Number of Day Care Centers

This EnviroAtlas community demographic map layer depicts the number of day care centers found in each U.S. Census Block Group in 2010.

Why is the number of day care centers important?

The location of day care centers, where children under 5 years old spend a significant portion of their day, may provide children with basic environmental benefits or expose them to environmental risks. Environmental conditions play an important role in fostering the current and future health of children because they are rapidly growing and developing both physically and mentally. Ecosystem services support child development by providing healthful food and water, air filtration, natural hazard mitigation, and mental well-being through a lifelong connection with the natural world.

Individual states, each with different standards, are responsible for licensing day care centers. Most states do not require an environmental assessment before licensing a child care facility. Twelve states expect some testing for lead, radon, and asbestos, and 39 states require an inspection for fire, health, and building code violations.[1] However, assessment of past use of the property or of neighboring facilities is rare. Recently, several urban day care centers closed after dangerous substances like dry cleaning fluid and mercury were discovered onsite.[1]

Children in low income or high-density urban neighborhoods are more likely to go to day care centers near degraded physical environments and to be exposed to toxic substances, including lead, asbestos, air pollutants, and industrial waste.[2] Over 6 million children have asthma in the US.[3] Children are particularly susceptible to asthma and acute respiratory illnesses that can be caused and exacerbated by air pollution from car exhaust, oil refineries, and coal-fired power plants. A recent study showed that children exposed to higher levels of traffic pollution at home and at school were at increased risk of developing asthma.[3] Economic losses from asthma occur through school absences, caregiver work absences, and increased use of health services.

Children may spend as much as 40 hours per week in day care centers and receive daily meals and snacks there. There are no federal standards for children's activity levels or nutritional standards in day care centers except for federally sponsored day care programs like Head Start.[4] Some child

Photo: National Institutes of Health

health researchers propose that setting standards for nutrition and physical activity for children in all day care centers would instill positive dietary and physical activity habits at an early age and at the same time reduce childhood obesity.[4] Surveys conducted by the Centers for Disease Control and Prevention show that childhood obesity has increased more than 10% since 1976.[5] Optimizing the use of day care center facilities for better food choices and more physical activity time may 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 day care center siting that avoids environmental risks and increases benefits, for example, by enhancing nearby urban tree cover and green space. Opportunities for physical exercise and engagement with nature provided by trees and green space have been linked in numerous studies to children's health and well-being.[6] Urban trees reduce heat and 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.[6] Simply viewing natural green space through a window has been shown to reduce stress, increase feelings of self-worth, and help children concentrate.[6]

Addressing inequalities in the distribution of ecosystem services relative to day care center locations may improve the health and well-being of children. The environmental

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justice movement seeks policies that reduce environmental inequalities in the distribution of environmental benefits and risks.[2] It is in the best interest of society to ensure that all children grow up healthy to meet their full potential.

How can I use this information?

This demographic information can be used in conjunction with other EnviroAtlas data to identify the numbers of day care centers within census block groups 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 day care center data could be combined with other data layers such as busy roadways or industrial facilities. Children at day care centers in close proximity to these air pollution sources could be at increased risk for developing asthma and potentially subject to delayed cognitive development. Once identified, these areas could be evaluated for emission reductions and enhanced tree cover to help filter harmful air pollutants.

Other pertinent EnviroAtlas data layers may be found in the Table of Contents under Community Ecosystem Services: Clean Air: Health Benefits of Pollutants Removed by Tree Cover, which includes data layers addressing negative health outcomes avoided (e.g., asthma exacerbation and acute respiratory symptoms) and the estimated monetary value of avoided health and productivity losses. Under Clean Air: Near Road Environments users may examine populations within 300 meters of busy roadways and roadways with and without tree buffers. Estimated views of green space from schools and daycare centers are mapped under Community Ecosystem Services: Recreation, Culture, and Aesthetics: Viewsheds.

How were the data for this map created?

This map layer was created by combining the US Census 2010 TIGER/Shapefile boundary data with Homeland Security Infrastructure Protection (HSIP) data for day care centers. These data were joined to the US Census 2010 boundary data using the block-group code.

What are the limitations of these data?

A block-group is a collection of census blocks, the smallest area mapped by the U.S. Census Bureau. EnviroAtlas data aggregated to the block group are useful to screen for vulnerable populations, hazards, and beneficial natural features. However, it is important to remember these are not distributed evenly throughout the area of a block-group. Block groups identified to be of potential concern require further exploration using local knowledge and site-specific information.

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. HSIP data are not available for general public use.

Where can I get more information?

A selection of resources on the relationships among day care center siting, 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 Sandra Bryce, Innovate!, Inc.

Selected Publications

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2. Brulle, R.J., and D.N. Pellow. 2006. Environmental justice: Human health and environmental inequalities. *Annual Review of Public Health* 27:103–124.

3. McConnell, R., T. Islam, K. Shankardass, M. Jerrett, F. Lurmann, F. Gilliland, J. Gauderman, E. Avol, N. Kunzli, L. Yao, J. Peters, and K. Berhane. 2010. Childhood incident asthma and traffic-related air pollution at home and school. *Environmental Health Perspectives* 118(7):1021–1026.

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5. Environmental Protection Agency. 2013. America's children and the environment: Third edition. U.S. Environmental Protection Agency, Washington, D.C. 504 p.

6. 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.