75 (per 100,000 population)	Multiple Cause of Death Data, NVSS, NCHS		✓	✓	✓	2015-2017

Domain	Metric (Short Name)	Metric (Long Name)	Data Source	Tract level	Race/ ethnicity subgroups	Gender subgroups	Multi-year	Most current year
Physical Environment	Air pollution - particulate matter	Average daily concentration of fine particulate matter (PM2.5) per cubic meter (average)	Community Multiscale Air Quality model, US Environmental Protection Agency	✓			✓	2017
	Housing with potential lead risk	Housing stock with potential elevated lead risk (%)	ACS	✓			✓	2019, 5 Year Estimate
	Limited access to healthy foods	Population living more than ½ mile from the nearest supermarket, supercenter, or large grocery store (%)	Food Access Research Atlas, Economic Research Service, United States Department of Agriculture	✓				2015
	Lead exposure risk index	Poverty-adjusted risk of housing-based lead exposure (index)	ACS	✓	✓		✓	2019, 5 Year Estimate
	Park access	Population living within a 10 minute walk of green space (%)	ParkServe®	✓				2018
	Walkability	Neighborhood amenities accessible by walking as calculated by Walk Score ® (index)	Walk Score®	✓				2019
Social and Economic Factors	Absenteeism	Public school students who miss ≥15 days of school in an academic year (%)	Civil Rights Data Collection		✓	✓		2015-2016
	Broadband connection	Households with connections to high speed broadband internet (cable, fiber optic, DSL) (%)	ACS	✓			✓	2019, 5 Year Estimate
	Children in poverty	Children living in households ≤100% of the federal poverty line (%)	ACS	✓	✓		✓	2019, 5 Year Estimate
	Housing cost, excessive	Households where ≥30% of household income is spent on housing costs (%)	ACS	✓	✓	✓	✓	2019, 5 Year Estimate
	High school completion	Residents aged ≥25 with high school diploma, or equivalent, or higher degree (%)	ACS	✓			✓	2019, 5 Year Estimate
	Income inequality	Households with income at the extremes of the national income distribution (the top 20% or bottom 20%)	ACS	✓			✓	2019, 5 Year Estimate
	Neighborhood racial/ethnic segregation	Distribution of the population by race/ethnic group within a census tract relative to the distribution across the city (index)	ACS				✓	2019, 5 Year Estimate
	Racial/ethnic diversity	Distribution of the population by race/ethnic group within a city or census tract (index)	ACS	✓			✓	2019, 5 Year Estimate
	Third-grade reading proficiency	Third-graders who score "proficient" or above in reading on standardized tests (%)	State-based					Varies by state
	Unemployment – annual, neighborhood-level	Population aged ≥16 years that is unemployed but seeking work (%)	ACS	✓	✓	✓	✓	2019, 5 Year Estimate
	Unemployment – current, city-level	Civilian labor force that is unemployed, by month (%)	Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics				✓	Updated monthly, from Jan. 2018
	Violent crime	Violent crime offenses (murder, aggravated assault, robbery, forcible rape) per 100,000 population	Uniform Crime Reporting, Federal Bureau of Investigation				✓	2019

For more information about these measures, including data sources, years of data, and measure calculation, visit the Metric page at cityhealthdashboard/metrics or refer to the rest of the City Health Dashboard Technical Document.

SECTION 2: Dashboard Analytic Decisions

Confidence Intervals (CIs)

Confidence intervals (CIs), also known as confidence limits, provide a measure of the variation around a given estimate of a population value. For consistency, this document exclusively uses the term confidence intervals.

Dashboard CIs are reported at the 90% level

Ninety-five percent CIs are most commonly reported in the scientific literature. However, the Dashboard reports 90% CIs for a number of reasons. Most notably, the Census Bureau recommends calculation of 90% CIs when using American Community Survey data.[6] The Dashboard opted to construct 90% CIs from standard errors where necessary to ensure consistency between measures.

Formulas for CI calculation

There are a number of formulas for deriving CIs; selection depends on properties of the underlying data. See Section 3 below for specifics on the formula used.

Confidence intervals for percentages were manually restricted to minimum 0 and maximum 100 when raw values exceeded these bounds.

Note on CIs for the Dashboard index values

As a rule, CIs were not calculated for the Dashboard's index values because indices reflect a weighted composite of measures that are then scaled, making CI calculation relatively complicated.

Data Censoring

See Appendix B for a summary of where and how censoring was applied.

Data Disclaimer

Estimates presented in the Dashboard are subject to the same limitations as those inherent in the source datasets. We identify the most likely sources of bias as necessary for each measure, but users should consult the data sources to understand potential biases more fully.

Data Rounding

All calculated values were rounded to one decimal place immediately prior to data export.

Federal Information Processing Standards (FIPS) Codes

The Federal Information Processing Series (FIPS), formerly Federal Information Processing Standards, are codes for geographic entities maintained and issued by the Census Bureau. When concatenated (linked together) as State-County, State-Place, or State-County-Tract, FIPS codes function as unique identifiers for geographic entities. For more detailed information, refer to Appendix Section D.

Note on Honolulu, HI FIPS code

The Dashboard originally selected city and tract FIPS codes as census tract boundary shapefiles released by the 500 Cities Project.[3] As per the CDC 500 Cities Project,[7] the Dashboard uses the FIPS code for the county of Honolulu, Hawaii (15-003) to represent the geographic area associated with the

city of Honolulu (Urban Honolulu CDP, FIPS code 15-71550). Dashboard metric values for the city of Honolulu, HI are calculated using values for Honolulu County (FIPS 15-003) where county-level data are available; otherwise, metric values for Honolulu city (FIPS code 15-71550) are presented. See Appendix E for a summary of the geographic coding used for Honolulu, HI, per metric.

Note on Macon, GA FIPS code

Consistent with the 500 Cities Project[8] (which determined the geographies of the original 500 cities on City Health Dashboard released in May 2018) City Health Dashboard master files exclusively use 13-49000 to represent Macon, GA. However, as of 2014, the city of Macon, GA and Bibb County share a consolidated government.[9,10] The US Census Bureau began to issue data for Macon, GA using FIPS code 13-49008 (Macon-Bibb County, Georgia) in 2014; FIPS 13-49000 (Macon city, Georgia) was used through 2013.

Although the Dashboard exclusively uses FIPS 13-49000, data for Macon, GA provided from data sources may use FIPS 13-49000, 13-49008 or 13-021. See Appendix E for a summary of the geographic (FIPS) code used for Macon, GA, per metric. Email info@cityhealthdashboard.com for more information.

Boundaries on the Dashboard's Metric Detail pages for Macon, GA represent 2010 Macon boundaries, defined prior to consolidation with Bibb County.

Use of County-Level Data on the Dashboard

County-level data is used where city-level data is unavailable/censored (see NVSS: City/County indicator section below) and as outlined in section "Federal Information Processing Standards (FIPS) codes" above. The Dashboard provides the county_indicator variable in the downloadable datasets to indicate which geography was utilized for all reported values:

0 = estimate is calculated from city-specific values
1 = estimate is calculated from an average of component counties' values (i.e. city falls under one or more counties)
2 = estimate is calculated from its single corresponding county values (i.e. city falls under one specific county)

The Dashboard indicates when county data is displayed on a page (i.e, where county_indicator = 1 or county_indicator = 2) under the "Tips and Cautions for Using the Data" sub-header.

Dashboard City Average Estimates

Dashboard city average estimates on the Dashboard averages data from the cities represented on the Dashboard, by metric, demographic group, and year. The estimates are not intended to reflect estimates for the United States nationally.

National estimates are calculated after censoring criteria defined below (see Appendix Table B) are applied.

Population Percentages

Text describing population breakdowns by racial/ethnic demographic group (and by sex, for the preventive services, 65+ metric only) accompanies metric values on the Demographic Detail page. These values are not available for download; please email info@cityhealthdashboard.com for more information on their calculation.

Race/Ethnicity Categories

Where possible, the Dashboard disaggregates metrics by the following demographic groups: Asian (Asian or Native Hawaiian or Pacific Islander (NHOPI)); black/African American; Hispanic/Latino; white (not Hispanic or Latino); and other (some other race, 2 or more races, or American Indian/Alaska Native (AIAN)).[11] Federal guidelines for reporting data by demographics[11] mandate separate categories for AIAN and NHOPI. However, the geographic areas reported on the Dashboard generally lack large enough populations for reporting stable estimates for these groups. The Dashboard consequently combines NHOPI with Asian and AIAN with "other race" and two or more races, as data availability allows. See Appendix F for a metric- and data source-specific summary of where Hispanic ethnicity is mutually exclusive of the other racial groups and definitions of NHOPI and other.

To ensure these population groups are represented on the Dashboard, the City Overview for each city includes a granular breakdown of each city's racial/ethnic composition by city and census tract to enable a more nuanced understanding of each area. See "Demographics Overview" and "Demographics by Census Tracts" on the City Overview page for more.

Validation

The Dashboard implemented a multi-step data validation process to ensure the accuracy of (1) metric value calculation and (2) data uploaded to the website display.

1. Internal data results validation

   All analyses* on the Dashboard were initially calculated by a primary analyst from the City Health Dashboard analysis team. All analyses* were then independently replicated by a secondary analyst within the group. Results were directly compared and if applicable, discrepancies were iteratively investigated, addressed, and internally documented until the two separate analyses generated identical values.

2. The Dashboard development site data validation

   A quality assurance audit by the site's web developers at Forum One ensures that values calculated by Dashboard staff in SAS correctly appear on the site.

*Please refer to Appendix B for a table listing metric values that were posted as received from the data source.

ZIP Codes

Estimates at the ZIP code level are not provided on the Dashboard.

ZIP codes are maintained by the United States Postal Service and do not perfectly align with Census FIPS. However, City Health Dashboard's Metric Detail pages indicate a ZIP code (ZIP-TRACT Crosswalk, 2nd Quarter 2019)[12] associated with each tract estimate. Please note that tracts may cross the boundaries of more than one ZIP code, but the Dashboard identifies only the ZIP code with the most overlap with the tract.

SECTION 3: Data Sources and Metric Analyses

Introduction to this Section

This section is organized by data source, with notes on elements specific to individual metrics.

American Community Survey (ACS)

General notes

ACS is administered by the US Census Bureau. Place (160) tables were used for city-level analyses; Tract (140) tables were used for tract-level analyses; County (050) tables were used for county-level analyses (*Honolulu only*). Data tables for 2017 and prior were downloaded from American FactFinder[13] from September 2017 to March 2020. (American FactFinder ceased operations on March 31, 2020.[14]) Data for 2018 Forward were accessed through the US Census Bureau's data.census.gov API,[15] which replaced American FactFinder.

Variables released through American FactFinder and the data.census.gov API had different nomenclature and labelling. Because an official crosswalk between American FactFinder and data.census.gov variables was not released by the US Census Bureau,[16] consistency between variables released through these two platforms was confirmed by Dashboard staff. Please contact info@cityhealthdashboard.com for more information.

Variable labels (e.g., Estimate; SEX AND AGE - Total population), not names (e.g., S2801_C01_017E), are outlined in this section. Variable labelling conventions used by the US Census Bureau's API are recorded below, except where otherwise noted.

Values derived from ACS that were used as population denominators in metric analysis vary in year (see Section 4 for more details). All analyses of ACS data were performed using SAS v9.4 unless specified otherwise.[17]

All values for Honolulu, HI using ACS data represent values associated with the county of Honolulu, HI. All metrics for 2017 and prior calculated using ACS data for the city of Macon, GA utilize Bibb County (FIPS code 13-021), which shares a consolidated government with Macon. Analyses for Macon, GA using 2018 data use FIPS 13-49008 (Macon-Bibb County). The area represented by FIPS 13-49008 is coterminous with Bibb County (FIPS code 13-021); American Community Survey estimates for FIPS 13-49008 and 13-021 are equivalent or nearly equivalent (maps and analyses available upon request). For more detail, see section "Federal Information Processing Standards (FIPS) codes" above and Appendix E for a summary of the geographic coding used for each metric.

Multi-year data

Data from 2013, 2014, 2015, 2016, 2017, 2018, and 2019 (5 Year Estimates) are used on the Dashboard.

Variable name changes in annual data releases are assessed by the Dashboard's analytic staff as per the US Census Bureau's technical documentation regarding table and geography changes.[18-23] Metric-specific sections note where analogous labels change over time. For parsimony and clarity, only the most recently available labels are listed in this document. Please contact info@cityhealthdashboard.com with any questions about specific variable names or labels used in multi-year analyses.

Weights

Weights were not applied to ACS data because data do not require weighting.

Categorizing race/ethnicity

Tables ending in the following letters were used to calculate metrics by race/ethnicity:

- Asian: Values in tables ending in D (Asian alone) and E (Native Hawaiian and other Pacific Islander alone) were summed
- Black/African American: Tables ending in B (Black or African American alone)
- Hispanic: Tables ending in I (Hispanic or Latino)
- Other: Values in tables ending in C (American Indian and Alaska Native alone), F (Some other race alone), and G (Two or more races) were summed
- White: Tables ending in H (White alone, not Hispanic or Latino)

Users should note that, unless specified otherwise (i.e., certain values from data table DP05, see Racial/ethnic diversity, Neighborhood racial/ethnic segregation, and Demographic Information sections below), estimates for Asian, black/African American, and other demographic groups derived from ACS data are not mutually exclusive with estimates for Hispanic/Latino ethnicity. Values presented for white are always for "White, non-Hispanic", as per the data available for download from ACS. Thus, individuals represented in the following racial categories who also identify as Hispanic may also contribute to counts for the Hispanic demographic subgroup: Asian, black, Native Hawaiian or Pacific Islander, two or more races, or some other race. These categorizations reflect those defined by ACS.

Refer to Section 2 "Race/ethnicity categories" (above) for more detail. See Appendix F for a metric- and data source-specific summary of where Hispanic ethnicity is mutually exclusive of the other racial groups and definitions of NHOPI and Other.

Confidence intervals

CIs for all ACS data were calculated according to the formula estimate ± MOE. See section "Calculating MOEs for Aggregate Count Data and Derived Proportions" below for more on how MOE's were calculated for summed estimates and derived proportions.

Calculating MOEs for aggregate count data and derived proportions

Approximated MOE's for aggregate count data and derived proportions in ACS data were calculated as per the US Census Bureau's publication.[24]

Relevant formulas are presented verbatim here for users' reference:

Calculating MOE's for Aggregated Count Data[24] (p. A-14)

$$MOE_{aggregated\ count} = \pm\sqrt{\sum_c MOE_c^2}$$, "where MOE_c is the of the c^{th} component estimate"

Calculating MOE's for Derived Proportions[24] (p. A-14, A-15)

$$MOE_{derived\ proportion} = \pm\frac{\sqrt{MOE_{numerator}^2 - (\hat{p}^2 * MOE_{denominator}^2)}}{\hat{X}_{denominator}}$$

"where $MOE_{numerator}$ is the MOE of the numerator; $MOE_{denominator}$ is the MOE of the denominator; $\hat{p} = \frac{\hat{X}_{numerator}}{\hat{X}_{denominator}}$ is the derived proportion; $\hat{X}_{numerator}$ is the estimate used as the numerator of the derived proportion; $\hat{X}_{denominator}$ is the estimate used as the denominator of the derived proportion."

Note: Estimates with particularly large margins of error sometimes resulted in an incalculable value of $\sqrt{MOE^2_{numerator}-(\hat{p}^2*MOE^2_{denominator})}$ because $MOE^2_{numerator}-\left(\hat{p}^2*MOE^2_{denominator}\right)$ resulted in a negative value. In these cases, confidence intervals could not be calculated and associated estimates were censored on the Dashboard. No other censoring of ACS data was performed.

Metric-specific notes

Broadband connection

Data tables

Data table S2801 was used to calculate percentage of households with connections to high speed broadband internet (including cable, fiber optic, and DSL connections). The metric is available for years 2017 Forward.

Analysis

$$\text{Broadband connection} = \frac{\text{[Households with connections to high speed broadband internet]}}{\text{Total households}} \text{ x } 100$$

Broadband connection is presented as reported using the variable labelled as:

- Estimate!!Percent!!Total households!!TYPE OF INTERNET SUBSCRIPTIONS!!With an Internet subscription:!!Broadband of any type!!Broadband such as cable, fiber optic or DSL

The associated margin of error variable was pulled to calculate confidence intervals.

Children in poverty

Data tables

Data table B17020 and associated race/ethnicity-specific tables were used to calculate percentage of children in poverty at city and tract levels.

Analysis

$$\text{Children in Poverty} = \frac{\text{Children age < 18 living in households below the poverty threshold}}{\text{Total number of children age < 18 living in households}} \times 100\%$$

Variables with the following labels within each data table were summed to calculate the numerator:

- Estimate!!Total!!Income in the past 12 months below poverty level!!Under 6 years
- Estimate!!Total!!Income in the past 12 months below poverty level!!6 to 11 years
- Estimate!!Total!!Income in the past 12 months below poverty level!!12 to 17 years

Numerator variables were summed with variables with the following labels within each data table to calculate the denominator:

- Estimate!!Total!!Income in the past 12 months at or above poverty level!!Under 6 years
- Estimate!!Total!!Income in the past 12 months at or above poverty level!!6 to 11 years
- Estimate!!Total!!Income in the past 12 months at or above poverty level!!12 to 17 years

Associated margins of error variables are used to calculate confidence intervals associated with these values.

High school completion

Data tables

High school completion represents the percent of the population over age 25 that has completed at least a high school degree or equivalent.

Data table S1501 was used to calculate high school completion, for "total population" and disaggregated by sex, for all years. Variable selection changed between years (see below).

Data tables C15002B, C15002C, C15002D, C15002E, C15002F, C15002G, C15002H, and C15002I were used to calculate high school completion, disaggregated by race/ethnicity, for all years.

Analysis

$$\text{High school completion} = \frac{[\text{Residents aged 25 or older with high school diploma (or equivalent) or higher}]}{\text{Total population aged 25 or older}} \times 100$$

Total population; sex: 2017 Forward Analyses (Table S1501)

High school completion is presented as reported using variables labelled as:

- Estimate!!Percent!!Population 25 years and over!!High school graduate or higher
- Estimate!!Percent Male!!Population 25 years and over!!High school graduate or higher
- Estimate!!Percent Female!!Population 25 years and over!!High school graduate or higher

Total population; sex: 2015-2016 Analyses (Table S1501)

Variables with the following labels were summed to calculate the numerator (replace "Total" with "Male" or "Female" for sex-specific estimates):

- Total!!Estimate!!Population 25 years and over!!High school graduate (includes equivalency)
- Total!!Estimate!!Population 25 years and over!!Some college, no degree
- Total!!Estimate!!Population 25 years and over!!Associate's degree
- Total!!Estimate!!Population 25 years and over!!Bachelor's degree
- Total!!Estimate!!Population 25 years and over!!Graduate or professional degree

This variable was used for the denominator (replace "Total" with "Male" or "Female" for sex-specific estimates):

- Total!!Estimate!!Population 25 years and over

Total population; sex: 2013-2014 Analyses (Table S1501)

High school completion was calculated by summing the variables with the following labels (replace "Total" with "Male" or "Female" for sex-specific estimates):

- Total!!Estimate!!Population 25 years and over!!High school graduate (includes equivalency)
- Total!!Estimate!!Population 25 years and over!!Some college, no degree
- Total!!Estimate!!Population 25 years and over!!Associate's degree
- Total!!Estimate!!Population 25 years and over!!Bachelor's degree
- Total!!Estimate!!Population 25 years and over!!Graduate or professional degree

Race/ethnicity Analyses (Tables C15002x)

Variables with the following labels were summed to calculate the numerator. See above "Categorizing race/ethnicity" section for information on which tables are used for each subgroup.

- Estimate!!Total!!Male!!High school graduate (includes equivalency)
- Estimate!!Total!!Male!!Some college or associate's degree

- Estimate!!Total!!Male!!Bachelor's degree or higher
- Estimate!!Total!!Female!!High school graduate (includes equivalency)
- Estimate!!Total!!Female!!Some college or associate's degree
- Estimate!!Total!!Female!!Bachelor's degree or higher

This variable was used for the denominator:

- Estimate!!Total

Notes on analysis

As of October 2020, the Dashboard revised its high school graduation metric, by changing the data source from state-based education data to the American Community Survey. While the old metric looked at public school students who graduated within four years of entering ninth grade in high schools geographically located within the city (whether or not students lived in the city), this new metric looks at high school completion rates among all city (or census tract) residents aged 25+ years old, regardless of where they went to high school.

Housing cost, excessive

Data tables

Data table DP04 was used to calculate excessive housing cost at both city and tract levels.

Analysis

$$\text{Excessive housing cost} = \frac{\begin{array}{c}\text{Selected monthly owner costs (with mortgage): 30.0\%-34.9\% of monthly income} \\ + \\ \text{Selected monthly owner costs (without mortgage): 30.0\%-34.9\% of monthly income} \\ + \\ \text{Gross Rent as a percentage of household income: 30.0\%-34.9\% of monthly income} \\ + \\ \text{Selected monthly owner costs (with mortgage): ≥35.0\% of monthly income} \\ + \\ \text{Selected monthly owner costs (without mortgage): ≥35.0\% of monthly income} \\ + \\ \text{Gross Rent as a percentage of household income: ≥35.0\% of monthly income}\end{array}}{\text{Total occupied housing units}} \text{ x } 100\%$$

In both City and Tract analyses, the variables in DP04 with the following labels were summed to calculate the numerator:

- Estimate!!SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)!!Housing units with a mortgage (excluding units where SMOCAPI cannot be computed)!!30.0 to 34.9 percent
- Estimate!!SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)!!Housing unit without a mortgage (excluding units where SMOCAPI cannot be computed)!!30.0 to 34.9 percent
- Estimate!!GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI)!!Occupied units paying rent (excluding units where GRAPI cannot be computed)!!30.0 to 34.9 percent
- Estimate!!SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)!!Housing units with a mortgage (excluding units where SMOCAPI cannot be computed)!!35.0 percent or more
- Estimate!!SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)!!Housing unit without a mortgage (excluding units where SMOCAPI cannot be computed)!!35.0 percent or more
- Estimate!!GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI)!!Occupied units paying rent (excluding units where GRAPI cannot be computed)!!35.0 percent or more

In both City and Tract analyses, the variable in DP04 with the following labels were summed to calculate the denominator:

- Estimate!!HOUSING OCCUPANCY!!Total housing units!!Occupied housing units

NOTE: Variable labels for 2013 and 2014 tables are slightly different from labels for 2015 Forward. Only the most recently available labels are provided here. Please email info@cityhealthdashboard.com with any questions or for more detailed information about variable naming over time.

Income inequality

Data tables

Data table B19001 was used to calculate income inequality at both city and tract levels.

Analysis

Income Inequality at the Extremes (ICE) was calculated as per Krieger and colleagues.[25]

The formula for ICE is as follows:

$$\text{ICE} = \frac{\text{Number of households in 80th income percentile - Number of Households in 20th income percentile}}{\text{Total households with known income level in geographic area}} \times 100$$

Where values of ICE range from -100 to 100.

Cut points for each year were selected from table B19001 to most closely represent the 20th and 80th household income percentiles[25], as reported by US Census Bureau data Table H-1 (All Races).[26]

Year	20th Percentile Cut Point	80th Percentile Cut Point
2019	< $29,999	> $150,000
2018	< $24,999	> $125,000
2017	< $24,999	> $125,000
2016	< $24,999	> $125,000
2015	< $24,999	> $125,000
2014	< $19,999	> $100,000
2013	< $19,999	> $100,000

Variables with the following labels in ACS Table B19001 were summed to calculate the number of households above the 80th percentile for each year:

- Estimate!!Total!!$125,000 to $149,999
- Estimate!!Total!!$150,000 to $199,999
- Estimate!!Total!!$200,000 or more

Variables with the following labels were summed to calculate the number of households below the 20th percentile for each year:

- Estimate!!Total!!Less than $10,000
- Estimate!!Total!!$10,000 to $14,999
- Estimate!!Total!!$15,000 to $19,999
- Estimate!!Total!!$20,000 to $24,999

In both City and Tract analyses, the variable with the following label was used to represent total households with known income level:

- Estimate!!Total

Notes on analysis

Confidence intervals were not calculated because ICE is an index. See the “Confidence intervals” in Section 2 above for further detail.

Housing with potential lead risk

Data tables

Data table B25034 was used to calculate housing risk data at both city and tract levels.

Analysis

The lead analysis was performed as per methodology initially developed by the Washington State Department of Health.[27] Vox Media worked in conjunction with Washington State Department of Health to apply this methodology on a national scale.[28] The Dashboard adapted Vox Media's Python code available on Github[29] for the present analysis, which was conducted by the Dashboard using SAS v9.4[17] and validated using Python v3.6.[30] Users should note that differences in rounding programming between the two softwares resulted in some minor but appreciable differences in housing risk score.

Dashboard's lead in housing metric reports the risk-adjusted percentage of housing stock at risk for lead and associated confidence intervals. Users can note that this value is the "housing_risk" variable in Washington State Department of Health/Vox Media's posted Python code. Margins of error (MOE) for these estimate values were derived using the following protocol: calculating adjusted MOE's for each housing-age group that had summed estimates[24]; weighting those MOE's with the same weights used to calculate the numerator; and then calculating an MOE for a derived proportion.[24] See section "*ACS: Calculating MOEs for aggregate count data and derived proportions*" for this equation in full.

Notes on analysis

a. Washington State Department of Health/Vox Media's analysis incorporates data on poverty, age of housing, and weights extrapolated from Jacobs 2002[31] to generate a decile ranking of lead risk in a given geography; see "Lead exposure risk, overall" metric below. The "Housing with potential lead risk" metric is a Dashboard sub-analysis intended to illustrate the lead-related quality of housing stock for the site's users. The "housing with potential lead risk metric that is presented on the Dashboard uses the "housing_risk" variable in the code available on Github.[29]

b. The Washington State Department of Health's analysis uses variables from 2014.[27] In updating the analysis to represent all housing stock built in 2010 or later for years subsequent to 2014 using table B25034, variables with the following labels were summed: "Estimate; Total: Built 2010-2013" and "Estimate; Total: Built 2014 and later".

Lead exposure risk index

Data tables

Data table B25034 was used to calculate housing risk at both city and tract levels. S1701 was used for calculating poverty risk at both city and tract levels. The decile ranking ranks risk of lead exposure risk relative to the other cities included on the Dashboard, not all US cities.

Analysis

The lead analysis was performed as per methodology initially developed by the Washington State Department of Health.[27] Vox Media worked in conjunction with Washington State Department of Health to apply this methodology on a national scale.[28] The Dashboard adapted Vox Media's Python code available on Github[29] for the present analysis, which was conducted by the Dashboard using SAS v9.4[17] and validated using Python v3.6.[30] Users should note that differences in rounding programming between the two softwares resulted in minor but appreciable differences in overall lead exposure risk score and, consequently, the decile ranking of these values.

The analysis uses data on poverty and age of housing and weights extrapolated from Jacobs 2002[31] to generate a decile index ranking of lead risk in a given geography; 1 represents "low risk" and 10

represents “high risk”. The decile ranking ranks risk of overall lead exposure risk relative to the other cities included on the Dashboard, not all US cities.

Confidence intervals were not calculated because lead exposure risk is a ranked index. See the “Confidence intervals” section in Section 2 above for more details.

Notes on analysis

The Washington State Department of Health’s analysis uses variables from 2014.[27] In updating the analysis to represent all housing stock built in 2010 or later for years subsequent to 2014 using table B25034, variables with the following labels were summed: “Estimate; Total: Built 2010-2013” and “Estimate; Total: Built 2014 and later”.

Neighborhood racial/ethnic segregation

Data tables

Data table DP05 was used to calculate racial/ethnic segregation at the city level.

Analysis

Segregation was quantified as per Iceland’s formula for H, the entropy index.[32]

Iceland defines the entropy index as follows: “The entropy index is the weighted average deviation of each unit’s entropy from the metropolitan-wide entropy, expressed as a fraction of the metropolitan area’s total entropy.” [32] The equation for H provides a raw value between 0-1. The segregation (entropy index) values that are presented on the Dashboard represent H*100 to provide segregation scores that range from 0 to 100.

Segregation on the Dashboard is calculated using the following formula, adapted from the entropy index:

$$\text{Neighborhood racial/ethnic segregation} = \sum_{i=i}^{n} \frac{t_i(E-E_i)}{ET} \times 100$$

Where:

t_i refers to the total population of tract i
T is the metropolitan area population
n is the number of tracts
E is the metropolitan area diversity (entropy) score
E_i is the tract i’s diversity (entropy) score

Iceland defines entropy scores for cities and tracts as follows: “A metropolitan area’s entropy score is calculated as:

$$E \text{ (city entropy/diversity)} = \sum_{r=1}^{r} (\pi_r) \ln[\frac{1}{\pi_r}]$$

Where:

$\boldsymbol{\pi_r}$ refers to a particular racial/ethnic group’s proportion of the whole metropolitan area population…

A unit within the metropolitan area, such as a census tract, would analogously have its entropy score, or diversity, defined as:

$$E_i \text{ (tract entropy/diversity)} = \sum_{r=1}^{r} (\pi_{ri}) \ln[\frac{1}{\pi_{ri}}]$$

Where:

π_{ri} refers to a particular racial/ethnic group's proportion of the population in tract i."[32]

As per footnote 5 in Iceland,[32] $\ln\left[\frac{1}{\pi_r}\right]$ is set to 0 when the proportion of a particular group is in a given geography (π_r) is 0. This is done for calculations of both E and E_i.

Variables with the following labels were used in the diversity and segregation analyses:

- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Black or African American alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!American Indian and Alaska Native alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Asian alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Native Hawaiian and Other Pacific Islander alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Some other race alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Two or more races
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!White alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Hispanic or Latino (of any race)

Notes on analysis

The estimates of persons in each racial/ethnic group within a city's tracts were summed to calculate the total population within each city. This calculated total population is not reported on the Dashboard. Users should note that this value sometimes equals the city's actual total population estimate reported in DP05. However, the summed total of tract total populations sometimes over-counts the total population of a city. This is because Census tract boundaries are not perfectly nested within Census place (city) boundaries. The Dashboard used this method for the purposes of calculating denominators for Diversity and Segregation (E, E(i) and H) analyses because the entropy index analyses demand that proportions of racial/ethnic groups sum to a total of 1. Thus, for the purposes of our calculation, the "total population" of a geographic area was necessarily the sum of the total population of each mutually exclusive racial/ethnic group within the area. Further, the entropy index analysis examines the relationship between populations at the city and tract level; analysis thus required use of all the tracts associated with a given city.

The Dashboard does not release segregation (H) scores for cities with a single census tract because the entropy index is not valid in cities in which residents may only live in a single census tract.

Confidence intervals were not calculated because the entropy scores are components of an index. See the "Confidence intervals" above for more details.

Racial/ethnic diversity

Data tables

Data table DP05 was used to calculate racial/ethnic diversity values at the city and tract levels.

Analysis

Racial/ethnic diversity represents how much of the maximum possible entropy (or diversity) is exhibited in a given tract or city. A lower value (closer to 0) indicates that all residents belong to one racial/ethnic group (low diversity) and a higher value (closer to 100) indicates that all racial/ethnic groups are in equal proportion (high diversity). This measure does not incorporate geographic distributions of racial/ethnic groups. Diversity (or entropy) was quantified using Iceland's formulas for E and E_i entropy scores (see below).[32] In our analysis, E and E_i represent city and tract racial/ethnic diversity scores (or entropy), respectively.

$$\text{Racial/ethnic diversity} = \frac{\text{City or tract entropy score (E or } E_i)}{\text{Maximum possible entropy score}} \times 100$$

Where:

Maximum possible entropy score is ln(5), as there are 5 racial/ethnic groups in the calculation

Iceland defines entropy scores for cities and tracts as follows: "A metropolitan area's entropy score is calculated as:

$$E \text{ (city entropy/diversity)} = \sum_{r=1}^{r} (\pi_r) \ln[\frac{1}{\pi_r}]$$

Where:

$\boldsymbol{\pi_r}$ refers to a particular racial/ethnic group's proportion of the whole metropolitan area population…

A unit within the metropolitan area, such as a census tract, would analogously have its entropy score, or diversity, defined as:

$$E_i \text{ (tract entropy/diversity)} = \sum_{r=1}^{r} (\pi_{ri}) \ln[\frac{1}{\pi_{ri}}]$$

Where:

$\boldsymbol{\pi_{ri}}$ refers to a particular racial/ethnic group's proportion of the population in tract i."[32]

As per footnote 5 in Iceland,[32] $\ln\left[\frac{1}{\pi_r}\right]$ and is set to 0 when the proportion of a particular group is in a given geography (π_r) is 0. This is done for calculations of both E and E_i.

Variables with the following labels were used in the diversity and segregation analyses:

- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Black or African American alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!American Indian and Alaska Native alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Asian alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Native Hawaiian and Other Pacific Islander alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Some other race alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!Two or more races
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Not Hispanic or Latino!!White alone
- Estimate!!HISPANIC OR LATINO AND RACE!!Total population!!Hispanic or Latino (of any race)

Notes on analysis

The estimates of persons in each racial/ethnic group within a city's tracts were summed to calculate the total population within each city. This calculated total population is not reported on the Dashboard. Users should note that while this value sometimes equals the city's actual total population estimate reported in DP05, the summed total of tract total populations sometimes over counts the total population of a city. This is likely because Census tract boundaries are not perfectly nested within Census place (city) boundaries. The Dashboard used this method for the purposes of calculating denominators for diversity and segregation (E, E(i) and H) analyses because the entropy index analyses demands that proportions of racial/ethnic groups sum to a total of 1. Thus, for the purposes of our calculation, the "total population" of a geographic area was necessarily the sum of the total population of each mutually exclusive racial/ethnic group within the area. Further, the entropy index analysis examines the relationship between populations at the city and tract level; analysis thus required use of all the tracts associated with a given city.

Confidence intervals were not calculated because the entropy scores are components of an index. See the "Confidence intervals" section in Section 2 above for more details.

Unemployment – annual, neighborhood level

Data tables

Data table S2301 was used to report annual unemployment rates, disaggregated by race/ethnicity and sex, at the city level.

S2301 is unavailable at the tract level; data table B23025 was used to report annual unemployment rates at the tract level. Values in B23025 are not disaggregated by sex and race/ethnicity.

Analysis

Total population; sex; black; white; Hispanic: 2013 Forward City Analyses (Table S2301)

Annual unemployment rates reported in S2301 are presented as reported using variables labelled as:

- Estimate!!Unemployment rate!!Population 16 years and over
- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!Black or African American alone
- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!White alone, not Hispanic or Latino
- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!Hispanic or Latino origin (of any race)
- Estimate!!Unemployment rate!!Population 20 to 64 years!!SEX!!Male
- Estimate!!Unemployment rate!!Population 20 to 64 years!!SEX!!Female

Other, Asian: 2013 Forward City Analyses (Table S2301)

Estimates and confidence intervals values for “other race” and “Asian” are weighted averages of estimates and confidence intervals for the subgroups that comprise these groups throughout the Dashboard.

The value for “other race” is a weighted average of the variables associated with the following labels in S2301:

- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!American Indian and Alaska Native alone
- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!Some other race alone
- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!Two or more races

Estimate and confidence interval values are weighted by the relative proportion of each of these groups within the summed total population of these three groups within each city as per ACS table DP05, using the variables with the following labels:

- Estimate!!RACE!!Total population!!One race!!American Indian and Alaska Native
- Estimate!!RACE!!Total population!!One race!!Some other race
- Estimate!!RACE!!Total population!!Two or more races

The value for “Asian” is a weighted average of the variables associated with the following labels in S2301:

- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!Asian alone
- Estimate!!Unemployment rate!!Population 16 years and over!!RACE AND HISPANIC OR LATINO ORIGIN!!Native Hawaiian and Other Pacific Islander alone

Estimate and confidence interval values are weighted by the relative proportion of each of these groups within the summed total population of these two groups within each city as per ACS table DP05, using the variables with the following labels:

- Estimate!!RACE!!Total population!!One race!!Asian
- Estimate!!RACE!!Total population!!One race!!Native Hawaiian and Other Pacific Islander

Confidence intervals were calculated using each estimate’s associated margin of error variable.

Total population: 2013 Forward Tract Analyses (Table B23025)

Annual unemployment rate was derived by dividing the estimate for individuals unemployed in the civilian labor force by the total number in the civilian labor force using the variables associated with the following labels in table B23025:

- Estimate!!Total!!In labor force!!Civilian labor force!!Unemployed
- Estimate!!Total!!In labor force!!Civilian labor force

Uninsured

Data tables

Uninsured status refers specifically to health insurance status, not lack of any type of insurance.

Data table S2701 was used to report percent of the civilian noninstitutionalized population without health insurance for ages 0-64 at the city level; this stratum is referred to as "total population". Table B23025 was used for tract-level analysis.

Data table S2701 was used to report percent of the civilian noninstitutionalized population without health insurance, disaggregated by age, at the city level for 2015 Forward; S2702 was used for 2013 and 2014. Age strata change over time in accordance with data availability. Of note, the Census Bureau changed age categories as of the 2017 data release to better align with the current health insurance landscape.[33]

Data table B27001 was used to report uninsured, disaggregated by sex, at the city level.

Data tables C27001B, C27001C, C27001D, C27001E, C27001F, C27001H, and C27001I were used to calculate uninsured, disaggregated by race/ethnicity, at the city level.

Analysis

Summary of data table provenance and strata for uninsured (total population and age), 2013 Forward						
		Age Strata*				
		Table S2702		**Table S2701**		
		2013	**2014**	**2015**	**2016**	**2017 Forward**
City only	Children	0-17	0-17	0-17	0-17	0-18
	Adult	18-24	18-24	18-24	18-24	19-25
		25-34	25-34	25-34	25-34	26-34
		35-44	35-44	35-44	35-44	35-44
		45-64 unavailable	*45-64 unavailable*	45-64	45-64	45-64
		Table S2701				
City and tract	Total population	0-64	0-64	0-64	0-64	0-64

Total population, Age: 2013, 2014 City Analyses (Table S2702)

NOTE: Table S2702 is used instead of S2701 for 2013 and 2014 analyses because of data availability. The percentage of uninsured people (any race/ethnicity, any sex, age 45-64) is not calculated for 2013 and 2014 because the data necessary for this analysis are unavailable. Labelling reflects variable labelling conventions used in data downloaded from American FactFinder.[13]

Percent uninsured are presented as reported in the S2702 data table using the variables labelled as:

- Uninsured Population; Estimate; AGE - Under 18 years
- Uninsured Population; Estimate; AGE - 18 to 64 years - 18 to 24 years
- Uninsured Population; Estimate; AGE - 18 to 64 years - 25 to 34 years
- Uninsured Population; Estimate; AGE - 18 to 64 years - 35 to 44 years

The percentage of uninsured people (any race/ethnicity, any sex, age 0-64) at the city level is calculated using the following formula:

$$\text{Uninsured}_{\text{total population, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{0 to 64}}}{\text{Total: Estimate}_{\text{0 to 64}}} \times 100\%$$

Variables associated with the following labels are summed to calculate the numerator:

- Number Uninsured; Estimate; AGE - Under 18 years
- Number Uninsured; Estimate; AGE - 18 to 64 years

Variables associated with the following labels are summed to calculate the denominator:

- Total; Estimate; AGE - Under 18 years
- Total; Estimate; AGE - 18 to 64 years

Associated margins of error variables are used to calculate confidence intervals associated with these values.

Total population, Age: 2015, 2016 City Analyses (Table S2701)

The percentage of total population uninsured people (any race/ethnicity, any sex, age 0-64) at the city level is calculated using the following formula:

$$\text{Uninsured}_{\text{total population, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{0 to 64}}}{\text{Total: Estimate}_{\text{0 to 64}}} \times 100\%$$

Variables associated with the following labels are summed to calculate the numerator:

- Uninsured; Estimate; AGE - Under 18 years
- Uninsured; Estimate; AGE - 18 to 64 years

Variables associated with the following labels are summed to calculate the denominator:

- Total; Estimate; AGE - Under 18 years
- Total; Estimate; AGE - 18 to 64 years

Percent uninsured are presented as reported in the S2701 data table using the variables labelled as:

- Percent Uninsured; Estimate; AGE - Under 18 years
- Percent Uninsured; Estimate; AGE - 18 to 64 years - 18 to 24 years
- Percent Uninsured; Estimate; AGE - 18 to 64 years - 25 to 34 years
- Percent Uninsured; Estimate; AGE - 18 to 64 years - 35 to 44 years

The percentage of uninsured people (any race/ethnicity, any sex, age 45-64) is calculated by the Dashboard using the following formula:

$$\text{Uninsured}_{\text{total population, 45 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{45 to 64}}}{\text{Total: Estimate}_{\text{45 to 64}}} \text{ x } 100\%$$

Variables associated with the following labels are summed to calculate the numerator:

- Uninsured; Estimate; AGE - 18 to 64 years - 45 to 54 years
- Uninsured; Estimate; AGE - 18 to 64 years - 55 to 64 years

Variables associated with the following labels are summed to calculate the denominator:

- Total; Estimate; AGE - 18 to 64 years - 45 to 54 years
- Total; Estimate; AGE - 18 to 64 years - 55 to 64 years

Associated margins of error variables are used to calculate confidence intervals associated with these values.

NOTE: Labelling reflects variable labelling conventions used in data downloaded from American FactFinder.[13]

Total population, Age: 2017 Forward City Analyses (Table S2701)

The percentage of total population uninsured people (any race/ethnicity, any sex, age 0-64) at the city level is calculated using the following formula:

$$\text{Uninsured}_{\text{total population, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{0 to 64}}}{\text{Total: Estimate}_{\text{0 to 64}}} \text{ x } 100\%$$

Variables associated with the following labels are summed to calculate the numerator:

- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!Under 19 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!19 to 25 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!26 to 34 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!35 to 44 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!45 to 54 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!55 to 64 years

Variables associated with the following labels are summed to calculate the denominator:

- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!Under 19 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!19 to 25 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!26 to 34 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!35 to 44 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!45 to 54 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!55 to 64 years

Percent uninsured are presented as reported in the S2701 data table using the variables labelled as:

- Estimate!!Percent Uninsured!!Civilian noninstitutionalized population!!AGE!!Under 19 years
- Estimate!!Percent Uninsured!!Civilian noninstitutionalized population!!AGE!!19 to 25 years
- Estimate!!Percent Uninsured!!Civilian noninstitutionalized population!!AGE!!26 to 34 years
- Estimate!!Percent Uninsured!!Civilian noninstitutionalized population!!AGE!!35 to 44 years

The percentage of uninsured people (any race/ethnicity, any sex, age 45-64) at both the city and tract level is calculated by the Dashboard using the following formula:

$$\text{Uninsured}_{\text{total population, 45 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{45 to 64}}}{\text{Total: Estimate}_{\text{45 to 64}}} \text{ x } 100\%$$

Variables associated with the following labels are summed to calculate the numerator:

- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!45 to 54 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!55 to 64 years

Variables associated with the following labels are summed to calculate the denominator:

- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!45 to 54 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!55 to 64 years

Associated margins of error variables are used to calculate confidence intervals associated with these values.

Sex: 2013 Forward City Analyses (Table B27001)

Table B27001 is used to calculate percentage of uninsured male and female populations at the city level only.

$$\text{Uninsured}_{\text{male, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{male, 0 to 64}}}{\text{Total: Estimate}_{\text{male, 0 to 64}}} \text{ x } 100\%$$

$$\text{Uninsured}_{\text{female, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{female, 0 to 64}}}{\text{Total: Estimate}_{\text{female, 0 to 64}}} \text{ x } 100\%$$

Variables associated with the following labels are summed to calculate the numerator for males:

- Estimate!!Total!!Male!!Under 6 years!!No health insurance coverage
- Estimate!!Total!!Male!!6 to 18 years!!No health insurance coverage
- Estimate!!Total!!Male!!19 to 25 years!!No health insurance coverage
- Estimate!!Total!!Male!!26 to 34 years!!No health insurance coverage
- Estimate!!Total!!Male!!35 to 44 years!!No health insurance coverage
- Estimate!!Total!!Male!!45 to 54 years!!No health insurance coverage
- Estimate!!Total!!Male!!55 to 64 years!!No health insurance coverage

Variables associated with the following labels are summed to calculate the denominator for males:

- Estimate!!Total!!Male!!Under 6 years
- Estimate!!Total!!Male!!6 to 18 years
- Estimate!!Total!!Male!!19 to 25 years
- Estimate!!Total!!Male!!26 to 34 years
- Estimate!!Total!!Male!!35 to 44 years
- Estimate!!Total!!Male!!45 to 54 years
- Estimate!!Total!!Male!!55 to 64 years

Variables associated with the following labels are summed to calculate the numerator for females:

- Estimate!!Total!!Female!!Under 6 years!!No health insurance coverage
- Estimate!!Total!!Female!!6 to 18 years!!No health insurance coverage
- Estimate!!Total!!Female!!19 to 25 years!!No health insurance coverage
- Estimate!!Total!!Female!!26 to 34 years!!No health insurance coverage
- Estimate!!Total!!Female!!35 to 44 years!!No health insurance coverage
- Estimate!!Total!!Female!!45 to 54 years!!No health insurance coverage
- Estimate!!Total!!Female!!55 to 64 years!!No health insurance coverage

Variables associated with the following labels are summed to calculate the denominator for females:

- Estimate!!Total!!Female!!Under 6 years
- Estimate!!Total!!Female!!6 to 18 years
- Estimate!!Total!!Female!!19 to 25 years
- Estimate!!Total!!Female!!26 to 34 years
- Estimate!!Total!!Female!!35 to 44 years
- Estimate!!Total!!Female!!45 to 54 years
- Estimate!!Total!!Female!!55 to 64 years

Race/ethnicity: 2013 Forward City Analyses
(Tables C27001B, C27001C, C27001D, C27001E, C27001F, C27001G, C27001H, C27001I)

Race/ethnicity-specific tables from the C27001 series are used to calculate percent of uninsured populations, by race/ethnicity and at the city level only, using the following formula:

$$\text{Uninsured}_{\text{racial/ethnic group, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{racial/ethnic group, 0 to 64}}}{\text{Total: Estimate}_{\text{racial/ethnic group, 0 to 64}}} \text{ x } 100\%$$

Variables associated with the following labels are summed to calculate the numerator, per racial/ethnic group:

- Estimate!!Total!!Under 19 years!!No health insurance coverage
- Estimate!!Total!!19 to 64 years!!No health insurance coverage

Variables associated with the following labels are summed to calculate the denominator, per racial/ethnic group:

- Estimate!!Total!!Under 19 years
- Estimate!!Total!!19 to 64 years
-

Total population: 2013, 2014, 2015, 2016 Tract Analyses (Table S2701)

The percentage of uninsured people (any race/ethnicity, any sex, age 0-64) at the tract level is calculated using the following formula:

$$\text{Uninsured}_{\text{total population, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{0 to 64}}}{\text{Total: Estimate}_{\text{0 to 64}}} \text{ x } 100\%$$

Variables associated with the following labels are summed to calculate the numerator:

- Uninsured; Estimate; AGE - Under 18 years
- Uninsured; Estimate; AGE - 18 to 64 years

Variables associated with the following labels are summed to calculate the denominator:

- Total; Estimate; AGE - Under 18 years
- Total; Estimate; AGE - 18 to 64 years

Associated margins of error variables are used to calculate confidence intervals associated with these values.

NOTE: Labelling reflects variable labelling conventions used in data downloaded from American FactFinder.[13]

Total population: 2017 Forward Tract Analyses (Table S2701)

The percentage of uninsured people (any race/ethnicity, any sex, age 0-64) at the city level is calculated using the following formula:

$$\text{Uninsured}_{\text{total population, 0 to 64}} = \frac{\text{Uninsured: Estimate}_{\text{0 to 64}}}{\text{Total: Estimate}_{\text{0 to 64}}} \text{ x } 100\%$$

Variables associated with the following labels are summed to calculate the numerator:

- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!Under 19 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!19 to 25 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!26 to 34 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!35 to 44 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!45 to 54 years
- Estimate!!Uninsured!!Civilian noninstitutionalized population!!AGE!!55 to 64 years

Variables associated with the following labels are summed to calculate the denominator:

- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!Under 19 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!19 to 25 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!26 to 34 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!35 to 44 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!45 to 54 years
- Estimate!!Total!!Civilian noninstitutionalized population!!AGE!!55 to 64 years

Associated margins of error variables are used to calculate confidence intervals associated with these values.

Community Multiscale Air Quality model, US Environmental Protection Agency (CMAQ, EPA)

General notes

The air pollution metric, Air pollution - Average daily concentration of fine particulate matter (PM2.5) per cubic meter, was calculated using Community Multiscale Air Quality model output for the continental United States. CONUS PM 2.5 Daily Average files are used in analyses. Data are downloaded from the US Environmental Protection Agency website.[34-37]

Multi-year data

Data from 2013, 2014, 2015, 2016 and 2017 are presented on the Dashboard.

Please note that the estimate variable 2013 and 2014 datasets is labelled as "pm25_daily_average_ug_m3_""; the estimate variable in the 2015 Forward datasets are labelled as "Prediction". Dashboard staff confirmed the equivalency of these variables in private correspondence with EPA staff in May 2019; please contact info@cityhealthdashboard.com with any questions.

Weights

The data available for download from the US Environmental Protection Agency's Community Multiscale Air Quality model provide daily tract-level estimates for all tracts in the contiguous United States for the given year. Population weights were calculated for each tract using the American Community Survey 5 Year Estimates (table DP05, variable labelled "Estimate; SEX AND AGE - Total population") for the associated year (e.g., 2015 DP05 is used for 2015 CMAQ data; 2014 DP05 is used for 2014 CMAQ data, etc.)

$$w_i = \frac{p_i}{\sum_{i=1}^{n} p_i}$$

Where:
w_i = tract-specific weight
p_i = tract total population (ACS Table DP05, variable labeled "Estimate!!SEX AND AGE!!Total population")
n = total tracts within a city

Categorizing race/ethnicity

Not applicable.

Confidence intervals

Not applicable.

Metric-specific notes

Data represent modeled estimates produced by CMAQ and do not include estimates for Alaska and Hawaii.

An interactive map of locations of active air quality monitors for PM2.5 is available online, through the EPA.[38]

Air pollution - particulate matter

Data tables

Tract level data are available for download from the US Environmental Protection Agency. Daily estimates of PM 2.5 concentration are reported for census tracts (vintage 2010) within the continental U.S.

For information about weighting of these values, see the Weights section above.

Analysis

An annual average for each census tract reported in the CMAQ data was calculated.

To calculate city-level estimates, the population weights were applied to the census tract annual averages and the weighted tract values were summed to the city level using the following formula:

$$PM2.5_j = \sum_{i=1}^{n} w_i \times PM2.5_i$$

Multiple Data Sources: COVID Local Risk Index

General notes

The City Health Dashboard created the COVID Local Risk Index to present accurate local data, comparable across cities, to help identify cities and neighborhoods that are susceptible to both higher numbers of COVID cases and more severe COVID cases. The metric was developed in response to the COVID-19 pandemic and is intended to assist public health practitioners in allocating resources to help address the impact of COVID-19.

The index is calculated using data from the Center for Disease Control and Prevention's Social Vulnerability Index (SVI)[39-41] (using ACS 2018 5 Year Estimates), the PLACES Project 2018 modeled health outcomes data (2020 release)[42-45] and demographic information from ACS 2018 5 Year Estimates. These analyses were performed using SAS v9.4.[17]

This metric was originally calculated from May 18-29, 2020 and an updated version was calculated in January, 2021 and release March 1, 2021. Calculations were completed by Dashboard analytic staff under scientific guidance from Dr. Ben Spoer, Dr. Lorna Thorpe, and Dr. Marc Gourevitch. Methodology was informed by other indices.[46-48] Please note that this index is informed by the best available scientific evidence as of that date; the index's components and weighting may be updated in the future as what is known about COVID changes.

Due to limited availability of COVID-19 data at the city- and census tract-level, the Dashboard was unable to validate this index against COVID-19 case and death rates. COVID-19 data is predominantly aggregated and released at the county- and state-level. We were able to access city- and census-tract level data for ~10% of our cities and census tracts as of January 2021. This is insufficient for validation. Please email info@cityhealthdashboard.com for more information.

The index represents three conceptual areas (themes):

- **Social vulnerability** The CDC's SVI was selected because it is a validated, peer-reviewed representation of a community's ability to prevent human suffering in the event of a disaster, including disease outbreak.[39] SVI is a well-established and validated index in the scientific literature for emergency preparedness and other health outcomes and has been shown to be associated with COVID outcomes.[41]
- **COVID-related chronic health conditions** were selected because they are known risk factors for COVID and are not included in the original SVI.[49-59] Health conditions with high-quality evidence of increased risk of COVID incidence, morbidity and mortality that were available as modeled estimates from the PLACES Project dataset were included; health outcomes with equivocal evidence were excluded.
- **COVID-related demographics** were selected because of strong evidence that these demographics are at higher risk.[49-59] Some of these demographics already exist in SVI, but were duplicated in this theme to reinforce their prominence within the Dashboard's index.

Each conceptual area (theme) contains component variables, listed in the table below.

Table: COVID Local Risk Index Data Sources and Conceptual Components

Theme	Data Source	Conceptual Components
Social Vulnerability	CDC Social Vulnerability Index, calculated using ACS 2018 5 Year Estimates[40,47]	*Please see CDC SVI 2018 documentation[47] for information on the SVI calculation and variables.* **Group 1: Socioeconomic Status** • Persons below poverty • Civilian (age 16+) unemployed • Per capita income • Persons (aged 25+) with no high school diploma **Group 2: Household Composition & Disability** • Persons aged 65+ • Persons aged 17 and younger • Civilian non-institutionalized population with a disability • Single parent household with children under 18 **Group 3: Minority Status & Language** • Minority (all persons except white, non-Hispanic) • Persons (age 5+) who speak English "less than well" **Group 4: Housing Type & Transportation** • Housing in structures with 10+ units • Mobile homes • At household level (occupied housing units), more people than rooms • Households with no vehicle available • Persons in institutionalized group quarters
COVID-related Chronic Health Conditions	PLACES Project, 2018 1 Year Modeled Estimate[42-45]	• Chronic obstructive pulmonary disease (COPD) among adults aged 18+[51,55,57,58] • Coronary heart disease among adults aged 18+[53,54,56-59] • Diagnosed diabetes among adults aged 18+[51-53,55-57] • Chronic kidney disease among adults aged 18+[49-51,54,55] • Obesity among adults aged 18+[49-52,55,57]
COVID-related Demographics	American Community Survey, 2018 5 Year Estimates (Table DP05)[14]	1. Minority (all persons except non-Hispanic white) [49,51-54,56,57] 2. Persons aged 75 to 84[49,50,52-56,58,59] 3. Persons aged 85+[49,52-56,58,59]

Multi-year data

Not applicable.

Weights

Each component was assigned a weight summing to the overall theme weight. To maintain fidelity to the equation established by the CDC's original analysis, SVI components contribute equally to the social vulnerability theme.[39,47] Social vulnerability was *a priori* assigned a theme weight of 30% to shift weight in our March 2021 update towards health conditions and demographic factors. This decision was informed by an in-depth literature review, current as of December 2020, to identify risk factors of severe COVID outcomes. Component weights were developed based on effect sizes found through this literature review and incorporate relative prevalence in the United States. Additional guidance from Dr. Ben Spoer, Dr. Marc Gourevitch, and Dr. Lorna Thorpe informed weighting scheme decisions.

Table: COVID Local Risk Index Theme and Component Weights

Theme	Theme Weight	Component	Component Weight within COVID Local Risk Index
Social Vulnerability	30%	*See list above for complete list (15 components)*	2% per component
COVID-related Chronic Health Conditions	42%	Chronic obstructive pulmonary disease (COPD) among adults aged 18+	4%
		Coronary heart disease among adults aged 18+	5%
		Diagnosed diabetes among adults aged 18+	6%
		Chronic kidney disease among adults aged 18+	9%
		Obesity among adults aged 18+.	18%
COVID-related Demographics	28%	Minority (all persons except non-Hispanic white)	12%
		Persons aged 75 to 84	11%
		Persons aged 85+	5%

Categorizing race/ethnicity

Not applicable.

Confidence intervals

Confidence intervals were not calculated because this metric is a ranked index. See the "Confidence intervals" section in Section 2 above for more details.

Metric-specific notes

COVID Local Risk Index

The Dashboard adopts the analytic strategy proposed by the CDC's Social Vulnerability Index[39,47] which orders each component's estimates and assigns the highest percentile (100%) to the highest value (with the exception of the per capita income component, which assigns the highest percentile to the lowest value).[47] A percentile is then assigned to the ordered estimates of each component. (Consistent with CDC's Social Vulnerability Index's use of the PERCENTRANK function in Excel,[47] the PERCENT option in SAS's PROC RANK[60] is used to calculate percentiles. In specifying the rank for tied values, the smallest of the corresponding ranks is assigned, using the TIES=LOW option in PROC RANK.[60]) The percentile of each component's estimate is then summed to establish a "sum of percentiles". This "sum of percentiles" is then ordered and categorized into deciles. This decile is reported as the COVID Local Risk Index.

The COVID Local Risk Index is calculated at both the city and tract levels. This analysis is performed separately for each geographic level.

However, the COVID Local Risk Index analytic strategy differs from the SVI in important ways:

1. While the SVI values are standardized to describe vulnerability relative to all census tracts in the US, the Dashboard tract-level COVID Local Risk Index standardizes relative to all tracts on the Dashboard (approximately 33,660 tracts).[8]

   City-level COVID Local Risk Index values are standardized to all cities on the Dashboard, not all cities in the US.

2. The Dashboard weights specific components of the COVID-related chronic health conditions and COVID-related demographics themes unequally (SVI components are equally weighted).

The formula for the Dashboard's COVID Local Risk Index is:

$$\text{COVID Local Risk Index} = \text{Decile of} \sum_{i=1}^{n} (\text{Percentile of component estimate relative to other tracts or cities}) * (\text{Component weight})$$

Where:
n = the 33,660 tracts (for tract-level COVID Local Risk Index) or 766 cities (for city-level COVID Local Risk Index) on the Dashboard

Note about city calculation

The variables used in CDC's SVI provide tract-level estimates; city-level values are not provided. To generate city-level estimates for Social Vulnerability components, population-weighted values were used. Population weights were calculated for each tract using the American Community Survey 2018 DP05 5 Year estimates)[14]:

$$w_i = \frac{p_i}{\sum_{i=1}^{n} p_i}$$

Where:
w_i = tract-specific weight
p_i = tract total population (ACS Table DP05, variable labeled "Estimate!!SEX AND AGE!!Total population")
n = total tracts within a city

After applying populating weights, tract-level SVI estimates were summed by city to generate city-level estimates, weighted by tract population.

Civil Rights Data Collection (CRDC)

General notes

Absenteeism estimates were calculated using the 2015-16 Civil Rights Data Collection survey.[61] These data were the most recently available data at the time of analysis in October 2018.

All analyses were performed using SAS v9.4.[17]

The Dashboard initially calculated absenteeism estimates using 2013-14 CRDC data, published in May 2018. An update using 2015-16 data was released in October 2018. Although the analysis of these two datasets was identical, markedly large differences in the percent of chronically absent students between the two datasets were identified for a minority of cities. Although it is plausible that these changes accurately reflect the reality of absenteeism in each city, CRDC data may be biased due to reporting error. Please email info@cityhealthdashboard.com with any questions.

Weights

No weights were applied to the CRDC analysis.

Categorizing race/ethnicity

With the exception of “Other”, racial/ethnic groups were categorized as they were throughout the Dashboard: black, Asian (Asian and Native Hawaiian or Pacific Islander); Hispanic; or White. “Other” represents summed values associated with American Indian or Alaska Native and two or more races only because CRDC data does not provide a “two or more races” category.

Confidence intervals

CIs are not presented because MOE or SE data were not presented in the underlying dataset, which presents counts.

Metric-specific notes

Absenteeism

Analysis

Chronic student absenteeism variables (see variables prefix SCH_ABSENT_) were used in this analysis. Sex-specific values within schools were summed to create totals per school. A spatial join was performed between the school locations (points) and the city boundaries (polygons) to identify schools within the city boundaries. The latitude and longitude of a school, as per the CCD_LATCOD and CCD_LONCOD variables, was used to determine its location within city boundaries. See Appendix K for more on geospatial joins.

Schools with preschools (SCH_GRADE_PS=“YES”) and Juvenile Justice Facility Schools (JJ=“YES”) were excluded from analysis.

Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics

General notes

Local Area Unemployment Statistics (LAUS) data are published by the U.S. Bureau of Labor Statistics. The LAUS program provides monthly and annual unemployment and labor force data for many geographies, by place of residence. Estimates are derived from the Current Population Survey (CPS)[62], Current Unemployment Statistics (CES), and State Unemployment Insurance (UI) and disaggregated using data from the American Community Survey (ACS) and annual population estimates[63].

Multi-year data

LAUS unemployment rates are released monthly. Monthly estimates are, on average, released by LAUS three months after the month has passed. The Dashboard provides estimates from January 2018 through present, updated monthly.

NOTE: January 2018-December 2020 data were updated in June 2021 to reflect revised estimates released by the Bureau of Labor Statistics. Estimates may have changed due to state-level model specifications and data correction.[64] The Dashboard recommends using the most recently updated data published.

Weights

The Dashboard reports LAUS data as downloaded. No weights were applied.

Categorizing race/ethnicity

LAUS data are not categorized by race/ethnicity.

Confidence intervals

CIs are not presented for LAUS data.

Metric-specific notes

Unemployment – current, city-level

Data tables

City-level data are downloaded monthly directly from the Bureau of Labor Statistics[65].

Analysis

City-level estimates represent the proportion of the civilian population that is unemployed and actively seeking work:

$$\frac{[\text{Civilian population aged} \geq 16 \text{ that is unemployed and actively seeking work}]}{\text{Civilian population aged} \geq 16} \times 100$$

LAUS provides Series Identifiers[66], which are 20-digit unique identifiers that contain information about the geography and analysis performed. The Dashboard made the follow selections to obtain monthly unemployment data:

- Prefix = “LA”
- Seasonal Adjustment Code = “S” (“Seasonally Adjusted”)

- Area Code = “CT” + FIPS code[67] + “000000”
- Measure Code = “03” (“Unemployment rate”)

Data are unavailable for cities smaller than 50,000 and cities created after 2010.

Manual FIPS code matching was required for four consolidated cities because LAUS only releases (consolidated) estimates. Consolidated cities share a government with their county, but retain unincorporated areas with distinct governments. (balance) estimates do not include these unincorporated areas, while (consolidated) estimates do. Therefore, data for these cities are equivalent to county estimates and include populations that live within unincorporated areas[68].

Dashboard City Name	***LAUS Geography Reported***
Athens-Clarke County unified government (balance)	Athens-Clarke County (consolidated) city
Augusta-Richmond County consolidated government (balance)	Augusta-Richmond County (consolidated) city
Louisville/Jefferson County metro government (balance)	Louisville-Jefferson County (consolidated) city
Nashville-Davidson metropolitan government (balance)	Nashville-Davidson (consolidated) city

National Vital Statistics System (NVSS)

General notes

Unless otherwise specified (see section "City/County Indicator" below), deaths are assigned to the reported city of residence of the deceased; births are assigned to the city of residence reported by the mother. All NVSS data were analyzed using SAS v9.4.[17]

American Community Survey data were used to calculate age-group specific total-population, female, and male values for NVSS data (please refer to Section 4 for more information on population denominators).

Restricted use NVSS data are available through the National Association for Public Health Statistics and Information Systems (NAPHSIS). Data request forms are available online.[69]

Users should be cautious when comparing values from different states because of variation in classifying cause of death across locations. This is particularly true for deaths related to opioid overdose.

The downloadable data tables shared on the City Health Dashboard website were not released as a micro-level downloadable datasets from NCHS/RDC, rather .csv aggregated data tables whose analyses were conducted per NCHS disclosure requirements in a secure environment and released as approved output. The findings and conclusions on this website are those of the author(s) and do not represent the views of the Research Data Center, the National Center for Health Statistics, or the Centers for Disease Control and Prevention. NCHS does not recommend further analysis of these tables because linking them to individually identifiable data from other NCHS or non-NCHS datasets could potentially cause disclosure. If you believe a disclosure has occurred please contact info@cityhealthdashboard.com and RDCA@cdc.gov.

NOTE: To provide vital statistics estimates for a subset of New Jersey cities (Burlington, Clayton, Egg Harbor City, Glassboro, Hammonton, Lawnside, Millville, Penns Grove, Pleasantville, and Salem), the Dashboard uses data from New Jersey State Health Assessment Data (NJSHAD),[70] a public health data source managed by the New Jersey Department of Health. Estimates from these data sources are valid for comparison with NCHS/RDC data presented on the Dashboard. For further information, please see Appendix G. Please contact info@cityhealthdashboard.com with any questions.

Multi-year data

NOTE: A single year is used to refer to NVSS data throughout the Dashboard. However, multiple years of data are used in the Dashboard's analyses of NVSS data. Nomenclature is determined based on the most recent year of data used in an analysis. For example, 2012 analyses use data from 2010, 2011 and 2012; 2013 analyses use data from 2011, 2012, and 2013; 2014 analyses use data from 2012, 2013, and 2014, etc.

Multiple Cause of Death Data

MCDD data for 2012, 2013, 2014, 2015, 2016, and 2017 for the following metrics are presented on the Dashboard: opioid overdose deaths, breast cancer deaths, cardiovascular disease deaths, colorectal cancer deaths and premature deaths (all causes).

Natality Data

ND data for 2012, 2013, 2014, 2015, 2016, and 2017 for the following metrics are presented on the Dashboard: prenatal care, low birthweight, and teen births, respectively. See below for more detail.

Weights

Multiple Cause of Death Data

Breast cancer, colorectal cancer, cardiovascular disease, and opioid overdose deaths metrics use US 2010 standardized population weights. These weights were calculated via the direct adjustment approach outlined by Klein & Schoenborn[71] utilizing the data table "QT-P1, 2010 Decennial Census" downloaded in December 2016 from American Fact Finder.[13]

Premature deaths (all causes) used premature death weights and years of life lost derived from the US 2010 standardized population weights using Dranger and Remington's approach.[72] Weights for age-adjusting premature deaths were calculated using the data table "QT-P1, 2010 Decennial Census".[13] The weights are similar to those used for other mortality metrics, but were adjusted to include only the population aged 74 and younger. Weights for years of potential life lost (i.e., the number of years of life "lost" for each death within an age group) were calculated as the mid-point of the age group subtracted from the reference age using the following formula Weight(age group *i*) = 75 – Mid-point age group *i*. Weights and years of life lost are presented in Appendix A.

Natality Data

No weights are applied to ND data.

Categorizing race/ethnicity

Multiple Cause of Death Data

"Hispanic origin/race recode" and "race recode 5" variables were used to categorize race/ethnicity for all mortality metrics:

- Hispanic/Latino: "Hispanic origin/race recode" code of either Mexican, Puerto Rican, Cuban, Central or South American, or other or unknown Hispanic, as well as a "race recode 5" code of either: white, black, American Indian, or Asian/Pacific Islander.
- White: "Hispanic origin/race recode code" of non-Hispanic white
- Black: "Hispanic origin/race recode code" of non-Hispanic black
- Asian: "Hispanic origin/race recode code" of non-Hispanic other races, as well as a race recode 5 code of Asian/Pacific Islander

Natality Data

2012, 2013 Data:
Mother's race/Hispanic origin (mracehisp) and mother's race recode (mracerec) variables were used to categorize race/ethnicity for all natality metrics:

- Hispanic/Latino: Mother's race/Hispanic origin code of either Mexican, Puerto Rican,
- Cuban, Central or South American, or other or unknown Hispanic, as well as a mother's race recode code of either: white, black, American Indian/Alaskan Native, or Asian/Pacific Islander.
- White: Mother's race/Hispanic origin code of non-Hispanic white
- Black: Mother's race/Hispanic origin code of non-Hispanic black
- Asian: Mother's race/Hispanic origin code of non-Hispanic other races, as well as a mother's race recode code of Asian/Pacific Islander

2014, 2015, 2016, 2017 Data:
Mother's Hispanic origin recode (mhisp_r) and mother's bridged race (mbrace) variables were used to categorize race/ethnicity for all natality metrics:

- Hispanic/Latino: Mother's Hispanic origin recode code of either Mexican, Puerto Rican, Cuban, Central or South American, or other or unknown Hispanic, as well as a mother's bridged race code of either: white, black, American Indian/Alaskan Native, or Asian/Pacific Islander.

- White: Mother's Hispanic origin recode code non-Hispanic, as well as a mother's bridged race code of white
- Black: Mother's Hispanic origin recode code of non-Hispanic, as well as a mother's bridged race code of black
- Asian: Mother's Hispanic origin recode code of non-Hispanic, as well as a mother's bridged race code of Asian/Pacific Islander

Confidence intervals

Multiple Cause of Death Data

CIs for breast cancer, colorectal cancer, cardiovascular disease, and opioid overdose deaths metrics were calculated according to following formula outlined by Lilienfeld and Stolley[73] in a document published by the Utah Department of Health[74]:

$$\text{LCL90} = \text{estimate} - (1.645 \times \text{SE(estimate)})$$
$$\text{UCL90} = \text{estimate} + (1.645 \times \text{SE(estimate)})$$

SE(estimate) = SQRT [sum((age-group specific US 2010 standardized population weight^2) ∗ ((age-group specific crude mortality rate^2)/(age-group specific total number of deaths)))]

CIs for premature deaths (all causes) were calculated according to the following formula outlined by Vohlonen, Bäckmand, & Korhonen:[75]

$$\text{LCL90} = \text{estimate} - (1.645 \times \text{SE(est)})$$
$$\text{UCL90} = \text{estimate} + (1.645 \times \text{SE(est)})$$

SE(est)=SQRT[sum[(((age-group specific crude mortality rate^2)/(age-group specific total number of deaths)) ∗ age-group specific premature deaths weight--years of life lost) ∗ US 2010 standardized population YPLL age-group specific weight]]

Natality Data

CIs for low birthweight and prenatal care metrics were calculated as follows:

$$\text{LCL90} = \text{estimate} - 1.645 * \sqrt{\text{estimate}*((100-\text{estimate})/\text{numerator})}$$
$$\text{UCL90} = \text{estimate} + 1.645 * \sqrt{\text{estimate}*((100-\text{estimate})/\text{numerator})}$$

CIs for teen births metric were calculated as follows:

$$\text{LCL90} = (1000 / \text{denominator}) * (\text{numerator} - (1.645 * \sqrt{\text{numerator}}))$$
$$\text{UCL90} = (1000 / \text{denominator}) * (\text{numerator} + (1.645 * \sqrt{\text{numerator}}))$$

City/County indicator

Multiple Cause of Death Data

Total population, sex-specific estimates: The Dashboard calculates total population and sex estimates based on city of residence.

Please note that some years of total population and sex estimates for Honolulu, HI, Macon, GA, and select consolidated cities (Athens, GA; Augusta, GA; Indianapolis, IN; Louisville, KY; Nashville, TN) use data from county of residence. Consolidated cities share a government with their county, but retain unincorporated areas with distinct governments. County estimates include populations that live within unincorporated areas; city estimates do not.[68]

See section “Federal Information Processing Standards (FIPS) codes” above for more or email info@cityhealthdashboard.com.

The Dashboard indicates where county values were utilized for MCDD reported values using an alert in the site’s “Tips and Cautions for Using the Data” box on the Dashboard and the county_indicator variable in downloadable data, available at www.cityhealthdashboard.com/data-access.

Race/ethnicity-specific estimates: The Dashboard calculates race/ethnicity estimates based on county of residence due to data quality issues with city-level race/ethnicity data. See section “Use of County-Level Data on the Dashboard” above or email info@cityhealthdashboard.com for more detail.

Natality Data

Total population, sex-specific estimates: The Dashboard calculates total population and sex estimates based on city of residence.

Please note that some years of total population and sex estimates for Honolulu, HI, Macon, GA, and select consolidated cities (Athens, GA; Augusta, GA; Indianapolis, IN; Louisville, KY; Nashville, TN) use county of residence. Consolidated cities share a government with their county, but retain unincorporated areas with distinct governments. County estimates include populations that live within unincorporated areas; city estimates do not.[68]

See section “Federal Information Processing Standards (FIPS) codes” above for more detail or email info@cityhealthdashboard.com.

The Dashboard indicates where county values were utilized for ND reported values using an alert in the site’s “Tips and Cautions for Using the Data” box on the Dashboard and the county_indicator variable in downloadable data, available at www.cityhealthdashboard.com/data-access.

Race/ethnicity-specific estimates: The Dashboard calculates race/ethnicity estimates based on county of residence due to data quality issues with city-level race/ethnicity data.
See section “Use of County-Level Data on the Dashboard” above or email info@cityhealthdashboard.com for more detail.

Year(s) of data used: Multiplier indicator

Multiple Cause of Death Data

All MCDD calculated values are based on data from three-year periods. For example, the estimate for 2015 on the Dashboard is calculated from 2013, 2014 and 2015 data. However, fewer years of data within each set are used in the event that city and/or county-level estimates are not available for all specified years in the dataset received by the Dashboard.

The Dashboard created an indicator to provide more information on how many years of data were utilized for all MCDD reported values. This indicator also serves as a multiplier for population. Population denominators from the midpoint of each wave of data are used as the multiplier (please refer to Section 4 for more information on population denominators).The multiplier is included as multiplier_indicator in the Dashboard’s downloadable data, available at www.cityhealthdashboard.com/data-access.

Natality Data

All ND calculated values are based on data from three-year periods (with the exception of 2015 prenatal care estimates, which are calculated using data from 2014 and 2015 only; see section “Prenatal care” below for more detail). For example, the estimate for 2015 on the Dashboard is calculated from 2013, 2014 and 2015. However, fewer years of data within each set are used in the event that city and/or county-level estimates are not available for all specified years in the dataset received by the Dashboard.

The Dashboard created an indicator to provide more information on how many years of data were utilized for all ND reported values. This indicator also serves as a multiplier for population. Population denominators from the midpoint of each wave of data are used as the multiplier (please refer to Section 4 for more information on population denominators).The multiplier is included as multiplier_indicator in the Dashboard's downloadable data, available at www.cityhealthdashboard.com/data-access.

Metric-specific notes

Breast cancer deaths

Data tables

Year	Data Files Used
2012	2010, 2011, 2012
2013	2011, 2012, 2013
2014	2012, 2013, 2014
2015	2013, 2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017

Multiple Cause of Death data files were combined across years to calculate breast cancer deaths among females at the city level. Please refer to Section 4 for more information on population denominators.

Analysis

$$\text{Breast cancer deaths} = \sum\left(\frac{\text{age-group specific total number of breast cancer deaths among females}}{\text{multiplier} * (\text{midpoint-year age-group specific total female population})} * \text{US 2010 standardized population age-group specific weight}\right) * 100{,}000$$

Notes on Analysis

Age-adjusted mortality rates are calculated as per National Association for Public Health Statistics and Information Systems recommendations.[76]

The following underlying cause of death ICD-10 codes were summed to calculate the total number of breast cancer deaths (females only): C500, C501, C502, C503, C504, C506, C508, & C509. ICD-10 codes were selected for inclusion as per the 2016 SEER Program Coding and Staging Manual.[77]

All deaths with either a missing, unknown, or not stated age are excluded from the analysis.

Cardiovascular disease deaths

Data tables

Year	Data Files Used
2012	2010, 2011, 2012
2013	2011, 2012, 2013
2014	2012, 2013, 2014
2015	2013, 2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017

Multiple Cause of Death data files were combined to calculate cardiovascular disease deaths at the city level. Please refer to Section 4 for more information on population denominators.

Analysis

Cardiovascular disease deaths =

$$\sum\left(\frac{\text{age-group specific total number of cardiovascular disease deaths}}{\text{multiplier * (midpoint-year age-group specific total population)}} * \text{US 2010 standardized population age-group specific weight}\right) * 100{,}000$$

Notes on Analysis

Age-adjusted mortality rates are calculated as per National Association for Public Health Statistics and Information Systems recommendations.[76]

The following underlying cause of death ICD-10 codes were summed to calculate the total number of cardiovascular disease deaths:

I110, I119, I130, I131, I132, I139, I10, I120, I129, I150, I159, I210, I211, I212, I213, I214, I219, I220, I229, I241, I248, I249, I200, I201, I209, I250, I251, I253, I254, I255, I258, I259, I500, I501, I509, I600, I602, I604, I605, I606, I607, I608, I609, I610, I611, I612, I613, I614, I615, I616, I618, I619, I620, I621, I629, I630, I631, I632, I633, I634, I635, I636, I638, I639, I64, I670, I671, I672, I673, I674, I675, I676, I677, I678, I679, I690, I691, I692, I693, I694, I698

ICD-10 codes were selected for inclusion based on Nolte & McKee[78] as well as in consultation with the NYU School of Medicine's Department of Population Health.

All deaths with either a missing, unknown, or not stated age are excluded from the analysis.

Colorectal cancer deaths

Data tables

Year	Data Files Used
2012	2010, 2011, 2012
2013	2011, 2012, 2013
2014	2012, 2013, 2014
2015	2013, 2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017

Multiple Cause of Death data files were combined to calculate colorectal cancer deaths at the city level. Please refer to Section 4 for more information on population denominators.

Analysis

Colorectal cancer deaths =

$$\sum\left(\frac{\text{age-group specific total number of colorectal cancer deaths}}{\text{multiplier * (midpoint-year age-group specific total population)}} * \text{US 2010 standardized population age-group specific weight}\right) * 100{,}000$$

Notes on Analysis

Age-adjusted mortality rates are calculated as per NAPHSIS recommendations.[76]

The following underlying cause of death ICD-10 codes were summed to calculate the total number of colorectal cancer deaths: C180, C181, C182, C183, C184, C185, C186, C187, C188, C189, C19, & C20. ICD-10 codes were selected for inclusion based on the publication by Siegel, et al[79] and in consultation with the NYU School of Medicine's Division of Gastroenterology.

All deaths with either a missing, unknown, or not stated age are excluded from the analysis.

Low birthweight

Data tables

Year	Data Files Used
2012	2010, 2011, 2012
2013	2011, 2012, 2013
2014	2012, 2013, 2014
2015	2013, 2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017
2018*	2016, 2017, 2018

*2018 data is only available for estimates using New Jersey State Health Assessment Data (NJSHAD). See Appendix G for more information about NJSHAD or contact info@cityhealthdashboard.com.

Natality data files were combined to calculate low birthweight at the city level.

Analysis

$$\text{Low birthweight} = \frac{\text{Number of live births with birthweight <2500 grams}}{\text{Total number of live births}} \times 100$$

Notes on Analysis

All births with birthweights that are either missing, unknown, or not stated are excluded from the analysis.

Opioid overdose deaths

Data tables

Year	Data Files Used
2012	2010, 2011, 2012
2013	2011, 2012, 2013
2014	2012, 2013, 2014
2015	2013, 2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017

Multiple Cause of Death data files were combined to calculate opioid overdose deaths at the city level. Please refer to Section 4 for more information on population denominators.

Analysis

$$\text{Opioid overdose deaths} = \sum\left(\frac{\text{age-group specific total number of opioid overdose deaths}}{\text{multiplier} * (\text{midpoint-year age-group specific total population})} * \text{US 2010 standardized population age-group specific weight}\right) * 100{,}000$$

Notes on Analysis

Age-adjusted mortality rates are calculated as per National Association for Public Health Statistics and Information Systems recommendations.[76]

The following underlying cause of death ICD-10 codes were summed to calculate the total number of opioid overdose deaths: X40, X41, X42, X43, X44, X60, X61, X62, X63, X64, X85, Y10, Y11, Y12, Y13, & Y14 in combination with T400, T401, T402, T403, T404, & T406 multiple cause of death codes. ICD-10

codes were selected for inclusion as per the CDC's Guide to ICD-9-CM and ICD-10 Codes Related to Poisoning and Pain in addition to the Henry J Kaiser Family Foundation.[80,81]

All deaths with either a missing, unknown, or not stated age are excluded from the analysis.

Due to reporting variability and rapid shifts in opioid use patterns, the reported estimated rates may not accurately reflect current opioid-related deaths.

Premature deaths (all causes)

Data tables

Year	Data Files Used
2012	2010, 2011, 2012
2013	2011, 2012, 2013
2014	2012, 2013, 2014
2015	2013, 2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017

Multiple Cause of Death data files were combined to calculate premature deaths (all causes) at the city level. Please refer to Section 4 for more information on population denominators.

Analysis

$$\text{Premature deaths (all causes)} = \sum \left(\left(\frac{\text{age-group specific total number of deaths}}{\text{multiplier} * (\text{midpoint-year age-group specific total population})} \right) * \begin{array}{c} (\text{US 2010 standardized population YPLL age-group specific weight}) * \\ (\text{age-group specific premature death weight - years of life lost}) \end{array} \right) * 100{,}000$$

Notes on Analysis

Premature deaths (all causes) rates are calculated as per Dranger and Remington's approach.[72] Refer to NVSS: Weights above and Appendix A for more detail.

All deaths with either a missing, unknown, or not stated age are excluded from the analysis.

Prenatal care

Data tables

Year	Data Files Used
2015	2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017

Natality data files were combined to calculate prenatal care at the city level.

Analysis

$$\text{Prenatal Care} = \frac{\text{Number of live births with prenatal care beginning between the first and third month}}{\text{Total number of live births}} \times 100$$

Notes on analysis

Due to changes in maternal gestational age reporting before 2014 that introduce unknown bias into the estimate across years, we do not release prenatal care estimates for 2012, 2013, and 2014.

Prenatal care estimates represent a slight modification of one component of the Kotelchuck Index.[82] All births with missing or unknown prenatal care are excluded from the analysis. Prenatal care data for certain states across years are missing because these states had not implemented 2003 birth certificate revisions. If prenatal care information is missing for 10% or more of a given city, all prenatal care values for that city are censored. For more information please refer to the natality public use data documentation files.[83-88]

Teen births

Data tables

Year	Data Files Used
2012	2010, 2011, 2012
2013	2011, 2012, 2013
2014	2012, 2013, 2014
2015	2013, 2014, 2015
2016	2014, 2015, 2016
2017	2015, 2016, 2017
2018*	2016, 2017, 2018

*2018 data is only available for estimates using New Jersey State Health Assessment Data (NJSHAD). See Appendix G for more information about NJSHAD or contact info@cityhealthdashboard.com.

Natality data files were combined to calculate teen births at the city level. Please refer to Section 4 for more information on population denominators.

Analysis

$$\text{Teen Births} = \frac{\text{Number of live births to mothers ages 15-19}}{\text{multiplier} * (\text{midpoint-year total female population age 15-19})} \times 1{,}000$$

ParkServe ®

General notes

Park access represents the percent of the population living within a 10 minute walk of green space. ParkServe ® obtained 2018 GIS data on parks through outreach to cities, towns and communities with direct request for parks data. If GIS data was not provided, park or green space locations were collected from a series of resources, including municipal websites, county or state GIS data, and satellite imagery.

Properties included in ParkServe ® analyses:

- Publicly-owned local, state, and national parks
- School parks with a joint-use agreement with the local government. Considering the scale of the project, only the joint-use agreements collected through ParkScore ® were used.
- Privately-owned parks that are managed for full public use

Multi-year data

Multi-year data for this metric are unavailable.

Weights

Weights were not applied to city level ParkServe ® data received from ParkServe.

Categorizing race/ethnicity

City level estimates of park access were also calculated by race/ethnicity. Data reported by ParkServe ® included estimates by the following categories: white, black, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, other or two or more races, and Hispanic. Estimates for Asian and Native Hawaiian/Pacific Islander were aggregated to match our Asian/PI designation. Similarly, estimates for other or two or more races and American Indian/Alaska Native were also aggregated.

Confidence intervals

CIs for Park Access were calculated as follows:

$$LCL90 = estimate - (1.645 \times SE(estimate))$$
$$UCL90 = estimate + (1.645 \times SE(estimate))$$

Metric-specific notes

Park access

This metric represents the percent of the population that lives within a 10-minute walk of a park or publicly accessible green space.

Data tables

The Dashboard reports ParkServe ® calculated city level estimates as received directly from ParkServe ®; data are not available for download from the ParkServe ® website.

City Health Dashboard analytic staff calculates tract level estimates using publicly available 2018 ParkServe ® GIS data[89] representing the 10 minute walk radius around each park and 2018 Esri block group demographic estimates.[90]

Analysis

City level data reports numerators (population living ≤10-minute walk of a park/green space) and denominators for total population and racial/ethnic subgroups. The formula for city-level values is:

$$\frac{\text{Population living} \leq \text{10 minute walk of a park/green space}}{\text{Total population}} \times 100\%$$

Tract level park access values were calculated using block group population estimates. Block groups are "building blocks" for census tracts. The formula for tract-level values is:

$$\frac{\sum(\text{(\% of block group covered by 10 minute walk radii)(Total block group population)})}{\sum(\text{Total block group population})} \times 100\%$$

PLACES Project (formerly 500 Cities Project), Centers for Disease Control and Prevention

General notes

Measures of health status, health behaviors, and clinical care were estimated by the Centers for Disease Control and Prevention's 500 Cities Project[91], renamed the PLACES Project in 2020 to reflect its expansion to more geographies[2]. The PLACES Project uses identical methods to the 500 Cities Project, except that PLACES Project only releases estimates for full census tracts, whereas 500 Cities Project releases estimates for census tract portions within city boundaries (see "Geographic Coverage" section here)[2]. The Dashboard reports most data as received, with the exception of the preventive service utilization values and CI values (see below; these analyses were performed using SAS v9.4 pre-2020 release, and R, v4.0.2 for the 2020 release).[17]

The PLACES and 500 Cities Projects apply a multi-level regression with post-stratification (MPR) approach to develop small area estimates (SAE) for key measures captured in the Behavioral Risk Factor Surveillance System (BRFSS). Prior to the 500 Cities Project, BRFSS measures were only available at the county, Metropolitan Statistical level or above. For further details on the methodology, see Zhang et al (2014).[92] For more information regarding these metrics, please refer to the PLACES Project's methodology pages.[93-95]

Multi-year data

The Dashboard reports values from the following 500 Cities and PLACES releases:

- 2016 500 Cities release: The Dashboard labels these data as 2014, 1 Year Modeled Estimates. The 2016 release uses the following data sources: BRFSS data (2014, 2013); Census Bureau 2010 census population data, and ACS 2009-2013, 2010-2014 estimates.[96]
- 2017 500 Cities release: The Dashboard labels these data as 2015, 1 Year Modeled Estimates. The 2017 release uses the following data sources: BRFSS data (2015, 2014); Census Bureau 2010 census population data; and ACS 2011-2015, 2010-2014 estimates.[3]
- 2018 500 Cities release: The Dashboard labels these data as 2016, 1 Year Modeled Estimates. The 2018 release uses the following data sources: Behavioral Risk Factor Surveillance System (BRFSS) data (2016, 2015); Census Bureau 2010 census population data; and American Community Survey (ACS) 2012-2016, 2011-2015 estimates.[97]
- 2019 500 Cities release: The Dashboard labels these data as 2017, 1 Year Modeled Estimates. The 2019 release uses the following data sources: Behavioral Risk Factor Surveillance System (BRFSS) data (2017, 2016); Census Bureau 2010 census population data; and American Community Survey (ACS) 2013-2017, 2012-2016 estimates.[42]
- 2020 PLACES release: The Dashboard labels these data as 2018, 1 Year Modeled Estimates. The 2020 release uses the following data sources: Behavioral Risk Factor Surveillance System (BRFSS) data (2018, 2017); Census Bureau 2010 census population data; and American Community Survey (ACS) 2014-2018, 2013-2017 estimates.

The following table outlines the years of PLACES Project and 500 Cities Project data available on the Dashboard, per metric. Multi-year data for some metrics listed below are unavailable because BRFSS asks some questions every other year. For more information, consult the PLACES Project website.[97]

Metric	2013, 1 Year Modeled Estimates	2014, 1 Year Modeled Estimates	2015, 1 Year Modeled Estimates	2016, 1 Year Modeled Estimates	2017, 1 Year Modeled Estimates	2018, 1 Year Modeled Estimates
Binge drinking		✓	✓	✓	✓	✓ (PLACES)
Dental care		✓		✓		✓ (PLACES)
Diabetes		✓	✓	✓	✓	✓ (PLACES)
Frequent mental distress		✓	✓	✓	✓	✓ (PLACES)
Frequent physical distress		✓	✓	✓	✓	✓ (PLACES)
High blood pressure	✓		✓		✓ (PLACES)	
Obesity		✓	✓	✓	✓	✓ (PLACES)

Metric	2013, 1 Year Modeled Estimates	2014, 1 Year Modeled Estimates	2015, 1 Year Modeled Estimates	2016, 1 Year Modeled Estimates	2017, 1 Year Modeled Estimates	2018, 1 Year Modeled Estimates
Physical inactivity		✓	✓	✓	✓	✓ (PLACES)
Preventive services, 65+		✓		✓		✓ (PLACES)
Smoking		✓	✓	✓	✓	✓ (PLACES)

Weights

The Dashboard reports PLACES Project and 500 Cities Project data as received, so in general, no weights are applied in the calculation of the estimates by the Dashboard analysts. (Please refer to the previous citations to learn more about how post-stratification weights are applied in the modeling process.) The one exception is the measure of preventive service utilization, 65+, which is reported separately for men and women in the 500 Cities data. Though the Dashboard reports the rates by sex, a weighted average rate is also calculated to get a total population rate.

Categorizing race/ethnicity

Estimates from the PLACES Project and 500 Cities Project do not include sub-group estimates by race/ethnicity. Race/ethnicity, age, and income are included as covariates in the MPR approach used to calculate modeled estimates.

Importantly, only crude (not age-adjusted) measures are available at the census tract level. The PLACES Project and 500 Cities Project report both crude and age-adjusted estimates at the city level. For consistency and comparability between tract and city estimates, the Dashboard reports crude estimates for both tracts and cities.

Confidence intervals

Confidence intervals were included with the estimates downloaded from the 500 Cities Project. However, the 500 Cities Project reports 95% confidence intervals, rather than the 90% confidence intervals reported by the Dashboard. Upper and lower limits of the 95% confidence intervals were used to calculate an approximate standard error (SE). The SE was then used to calculate 90% confidence intervals. See Preventive services, 65+ below for metric-specific confidence interval calculations.

$$SE = \frac{UCL95 - LCL95}{1.96 \times 2}$$

$$LCL90 = Estimate - (1.645 \times SE)$$

$$UCL90 = Estimate + (1.645 \times SE)$$

Where:

SE = approximate standard error
LCL95 = Reported lower limit for the 95% confidence interval
UCL95 = Reported upper limit for the 95% confidence interval
LCL90 = Calculated lower limit for the 90% confidence interval
UCL90 = Calculated upper limit for the 90% confidence interval

Data tables

Tract and city-level data were downloaded directly from the PLACES Project and 500 Cities Project website.[7,43-45,96,97]

Metric-specific notes

Definitions are taken verbatim from the PLACES Project and 500 Cities Project:

Binge drinking

Definition: Adults aged ≥18 years who report having five or more drinks (men) or four or more drinks (women) on an occasion in the past 30 days.[94]

Dental care

Definition: Percent of respondents aged ≥18 years who report having been to the dentist or dental clinic in the previous year.[95]

Diabetes

Definition: Respondents aged ≥18 years who report ever been told by a doctor, nurse, or other health professional that they have diabetes other than diabetes during pregnancy.[93]

Frequent physical distress

Definition: Respondents aged ≥18 years who report 14 or more days during the past 30 days during which their physical health was not good.[93]

Frequent mental distress

Definition: Respondents aged ≥18 years who report 14 or more days during the past 30 days during which their mental health was not good.[93]

High blood pressure

Definition: Respondents aged ≥18 years who report ever having been told by a doctor, nurse, or other health professional that they have high blood pressure. Women who were told high blood pressure only during pregnancy and those who were told they had borderline hypertension were not included.[93]

Obesity

Definition: Adult obesity among adults aged ≥18 years.[94]

Physical inactivity

Definition: Respondents aged ≥18 years who answered “no” to the following question: “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?”[94]

Preventive services, 65+

Definition, Women: Number of women aged ≥65 years reporting having received all of the following: an influenza vaccination in the past year; a pneumococcal vaccination (PPV) ever; either a fecal occult blood test (FOBT) within the past year, a sigmoidoscopy within the past 5 years and a FOBT within the past 3 years, or a colonoscopy within the previous 10 years; and a mammogram in the past 2 years.[95]

Definition, Men: Number of men aged ≥65 years reporting having received all of the following: an influenza vaccination in the past year; a PPV ever; and either a fecal occult blood test (FOBT) within the past year, a sigmoidoscopy within the past 5 years and a FOBT within the past 3 years, or a colonoscopy within the past 10 years.[95]

Analysis

At the recommendation of the PLACES analytic team[98], overall preventive services, 65+ values were calculated as a weighted average of preventive service use by women and preventive service use by

men. Per PLACES, we used 2010 Decennial Census Survey (DCS) population counts for place and tract, and American Community Survey (ACS) 5-year population estimates for county[2,98].

The weighted proportion formula is below:

$$\widehat{p_{weighted}} = \frac{\hat{p}_{male\ 65+} * n_{male\ 65+} + \hat{p}_{female\ 65+} * n_{female\ 65+}}{n_{male\ 65+} + n_{female\ 65+}}$$

Where:

$p_{weighted}$ = weighted proportion of overall use of preventive services by men and women 65+
$p_{male\ 65+}$ = reported proportion of overall use of preventive services by men 65+
$p_{female\ 65+}$ = reported proportion of overall use of preventive services by women 65+
$n_{male\ 65+}$ = population, men 65+
$n_{female\ 65+}$ = population, women 65+

To calculate our pooled MOE, we performed a series of steps:

1. For male and female, convert *upper* MOE to standard error (SE)

$$SE = \frac{MOE_{upper} - \hat{p}}{1.96}$$

2. For male and female, transform standard error into variance (var)

$$var = \left(SE * \sqrt{n}\right)^2$$

3. Pool the variances into a pooled standard deviation

$$SD_{pooled} = \sqrt{\frac{(n_{male\ 65+} - 1) * var_{male} + (n_{female\ 65+} - 1) * var_{female}}{n_{male\ 65+} + n_{female\ 65+} - 2}}$$

4. Transform pooled standard deviation into standard error

$$SE_{pooled} = SD_{pooled} * \sqrt{\frac{1}{n_{male\ 65+}} + \frac{1}{n_{female\ 65+}}}$$

5. Compute pooled MOE at the 90% confidence level.

$$MOE_{pooled,\ 90\%} = SE_{pooled} * 1.645$$

Where:

n = population (by sex)
SD_{pooled} = pooled standard deviation
SE_{pooled} = pooled standard error
MOE_{pooled} = pooled margin of error

Note that, for Preventive services, 65+ *only, the* MOE remains the same on both sides compared to other PLACES-derived metrics. PLACES uses other methods to generate their confidence limits[98], where the Dashboard uses population parameters to calculate MOE and confidence limits.

Smoking

Definition: Respondents aged ≥18 years who report having smoked ≥100 cigarettes in their lifetime and currently smoke every day or some days.[94]

State-Based Education

General notes

The Dashboard chose to use state-based education data sources for third-grade reading proficiency instead of federally reported data sources through the U.S. Department of Education EDFacts (EDFacts). State-based education data sources are updated more regularly and provide data at a more granular level than federally reported data.

Overall, state-based education data are not reported or collected centrally; the Dashboard made best efforts to submit data requests as allowed by the project's timeline. **Caution is needed when comparing values across states as there may be variability in data collection and reporting practices by each state department of education.** Any specific questions regarding the original data collection and reporting should be directed to the specific state departments of education.

School districts, also known as local education agencies (LEA), do not map directly to city boundaries. Thus, the Dashboard acquired data at the individual school level in order to select the schools that are physically located within the city boundaries. The provided education estimates are only city-level estimates, not school district-level estimates. Census tract-level estimates are not available. For more detailed information on the count of schools within each city and the number of schools contributing to each city-level estimate, please refer to Appendix K or email info@cityhealthdashboard.com.

Multi-year data

Multi-year data are not available for third-grade reading proficiency and only data from the May 2018 release are displayed on the site. These data were acquired from August 2017-April 2018.

Weights

Since there were not always numerators or denominators reported, the Dashboard analysts calculated weights based on grade-level enrollment for aggregating school-based rates to the city level. The Dashboard used third-grade school enrollment data from NCES ElSi to create weights for the school and student subgroups in order to provide a city estimate for third-grade reading proficiency. The output from our geographic analysis was used to select which schools to include (see Appendix K). Weights were adjusted to account for schools that did not report or censored their third-grade reading proficiency rate data. For more detail on the formulas, please refer to the *Analysis section*.

Categorizing race/ethnicity

The Dashboard did not report any disaggregated data by subgroup for third-grade reading proficiency. There was substantial state censorship of subgroups, especially in race/ethnicity groups, at the school level.

Confidence intervals

Confidence intervals are not calculated as not all state-based education data sources provided the necessary data elements.

Metric-specific notes

Third-Grade Reading Proficiency

Data tables

Data were acquired from state departments of education (Appendix I & J). States vary in how they report rates. The Dashboard selected the state-provided combined rate over the individual proficiency levels if rates were reported both as a combined proficient or above rate AND as individual proficiency levels (i.e.

proficient or above). This was done to reduce missingness from state censorship in individual proficiency levels, and was applied to the District of Columbia and the 32 states that provided a combined proficient or above rate. The remaining 19 states reported rates as individual proficiency levels. For those states, the Dashboard summed the rates for proficient or above to get an overall estimate of proficient or above. The overall rate was censored if a component rate was missing. For more detail on which states provided a combined proficient or above rate, please refer to Appendix I. The type of rate is noted in the downloadable data.

State-based education data adhere to the state's data censoring criteria. Specific criteria for data censoring can also vary within a state as well, with third-grade reading proficiency metrics having different criteria. No individual-level data were accessed or analyzed. For more detail on data censoring criteria by state, please refer to Appendix H.

From each file, the Dashboard identified columns relevant to the metric and created a macro that would systematically import the state data files, pulling these relevant columns to create a unified dataset. When available, the following elements were included in the macro: school names and IDs, counts for numerators, counts for denominators, rates, subgroup designation, and filtering criteria (i.e. year, subject, test, grade).

Analysis

Third-grade reading proficiency rates are reported as calculated by the Dashboard staff. The Dashboard defines third-grade reading proficiency as the percent of public school third-graders who score "proficient" or above in reading on standardized tests. Third-grade reading proficiency tests are different in every state, with different definitions of proficiency and different skills tested. In general, achieving a score of "proficient" or above implies that students have satisfactorily achieved the grade-level reading standard, adequately preparing them to advance to the next grade. The reading proficiency test scores do not include scores from alternative reading proficiency tests (for third-graders in specialized education programs).

All public schools were included in analysis. This consists of regular schools (including charter and magnet schools), special education schools, vocational schools, and other/alternative schools. For definitions of these types of schools, please refer to individual state departments of education or Appendix H.

Rates were reported differently by each state and were cleaned as follows:

- Approximate rates were set to the specific value (i.e. ~95% becomes 95%)
- Rates reported in decimal format were multiplied by 100
- If rates were not reported, calculating the rate from the numerator and denominator
- If rates were reported both as a combined proficient or above rate AND as individual proficiency levels (i.e. proficient or above), the Dashboard selected the state-provided combined rate over the individual proficiency levels. If rates were only reported in individual proficiency levels, the Dashboard summed the rates for proficient or above to get an overall estimate of proficient or above. The overall rate was censored if a component rate was missing.

Next, data were matched according to the following steps:

1. The files of directories (2015-16 and 2016-17) containing NCES school IDs, state school IDs, school grades information, and the spatial join result were merged using a common field, NCESSCH (NCES school ID).
2. State-based education files were matched to the spatial join/directory files based on school IDs and NCES IDs, as available in the individual state files.
3. The Dashboard used string matching for state files that did not have school IDs. The Dashboard cleaned school names and matched them to NCES data through the SAS procedure COMPGED.

4. For schools that did not have an exact match, the top five matches were manually reviewed to determine true and false matches.
5. There were 8 states (AK, LA, MS, ND, NY, UT, VA, WY) for which there were duplicate match results for school names that were not unique. For those school names, the Dashboard used state school directories or other files to identify which of the duplicate schools are located in the city boundaries.

The Dashboard multiplied school specific third-grade reading proficiency rates by the corresponding weight and summed all schools within the given city (see below). These city-level rates were then adjusted by dividing them by the weight adjustments, the sum of weights for all schools that did not censor their reading proficiency data.

Relevant formulas are presented here for users' reference:

$$\text{Third-grade Reading Proficiency Weight}_i = \frac{\text{Total 3rd grade population for school}_i}{\text{Total 3rd grade population for all schools in city}}$$

$$\text{Third-grade Reading Proficiency Unadjusted City Rate} = \sum_{i=1}^{n} (\text{Rate}_i * \text{Weight}_i)$$

Where rate_i is the third-grade reading proficiency rate of an individual school; where weight_i is the weight of that individual school; where unadjusted city rate is the derived city third-grade reading proficiency estimate from multiplying rate_i and weight_i for an individual school and summing it for all schools in the city

$$\text{Weight Adjustment} = \sum_{i=1}^{n} (\text{Weight}_i)$$

Where the weight adjustment is calculated as the sum of weights for all schools that did not censor their third-grade reading proficiency data

$$\text{Third-grade Reading Proficiency Adjusted City Rate} = \frac{\sum_{i=1}^{n} (\text{Rate}_i * \text{Weight}_i)}{\text{Weight Adjustment}}$$

Rate Indicator:
The Dashboard created the following indicator, available in the Dashboard data download, to provide more information on what type of rate was utilized for all reported third-grade reading proficiency values.

educ_indicator=1: All school estimates are a rate
educ_indicator=2: At least one school estimate is an approximate rate

The Dashboard indicates when an approximate rate is displayed on a page (i.e., where educ_indicator=2) under the "Tips and Cautions for Using the Data" sub-header.

County Indicator:
County-level data are used where city-level data are unavailable/censored. The Dashboard indicates where county values were utilized for third-grade reading proficiency using the county_indicator variable in downloadable data, available at www.cityhealthdashboard.com/data-access. See Section 2: Use of County-level Data for the Dashboard for more information.

State-specific notes
There are nuances to each state's data for third-grade reading proficiency.

- For Massachusetts, the state is currently transitioning between two different reading proficiency tests (MCAS and Next Generation MCAS). Thus, some of the schools in the Dashboard's Massachusetts cities are taking one test, while others are taking the other test. The Dashboard chose to analyze assessment results from the Next Generation MCAS.
- For Virginia, elementary school reading proficiency scores are not disaggregated by grade level, thus any reading proficiency values for Virginian cities are elementary school values.

- For California, the enrollment data are from the state department of education, not from NCES ElSi.
- For the District of Columbia, the Dashboard used district-level data as all schools fall within district boundaries, rendering the spatial join unnecessary.
- For a subset of New Jersey Cities (Burlington, Clayton, Egg Harbor City, Glassboro, Hammonton, Lawnside, Millville, Penns Grove, Pleasantville, and Salem), third-grade reading proficiency data are not available.

For more detail on the data sources, method of data acquisition, year of data, month of acquisition, and specific notes, please refer to Appendix I & J.

United States Small-Area Life Expectancy Project (USALEEP)

General notes

Tract-level life expectancy estimates were estimated by the United States Small-Area Life Expectancy Project (USALEEP), a joint effort of The Robert Wood Johnson Foundation, National Association for Public Health Statistics and Information Systems (NAPHSIS) and the National Center for Health Statistics (NCHS) at the Centers for Disease Control (CDC). The methodology used to calculate tract-level data is published.[99]

Multi-year data

Multi-year data for this metric are unavailable.

Weights

Tract values are presented on the Dashboard as downloaded (see below). The methodology used to calculate tract-level data is published.[99] City values represent a population weighted average of tract values associated with respective cities. See “Analysis” section below for more details.

Categorizing race/ethnicity

Not applicable.

Confidence intervals

Tract-level standard errors are included in downloadable USALEEP data. Ninety percent confidence intervals for tract-level data were calculated as per the following formulas:

$$LCL90 = estimate - (1.645 \times SE(estimate))$$
$$UCL90 = estimate + (1.645 \times SE(estimate))$$

Where:

LCL90 = Calculated lower limit for the 90% confidence interval
UCL90 = Calculated upper limit for the 90% confidence interval
SE = approximate standard error

City-level CI’s were calculated using the formulas for 90% confidence internals listed above. The Satterthwaite approximation was used to calculate a pooled standard error of the tracts associated with each city.[100] The formula for the Satterthwaite approximation is:

$$se_S = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

where *s* is the tract standard error provided in USALEEP downloadable data[101] (variable se_e_0__) and *n* is the six-year population of the tract (see “Analysis” section below).

Metric-specific notes

Life expectancy

Data tables

The Dashboard reports tract-level data as received from USALEEP; tract-level data and documentation files are available for free download.[101-103]

City-level life expectancy estimates are calculated by Dashboard analytic staff using SAS[17] as outlined below.

Analysis

This section outlines the calculation of city-level weighted calculations of tract life expectancy estimates. As per email correspondence with USALEEP analytic staff at the National Center for Health Statistics, weights are calculated as followed:

$$\text{Tract weight} = \frac{\text{Six-year tract population}}{\text{Six-year city population}}$$

Where:

$$\text{six year tract population} = \left(\text{tract population}_{\text{2010 Census}}\right) + \left(5 \times \text{tract population}_{\text{2015 American Community Survey, 5 Year Estimates}}\right)$$

$$\text{six-year city population} = \sum \text{six year tract populations in city}$$

Variable HD01_S001 in table "2010 SF1 100% Data, DP-1 Profile of General Population and Housing Characteristics: 2010" is used to define tract population in 2010 Census data. Variable HC01_VC03 in table DP05 is used to define tract population in 2015 ACS (5 Year Estimates) data. Both tables are accessible through the US Census Bureau's API.[15]

NOTE: As per private correspondence with CDC/USALEEP staff,[104] estimates for Maine and Wisconsin exclusively use 2015 ACS (5 Year Estimates) data, excluding data from the 2010 Census. Therefore, City Health Dashboard calculations of city-level life expectancy estimates for Maine and Wisconsin exclusively weight tract populations by 2015 ACS (5 Year Estimates).

Tracts with missing life expectancy, Decennial Census, or ACS values were excluded from analysis.

City life expectancy estimates that are calculated where data for 20% or more tracts are missing are indicated with a note in the Tips and Cautions for Using the Data box on the Dashboard.

Uniform Crime Reporting, Federal Bureau of Investigation

General notes

Uniform Crime Reporting data are published by the Federal Bureau of Investigation. All analyses of UCR data were performed using SAS v9.4.[17]

Multi-year data

Data from 2016, 2017, 2018 and 2019 are presented on the Dashboard.

Weights

No weights were applied to UCR data.

Categorizing race/ethnicity

Not applicable.

Confidence intervals

CIs for violent crime were calculated as follows:

$$\text{LCL 90} = \frac{100{,}000}{\text{denominator}} \times (\text{numerator} - (1.645 \times \sqrt{\text{numerator}}))$$

$$\text{UCL 90} = \frac{100{,}000}{\text{denominator}} \times (\text{numerator} + (1.645 \times \sqrt{\text{numerator}}))$$

Metric-specific notes

City-level specific values are not available for all cities within the Uniform Crime Reporting dataset. In the event that a city-level specific value is not available, the Dashboard reports the most approximate geography reported by the Uniform Crime Reporting dataset. The following table lists corresponding geographies:

Dashboard City Name	***UCR Geography Reported***
Athens, Georgia	Athens-Clarke County, Georgia
Burlington, New Jersey	Burlington City, New Jersey
Camden, New Jersey	Camden County Police Department, New Jersey
Charlotte, North Carolina	Charlotte-Mecklenburg, North Carolina
Las Vegas, Nevada	Las Vegas Metropolitan Police Department, Nevada
Louisville, Kentucky	Louisville Metro, Kentucky
Nashville, Tennessee	Nashville Metropolitan, Tennessee (2016, 2017)[105,106] Metropolitan Nashville Police Department (2018)[107]
Savannah, Georgia	Savannah-Chatham Metropolitan, Georgia
San Buenaventura (Ventura)	Ventura, California

Violent Crime

Data tables

The data tables “Table 8: Offenses Known to Law Enforcement by State by City”[105-108] from Uniform Crime Reporting were used to calculate total number of violent crimes for 2016, 2017, 2018 and 2019.

The American Community Survey’s data table DP05 (variable DP05_0001E, “Estimate!!SEX AND AGE!!Total population”) [13,15] was used to calculate total population values. Please refer to Section 4 for more information regarding ACS population denominators.

Analysis

The measure was calculated as follows:

$$\text{Violent crime} = \frac{\text{Total number of reported violent crimes}}{\text{Total population}} \times 100{,}000$$

The following types of violent crimes were summed to calculate the total number of violent crimes: murder and non-negligent manslaughter, rape (revised definition), rape (legacy definition), robbery, and aggravated assault.

Food Access Research Atlas, Economic Research Service, United States Department of Agriculture (USDA Food Atlas)

General notes

The limited access to healthy food metric represents the percent of the population that lives ≥ ½ mile from a supermarket, large grocery store, or supercenter. Data on store locations were obtained by USDA ERS from the 2015 STARS directory of stores authorized to accept SNAP benefits and the 2015 Trade Dimensions TDLinx directory of stores.[109] Population data total and by race/ethnicity were obtained at the block level from US Census. Data are available for download online.[110]

Multi-year data

Multi-year data for this metric are unavailable.

Weights

Weights were not applied to USDA ERS data as these data do not require weighting.

Categorizing race/ethnicity

City level estimates of limited access to healthy food were also calculated by race/ethnicity. Data reported by USDA ERS included estimates by the following categories: white, black, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, other or two or more races, and Hispanic. Estimates for Asian and Native Hawaiian/Pacific Islander were aggregated to match our Asian/PI designation. Similarly, estimates for other or two or more races and American Indian/Alaska Native were also aggregated.

Metric-specific notes

Limited access to healthy foods

The limited access to healthy food metric represents the percent of the population that lives ≥ ½ mile from a supermarket, large grocery store, or supercenter. Stores were defined as a healthy food outlet if they reported at least $2 million in annual sales, were certified to accept SNAP benefits, and sold food in all the following categories: fresh produce, fresh meat and poultry, dairy, dry and packaged goods, and frozen foods.

Data tables

Census tract-level data were downloaded directly for this measure.

Analysis

The downloaded data set from USDA ERS reports numerators (population living ≥ ½ mile from a supermarket, large grocery store, or supercenter) and denominators for total population and by race/ethnicity. The measure was calculated as follows:

$$\frac{\text{Population living} \geq 0.5 \text{ mile from a healthy food store}}{\text{Total population}} \times 100\%$$

City level estimates were calculated by summing tract numerators and denominators to the city level for total population and by race/ethnicity.

Walk Score ®

General notes

Walk Score measures the walkability of any address[111] by incorporating walking routes to nearby amenities from multiple categories.[112] This metric is a value from 0 to 100, with 100 being more walkable.

Multi-year data

Multi-year data for this metric are unavailable.

Weights

The Dashboard reports Walk Score data as received. No weights were applied.

Categorizing race/ethnicity

Walk Score data are not categorized by race/ethnicity.

Confidence intervals

CIs are not presented for Walk Score ® data.

Metric-specific notes

Walkability

The Dashboard reports 2019 Walk Score ® data as received from Redfin Real Estate.[113]

Analysis

Tract-level and city-level values represent population-weighted aggregations of city blocks.[112]

For more detailed information, please refer to the "How Walk Score Works" webpage, available at https://www.redfin.com/how-walk-score-works, and the Walk Score Methodology page, available at https://www.walkscore.com/methodology.shtml.

SECTION 4: Population Estimates

Population denominators are **not** a metric and are not displayed on the Dashboard. The values are used as denominators in Dashboard analyses that result in metric values presented on the website. This section outlines the analytics that generate the population denominator analyses and documents the sources of the values.

Population denominators are used in two instances:

1. Where the total population of a geographic area is required for an analysis.

   The variable labelled "Estimate; SEX AND AGE - Total population" (in American FactFinder[13]) or the equivalent, "Estimate!!SEX AND AGE!!Total population" (in the US Census Bureau's API[15]) value in ACS table DP05 is used to estimate the total population within a city. (See metric-specific notes for the year of DP05 that is selected for the analysis.) These values are not altered and are used as presented in downloads from American FactFinder or US Census Bureau API.[13,15] These values from DP05 are also used as the denominator for the "Demographic information" percentages (see section "Demographic information" above for more detail).

   Population denominator values for Honolulu, HI generated using ACS data represent values associated with the county of Honolulu, HI.

   Unless otherwise noted, population denominator values for Macon, GA generated using ACS data from 2018 represent values associated with Macon-Bibb County, GA (FIPS 13-49008); population denominator values for Macon, GA generated using ACS data prior to 2018 represent values associated with Bibb County, GA (FIPS 13-021). See section "Federal Information Processing Standards (FIPS) codes" (above) and Appendix E (below) for a summary of the geographic coding used for each metric for more detail. Contact info@cityhealthdashboard.com with any questions.

2. Where sex- and/or age-specific population estimates are required for adjustment in data from National Vital Statistics System (see section "National Vital Statistics System (NVSS)" above):

   a. For city-level analyses of total population and sex subgroups, population estimate denominators are generated from American Community Survey table B01001 (5 Year Estimates) for Place.[13]

      Data from the midpoint year of a three-year wave is used in each analysis. For example, B01001 (2015, Year Estimate) is used for 2014-2016 NVSS estimates; B01001 (2014, Year Estimate) is used for 2013-2015 NVSS estimates, etc.

   b. For county-level analyses of racial/ethnic subgroups, population estimate denominators are generated from the National Center for Health Statistics.

      Data from the midpoint year of a three-year wave is used in each analysis. For example, 2013-2015 estimates use vintage 2016 Bridged-Race Postcensal Population Estimates data file for 2014.[114] 2014-2016 estimates use vintage 2016 Bridged-Race Postcensal Population Estimates data file for 2015.[115]

SECTION 5: Acknowledgements

The Dashboard acknowledges Allegra Wilson, Sarah Conderino, Miriam Gofine, Dr. Ben Spoer, Taylor Lampe, Alexander Chen, Dr. Jessica Athens, Shauna Ford, Dr. Susan Kum, Peggy Hsieh and Leena Abbas for their significant contributions to the Dashboard site and analyses.

The Dashboard acknowledges Rania Kanchi, Alexis Feinberg, and Priscilla Lopez for their significant contributions to the pilot Dashboard site and analyses.

The Dashboard acknowledges the following individuals for their technical assistance: Dr. Ingrid Ellen, Dr. Justin Feldman, Dr. Kevin Kromar, Dr. Jennifer Norton, Dr. Pasquale Rummo, and the Dashboard Scientific Advisory Committee.

The Dashboard acknowledges Dr. Xingyou Zhang, Senior Mathematical Statistician, U.S. Department of Agriculture, Economic Research Service, for his expertise surrounding the “Air pollution – particulate matter” metric.

The Dashboard acknowledges Dr. Erin Fahle, Assistant Professor, St. John’s University, and Dr. sean f. reardon, Professor, Stanford University, for their expertise surrounding development of the education metrics, particularly third-grade reading proficiency.

The Dashboard acknowledges Dr. Celia Stall-Meadows (Tribal Research Department, Choctaw Nation), Dr. Carmela Alcántara (Associate Professor, Columbia University School of Social Work), Dr. Stella Yi (Assistant Professor, NYU School of Medicine), Dr. Simona Kwon (Associate Professor, NYU School of Medicine), Jennifer Wong (Senior Program Coordinator, NYU School of Medicine), Center for the Study of Asian American Health, and Dr. Sheri Daniels (Executive Director, Papa Ola Lokahi) for their expertise surrounding demographic maps.

SECTION 6: References

1. Ratcliffe M. Understanding "Place" in Census Bureau Data Products. [Presentation]. https://www.census.gov/content/dam/Census/data/developers/understandingplace.pdf. Accessed January 3, 2020.
2. Centers for Disease Control and Prevention. About the Project - PLACES: Local Data for Better Health. 2020; https://www.cdc.gov/places/about/index.html. Accessed February 25, 2021.
3. 500 Cities: Local Data for Better Health. 500 Cities: Local Data for Better Health, Census Tract Boundaries (Last Update Date: December 8, 2020). 2017; https://chronicdata.cdc.gov/500-Cities-Places/500-Cities-Census-Tract-Boundaries/x7zy-2xmx. Accessed December 4, 2017.
4. City Health Dashboard. New Data, New Cities: City Health Dashboard Updates - Introducing 10 New Cities. 2020; https://www.cityhealthdashboard.com/story/1152. Accessed April 24, 2020.
5. City Health Dashboard. Small and Midsized Cities. 2020; www.cityhealthdashboard.com/citytypes. Accessed April 24, 2020.
6. Berkley J. Using American Community Survey estimates and margins of error. [Presentation]. 2017; https://www.census.gov/mso/www/training/pdf/acs-estimates-moe4-19-17.pdf. Accessed January 1, 2018.
7. 500 Cities: Local Data for Better Health. Local Data for Better Health, 2017 Release. 2017; https://chronicdata.cdc.gov/500-Cities-Places/500-Cities-Local-Data-for-Better-Health-2017-relea/vurf-k5wr. Accessed September 27, 2017.
8. The 500 Cities. 500 Cities: Census Tract Boundaries. 2018; https://chronicdata.cdc.gov/500-Cities/500-Cities-Census-Tract-Boundaries/x7zy-2xmx. Accessed January 5, 2018, 2018.
9. Stucka M. Macon-Bibb County consolidation wins with strong majorities. August 5, 2015, 2012.
10. Macon-Bibb County. Macon-Bibb County. 2018; http://www.maconbibb.us/. Accessed April 10, 2018.
11. US Department of Education. Policy questions on the Department of Education's 2007 guidance on collecting, maintaining and reporting data by race or ethnicity. 2008; https://www2.ed.gov/policy/rschstat/guid/raceethnicity/questions.html. Accessed January 9, 2018.
12. Office of Policy Development and Research - US Department of Housing and Urban Development. HUD USPS ZIP Code Crosswalk Files (ZIP-TRACT, 2nd Quarter 2019). 2019; https://www.huduser.gov/portal/datasets/usps_crosswalk.html. Accessed December 19, 2019.
13. American FactFinder. US Census Bureau. 2017; https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.
14. US Census Bureau. Explore Census Data. 2020; https://data.census.gov/cedsci/. Accessed March 3, 2020.
15. US Census Bureau. Available APIs. 2020; https://www.census.gov/data/developers/data-sets.html. Accessed January, 2020.
16. ACSO Users Support (CENSUS/ACSO). Private communication: request: data.census.gov <> AFF variable/label crosswalk. In:November 5, 2019.
17. SAS Institute Inc. SAS System. In. Vol 9.4. Cary, NC 2015.
18. US Census Bureau. Technical Documentation: Table & Geography Changes: 2013-2017 ACS 5-year Estimates. 2018; https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2017/5-year.html. Accessed March 22, 2019.
19. US Census Bureau. Technical Documentation: Table & Geography Changes: 2012-2016 ACS 5-year Estimates. 2017; https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2016/5-year.html. Accessed March 22, 2019.
20. US Census Bureau. Technical Documentation: Table & Geography Changes: 2010-2015 ACS 5-year Estimates. 2016; https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2015/5-year.html. Accessed March 22, 2019.
21. US Census Bureau. Technical Documentation: Table & Geography Changes: 2009-2014 ACS 5-year Estimates. 2015; https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2014/5-year.html. Accessed March 22, 2019.
22. US Census Bureau. Technical Documentation: Table & Geography Changes: 2008-2013 ACS 5-year Estimates. 2015; https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2013/5-year.html. Accessed March 22, 2019.
23. US Census Bureau. Technical Documentation: Table & Geography Changes: 2014-2018 ACS 5-year Estimates. 2019; https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2018/5-year.html. Accessed March 3, 2020.
24. US Census Bureau. *A compass for understanding and using American Community Survey Data: Appendix 1, Understanding and using ACS single-year and multiyear estimates.* US Census Bureau,.
25. Krieger N, Waterman PD, Spasojevic J, Li W, Maduro G, Van Wye G. Public health monitoring of privilege and deprivation with the index of concentration at the extremes. *American journal of public health.* 2016;106(2):256-263.

26. US Census Bureau. Table H-1. Income Limits for Each Fifth and Top 5 Percent (All Races): Table H-1. Income Limits for Each Fifth and Top 5 Percent of All Households: 1967 to 2018. (Households as of March of the following year. Income in current and 2018 CPI-U-RS adjusted dollars (28)). 2019; https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-income-households.html. Accessed January 27, 2020.
27. Lofy K, Davies H, Fotinos C, et al. A targeted approach to blood lead screening in children, Washington State: 2015 expert panel recommendations. 2015; https://assets.documentcloud.org/documents/2644455/Expert-Panel-Childhood-Lead-Screening-Guidelines.pdf. Accessed January 9, 2018.
28. Frostenson S, Kliff S. Lead Exposure Risk data (readme.md). 2016; https://github.com/voxmedia/data-projects/tree/master/vox-lead-exposure-risk. Accessed January 9, 2017.
29. Frostenson S, Kliff S. Added data for vox-lead-exposure-risk-map: Lead Exposure Risk data. 2016; https://github.com/voxmedia/data-projects/commit/f8ed1caa78af3232f18c0fcee23626a822fc2169. Accessed January 9, 2017.
30. Foundation PS. Python Language Reference, version 3.6. In.
31. Jacobs DE, Clickner RP, Zhou JY, et al. The prevalence of lead-based paint hazards in US housing. *Environmental health perspectives.* 2002;110(10):A599.
32. Iceland J. The multigroup entropy index (also known as Theil's H or the Information Theory Index). 2004; https://www.census.gov/hhes/www/housing/resseg/multigroup_entropy.pdf. Accessed January 5, 2018.
33. US Census Bureau. Technical Documentation: Table & Geography Changes: 2013-2017 ACS 5-year Estimates: Modified Tables: Health Insurance. 2018; https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2017/5-year.html. Accessed March 22, 2019.
34. United States Environmental Protection Agency. RSIG-Related Downloadable Data Files: Fused Air Quality Surface Using Downscaling (FAQSD) Files: Downscaling Output files (files compressed in gzip format): 2013 (CONUS): PM 2.5 Daily Average. 2019; https://www.epa.gov/hesc/rsig-related-downloadable-data-files#output. Accessed May 1, 2018.
35. United States Environmental Protection Agency. RSIG-Related Downloadable Data Files: Fused Air Quality Surface Using Downscaling (FAQSD) Files: Downscaling Output files (files compressed in gzip format): 2014 (CONUS): PM 2.5 Daily Average. 2019; https://www.epa.gov/hesc/rsig-related-downloadable-data-files#output. Accessed January 28, 2019.
36. United States Environmental Protection Agency. RSIG-Related Downloadable Data Files: Fused Air Quality Surface Using Downscaling (FAQSD) Files: Downscaling Output files (files compressed in gzip format): 2015 (CONUS): PM 2.5 Daily Average. 2019; https://www.epa.gov/hesc/rsig-related-downloadable-data-files#output. Accessed May 7, 2019.
37. United States Environmental Protection Agency. RSIG-Related Downloadable Data Files: Fused Air Quality Surface Using Downscaling (FAQSD) Files: Downscaling Output files (files compressed in gzip format): 2016 (CONUS): PM 2.5 Daily Average. 2019; https://www.epa.gov/hesc/rsig-related-downloadable-data-files#output. Accessed October 29, 2019.
38. Environmental Protection Agency. Interactive Map of Air Quality Monitors. 2017; https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors#kmz. Accessed May 7, 2018.
39. Flanagan BE, Gregory EW, Hallisey EJ, Heitgerd JL, Lewis B. A social vulnerability index for disaster management. *Journal of homeland security emergency management.* 2011;8(1).
40. Centers for Disease Control and Prevention/ Agency for Toxic Substances and Disease Registry/ Geospatial Research Analysis a, Services Program,. Social Vulnerability Index 2018 Database US. 2018; https://svi.cdc.gov/data-and-tools-download.html. Accessed May 25, 2020.
41. Nayak A, Islam SJ, Mehta A, et al. Impact of Social Vulnerability on COVID-19 Incidence and Outcomes in the United States. 2020.
42. 500 Cities: Local Data for Better Health. Local Data for Better Health, 2019 Release. 2019; https://chronicdata.cdc.gov/500-Cities/500-Cities-Local-Data-for-Better-Health-2019-relea/6vp6-wxuq. Accessed December 9, 2019.
43. PLACES: Local Data for Better Health. Local Data for Better Health, 2020 Tract Release. 2020; https://chronicdata.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2020-/yjkw-uj5s. Accessed December 8, 2020.
44. PLACES: Local Data for Better Health. Local Data for Better Health, 2020 Place Release. 2020; https://chronicdata.cdc.gov/500-Cities-Places/PLACES-Place-Data-GIS-Friendly-Format-2020-release/vgc8-iyc4. Accessed December 8, 2020.
45. PLACES: Local Data for Better Health. Local Data for Better Health, 2020 County Release. 2020; https://chronicdata.cdc.gov/500-Cities-Places/PLACES-County-Data-GIS-Friendly-Format-2020-releas/i46a-9kgh. Accessed December 8, 2020.

46. Surgo Foundation. The COVID-19 Community Vulnerability Index (CCVI). 2020; https://precisionforcovid.org/ccvi. Accessed June 4, 2020.
47. Centers for Disease Control and Prevention/ Agency for Toxic Substances and Disease Registry/ Geospatial Research Analysis and Services Program. CDC SVI 2018 Documentation - 1/31/2020. 2020; https://svi.cdc.gov/Documents/Data/2018_SVI_Data/SVI2018Documentation.pdf. Accessed May 25, 2020.
48. Social Progress Imperative. US Cities Covid-19 Vulnerability Index Methodology. 2020; https://socialprogressdotblog.files.wordpress.com/2020/04/methodology-for-us-cities-covid-19-vulnerability-index-2.pdf. Accessed May 29, 2020.
49. Rozenfeld Y, Beam J, Maier H, et al. A model of disparities: risk factors associated with COVID-19 infection. *Int J Equity Health.* 2020.
50. Petrilli CM, Jones SA, Yang J, et al. Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: prospective cohort study. *BJM.* 2020;369:m1966.
51. van Gerwen M, Alsen M, Little C, et al. Risk factors and outcomes of COVID-19 in New York City; a retrospective cohort study. *J Med Virol.* 2020.
52. Ebinger JE, Achamallah N, Ji H, et al. Pre-existing traits associated with Covid-19 illness severity. *PLOS ONE.* 2020;15(7):e0236240.
53. Azar KMJ, Shen Z, Romanelli RJ, et al. Disparities In Outcomes Among COVID-19 Patients In A Large Health Care System In California. *Health Aff (Millwood).* 2020.
54. Gottlieb M, Sansom S, Frankenberger C, Ward E, Hota B. Clinical Course and Factors Associated with Hospitalization and Critical Illness Among COVID-19 Patients in Chicago, Illinois. *Acad Emerg Med.* 2020.
55. Kim L, Garg S, O'Halloran A, et al. Risk Factors for Intensive Care Unit Admission and In-hospital Mortality Among Hospitalized Adults Identified through the US Coronavirus Disease 2019 (COVID-19)-Associated Hospitalization Surveillance Network (COVID-NET). *Clinical Infectious Diseases.* 2020.
56. Hirsch JS, Ng JH, Ross DW, et al. Acute kidney injury in patients hospitalized with COVID-19. *Kidney International.* 2020;98(1):209-218.
57. Williamson EJ, Walker AJ, Bhaskaran K, et al. Factors associated with COVID-19-related death using OpenSAFELY. *Nature.* 2020;584(7821):430-436.
58. Cummings MJ, Baldwin MR, Abrams D, et al. Epidemiology, clinical course, and outcomes of critically ill adults with COVID-19 in New York City: a prospective cohort study. *Lancet.* 2020.
59. Gupta S, Hayek SS, Wang W, et al. Factors Associated With Death in Critically Ill Patients With Coronavirus Disease 2019 in the US. *JAMA Intern Med.* 2020.
60. Inc SI. PROC RANK. 1999; https://v8doc.sas.com/sashtml/proc/z0146840.htm. Accessed May 25, 2020.
61. US Department of Education. Civil Rights Data Collection (CRDC) for the 2015-16 School Year. *Access 2015-16 CRDC Data* https://www2.ed.gov/about/offices/list/ocr/docs/crdc-2015-16.html. Accessed October 1, 2018.
62. US Census Bureau. CPS Methodology. 2020; https://www.census.gov/programs-surveys/cps/technical-documentation/methodology.html, 2020.
63. U.S. Bureau of Labor Statistics. Overview: Local Area Unempoyment Statistics. 2020; https://www.bls.gov/lau/lauov.htm. Accessed 9/30/20.
64. U.S. Bureau of Labor Statistics. Local Area Unemployment Statistics: Estimation Methodology. 2020; https://www.bls.gov/lau/laumthd.htm. Accessed May 20, 2021.
65. U.S. Bureau of Labor Statistics. Download City LAUS Time Series Data. 2020; https://download.bls.gov/pub/time.series/la/la.data.65.City. Accessed 9/30/20.
66. U.S. Bureau of Labor Statistics. Series ID Formats: Local Area Unemployment Statistics. 2020; https://www.bls.gov/help/hlpforma.htm#LA. Accessed 9/30/20.
67. U.S. Bureau of Labor Statistics. Download LAUS Time Series Area Codes. 2020; https://download.bls.gov/pub/time.series/la/la.area. Accessed 9/30/20.
68. US Census Bureau. Population and Housing Unit Estimates: Terms and Definitions. 2020; https://www.census.gov/programs-surveys/popest/guidance-geographies/terms-and-definitions.html. Accessed April 17, 2020.
69. National Association for Public Health Statistics and Information Systems. NAPHSIS Research Requests. 2018; https://www.naphsis.org/research-requests. Accessed January 30, 2018.
70. State of New Jersey Department of Health. New Jersey State Health Assessment Data (NJSHAD). 2019; https://www-doh.state.nj.us/doh-shad/home/Welcome.html. Accessed December 6-16, 2019.
71. Klein R, Schoenbon C. Age adjustment using the 2000 projected US population. 2007; https://www.cdc.gov/nchs/data/statnt/statnt20.pdf.
72. Dranger E, Remington P. YPLL: A summary measure of premature mortality used in measuring the health of communities 2004; https://uwphi.pophealth.wisc.edu/publications/issue-briefs/issueBriefv05n07.pdf.
73. Lilienfeld D, Stolley P. *Foundations of Epidemiology.* 3rd ed. New York: Oxford University Press; 1994.
74. Office of Public Health Assessment. Confidence intervals in public health. http://health.utah.gov/opha/IBIShelp/ConfInts.pdf. Accessed January 9, 2018.

75. Vohlonen I, Bäckmand H, Korhonen J. Potential years of life lost: The PYLL rate in monitoring the wellbeing of a population. 2007; http://www.ndphs.org/documents/2662/Vohlonen%20Ilkka%20PYLL_article_2007.pdf.
76. National Association for Public Health Statistics and Information Systems. Age-adjusted death rate. https://naphsis-web.sharepoint.com/about/Documents/Mortality_AgeAdj_Final_Lois.pdf. Accessed January 9, 2018.
77. National Cancer Institute SEER Program. SEER Program Coding Guidelines: Breast C500-C509. 2016; https://seer.cancer.gov/manuals/2016/AppendixC/Coding_Guidelines_Breast_2016.pdf. Accessed January 22, 2018.
78. Nolte E, McKee M. *Does health care save lives? Avoidable mortality revisited.* The Nuffield Trust; 2004.
79. Siegel RL, Miller KD, Fedewa SA, et al. Colorectal cancer statistics, 2017. *CA: a cancer journal for clinicians.* 2017;67(3):177-193.
80. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Guide to ICD-9-CM and ICD-10 codes related to poisoning and pain. 2013; https://www.cdc.gov/drugoverdose/pdf/pdo_guide_to_icd-9-cm_and_icd-10_codes-a.pdf. Accessed January 22, 2018.
81. Henry J Kaiser Family Foundation. Opioid Overdose Death Rates and All Drug Overdose Death Rates per 100,000 Population (Age-Adjusted). 2018; https://www.kff.org/other/state-indicator/opioid-overdose-death-rates/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D. Accessed May 5, 2018.
82. Kotelchuck M. An evaluation of the Kessner Adequacy of Prenatal Care Index and a proposed Adequacy of Prenatal Care Utilization Index. *Am J Public Health.* 1994;84(9):1414-1420.
83. Centers for Disease Control and Prevention. User guide to the 2015 natality public use file. 2015; ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2015.pdf. Accessed December 7, 2018.
84. Centers for Disease Control and Prevention. User guide to the 2014 natality public use file. 2014; ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2014.pdf. Accessed January 22, 2018.
85. Centers for Disease Control and Prevention. User guide to the 2012 natality public use file. 2012; ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2012.pdf. Accessed August 22, 2019.
86. Centers for Disease Control and Prevention. User guide to the 2013 natality public use file. 2013; ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2013.pdf. Accessed August 22, 2019.
87. Centers for Disease Control and Prevention. User guide to the 2016 natality public use file. 2016; ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2016.pdf. Accessed August 22, 2019.
88. Centers for Disease Control and Prevention. User guide to the 2017 natality public use file. 2017; ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2017.pdf. Accessed August 22, 2019.
89. The Trust for Public Land. ParkServe® Data Downloads: Complete U.S. ParkServe® Dataset: Shapefile (ParkServe_shp_DataShare_05152019.zip). 2018; https://parkserve.tpl.org/downloads/. Accessed August 14, 2019.
90. Esri. 2013/2018 Block Group Demographic Estimates. 2019; https://hub.arcgis.com/datasets/96b3065efca0439a869410ca1829b6f8?layer=5. Accessed November 19, 2019.
91. Centers for Disease Control and Prevention. About the Project - 500 Cities: Local Data for Better Health. 2018; https://www.cdc.gov/500cities/about.htm. Accessed April 10, 2018.
92. Zhang X, Holt JB, Lu H, et al. Multilevel regression and poststratification for small-area estimation of population health outcomes: a case study of chronic obstructive pulmonary disease prevalence using the behavioral risk factor surveillance system. *American journal of epidemiology.* 2014;179(8):1025-1033.
93. PLACES: Local Data for Better Health. Health outcomes. 2020; https://www.cdc.gov/places/measure-definitions/health-outcomes/index.html. Accessed December 8, 2020.
94. PLACES: Local Data for Better Health. Unhealthy behaviors. 2020; https://www.cdc.gov/places/measure-definitions/unhealthy-behaviors/index.html. Accessed December 8, 2020.
95. PLACES: Local Data for Better Health. Prevention. 2020; https://www.cdc.gov/places/measure-definitions/prevention/index.html. Accessed December 8, 2020.
96. 500 Cities: Local Data for Better Health. Local Data for Better Health, 2016 Release. 2018; https://chronicdata.cdc.gov/500-Cities-Places/500-Cities-Local-Data-for-Better-Health-2016-relea/9z78-nsfp. Accessed May 6, 2019.
97. 500 Cities: Local Data for Better Health. Local Data for Better Health, 2018 Release. 2018; https://chronicdata.cdc.gov/500-Cities-Places/500-Cities-Local-Data-for-Better-Health-2018-relea/rja3-32tc. Accessed December 4, 2018.

98. PLACES: Local Data for Better Health, Wang Y, Lu H. Personal Email Correspondence: PLACES Release Questions. In: City Health Dashboard Analysts, ed2020.
99. Arias E, Escobedo LA, Kennedy J, Fu C, Cisewski JA. US small-area life expectancy estimates project: methodology and results summary. 2018.
100. Dyer L. Pooled Standard Error versus the Satterthwaite Approximation. 2018; https://wolfweb.unr.edu/~ldyer/classes/396/PSE.pdf. Accessed October 18, 2018.
101. National Center for Health Statistics. U.S. Small-Area Life Expectancy Estimates Project - USALEEP: Life Expectancy Estimates File for United States, 2010-2015. 2020; https://www.cdc.gov/nchs/nvss/usaleep/usaleep.html. Accessed April 8, 2020.
102. National Center for Health Statistics. U.S. Small-Area Life Expectancy Estimates Project - USALEEP: Life Expectancy Estimates File for Maine, 2010-2015. 2020; https://www.cdc.gov/nchs/nvss/usaleep/usaleep.html. Accessed April 8, 2020.
103. National Center for Health Statistics. U.S. Small-Area Life Expectancy Estimates Project - USALEEP: Life Expectancy Estimates File for Wisconsin, 2010-2015. 2020; https://www.cdc.gov/nchs/nvss/usaleep/usaleep.html. Accessed April 8, 2020.
104. Centers for Disease Control and Prevention/City Health Dashboard Anaytic Staff. Personal email communication (April 9, 2020). In:2020.
105. Federal Bureau of Investigations. Offenses known to law enforcement by state by city, 2016. 2016; https://ucr.fbi.gov/crime-in-the-u.s/2016/crime-in-the-u.s.-2016/tables/table-6/table-6.xls/view. Accessed October 20, 2017.
106. Federal Bureau of Investigations. Offenses known to law enforcement by state by city, 2017. 2017; https://ucr.fbi.gov/crime-in-the-u.s/2017/crime-in-the-u.s.-2017/tables/table-8/table-8.xls/view. Accessed October 26, 2018.
107. Federal Bureau of Investigations. Offenses known to law enforcement by state by city, 2018. 2018; https://ucr.fbi.gov/crime-in-the-u.s/2018/crime-in-the-u.s.-2018/tables/table-8/table-8.xls/view. Accessed October 9, 2019.
108. Federal Bureau of Investigations. Offenses known to law enforcement by state by city, 2019. 2019; https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/topic-pages/tables/table-8/table-8.xls/view. Accessed May 18, 2021.
109. United States Department of Agriculture Economic Research Service. Food Access Research Atlas Documentation. 2017; https://www.ers.usda.gov/data-products/food-access-research-atlas/documentation/. Accessed February 28, 2019.
110. United States Department of Agriculture Economic Research Service. Download the Data: Food Access Research Atlas Data Download 2015. 2017; https://www.ers.usda.gov/data-products/food-access-research-atlas/download-the-data/. Accessed May 1, 2018.
111. Walk Score®. How Walk Score Works. 2019; https://www.walkscore.com/how-it-works/. Accessed December 24, 2019.
112. Walk Score®. Walk Score Methodology. 2019; https://www.walkscore.com/methodology.shtml. Accessed December 24, 2019.
113. Redfin Real Estate. Redfin. 2020; https://www.redfin.com/.
114. CDC/National Center for Health Statistics. Bridged-Race Population Estimates - Data Files and Documentation: Vintage 2016 Bridged-Race Postcensal Population Estimates for 2014 (pcen_v2016_y14.sas7bdat). 2017; https://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2016. Accessed June 14, 2017.
115. CDC/National Center for Health Statistics. Bridged-Race Population Estimates - Data Files and Documentation: Vintage 2016 Bridged-Race Postcensal Population Estimates for 2015 (pcen_v2016_y15.sas7bdat). 2017; https://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2016. Accessed September 3, 2018.
116. U.S. Department of Education. Developing Programs for English Language Learners: Glossary. 2019; https://www2.ed.gov/about/offices/list/ocr/ell/glossary.html. Accessed May 14, 2019.
117. U.S. Department of Education. Definitions. 2018; https://www.ed.gov/race-top/district-competition/definitions. Accessed March, 2018.
118. National Center for Education Statistics. CCD School and District Glossary. 2018; https://nces.ed.gov/ccd/commonfiles/glossary.asp. Accessed March, 2018.
119. US Census Bureau. Geographic Terms and Concepts – Census Tract. 2018; https://www.census.gov/geo/reference/gtc/gtc_ct.html. Accessed January 24, 2018.
120. Bivand R, Keitt T, Rowlingson B. rgdal: Bindings for the Geospatial Data Abstraction Library (R package version 1.2-8). 2017; https://CRAN.R-project.org/package=rgdal.

121. US Census Bureau. Gazetteer Files: 2017: Places: Download the National Places Gazetteer Files. 2017; https://www.census.gov/geographies/reference-files/time-series/geo/gazetteer-files.2017.html. Accessed December 24, 2019.
122. National Historical Geographic Information System. Download U.S. census data tables & mapping files. https://data2.nhgis.org/main. Accessed November 4, 2019.
123. *ArcGIS Desktop: Release 10.4.1* [computer program]. Redlands, CA: Environmental Systems Research Institute,; 2016.
124. National Center for Education Statistics Public Elementary/Secondary School Universe Survey Data. Directory (v.1a). 2015-16; https://nces.ed.gov/ccd/pubschuniv.asp. Accessed February, 2018.
125. National Center for Education Statistics Public Elementary/Secondary School Universe Survey Data. Preliminary directory. 2016-17; https://nces.ed.gov/ccd/pubschuniv.asp. Accessed February, 2018.
126. National Center for Education Statistics Education Demographic and Geographic Estimates. Public Schools & School Districts: School Data. 2015-16; https://nces.ed.gov/programs/edge/Geographic/SchoolLocations. Accessed February, 2018.
127. National Center for Education Statistics Elementary/Secondary Information System (ElSi). tableGenerator. 2015-16; https://nces.ed.gov/ccd/elsi/. Accessed February, 2018.
128. 500 Cities: Local Data for Better Health. 500 Cities: Local Data for Better Health Census Tract Boundaries (Last Update Date: December 4, 2017). 2017; https://chronicdata.cdc.gov/500-Cities/500-Cities-City-Boundaries/n44h-hy2j. Accessed December 4, 2017.

SECTION 7: Appendices

Appendix A: Table of US 2010 Standardized Population

Refer to NVSS: Weights (MCDD) and Premature deaths (all causes): Notes on analysis above for detail on how these weights were calculated.

Table of US 2010 Standardized Population

Age Group	Number	Weight	Weight for YPLL Age-adjustment	Premature Deaths Weight (Years of Life Lost)
Total	308745538			
< 5 years	20201362	0.0654	0.0696	72.5
5 to 9 years	20348657	0.0659	0.0701	67.5
10 to 14 years	20677194	0.0670	0.0713	62.5
15 to 19 years	22040343	0.0714	0.0760	57.5
20 to 24 years	21585999	0.0699	0.0744	52.5
25 to 29 years	21101849	0.0683	0.0727	47.5
30 to 34 years	19962099	0.0647	0.0688	42.5
35 to 44 years	41070606	0.1330	0.1415	35
45 to 54 years	45006716	0.1458	0.1551	25
55 to 64 years	36482729	0.1182	0.1257	15
65 to 74 years	21713429	0.0703	0.0748	5
75 to 84 years	13061122	0.0423	0	0
85 years and over	5493433	0.0178	0	0

Appendix B: Summary of Dataset of Origin, Censorship Rules, Estimate Provenance and Date of Download (metrics only)

NOTE: Symbol key on next page

Metric *Summary applies to city and tract analyses except where otherwise noted*	**Dataset of origin**	**Censorship**		**Estimate Provenance**	**Date of Data Access***
		Internal Dashboard Guidelines	NVSS Guideline (as per DUA)‡	*Estimates posted on the Dashboard as received from source or calculated by the Dashboard's staff*	
		Censor where denominator <50	Censor where numerator <10		
Absenteeism	National Center for Education Statistics (NCES) Civil Rights Survey	No	No	Calculated by the Dashboard	8/7/2018
Air pollution - particulate matter	CMAQ, US EPA	no	no	Calculated by the Dashboard	2013: 5/1/18 2014: 1/28/19 2015: 5/7/19 2016: 10/29/19 2017: 3/19/21
Binge drinking	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	2016 release: 4.18.19; 2017, 2018 release: 12/4/18; 2019 release: 12/4/19; 2020 release: 12/8/20
Breast cancer deaths	MCDD, NVSS	yes	yes	Calculated by the Dashboard	6/2019
Broadband connection	ACS**	no	no	Calculated by the Dashboard	2017-2019: 4/22/21
Cardiovascular disease deaths	MCDD, NVSS	yes	yes	Calculated by the Dashboard	6/2019
Children in poverty	ACS	no	no	Calculated by the Dashboard	2013, 14, 15: 11/20/2017 2016: 1/18/18 2017: 12/12/19 2018: 1/29/20 2019: 12/15/20
Colorectal cancer deaths	MCDD, NVSS	yes	yes	Calculated by the Dashboard	6/2019
COVID Local Risk Index	ACS BRFSS-PLACES CDC Social Vulnerability Index	no	no	Calculated by the Dashboard	5/29/20; 12/8/20; 5/29/20
Dental care	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	2016 release: 4/18/19; 2017, 2018 release: 12/4/18; 2019 release: 12/4/19; 2020 release: 12/8/20
Diabetes	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	
High blood pressure	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	
High school completion	ACS	No	No	Calculated by the Dashboard	2013, 14, 15, 16, 17, 18: 6/8/2020 2019: 12/15/20
Housing cost, excessive	ACS**	no	no	Calculated by the Dashboard	2013, 14, 15 : 10/30/17 2016: 1/24/18 2017: 12/12/19 2018: 1/29/20; 2019: 12/15/20
Frequent mental distress	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	2016 release: 4/18/19; 2017, 2018 release: 12/4/18; 2019 release: 12/4/19; 2020 release: 12/8/20
Frequent physical distress	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	
Income inequality	ACS**	no	no	Calculated by the Dashboard	2013, 14, 15 : 12/7/17 2016: 1/25/18 2017: 12/12/18 2018: 1/29/20 2019: 12/15/20
Lead exposure risk index	ACS**	no	no	Calculated by the Dashboard	2013, 14, 15 : 11/13/17 2016: 1/25/18 2017: 12/12/18 2018: 1/29/20 2019: 12/15/20
Housing with potential lead risk	ACS**	no	no	Calculated by the Dashboard	
Life expectancy	USALEEP	no	no	Tract: Posted as received City: Calculated by the Dashboard	4/8/20
Limited access to healthy foods	USDA	yes	no	Calculated by the Dashboard	2/23/18
Neighborhood racial/ethnic segregation	ACS**	no	no	Calculated by the Dashboard	2013, 14, 15 : 2/11/19 2016: 1/18/18 2017: 12/12/18 2018: 1/29/20 2019: 12/15/20
Low birthweight	ND, NVSS	yes	yes	Calculated by the Dashboard	6/2019

Obesity	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	2016 release: 4/18/19; 2017, 2018 release: 12/4/18; 2019 release: 12/4/19; 2020 release: 12/8/20
Opioid overdose deaths	MCDD, NVSS	yes	yes	Calculated by the Dashboard	6/2019
Park access	ParkServe	no	no	City: Posted as received from ParkServe ® Tract: Calculated by the Dashboard	City: 10/14/2019; Tract: 8/14/2019
Physical inactivity	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	2016 release: 4.18.19; 2017, 2018 release: 12/4/18; 2019 release: 12/4/19; 2020 release: 12/8/20
Premature deaths (all causes)	MCDD, NVSS	yes	yes	Calculated by the Dashboard	6/2019
Prenatal care†††	ND, NVSS	yes	yes	Calculated by the Dashboard	
Preventive services, 65+	BRFSS-CDC500, PLACES	no	no	Total population: Calculated by the Dashboard Male/Female: Posted as received from CDC	2016 release: 4.18.19; 2017, 2018 release: 12/4/18; 2019 release: 12/4/19; 2020 release: 12/8/20
Racial/ethnic diversity	ACS**	no	no	Calculated by the Dashboard	2013, 14, 15 : 2.11.19 2016: 1/18/18 2017: 12/12/18 2018: 1/29/20 2019: 12/15/20
Smoking	BRFSS-CDC500, PLACES	no	no	Posted as received from CDC	2016 release: 4.18.19; 2017, 2018 release: 12/4/18; 2019 release: 12/4/19
Teen births	ND, NVSS	yes	yes	Calculated by the Dashboard	6/2019
Third-grade reading proficiency	State-based education data	No	No	Calculated by the Dashboard	Varies. See Appendix J.
Unemployment – annual, city-level (City analysis)	ACS**	no	no	Posted as received***	2013, 14, 15: 11/16/17 2016: 1.26.18 2017: 12/12/19 2018: 1/29/20 2019: 12/15/20
Unemployment – annual, city-level (Tract analysis)	ACS**	no	no	Calculated by the Dashboard	2013, 14, 15: 11/20/17 2016: 1/24/18 2017: 12/12/19 2018: 1/29/20 2019: 12/15/20
Unemployment – current, city-level	LAUS, U.S. Bureau of Labor Statistics	no	no	Posted as received	Downloaded monthly. Through Jan 2021: 4/16/21
Uninsured	ACS**	no	no	Calculated by the Dashboard	2013, 14, 15: 2/19; 2016: 8/18 (B27001), 1/18 (S2701, C27001x); 2017: 12/18 2018: 1/29/20 2019: 12/15/20
Violent crime	FBI Uniform Crime Reporting	yes	no	Calculated by the Dashboard	2016, 17: 10/5/18; 2018: 10/9/19; 2019: 3/8/21
Walkability	Walk Score	no	no	Posted as received from Walk Score ®	3/6/2020

Symbol KEY

[*] Datasets are sometimes updated after the initial release if the administrator identifies an error. This column records the date of dataset download to indicate to users which version of the underlying dataset informs our analyses.

[‡] NVSS Data Use Agreement censorship guidelines require censorship of values with numerator less than 10

[§] Data are posted as received from CDC; no analysis applied by the Dashboard

[***] With exception of weighted averages for Asian and Other (see section on Unemployment above)

[†††] If prenatal care information is missing for 10% or more of a given city, all prenatal care values for that city are censored.

[**] As noted in "American Community Survey: ACS: Calculating MOEs for aggregate count data and derived proportions" above, estimates with particularly large margins of error sometimes resulted in an incalculable value of $\sqrt{MOE_{numerator}^2 - (\hat{p}^2 * MOE_{denominator}^2}$) because $MOE_{numerator}^2 - \left(\hat{p}^2 * MOE_{denominator}^2\right)$ resulted in a negative value. In these cases, confidence intervals could not be calculated and associated estimates were censored on the Dashboard. No other censoring of ACS data was performed.

Appendix C: Glossary of Terms and Abbreviations

Definitions are presented here verbatim from their source.

ACS American Community Survey v
AMA American Medical Association
BLS U.S. Bureau of Labor Statistics
BRFSS Behavioral Risk Factor Surveillance System
BRFSS-CDC500 Behavioral Risk Factor Surveillance System (BRFSS) data, reported by 500 Cities Project, Centers for Disease Control
CDC-500 500 Cities Project, Centers for Disease Control
CDC Centers for Disease Control
CI Confidence Interval
CIs Confidence intervals
CRDC Civil Rights Data Collection
EDFacts U.S. Department of Education EDFacts
EL English Learners
ELL English Language Learners
FBI Federal Bureau of Investigation
FIPS Federal Information Processing Standards
ICD-10 International Statistical Classification of Diseases and Related Health Problems, 10th Revision
LAUS Local Area Unemployment Statistics
LEA Local Education Agency
LEP Limited English Proficiency
Limited English Proficiency: An English language learner. A national-origin-minority student who is limited-English-proficient. Also referred to as ELL or EL.[116]
Local education agency: As defined in ESEA, a public board of education or other public authority legally constituted within a State for either administrative control or direction of, or to perform a service function for, public elementary schools or secondary schools in a city, county, township, school district, or other political subdivision of a State, or for a combination of school districts or counties that is recognized in a State as an administrative agency for its public elementary schools or secondary schools.[117]
Macro: a code for performing a specific task. In the case of the Dashboard, a macro is used to import different state-based education data files in SAS to create a unified dataset.
MCDD Multiple Cause of Death Data, National Vital Statistics System
NAEP National Assessment of Educational Progress
NCES National Center for Education Statistics
NCES EDGE National Center for Education Statistics Education Demographic and Geographic Estimates
NCES ELSI National Center for Education Statistics Elementary and Secondary Information System
NCES School District ID: The 7 digit school identification number. The first 2 digits of the 7 digit school district ID identify the state and the last 5 identify the district ID. Put together, they make a 7 digit unique ID code for each school district.[118]
NCES School ID: The 5 digit school identification number. When combined with the NCES School District ID, the two codes comprise a unique 12 digit code for each school. The first 7 digits of the 12 digit school ID are the district ID, and the last five are the school ID.[118]
NCHS National Center for Health Statistics
ND Natality Data, National Vital Statistics System
NJSHAD New Jersey State Health Assessment Data
NVSS National Vital Statistics System
PLACES PLACES Project, Centers for Disease Control and Prevention
Regular Schools: A public elementary/secondary school providing instruction and education services that does not focus primarily on special education, vocational/technical education, or alternative education, or on any of the particular themes associated with magnet/special program emphasis schools.[118]
RSE Relative Standard Error
SE Standard Error

Special Education Schools: A public elementary/secondary school that focuses primarily on special education—including instruction for any of the following students with: autism, deaf-blindness, developmental delay, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, serious emotional disturbance, specific learning disability, speech or language impairment, traumatic brain injury, visual impairment, and other health impairments—and that adapts curriculum, materials, or instruction for students served.[118]
SVI Social Vulnerability Index
UCR Uniform Crime Reporting
Vocational Schools: A public elementary/secondary school that focuses primarily on providing formal preparation for semiskilled, skilled, technical, or professional occupations for high school-age students who have opted to develop or expand their employment opportunities, often in lieu of preparing for college entry.[118]

Appendix D: Detailed Notes on Selection of City and Tract FIPS Codes

Notes on Selection of City and Tract FIPS Codes

Census tracts are subdivisions of county or equivalent entity with population size between 1200 and 8000 people. Census tract boundaries are defined to be maintained over time to facilitate statistical comparisons from census to census. Census tracts may be split because of population growth or merged because population decline at each decennial census. Census tracts are labelled with an integer basic tract number of maximum four digits and an optional two-digit suffix. Hence, census tract codes consist of six digits, with leading zeroes for basic tract number and trailing zeroes for suffix.[119] State FIPS are 2 digits, county FIPS are 3 digits, place FIPS are 5 digits, and tract codes are 6 digits.

500 Cities
The 500 Cities: Census Tract Boundaries file (500Cities_Tracts_11082016.zip) was downloaded from the 500 Cities Data Portal.[7] The shapefile in the .zip file, 500Cities_Tracts_Clip.shp, was imported into R version 3.4.16 with the rgdal package.[120] The field (variable) names were modified; refer to table below:

Original Variable Names	New Variable Names	Description
place2010	PLACE_FIPS	Place FIPS
tract2010	STCOTR_FIPS	Concatenation of State FIPS, County FIPS, and Tract FIPS
ST	STATE_FIPS	State FIPS
PlaceName	CITY_NAME	Place Name
PlcTrPop10		Tract Population

STCOTR_FIPS (formerly tract2010) is a character string comprised of state FIPS, county FIPS, and tract FIPS; substrings were extracted from this string to create two new variables, COUNTY_FIPS and TRACT_FIPS.
- COUNTY_FIPS is a substring of STCOTR_FIPS, start position 3 to end position 5.
- TRACT_FIPS is a substring of STCOTR_FIPS, start position 6 to end position 11.

County names, COUNTY_NAME, and state abbreviations, STATE, were appended by joining the “2010 FIPS Codes for Counties and County Equivalent Entities” text file by state FIPS and county FIPS.8 State names, STATE_NAME, were appended by joining the “National FIPS and GNIS Codes File” by state FIPS.9

Notable changes to geography: As of 2012, there was a change in the numbering of census tracts in Pima County, Tucson, Arizona.10 The CDC 500 Cities data reflects these changes.

10 New Jersey Cities
2017 Census Place Gazetteer File was downloaded[121] and merged with the list of new cities to select place FIPS variables.

Census Block total population counts from the 2010 Decennial Census (table SF1, variable P001001) were downloaded for the entire country from IPUMS NGHIS.[122] This file was merged with place FIPS to keep only blocks contained within places. Any tract that had at least one block within place boundaries was kept and assigned to that place. Therefore, tracts can be in multiple cities. Tracts beginning with 99xxxx were removed because these have 0 population and are over water.

Appendix E: Summary of Geographies Reported for Honolulu, HI and Macon, GA (by Metric)

Metric	Dataset of origin	Macon, GA: Geography of Reported Value	Honolulu, HI: Geography of Reported Value
Broadband connection	ACS	2017 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Children in poverty	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
High school completion	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Housing cost, excessive	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Income inequality	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Lead exposure risk index	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Housing with potential lead risk	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008))	Honolulu County (FIPS 15-003)
Neighborhood racial/ethnic segregation	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008))	Honolulu County (FIPS 15-003)
Racial/ethnic diversity	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Unemployment – annual, neighborhood-level	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Uninsured	ACS	2013: Macon city, Georgia (FIPS 13-49000; 2014-2017: Bibb County (FIPS 13-021) 2018 - : Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Unemployment – current, city-level	LAUS, BLS	Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Air pollution - particulate matter	CMAQ, EPA	Macon city (FIPS 13-49000)	n/a
Binge drinking	BRFSS-CDC500, PLACES	2014-2017: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Dental care	BRFSS-CDC500, PLACES	2014-2016: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Diabetes	BRFSS-CDC500, PLACES	2014-2017: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
High blood pressure	BRFSS-CDC500, PLACES	2013-2015: Macon city (FIPS 13-49000) 2017: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Frequent mental distress	BRFSS-CDC500, PLACES	2014-2017: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Frequent physical distress	BRFSS-CDC500, PLACES	2014-2017: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Obesity	BRFSS-CDC500, PLACES	2014-2017: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Physical inactivity	BRFSS-CDC500, PLACES	2014-2017: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Preventive services, 65+	BRFSS-CDC500, PLACES	2014-2016: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Smoking	BRFSS-CDC500, PLACES	2014-2017: Macon city (FIPS 13-49000) 2018: Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Violent crime	FBI UCR	Macon city (FIPS 13-49000)	Honolulu County (FIPS 15-003)
COVID Local Risk Index	*Multiple*	Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)
Breast cancer deaths	MCDD, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)
Cardiovascular disease deaths	MCDD, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)
Colorectal cancer deaths	MCDD, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)
Opioid overdose deaths	MCDD, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)
Premature deaths (all causes)	MCDD, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)
Absenteeism	NCES CRDC	Macon (FIPS 13-49000)	Honolulu County (FIPS 15-003)
Low birthweight	ND, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)
Prenatal care	ND, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)
Teen births	ND, NVSS	Macon (city) and Bibb county - see county_indicator variable	Honolulu County (FIPS 15-003)

Metric	Dataset of origin	Macon, GA: Geography of Reported Value	Honolulu, HI: Geography of Reported Value
Park access	ParkServe®	Macon-Bibb County (FIPS 13-49008)	Urban Honolulu CDP (FIPS 15-71550)
Third-grade reading proficiency	State-based	Macon (FIPS 13-49000)	Honolulu County (FIPS 15-003)
Life expectancy	USALEEP, NCHS	Macon city (FIPS 13-49000)	Honolulu County (FIPS 15-003)
Limited access to healthy foods	USDA	Macon city (FIPS 13-49000)	Honolulu County (FIPS 15-003)
Walkability	Walk Score®	Macon city (FIPS 13-49000)	Urban Honolulu CDP (FIPS 15-71550)
Demographic information (non-metric) - All Metrics View > More about…	ACS	Macon-Bibb County (FIPS 13-49008)	Honolulu County (FIPS 15-003)

Note: 13 is the state FIPS for Georgia; 15 is the state FIPS for Hawaii

Appendix F: Summary of Definition of Hispanic, NHOPI and Other Race for Metrics with Demographic-Specific Values (by Metric)

Metric	Data Source	Hispanic ethnicity is mutually exclusive with racial groups	Definition of Native Hawaiian/ Pacific Islander*	Definition of "Other"	Metric value is available for specific racial/ethnic groups
Absenteeism	Civil Rights Data Collection	No†	Native Hawaiian or other Pacific Islander†	American Indian or Alaska Native; Two or more races†	Yes
Broadband connection	American Community Survey (ACS)	n/a	n/a	n/a	no
Breast cancer deaths	Multiple Cause of Death Data, National Vital Statistics System (NVSS), National Center for Health Statistics (NCHS)	Yes	Pacific Islander	n/a	Yes
Cardiovascular disease deaths	Multiple Cause of Death Data, NVSS, NCHS	Yes	Pacific Islander	n/a	Yes
Children in poverty	ACS	No	Native Hawaiian and Pacific Islander	American Indian or Alaska Native; Two or more races; Some other race	Yes
Colorectal cancer deaths	Multiple Cause of Death Data, NVSS, NCHS	Yes	Pacific Islander	n/a	Yes
COVID Local Risk Index	ACS; PLACES Project, CDC; Social Vulnerability Index, CDC	n/a	n/a	n/a	No
High school completion	ACS	No	Native Hawaiian and Pacific Islander	American Indian or Alaska Native; Two or more races; Some other race	Yes
Limited access to healthy foods	Food Access Research Atlas, Economic Research Service, United States Department of Agriculture	No	Native Hawaiian or Other Pacific Islander		Yes
Low birthweight	Natality Data, NVSS, NCHS	Yes	Pacific Islander	n/a	Yes
Opioid overdose deaths	Multiple Cause of Death Data, NVSS, NCHS	n/a	n/a	n/a	No
Premature deaths (all causes)	Multiple Cause of Death Data, NVSS, NCHS	Yes	Pacific Islander	n/a	Yes
Prenatal care	Natality Data, NVSS, NCHS	Yes	Pacific Islander	n/a	Yes
Teen births	Natality Data, NVSS, NCHS	Yes	Pacific Islander	n/a	Yes
Unemployment – annual, neighborhood-level	ACS	No	Native Hawaiian and Pacific Islander	American Indian or Alaska Native; Two or more races; Some other race	Yes
Unemployment – current, city-level	Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics	n/a	n/a	n/a	No
Air pollution - particulate matter	Community Multiscale Air Quality model, US Environmental Protection Agency	n/a	n/a	n/a	No
Binge drinking	500 Cities Project, PLACES Project, Centers for Disease Control and Prevention	n/a	n/a	n/a	No
Dental care	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Diabetes	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Frequent mental distress	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Frequent physical distress	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No

Metric	Data Source	Hispanic ethnicity is mutually exclusive with racial groups	Definition of Asian/Pacific Islander	Definition of "Other"	Metric value is available for specific racial/ethnic groups
High blood pressure	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Housing cost, excessive	ACS	n/a	n/a	n/a	No
Income inequality	ACS	n/a	n/a	n/a	No
Lead exposure risk index	ACS	n/a	n/a	n/a	No
Housing with potential lead risk	ACS	n/a	n/a	n/a	No
Life expectancy	USALEEP	n/a	n/a	n/a	No
Neighborhood racial/ethnic segregation	ACS	Yes – see Technical Document	Native Hawaiian and Pacific Islander	American Indian or Alaska Native; Two or more races; Some other race	No
Obesity	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Park access	ParkServe®	No	Native Hawaiian and Pacific Islander	American Indian or Alaska Native; Two or more races; Some other race	Yes
Physical inactivity	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Preventive services, 65+	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Racial/ethnic diversity	ACS	Yes – see Technical Document	Native Hawaiian and Pacific Islander	American Indian or Alaska Native; Two or more races; Some other race	No
Smoking	500 Cities Project, PLACES Project, CDC	n/a	n/a	n/a	No
Third-grade reading proficiency	State-based	n/a	n/a	n/a	No
Uninsured	ACS	n/a	n/a	n/a	No
Violent crime	Uniform Crime Reporting, Federal Bureau of Investigation	n/a	n/a	n/a	No
Walkability	Walk Score®	n/a	n/a	n/a	No

*Native Hawaiian/Pacific Islander is combined with Asian on the Demographic Detail display on the website

†Civil Rights Data Collection. Survey Forms: 2013-14 CRDC School Form (downloadable MS Word Document) - see table headers on page 10. Available at: https://www2.ed.gov/about/offices/list/ocr/data.html. Accessed April 26, 2018

Appendix G: Summary of State-Based Vital Statistics Data Sources

New Jersey State Health Assessment Data (NJSHAD)

General notes

To provide vital statistics estimates for a subset of New Jersey cities (Burlington, Clayton, Egg Harbor City, Glassboro, Hammonton, Lawnside, Millville, Penns Grove, Pleasantville, Salem), the Dashboard uses data from New Jersey State Health Assessment Data (NJSHAD),[70] a public health data source managed by the New Jersey Department of Health.

Data were accessed and analyzed using procedures identical to those in NCHS/RDC analyses of NVSS data, as defined above in Section 3.

As per private correspondence with NJSHAD staff, analyses by Dashboard analytic staff, and consultation with an NYU School of Medicine faculty expert in vital statistics, estimates from these data sources are valid for comparison with NCHS/RDC NVSS data presented on the Dashboard. To establish comparability between NJSHAD and RDC/NCHS data, Dashboard staff compared estimates for New Jersey cities already on the Dashboard generated from NJSHAD data with estimates generated at RDC/NCHS. In consultation with a NYU School of Medicine faculty expert in vital statistics, Dashboard staff concluded that estimates from both datasets were identical or of inconsequential difference. Please contact info@cityhealthdashboard.com for more information on the analyses that establish comparability between NJSHAD and NCHS/RDC data or any other questions or concerns.

Weights

Note that NJSHAD provides counts of deaths and births by 5-year age groups. A subset of age strata used in Dashboard age adjusted analyses use 10-year age groups (see Section 7, Appendix A). When necessary, age groups were summed to mirror the age groups defined above in Section 7, Appendix A.

Metric-specific notes

Opioid overdose deaths

Not calculated by Dashboard staff due to insufficient data availability on NJSHAD.

Prenatal care

Not calculated by Dashboard staff due to insufficient data availability on NJSHAD.

Appendix H: Third-grade Reading Proficiency Censorship Criteria by State

State	Data Censorship Criteria	State	Data Censorship Criteria	State	Data Censorship Criteria
Alabama	Censorship: N<11 Range: Percentage: ≥95%,<1%	**Kentucky**	Censorship: N<10	**North Dakota**	Censorship: N<10
Alaska	Censorship: N<6 Range: Percentages may be reported in ranges	**Louisiana**	Censorship: N<10 Range: Percentages ≤1%	**Ohio**	Censorship: N<10
Arizona	Censorship: N<11 Range: Percentages: >98%,<2%	**Maine**	Censorship: N<5	**Oklahoma**	Censorship: N<10 Range: Percentages: >95%,< 5%
Arkansas	Censorship: N<11	**Maryland**	Censorship: N<10 Range: Percentages: ≥95%, ≤5%	**Oregon**	Censorship: N<6 Range: Percentages:>95%, <5%
California	Censorship: N<11	**Massachusetts**	Censorship: N<10	**Pennsylvania**	Censorship: N<11
Colorado	Censorship: N<16	**Michigan**	Censorship: N<10 Range: Percentages: <5%, >95%	**Rhode Island**	Censorship: N<10
Connecticut	Censorship: N<6 Range: Percentages: >95%,<5%	**Minnesota**	Censorship: N<10	**South Carolina**	Censorship: N<10
Delaware	Censorship: N<15 Range: Percentages: >95%,<5%	**Mississippi**	Censorship: N<10 Range: Percentages: >95%,<5%	**South Dakota**	Censorship: N<10
District of Columbia	Censorship: N<10	**Missouri**	Censorship: N<30	**Tennessee**	Censorship: N<10 Range: Percentages: ≥99%, <1%
Florida	Censorship: N<10	**Montana**	Censorship: N<5	**Texas**	Censorship: N<5
Georgia	Censorship: N<15	**Nebraska**	Censorship: N<10 in a group, N<5 students at a performance level.	**Utah**	Censorship: N<10
Hawaii	Censorship: N<10	**Nevada**	Censorship: N<10	**Vermont**	Censorship: N<11
Idaho	Censorship: N<10	**New Hampshire**	Censorship: N<11	**Virginia**	Censorship: N<10
Illinois	Censorship: N<10	**New Jersey**	Censorship: N<11	**Washington**	Censorship: N<10 Range: Percentages>95%
Indiana	Censorship: N<10	**New Mexico**	Censorship: N<10 Range: Percentages may be reported in ranges	**West Virginia**	Censorship: N<10
Iowa	Censorship: N<10	**New York**	Censorship: N<5	**Wisconsin**	Censorship: N<20
Kansas	Censorship: N<10	**North Carolina**	Censorship: N<10 Range: Percentages: >95%,<5%	**Wyoming**	Censorship: N<5 Range: Percentages: >95%, <5%

Appendix I: Third-grade Reading Proficiency by State

State	Reading Proficiency Test	Data Year	Notes	State	Reading Proficiency Test	Data Year	Notes
Alabama	ACT Aspire	2015-2016		**Montana**	SBA	2016-2017	Using combined rate
Alaska	PEAKS	2016-2017	Using combined rate	**Nebraska**	NeSA	2016-2017	
Arizona	AzMERIT	2015-2016		**Nevada**	CRT/SBA	2016-2017	Using combined rate
Arkansas	ACT Aspire	2016-2017	Using combined rate	**New Hampshire**	SBA	2016-2017	
California	CAASP/SBA	2015-2016	Using combined rate	**New Jersey**	PARCC	2015-2016	
Colorado	CMAS/PARCC	2016-2017	Using combined rate	**New Mexico**	PARCC	2016-2017	Using combined rate
Connecticut	SBA	2015-2016	Using combined rate	**New York**	Engage NY	2016-2017	Using combined rate
Delaware	DE SBA	2014-2015	Using combined rate	**North Carolina**	North Carolina End of Grade (EOG) Assessment	2015-2016	Using combined rate
District of Columbia	DC PARCC	2015-2016	Using district values and combined rate	**North Dakota**	SBA	2015-2016	
Florida	FSA	2016-2017	Using combined rate	**Ohio**	Ohio State Test	2016-2017	Using combined rate
Georgia	Georgia Milestones End of Grade Assessments	2016-2017		**Oklahoma**	OSTP	2015-2016	
Hawaii	SBA	2016-2017	Using combined rate	**Oregon**	SBA	2015-2016	Using combined rate
Idaho	ID SBA	2015-2016		**Pennsylvania**	PSSA	2015-2016	
Illinois	PARCC	2015-2016		**Rhode Island**	PARCC	2016-2017	Using combined rate
Indiana	ISTEP+	2016-2017	Using combined rate	**South Carolina**	SC Ready	2016-2017	Using combined rate
Iowa	IA Assessment	2015-2016		**South Dakota**	SBA	2015-2016	
Kansas	KSA	2016-2017		**Tennessee**	TN Ready	2014-2015	Using combined rate
Kentucky	KPREP	2015-2016	Using combined rate	**Texas**	STAAR	2015-2016	Using combined rate
Louisiana	LEAP	2016-2017		**Utah**	SAGE	2015-2016	Using combined rate
Maine	eMPowerME	2016-2017	Using combined rate	**Vermont**	SBA	2016-2017	Using combined rate
Maryland	PARCC	2015-2016		**Virginia**	SOL	2016-2017	Only provides an elementary school reading proficiency value, not disaggregated by grade. Using combined rate

Massachusetts	Next Generation MCAS	2016-2017	Transitioning between two tests and not all schools are taking the same test. Using combined rate	**Washington**	SBA	2015-2016	Using combined rate
Michigan	M-STEP	2015-2016	Using combined rate	**West Virginia**	WVGSA	2016-2017	Using combined rate
Minnesota	MCA-III	2016-2017		**Wisconsin**	Wisconsin Forward Exam	2016-2017	Using combined rate
Mississippi	MAAP	2016-2017		**Wyoming**	PAWS	2016-2017	Using combined rate
Missouri	MAP	2015-2016					

Appendix J: Third-grade Reading Proficiency Data Sources

State	Author	Method of Acquisition	Hyperlink (active as of April 20, 2018)	Click-through	Month of Data Acquisition	State	Author	Method of Acquisition	Hyperlink (active as of April 20, 2018)	Click-through	Month of Data Acquisi
Alabama	Alabama State Department of Education	Download	http://www.alsde.edu/dept/data/Pages/assessment-all.aspx?navtext=Assessment%20Reports:%20Statewide%20Reports		September 2017	**Montana**	Montana Office of Public Instruction	Data request			Decemb 2017
Alaska	Alaska Department of Education & Early Development	Data request			December 2017	**Nebraska**	Nebraska Department of Education	Download	http://nep.education.ne.gov/Links	Select "NeSA Reading Assessments Detail Data"	March 2
Arizona	Arizona Department of Education	Download	http://www.azed.gov/accountability-research/data/		August 2017	**Nevada**	State of Nevada Department of Education	Download	http://nevadareportcard.com/di/main/assessment	Select "CRT (New NV Standards" under "Exam. "Select Schools. Select all districts and schools under the "Available" table and move to the "Selected" table.	March 2
Arkansas	Arkansas Department of Education	Download	http://www.arkansased.gov/divisions/learning-services/student-assessment/test-scores/year?y=2017		October 2017	**New Hampshire**	New Hampshire Department of Education	Download	https://www.education.nh.gov/instruction/assessment/index.htm	Select "2017 Smarter Balanced Disaggregated Data File" under "2017 Final Assessment Results for SAT and Smarter Balanced"	Decemb 2017
California	California Department of Education	Download	Reading proficiency: https://caaspp.cde.ca.gov/sb2017/ResearchFileListCAA?ps=true&lstTestType=A&lstCounty=00&lstCntyNam=Select%20County...&lstTestYear=2016 Enrollment: https://www.cde.ca.gov/ds/sd/sd/filesenr.asp		Third-grade reading proficiency: December 2017 Enrollment: March 2018	**New Jersey**	State of New Jersey Department of Education	Download	http://www.state.nj.us/education/schools/achievement/16/parcc/spring/excel.htm		August
Colorado	Colorado Department of Education	Download	http://www.cde.state.co.us/assessment/cmas-dataandresults		January 2018	**New Mexico**	New Mexico Public Education Department	Download	https://webnew.ped.state.nm.us/bureaus/accountability/achievement-data/	Select "Proficiencies Webfiles, State, District, School by Grade 2017"	January 2018
Connecticut	Connecticut State Department of Education	Download	http://edsight.ct.gov/SASPortal/main.do	Select "Smarter Balanced" under "Performance"	December 2017	**New York**	New York State Education Department	Download	https://data.nysed.gov/downloads.php	Select "3-8 Assessment Database"	Septem 2017
Delaware	Delaware Department of Education	Download	https://data.delaware.gov/Education/Student-		November 2017	**North Carolina**	Public Schools of North Carolina	Download	http://www.ncpublicschools.org/src/researchers/	Select "Drilldown" under "Ready Accountability Tables"	Decemb 2017

			Performance/a7g2-pipe								
District of Columbia	District of Columbia Public Schools	Download	https://dcps.dc.gov/publication/dcps-data-set-parcc		August 2017	**North Dakota**	North Dakota Department of Public Instruction	Data request			Septem 2017
Florida	Florida Department of Education	Download	http://www.fldoe.org/accountability/data-sys/edw/	Select "Florida PK-20 Education Information Portal" on left sidebar" -> Select "PK-12 Public Schools"-> Select "English Language Arts" under "Assessments"-> Select "Build Your Own Table"	January 2018	**Ohio**	Ohio Department of Education	Download	http://reportcard.education.ohio.gov/Pages/Download-Data.aspx	Select year->select "School Building Data"-> select "Building Achievement Ratings"	Decemb 2017
Georgia	The Governor's Office of Student Achievement	Download	https://gosa.georgia.gov/downloadable-data		December 2017	**Oklahoma**	Oklahoma State Department of Education	Download	http://sde.ok.gov/sde/accountability-resources	Under "Data"	August
Hawaii	Hawaii State Department of Education	Download	http://www.hawaiipublicschools.org/VisionForSuccess/AdvancingEducation/StriveHIPerformanceSystem/Pages/2016-17-results.aspx		December 2017	**Oregon**	Oregon.gov	Download	http://www.oregon.gov/ode/educator-resources/assessment/Pages/Assessment-Group-Reports-for-2014-2015-and-2015-2016.aspx		Septem 2017
Idaho	Idaho State Department of Education	Download	http://sde.idaho.gov/communications/frequently-requested-data.html		August 2017	**Pennsylvania**	Pennsylvania Department of Education	Data request			January 2018
Illinois	Illinois State Board of Education	Download	https://www.isbe.net/Pages/Illinois-State-Report-Card-Data.aspx		February 2018	**Rhode Island**	Rhode Island Department of Education	Data request			January 2018
Indiana	Indiana Department of Education	Download	https://www.doe.in.gov/accountability/find-school-and-corporation-data-reports	select "2017 ISTEP+ School Results Grades 3-8"	January 2018	**South Carolina**	South Carolina Department of Education	Download	https://ed.sc.gov/data/test-scores/state-assessments/sc-ready/2017/	Select "SC READY 2017 Data File" under "2017" under "Data" on the right sidebar	October 2017
Iowa	Iowa Department of Education	Data request			August 2017	**South Dakota**	South Dakota Department of Education	Download	http://doe.sd.gov/reportcard/index.aspx	Select "English Language Arts 2015-16" under "Report Card Tables"	Septem 2017
Kansas	Kansas State Department of Education	Download	http://ksreportcard.ksde.org/assessment_results.aspx?org_no=State&rptType=3	Select "Download Full Results"	December 2017	**Tennessee**	Tennessee Department of Education	Download	https://www.tn.gov/education/data/data-downloads.html	Select "Base Accountability File Updated 12/13/16" under "State Assessments"	Septem 2017
Kentucky	Kentucky Department of Education	Download	http://applications.education.ky.gov/SRC/DataSets.aspx	Select "Grade" under "KPREP" under "Assessment"	September 2017	**Texas**	Texas Education Agency	Download	https://rptsvr1.tea.texas.gov/perfreport/tapr/2017/download/DownloadData.html		August

Louisiana	Louisiana Department of Education	Download	https://www.louisianabelieves.com/resources/library/pk-8-performance	Select "Spring 2017 State-LEA-School LEAP Achievement Level Summary"	August 2017	**Utah**	Utah State Board of Education	Download	https://www.schools.utah.gov/data/reports	Under "SAGE Proficiency Rates"	Septem 2017
Maine	Maine Department of Education	Data request			September 2017	**Vermont**	State of Vermont Agency of Education	Data request			January 2018
Maryland	Maryland State Department of Education	Download	http://reportcard.msde.maryland.gov/downloadindex.aspx?K=99AAAA		August 2017	**Virginia**	Virginia Department of Education	Download	http://www.doe.virginia.gov/statistics_reports/school_report_card/index.shtml	Select "School Subject-Area"	Decemb 2017
Massachusetts	Massachusetts Department of Elementary and Secondary Education	Download	http://profiles.doe.mass.edu/statereport/nextgenmcas.aspx		April 2018	**Washington**	State of Washington Office of Superintendent of Public Instruction	Download	http://reportcard.ospi.k12.wa.us/DataDownload.aspx	Select "AIM-EOC-MSP-SBA Assessments School (with suppression - new format)" under "AIM/EOC/MSP/SBA Data Downloads"	Septem 2017
Michigan	Michigan Department of Education	Download	https://www.mischooldata.org/DistrictSchoolProfiles2/EntitySummary/SchoolDataFile.aspx		September 2017	**West Virginia**	West Virginia Department of Education	Download	https://zoomwv.k12.wv.us/Dashboard/portalHome.jsp	Select "State Assessment Results" on top bar. Select "SY16-17 Assessment Proficiency & Subgroup Summary" under "Related Links"	Decemb 2017
Minnesota	Minnesota Department of Education	Download	http://w20.education.state.mn.us/MDEAnalytics/DataTopic.jsp?TOPICID=1	Select "TAB" file	December 2017	**Wisconsin**	Wisconsin Department of Public Instruction	Download	https://dpi.wi.gov/wisedash/download-files/type?field_wisedash_upload_type_value=Forward&field_wisedash_data_view_value=Certified		Septem 2017
Mississippi	Mississippi Department of Education	Download	http://mdereports.mdek12.org/report1/r2016-17.aspx	Select "2017 Mississippi Academic Assessment Program (MAAP) Results"	September 2017	**Wyoming**	Wyoming Department of Education	Download	https://fusion.edu.wyoming.gov/MySites/Data_Reporting/data_reporting_assessment_reports.aspx	Select "Performance Level Results Grades 3-8 and 11 PAWS, ACT, and WY-ALT Disaggregated-School Level"	Decemb 2017
Missouri	Missouri Department of Elementary & Secondary Education	Download	https://mcds.dese.mo.gov/quickfacts/Pages/State-Assessment.aspx/		September 2017						

Appendix K: School Geographic Mapping

Absenteeism and third-grade reading proficiency metrics were defined using schools that fell within the geographic boundaries of the Dashboard cities. The final sample of schools were filtered based on the following National Center for Education Statistics (NCES) data files:

- NCES School Directory files
- NCES Education Demographic and Geographic Estimates (EDGE) files
- NCES Elementary/Secondary Information Systems (ElSi) grade enrollment files

The years of data for each data file varied by metric depending on when the analysis was conducted. The individual school estimates within a city were then aggregated to provide city-level metrics for absenteeism and third-grade reading proficiency. Please note that estimates are not available for cities that do not have a school within their geographic boundaries.

All analyses were performed using SAS version 9.4 and ArcGIS 10.4.1.[17,123]

Data inputs

(1) NCES School Directories. The flat files were downloaded from here.
    a. Absenteeism and third-grade reading proficiency: NCES (Preliminary) Directory 2016-17 & NCES Directory (v.1a) 2015-2016 [124,125]
(2) NCES Education Demographic and Geographic Estimates (EDGE) files for public schools for a school year. The file was downloaded from here.
    a. Absenteeism and third-grade reading proficiency: NCES EDGE 2015-16 shapefile (points)[126]
(3) NCES Elementary/Secondary Information Systems (ElSi) data file created using the tableGenerator for the 2015-16 school year (most recent available in the system).[127] This file was only used for third-grade reading proficiency. Data file containing information about grades from NCES ElSi was downloaded from here. The following fields were use:
    a. NCESSCH
    b. School Type [Public School]: “1-Regular school”, “2-Special education school”, “3-Vocational school”, “4-Alternative/other school”
        i. Third-grade reading proficiency: Grade 3 offered [Public School]: “1-Yes”, “2-No”
(4) City boundaries shapefile (polygons) from the CDC 500 Cities Project[128] and Census TIGER/Line Shapefiles.

Spatial join

(5) The spatial projection of the public schools shapefile was transformed to match the projection of the city boundaries shapefile.
(6) A spatial join was performed between the re-projected EDGE public schools shapefile and the city boundaries shapefile. The result of the spatial join is public schools within city boundaries cities.
(7) For absenteeism, the latitude and longitude of a school, as per the CCD_LATCOD and CCD_LONCOD variables, was used to determine its location within city boundaries.

For more details on the SAS code and ArcGIS methods, please contact the Dashboard at info@cityhealthdashboard.com.

Appendix L: Updates Summary

Technical Document Part 1 Version	Date Posted Online	Update Notes
12.0	6/1/21	• ACS metrics: Add 2019 (5 year estimate) data • Air pollution: Add 2017 CMAQ data • Violent crime: Add 2019 UCR data • Broadband connection: Release of new metric; 2017, 2018, 2019 ACS (5 year estimate) data • Unemployment – annual, neighborhood-level: Slight revision of estimates to improve precision; see page 41 for more details.
11.0	3/1/21	• COVID Local Risk Index: Replace with updated estimates (new components and weighting); expand to all 766 Dashboard cities • PLACES Project (formerly 500 Cities Project): 2020 release; expand to all 766 cities for 2018 estimates and High blood pressure (2017 estimates) • Preventive services, 65+: Name changed from "Preventive services"; Revision of 2014, 2016 estimates and confidence levels to improve precision
10.3	2/1/21	• Income inequality: 20th and 80th percentile cut points updated for 2013, 2014 to more closely approximate underlying distribution
10.2	1/7/21	• Unemployment – annual, neighborhood-level: Metric added back to website; still available for download
10.1	10/29/20	• High school completion: Revision of metric analysis and data source; addition of tract-level data; addition of multi-year data; revision of metric name (formerly "High school graduation") • Unemployment – current, city-level: Release of new metric • Unemployment – annual, neighborhood-level: Revision of metric name (previously "Unemployment"); temporarily removed from website; still available for download • Technical Document Part 2, Education Data no longer released: Addition of Absenteeism, High school completion and Third-grade reading proficiency metrics to Technical Document Part 1
10.0	6/4/20	• COVID Local Risk Index: Release of metric for cities represented in 500 Cities Project
9.0	5/1/20	• Addition of 256 cities with populations >50,000 and not already included in 500 Cities[5] *(financial support provided by the Robert Wood Johnson Foundation)* • ACS metrics: Updated to 2018 (5 year estimate) data; 2018 ACS data for Macon, GA represented by FIPS 1349008 (Macon-Bibb County, GA) instead of 1349000 (Macon, GA) or 13021 (Bibb County, GA) • Life expectancy: Addition of data for Maine and Wisconsin as per update to USALEEP • NVSS metrics: Addition of data for some years and metrics for consolidated cities (Athens, GA; Augusta, GA; Indianapolis, IN; Louisville, KY; Nashville, TN) • Walkability: Updated to 2019; Methodology updated from tract centroid value to entire tract population weight
8.0	1/23/20	• Addition of subset of New Jersey cities (Burlington, Clayton, Egg Harbor City, Glassboro, Hammonton, Lawnside, Millville, Penns Grove, Pleasantville, Salem) *(financial support provided by New Jersey Health Initiatives)* • Air pollution: Added 2016 CMAQ data • Park access: Updated to 2018 (city); addition of tract data • Violent crime: Added 2018 UCR data • 500 Cities Project metrics: Added 2019 release • NVSS metrics: Use of NJSHAD data source for NJ cities listed above

7.0	8/29/19	• NVSS metrics: Added 2010-2012, 2011-2013, 2012-2014, 2015-2017 data ○ Prenatal care: 2010-2012, 2011-2013, 2012-2014 not released • NVSS metrics: Revisions to 2013-2015 and 2014-2016 data for improved accuracy
6.0	7/15/19	• Correction of Table of Contents and section label enumeration; no changes to Technical Document context or version number
6.0	6/5/19	• Information on Absenteeism moved to Technical Document Part 2: Education Data • Multi-year data added to site and associated metadata added to Technical Documentation ○ Added multi-year data, by metric: 500 Cities Project metrics: 2016 and 2017 releases; Air pollution: 2015; ACS metrics: 2013, 2014, 2015, 2016 (5 year estimate) data; CMAQ: 2013 data; NVSS metrics: 2013-2015 data; UCR metric: 2016 data
5.0	2/14/19	• ACS metrics: Updated to 2017 (5 year estimate) data ○ Uninsured: Note revision of age strata • Air pollution: Updated to 2014 CMAQ data; city population denominator changed from ACS DP05 2016 (5 year estimate) to ACS DP05 2014 (5 year estimate)
4.1	12/20/18	• Note regarding temporary removal of primary care physicians data from Dashboard inserted in this document
4.0	12/12/18	• 500 Cities metrics: Updated to 2018 release • NVSS metrics: Updated to 2014-2016 data
3.1	October 2018	• Absenteeism: Data source updated to 2015-16 from 2013-14 (10/29/18) • Life expectancy: Metric posted 10/2/18; minor revision to city values posted 10/29/18 • Uninsured: Data source changed to ACS from BRFSS-CDC 500 (10/29/18); revised strata • Violent crime: Updated to 2017 UCR data (10/29/18) • Revised Technical Documentation (v3.0), downloadable data (v3.0) and codebook (v3.0) (10/29/18) • Minor typos corrected in Technical Documentation (v3.1) (10/31/18)