

Opportunity Index: Note on Methodology and Sources

Overview

The Opportunity Index shows how states and counties perform on a set of indicators that measure access to opportunity in communities relative to the average performance of U.S. states and counties. The Index shows how states and counties perform on these indicators within three dimensions of opportunity: Jobs and Local Economy, Education and Community Health and Civic Life. The following table summarizes these three dimensions, the various themes within these dimensions, and the indicators used in the Index to represent critical components of community opportunity.

DIMENSION	THEME	INDICATOR
Jobs and Local Economy Dimension	JOBS	Unemployment Rate (%)
	WAGES	Median Household Income (\$)
	POVERTY	Poverty (% of population below poverty line)
	ASSETS	Banking Institutions (commercial banks, savings institutions, and credit unions per 1,000 residents)
	AFFORDABLE HOUSING	Renters Spending Less than 30% of Household Income on Housing Costs (%)
	INTERNET ACCESS	High-Speed Internet (% of households)
Education Dimension	PRE-SCHOOL	Preschool (% ages 3 and 4 in school)
	K-12	On-Time High School Graduation (% of freshmen who graduate in four years)
	POST-SECONDARY FUNDING	State Higher Education Subsidy (% of annual average per pupil education and related costs covered by state subsidy) [STATES ONLY]
	POST-SECONDARY EDUCATION	Bachelor's Degree or Higher (% of adults 25 and over)
Community Health and Civic Life Dimension	CIVIC ENGAGEMENT	Group Membership (% of adults 18 and over involved in social, civic, sports, and religious groups) [STATES ONLY]
	VOLUNTEERISM	Volunteerism (% of adults ages 18 and older) [STATES ONLY]
	YOUTH ECONOMIC AND ACADEMIC INCLUSION	Teenagers Not in School and Not Working (% ages 16-19) [STATES ONLY]
	SAFETY	Violent Crime (per 100,000 population) or Homicide (per 100,000) for counties where violent crime rates were not available
	ACCESS TO HEALTH CARE	Primary Care Providers (per 100,000 population)
	ACCESS TO HEALTHY FOOD	Grocery Stores and Supermarkets (% of zip codes with at least one)

Note on Methodology

The Index provides results for all 50 states and Washington DC and about 2,400 counties and county equivalents with a population of at least 10,000 as of the 2010 Census.¹ This note gives a short overview of how the Opportunity Index is calculated for states and for counties.

For any state and county, the Index presents data for as many of the indicators listed above as possible, shows how each state and county performs within the three dimensions of opportunity, and provides a score across all three dimensions. In order to create an Index, each of its constituent parts must be comparable. The first step is therefore to normalize all the indicators so that rates, percentages, and other scores are set on a common scale, normed to the average for the set. Raw indicator scores are converted to “z-scores”, which tell us how far any value falls from the mean of the set, measured in standard deviations. States data are normalized based on data for other states and county data are normalized based on data for other counties. The general formula for normalizing indicator scores is:

$$z = \frac{(x - \mu)}{\sigma}$$

where x is any state or county’s indicator value, μ is the unweighted average and σ the standard deviation for that indicator and z is the resulting z-score.

One additional step in normalizing the indicators is taken to ensure that higher z-score values always reflect better outcomes and that lower values reflect worse outcomes. In the case of four of the indicators (unemployment rate, poverty rate, teenagers not in school and not working, and the violent crime/homicide rate), z-scores were “reversed” by multiplying z-scores for these indicators by -1.

Exploring Dimension Scores

In addition to an overall score for each state and county on the Index, it is also possible to understand how a state or county does in terms of opportunity within each of the three dimensions of opportunity: Jobs and Local Economy, Education, and Community Health and Civic Life. The tables below summarize of the Dimensions Scores for states and counties are determined. These scores enable comparisons of the performance of states and of counties within the three dimensions of opportunity relative to the distribution of achievement of other states/counties. This analysis involves dividing the raw dimension scores for each of the dimensions into intervals of equal width, measured in standard deviations. State Dimension Scores are divided into 10 categories, each 0.3 standard deviations wide, except for the top and bottom categories. Ten represents the best average performance and 1 the worst:

¹ This total includes boroughs in Alaska, parishes in Louisiana, and cities with county-level governance status. Counties and county-equivalents with fewer than 10,000 residents are excluded from the Index because data for many of the indicators used in the Index were either unavailable or unreliable for these low-population areas.

STATE DIMENSION SCORE CATEGORIES	
SUMMARY CATEGORY	RANGE OF DIMENSION SCORES IN EACH CATEGORY
10	$z \geq 1.2$
9	$0.9 \leq z < 1.2$
8	$0.6 \leq z < 0.9$
7	$0.3 \leq z < 0.6$
6	$0.0 \leq z < 0.3$
5	$-0.3 \leq z < 0.0$
4	$-0.6 \leq z < -0.3$
3	$-0.9 \leq z < -0.6$
2	$-1.2 \leq z < -0.9$
1	$z < -1.2$

County Dimension Scores are summarized using five Summary Categories, as defined below. Owing to their generally smaller populations, data for counties tend to be more unstable than data for states. Because of this, only five categories are available for counties as compared with ten for states to minimize the risk of over-stating small or insignificant differences. These intervals are 0.75 standard deviations wide, except for the top and bottom categories. Here 5 represents the best average performance and 1 the worst:

COUNTY DIMENSION SCORE CATEGORIES	
SUMMARY CATEGORY	RANGE OF DIMENSION SCORES IN EACH CATEGORY
5	$z \geq 1.125$
4	$0.375 \leq z < 1.125$
3	$-.0375 \leq z < 0.375$
2	$-1.125 \leq z < -0.375$
1	$z < -1.125$

Exploring the Opportunity Scores for States and Opportunity Grades for Counties

The final Opportunity Score for states is obtained by averaging the raw Dimension Scores for each of the three dimensions of the Index. Each dimension is weighted equally in determining the final raw score. This final raw score is then rescaled so that it can be presented on a scale between 0 and 100 much like a school test out of 100 points. To the raw overall average score for each state, a constant value is added to shift the average for the set from 0.0 to a positive value and to make all values positive. These new sums are then rescaled based on minimum and maximum values observed in the data, chosen to allow for future progress or backsliding in the scores of individual states, using the following formula:

$$\text{Rescaled State Opportunity Score} = \left(\frac{((z_{avg} + c) - \text{min})}{\text{max} - \text{min}} \right) \times 100$$

where z_{avg} is the raw final averaged z-score for any state, c is a constant set at 1.75, min is set to 0.0 and max to 3.0.

Unlike states, counties are presented in five final groups based on their performance across the three dimensions of the Opportunity Index. To determine which Opportunity Grade a county receives, Summary Category scores across the three dimensions of the Index are simply added up. Counties are then sorted into groups based on this resulting sum as follows:

COUNTY OPPORTUNITY GRADES	
OPPORTUNITY GRADE	Sum of Dimension Scores is:
A	14 to 15
B	11 to 13
C	8 to 10
D	5 to 7
F	3 to 4

Data Notes

If states or counties were missing data for any of the indicators within the three dimensions of opportunity, the average of the remaining indicators was used to calculate the Dimension Score so as to minimize the number of states and counties that needed to be excluded from the Index due to missing data. In cases where data are missing, this implicitly shifts a higher weight onto the remaining indicators in that dimension for that state or county. However, in no cases were Dimension Scores calculated if more than one indicator was missing in a Dimension. In a very limited number of cases, z-scores for the state average were imputed at the county level so as to avoid having to drop counties from the Index.

Most of the indicators used in the Index are estimates based on analysis of survey data and are therefore subject to both sampling and non-sampling error. Different Dimension Scores and overall Opportunity Scores and Opportunity Grades do not imply that differences between these estimates for states or for counties are necessarily statistically significant. Where possible, error margins for Index indicators are provided in the downloadable data set.

Note on Sources

ECONOMIC OPPORTUNITY DIMENSION

Indicator: Unemployment Rate (%)

Definition: The total number of people who do not have jobs but who have actively looked for work within the preceding four weeks and are available to work. Data are for July 2011.

Source: Bureau of Labor Statistics, Local Area Unemployment Statistics tables and news releases (<http://www.bls.gov/lau/>).

Note: Unemployment rates are for July of 2011 and are not seasonally adjusted.

Indicator: Median Household Income (\$)

Definition: The exact middle income of the distribution of households by income, ranked from wealthiest to poorest. Household income includes earnings from work, as well as other income from interest, dividends, Social Security, pension payments, unemployment compensation, and other regularly-received forms of money for members of the household. Data are for 2005-2009.

Source: U.S. Census Bureau, American Community Survey 2005-2009 (<http://factfinder.census.gov/home/saff/main.html? lang=en>)

Note: Median household incomes reflect the income of the household in the middle of the income distribution. Because income is not distributed equally across individuals or households, the average household income is much higher than the median. Median household income for the United States is about \$51,500 whereas average household income is \$70,000, over \$18,000 more.

Indicator: Poverty (% of population below poverty line)

Definition: Percentage of people of all ages living in poverty. Data are for 2005-2009.

Source: U.S. Census Bureau, American Community Survey 2005-2009 (<http://factfinder.census.gov/home/saff/main.html? lang=en>)

Indicator: Banking Institutions (commercial banks, savings institutions, and credit unions per 1,000 residents)

Definition: Total number of commercial banks, credit unions, and savings institutions per 1,000 residents. Data are for 2009.

Source: U.S. Census Bureau, County Business Patterns 2009 and CDC WONDER Bridged-Race July 1, 2009 Population Estimates (Vintage 2009) (<http://www.census.gov/econ/cbp/index.html> and <http://wonder.cdc.gov/Bridged-Race-v2009.HTML>)

Indicator: Renters Spending Less than 30% of Household Income on Housing Costs (%)

Definition: The percentage of renters who spend less than 30% of their household income on rent and utilities. Data are for 2005-2009.

Source: U.S. Census Bureau, American Community Survey 2005-2009 (<http://factfinder.census.gov/home/saff/main.html?lang=en>)

Note: 30% of household income going to gross rent is a widely accepted cut-off for affordability. This percentage excludes rental units for which gross rent and/or household income could not be determined.

Indicator: High-Speed Internet (% of households)

Definition: Ratio of the number of residential fixed connections with a speed of at least 200 kbps in at least one direction to the total number of households. Data are for March, 2011.

Source: Federal Communications Commission Internet Access Services March, 2011 Release (<http://transition.fcc.gov/wcb/iatd/comp.html>)

Note: Due to confidentiality concerns, the FCC does not make the actual ratio of residential fixed connections to total households available at the county-level; these data are only provided in a categorical format giving ranges of the number of fixed residential connections per 1,000 households. The categories in which the county-level data are presented are as follows:

Category	Range (per 1,000 households)
1	Zero < x <= 200
2	200 < x <=400
3	400 < x <=600
4	600 < x <=800
5	800 < x

The actual ratio is however available for the nation as a whole and for most states. Data were not available for Hawaii overall.

EDUCATIONAL OPPORTUNITY DIMENSION

Indicator: Preschool (% ages 3 and 4 in school)

Definition: The percentage of children ages 3 and 4 enrolled in public or private nursery school, preschool, or kindergarten. Data are for 2005-2009.

Source: U.S. Census Bureau, American Community Survey 2005-2009
(<http://factfinder.census.gov/home/saff/main.html?lang=en>)

Indicator: On-Time High School Graduation (% of freshmen who graduate in four years)

Definition: The percentage of high school freshmen who graduate after four years of high school. Data are for the 2006-2007 school year.

Source: County Health Rankings analysis of data from the U.S. Department of Education, National Center for Education Statistics. University of Wisconsin Population Health Institute. County Health Rankings 2011. Available at www.countyhealthrankings.org.

Note: State data sources were used instead of the above source for Kentucky, New Hampshire, North Carolina, Pennsylvania, South Carolina, and Utah due to missing data in the above source. Data for these years is for the 2008-2009 school year. Differences in data years and reporting standards may compromise the comparability of estimates between some states and counties.

Indicator: State Higher Education Subsidy (% of annual average per pupil education and related costs covered by state subsidy).

Definition: State subsidy as a share of total average annual educational expenses per full-time student in a public research university. Data are for 2009 and are only available for states.

Source: Delta Cost Project analysis of the Department of Education, National Center for Education Statistics IPEDS State Database (Delta Project on Postsecondary Education Costs, Productivity, and Accountability, <http://www.deltacostproject.org/data/state/>)

Note: Figures reflect the average percentage of all education and related costs associated with putting a student at a post-secondary public research institution through their program for one academic year that are paid by state subsidies, with the remainder coming from tuition. Post-secondary public research institutions generally include the state public university system flagship and branches but may include other post-secondary institutions as well depending on the state. No data were available for Washington DC because there are no post-secondary educational institutions in the nation's capital classified as public research universities. Please see factsheets available from the Delta Cost Project for a full list of public research institutions by state (<http://www.deltacostproject.org/data/state/>).

Indicator: Bachelor's Degree or Higher (% of adults 25 and over)

Definition: The percentage of adults ages 25 and over who have completed a Bachelor's or higher degree. Data are for 2005-2009.

Source: U.S. Census Bureau, American Community Survey 2005-2009
(http://factfinder.census.gov/home/saff/main.html?_lang=en)

Note: Associate's degree holders and those who have completed some college or university credits but who have not completed a degree are not included in this percentage.

COMMUNITY HEALTH AND CIVIC LIFE DIMENSION

Indicator: Group Membership (% of adults 18 and over involved in social, civic, sports, and religious groups).

Definition: The percentage of adults 18 and over who report being members of social, civic, service, recreational, or religious groups in the previous year. Data are for 2008-2009 and are only available for states.

Source: American Human Development Project analysis of data from the U.S. Census Bureau, DataFerrett, Current Population Survey, Civic Engagement Supplements for 2008 and 2009.

Note: Membership in a religious group includes those actively involved in activities in their place of worship and does not include those who attended religious services only. Two years worth of survey responses were pooled to increase the sample size available for analysis. This helps make estimates of the percentage of the adult population that are members of groups more stable.

Indicator: Teenagers Not in School and Not Working (% ages 16-19)

Definition: The percentage of the population ages 16 to 19 who are not enrolled in school and either unemployed or not in the labor force. Data are for 2005-2009 and are only available for states.

Source: U.S. Census Bureau, American Community Survey 2005-2009
(http://factfinder.census.gov/home/saff/main.html?_lang=en)

Indicator: Volunteerism (% of adults ages 18 and older)

Definition: The percentage of adults 18 and over who did volunteer work through or for an organization at any time in the previous year. Data are for 2009-2010 and are only available for states.

Source: American Human Development Project analysis of data from the U.S. Census Bureau, DataFerrett, Current Population Survey, Volunteering Supplements for 2009 and 2010.

Note: Two years worth of survey responses were pooled to increase the sample size available for analysis. This helps make estimates of the percentage of the adult population that engage in volunteer activities more stable.

Indicator: Violent Crime (per 100,000 population)

Definition: Total number of violent crimes per 100,000 people. Violent crimes include homicide, rape, robbery, and assault. State data are for 2009 while county data span 2006-2008.

Source: State data from the U.S. Department of Justice, Federal Bureau of Investigation Uniform Crime Reporting Statistics (www.ucrdatatool.gov); county data from the County Health Rankings analysis of data from the U.S. Department of Justice, Federal Bureau of Investigation Criminal Justice Information Services. County data from Illinois were obtained by County Health Rankings from the Illinois State Police Uniform Crime Reporting data. University of Wisconsin Population Health Institute. County Health Rankings 2011. Available at www.countyhealthrankings.org.

Note: Not all states report violent crimes at the county level in a comparable fashion. When violent crime rate data were not available at the county level, homicide rates were used instead as a reasonable proxy for a safe neighborhood environment when possible (see below). Data for these two indicators, though both used as proxies for community safety, were normalized separately from one another. In other words, the violent crime rate for counties was normalized using the mean and standard deviation for violent crime rates in all counties.

Indicator: Homicide (per 100,000 population)

Definition: Age-adjusted death rate due to homicide per 100,000 residents. Data are for 2001-2007.

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. Health Indicators Warehouse. www.healthindicators.gov. [accessed August 9th, 2011]

Note: The Centers for Disease Control and Prevention suppress homicide rates based on fewer than 20 deaths due to homicide which is a major reason for the large number of counties for which no data are available for this indicator. As the violent crime rate is a more comprehensive indicator of community safety than the homicide rate, preference has been given to the violent crime rate as an indicator of community safety when both indicators are available for any state or county. However, when data for the violent crime rate was unavailable, the homicide rate has been used in its place where possible. As described above, data for these two indicators, though both used as proxies for community safety, were normalized separately from one another. In other words, the homicide rate for counties was normalized using the mean and standard deviation for homicide rates in all counties.

Indicator: Primary Care Providers (per 100,000 population)

Definition: The number of primary care physicians per 100,000 residents. Primary care physicians include those in general practice and internal medicine, family care, pediatrics, and obstetrics/gynecology. Data are for 2008.

Source: County Health Rankings analysis of data from the U.S. Department of Health and Human Services, Health Resources and Services Administration, Area Resource File. University of Wisconsin Population Health Institute. County Health Rankings 2011. Available at www.countyhealthrankings.org.

Indicator: Healthy Food Stores (% of zip codes with at least one)

Definition: The percentage of zip-codes in a county or state with at least one grocery store with more than four employees, produce stand, or farmer's market. Data are for 2008.

Source: County Health Rankings analysis of data from the U.S. Census Bureau, County Business Patterns. University of Wisconsin Population Health Institute. County Health Rankings 2011. Available at www.countyhealthrankings.org.

Methodological References:

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