



## Percent Population under 13 Years Old

This EnviroAtlas community demographic map layer depicts the percentage of the population in each U.S. Census Block Group that was less than 13 years of age in 2010.

### Why is the population under 13 years old important?

Environmental conditions play an important role in fostering the current and future health of children. Children are rapidly growing and developing physically and mentally. [Ecosystem services](#) support child development by providing healthful food and water, air filtration, natural hazard buffering, and mental well-being through a lifelong connection with the natural world.

Children in low income neighborhoods are more likely to live in degraded physical environments and to be exposed to toxic substances, including lead, asbestos, air pollutants, and industrial waste.<sup>1</sup> Exposure to harmful chemicals early in life is more likely to result in cancers and other diseases that require long periods to develop and manifest. Children are particularly susceptible to asthma and acute respiratory illnesses that can be caused and exacerbated by air pollution from factories, car exhaust, and coal fired power plants. Children have a greater lung surface area compared to their body weight; they breathe 50% more air in relation to their body weight than adults. Therefore, air pollutants will have a greater impact on a child's health.<sup>2</sup> A child's cognitive development can be impaired by air pollutants such as carbon monoxide, a byproduct of combustion engines in cars and other machinery.

Exposure to toxic substances may also contribute to childhood obesity through disruption of the body's regulation of metabolism and fat accumulation.<sup>3</sup> Surveys conducted by the Centers for Disease Control show that childhood obesity has increased more than 10% since 1976.<sup>3</sup> Although it occurs across all income levels, a relatively high incidence of childhood obesity occurs in low income or urban environments partly because of a lack of opportunity for physical activity and outdoor play. Barriers to children's outdoor activity include a shortage of free parks and physical activity facilities, inability to pay for activity fees, transportation problems, and safety concerns.<sup>4,5</sup> Increasing the availability of parks and free physical activity facilities may increase activity levels in lower income neighborhoods to help reduce childhood obesity and other health risks.



From a city planning perspective, the risks of adverse health conditions in children could be reduced by increasing the extent and distribution of urban tree cover and improving access to [green space](#). The opportunities for physical exercise and engagement with nature provided by parks and green space have been linked in numerous studies to children's health and well-being.<sup>4,7</sup> Urban trees provide filtration and cleaner air for children by reducing concentrations of fine airborne particles and gaseous air pollutants. Studies have demonstrated that children who suffer from attention deficit hyperactivity disorder (ADHD) experience a reduction in symptoms following participation in activities in natural and green settings.<sup>6</sup> Simply viewing natural green space through a window has been shown to reduce stress, increase feelings of self-worth, and help children concentrate.<sup>7</sup>

Addressing inequalities in the distribution of ecosystem services may improve the health and well-being of children. The [environmental justice](#) movement seeks policies that reduce environmental inequalities in the distribution of environmental benefits and risks. It is in the best interest of society to ensure that all children grow up healthy to meet their full physical and mental potential. Healthy children grow into healthy adults who are able to contribute to society and the economy by living productive lives.

### How can I use this information?

This demographic information can be used in conjunction with other EnviroAtlas data to identify the percentage of the population in each census block group that was less than 13

years of age in 2010 relative to nearby ecosystem services and benefits. Areas with significant disparities can be identified, and planners can consider additional investments to provide services to meet existing or projected demand. For example, the percent of children in a block group could be combined with other EnviroAtlas data layers showing density of green space or walking distances to park entrances. Children living in areas with limited green space could be at increased risk for weight gain and associated health issues as well as impaired cognitive performance. Once identified, these areas could be evaluated for enhanced natural infrastructure to help promote physical activity and engagement with nature.

Other pertinent EnviroAtlas data layers relate to the health benefits gained from pollutants removed by tree cover, including data layers addressing negative health outcomes avoided (e.g., asthma exacerbation and acute respiratory symptoms) and the estimated monetary value of health and productivity losses avoided. In addition, users may examine populations within 300 meters of busy roadways and roadways with and without tree buffers.

### How were the data for this map created?

This map layer was created by combining the US Census 2010 TIGER/Shapefile boundary data with the age data found in US Census 2010 Summary File 1 Population Subjects Summarized to the Block Level (Table P14: Sex by Age for the Population Under 20 Years). For percent population under 13 years of age, males and females were added together, and this figure was divided by the total population in the block group to create the metric. These tabular data were joined to the US Census 2010 boundary data using the block-group code.

### Selected Publications

1. Brulle, R.J., and D.N. Pellow. 2006. [Environmental justice: Human health and environmental inequalities](#). *Annual Review of Public Health* 27:103–124.
2. Ritz, B., and M. Wilhelm. 2008. [Air pollution impacts on infants and children](#), UCLA Institute of the Environment and Sustainability. Accessed June 2014.
3. Environmental Protection Agency. 2013. [America's children and the environment: Third edition](#). U.S. Environmental Protection Agency, Washington, D.C. 504 p.
4. Powell, L.M., S. Slater, F.J. Chaloupka, and D. Harper. 2006. [Availability of physical activity related facilities and neighborhood demographic and socioeconomic characteristics: A national study](#). *American Journal of Public Health* 96(9):1676–1680.
5. Pickett, K.E., S. Kelly, E. Brunner, T. Lobstein, and R.G. Wilkinson. 2005. [Wider income gaps, wider waistbands? An ecological study of obesity and income inequality](#). *Journal of Epidemiology and Community Health* 59:670–674.
6. Taylor, A.F., and F.E. Kuo. 2001. [Coping with ADD: The surprising connection to green play settings](#). *Environment and Behavior* 33:57–77.
7. Taylor, A.F., and F.E. Kuo. 2006. [Is contact with nature important for healthy child development? State of the evidence](#). Pages 124–140 in Spencer, C., and M. Blades (eds.), *Children and Their Environments*. Cambridge University Press, Cambridge, United Kingdom.

### What are the limitations of these data?

Block-group population data are derived from 2010 U.S. Census data that are presented at the census block-group scale. A block group is a collection of census blocks, the smallest area mapped by the U.S. Census Bureau. Population data are supplied by census blocks to preserve the privacy of individuals. It is important to remember that residents are not distributed evenly throughout the area of a block group. The U.S. Census Bureau maintains a website on methodology and [reliability of data](#).

### How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. Data from the [2010 U.S. Census](#) may be viewed and downloaded from the census website.

### Where can I get more information?

A selection of resources on the relationship between children's health and ecosystem services is listed below. For additional information on the data creation process, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

### Acknowledgments

The data for this map were prepared by Timothy Wade, EPA. The fact sheet was created by Andrew Potter, Oneida Total Integrated Enterprises (OTIE), Laura Jackson, EPA, and Sandra Bryce, Innovate!, Inc.