Indoor Environments

Children spend most of their time in indoor environments, including homes, schools, child care facilities, and other buildings.[1] The chemicals found indoors or measured in indoor air are numerous and diverse. Hundreds of chemicals have been measured in indoor air, including multiple pesticides, fragrance-related compounds, polychlorinated biphenyls (PCBs), phthalates, combustion byproducts, carbon monoxide, benzene, formaldehyde, and other compounds.[2-4] Pollutants in indoor environments can come from many different sources, including combustion sources such as furnaces, gas stoves, fireplaces, and cigarettes; building materials and furnishings such as treated wood, paints, furniture, carpet, and fabrics; consumer goods such as electronics and toys; cleaning products, pesticides, and other products used for maintenance of the home or building; and products used for hobbies, science projects, arts and crafts projects, and other activities.

Children may also be routinely exposed to chemical contaminants that accumulate in dust, including lead, nicotine, pesticides, brominated flame retardants, phthalates, and perfluorinated chemicals.[3,5-9] Many pesticides and other chemicals that break down relatively quickly outdoors are much more persistent and long-lasting indoors, where they are less exposed to natural elements such as sunlight, moisture, and microorganisms that can accelerate the breakdown of chemicals.[10-12]

Infants and small children may have the highest exposure to house dust contaminants due to their frequent and extensive contact with floors, carpets, and other surfaces where dust gathers, as well as their frequent hand-to-mouth activity. However, children of all ages (as well as adults) are likely to be exposed to dust contaminants through hand-to-mouth activity[1,13] and other ingestion pathways, such as the settling of dust onto food and food preparation surfaces in the kitchen.

The indoor environments of personal cars and school buses are also important to children's exposure, as a child can spend up to an average of 84 minutes per day in a vehicle, depending on his or her age.[1] School bus cabins can have levels of fine particulate matter ($PM_{2.5}$) four times higher than levels in ambient air.[14] In addition, children riding school buses in urban areas are likely to be exposed to elevated levels of benzene, formaldehyde, and other pollutants in motor vehicle emissions. It is estimated that school buses commuting through congested urban areas may contribute up to 30% of a child's daily exposure to diesel engine-related pollutants.[15]

Adult smoking in personal cars can have a significant impact on children's environmental tobacco smoke exposures, as the air in smokers' cars tends to have significantly higher nicotine concentrations than that in non-smokers' cars.[16] Smoking in cars also leaves nicotine residues that may linger in dust and surfaces within smokers' cars, leading to continued exposure even after the practice of smoking within the car has ceased.[17]

Pollutants in indoor environments can also come from outside sources. For example, pollutants in outdoor air will penetrate to the indoor environment,[18,19] and contaminants from workplaces, streets, or lawns may be carried into the home on people's shoes or clothing.[20,21] Some contaminants in drinking water can enter indoor air through uses of hot water such as showering.[22,23] In areas where groundwater is contaminated, chemicals may enter indoor environments via vapor intrusion.[24,25] Radon, a gaseous radioactive element that causes lung cancer, is found in soils and can enter homes through cracks in the foundation and other entry points.[26]

Indoor air pollutants from biological sources such as mold; dust mites; pet dander (skin flakes); and droppings and body parts from cockroaches, rodents, and other pests or insects are commonly found in children's homes.[27-30] These contaminants are important because they can lead to allergic reactions, exacerbate existing asthma, and have been associated with the development of respiratory symptoms.[28-31]

Two indoor environmental contaminants for which there is extensive evidence of children's health effects are environmental tobacco smoke and lead. The following indicators present data on environmental tobacco smoke and lead dust hazards in children's homes, because they are well-established indoor hazards to children's health and because they have nationally representative data available for more than one point in time. Other indoor environmental hazards in children's homes generally lack nationally representative data necessary for development of indicators that can identify any changes over time. Unlike many outdoor pollutants, indoor pollutants are not regulated or systematically monitored in residential settings, and data collection for indoor pollutants is much more limited. Indicator E5 presents data on environmental tobacco smoke, based on national survey data of homes with young children where someone smokes regularly. Indicator E6 presents data on lead dust hazards in children's homes. Further information on these issues is provided in the following sections. In addition, indoor environments in children's schools and in child care facilities are discussed in the Supplementary Topics section of this report.

Environmental Tobacco Smoke

Environmental tobacco smoke (ETS), commonly referred to as secondhand smoke, is a complex mixture of gases and particles and includes smoke from burning cigarettes, cigars, and pipe tobacco (sidestream smoke), as well as exhaled mainstream smoke.[32] There are at least 250 chemicals in ETS that are known to be toxic or carcinogenic, including acrolein, ammonia, benzene, carbon monoxide, formaldehyde, hydrogen cyanide, nicotine, nitrogen oxides, and sulfur dioxide.[32,33] In 1992, EPA classified ETS as a known human carcinogen.[34] Children can be exposed to ETS in their homes or in places where people are allowed to smoke, such as some restaurants in some locations throughout the United States.

According to the U.S. Surgeon General, there is no safe level of exposure to ETS, and breathing even a small amount can be harmful to human health.[32] The Surgeon General has concluded that exposure to ETS causes sudden infant death syndrome (SIDS), acute lower respiratory

infection, ear problems, and more severe asthma in children. Smoking by parents causes respiratory symptoms and slows lung growth in their children.[32] Young children appear to be more susceptible to the respiratory effects of ETS than are older children.[29,34,35]

The exposure of a pregnant woman to ETS can also be harmful to her developing fetus. The Surgeon General has determined that exposure of pregnant women to ETS causes a small reduction in mean birth weight, and that the evidence is suggestive (but not sufficient to infer causation) of a relationship between maternal exposure to environmental tobacco smoke during pregnancy and preterm delivery.[32] In addition, the Surgeon General concluded the evidence is suggestive but not sufficient to infer a causal relationship between prenatal and postnatal exposure to ETS and childhood cancer.[32]

Exposure to ETS in the home is influenced by adult behaviors, including the decisions to smoke at home and to allow visitors to smoke inside the home. Children living in homes with smoking bans have significantly lower levels of cotinine (a biological marker of exposure to ETS) in urine than children living in homes without smoking bans.[36] Household smoking bans can significantly decrease children's exposures to ETS, but do not completely eliminate them, especially in multi-unit housing where ETS from other apartments may infiltrate through seepage in walls or shared ventilation systems.[37-39] Furthermore, children may be exposed to toxic residues that remain from ETS in dust and on surfaces inside the home for weeks or months after smoke has cleared from the air.[6,40-43] These residues, referred to as "third-hand smoke," may be re-emitted into the gas phase or may react with other compounds to form secondary pollutants.[40,43] The risk of exposure to third-hand smoke may be particularly high for infants, due to their close proximity to contaminated objects such as blankets, carpets, and floor surfaces, and their frequent hand-to-mouth activity.[6]

Parental smoking status inside the home greatly affects children's exposures to ETS, but research suggests a difference in impact between maternal and paternal smoking. Maternal smoking is associated with higher cotinine levels in children, and maternal smoking appears to have a greater effect on lower respiratory illnesses than does paternal smoking.[32]

In recent years there has been a significant decline in children's exposures to ETS.[44] This reduction is in part attributable to a decline in the percentage of adults who smoke, and is likely related to increased restrictions on smoking at workplaces and other public places, as well as efforts to reduce the exposure of nonsmokers in homes.[44] In 2010, an estimated 19.3% of adults were current smokers, down from 24.7% in 1997.[45,46] In addition, the prevalence of smoke-free households increased from 43% of U.S. homes in 1992–1993 to 72% in 2003.[47] Children living in homes with smoking bans have significantly lower levels of cotinine than children living in homes without smoking bans.[36] Recent studies also suggest that smoking bans in workplaces and other public places can reduce the number of asthma-related emergency room visits and hospitalizations, including among children when legal bans lead to an increase in voluntary smoking bans in homes.[48,49] However, despite the increasing numbers of adults disallowing smoking in the home, approximately 34% of children live in a home with at least one smoker as of 2009.[50]

Lead in House Dust

The ingestion of lead-contaminated house dust, soil, and water is the primary pathway of current childhood exposure to lead.[51] Children have a greater risk of exposure to lead-contaminated dust than that of adults, due to their frequent and extensive contact with floors, carpets, and other surfaces where dust gathers, as well as their high rate of hand-to-mouth activity. Additionally, lead-contaminated dust particles are more readily absorbed into the body than soil or paint chips, and children's bodies absorb up to 10 times more ingested lead than adults do as a result of their less-developed gastrointestinal pathways.[52] Children living in homes with higher levels of lead-contaminated dust tend to have higher blood lead levels.[53-58]

Lead dust is composed of fine particles of soil, paint, and other settled industrial or automotive emissions from the outdoor and indoor air.[59] Residences with deteriorated lead-based paint tend to have higher levels of lead in house dust and the surrounding soil.[51,60] Deteriorated lead-based paint that is cracked, peeling, or chipped can be ingested directly by children or can mix with and contaminate house dust, which can also be ingested.[61] Normal wear as the result of cleaning activities or repeated surface friction can lead to further deterioration and the release of lead-based paint particles.[62] Any house built before 1978 may contain lead-based paint. As of the year 2000, approximately 38 million older housing units in the United States still contained lead-based paint.[51]

Home maintenance and renovation activities that disturb lead-based paint, such as sanding, scraping, cutting, and demolition, create hazardous lead dust and chips and have been associated with higher levels of lead dust and blood lead in children.[60,63] Beginning in April 2010, all contractors performing renovation, repair, and painting projects that disturb lead-based paint in pre-1978 homes and child-occupied facilities, such as child care facilities and preschools, must be certified and follow specific work practices to prevent lead contamination.[60] Lead-contaminated soil is another contributor to lead in house dust. Known sources of lead in soil include historical airborne emissions from leaded gasoline use, emissions from industrial sources such as smelters, and lead-based paint. Current sources of lead in ambient air in the United States include smelters, ore mining and processing, lead acid battery manufacturing, and coal combustion activities, such as electricity generation.[58] Lead-contaminated dust and soil from the outdoors can be transported into the home after becoming airborne via soil resuspension, or can be tracked into the home by occupants or family pets.[52]

The National Toxicology Program (NTP) has concluded that childhood lead exposure is associated with reduced cognitive function.[64] Children with higher blood lead levels generally have lower scores on IQ tests[55,65-70] and reduced academic achievement.[64] The NTP has also concluded that childhood lead exposure is associated with attention-related behavioral problems (including inattention, hyperactivity, and diagnosed attention-deficit/hyperactivity disorder) and increased incidence of problem behaviors (including delinquent, criminal, or antisocial behavior).[64]

Until recently, the Centers for Disease Control and Prevention (CDC) defined a blood lead level of 10 micrograms per deciliter (µg/dL) as "elevated." This definition was used to identify children for blood lead case management.[71,72] However, no level of lead exposure has been identified that is without risk of deleterious health effects.[58] CDC's Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) recommended in January 2012 that the 97.5th percentile of children's blood lead distribution (currently 5 µg/dL) be defined as "elevated" for purposes of identifying children for follow up activities such as environmental investigations and ongoing monitoring.[73] CDC has adopted the ACCLPP recommendation.[74] CDC specifically notes that "no level of lead in a child's blood can be specified as safe,"[75] and the NTP has concluded that there is sufficient evidence for adverse health effects in children at blood lead levels less than 5 µg/dL.[64]

The current federal standards indicate that floor and window lead dust should not exceed 40 micrograms of lead per square foot (µg/ft^2) and 250 µg/ft^2, respectively, in order to protect children from developing "elevated" blood lead levels as formerly defined by the CDC. EPA is currently reviewing the lead dust standards to determine whether they should be lowered, based on indications from more recent epidemiological studies that the current standards may not be sufficiently protective of children.[76]

Childhood blood lead and house dust lead levels in the United States differ across groups in the population, such as those defined by socioeconomic status, race/ethnicity,[51,53,77] and geographic location. Children living in poverty and Black non-Hispanic children tend to have higher blood lead levels[53,78] and higher levels of lead-contaminated dust in the home than do White non-Hispanic children.[77] Blood lead levels tend to be higher for children living in older housing, because older housing units are more likely to contain lead-based paint.[77,79] Additionally, housing in the Northeast and Midwest has twice the prevalence of lead-based paint hazards compared with housing in the South and West,[59] because of the older housing stock in those areas.

Indicator E5: Percentage of children ages 0 to 6 years regularly exposed to environmental tobacco smoke in the home, by family income, 1994, 2005, and 2010

About the Indicator: Indicator E5 presents the percentage of children ages 0 to 6 years regularly exposed to environmental tobacco smoke (ETS) in the home. The data are from a national survey that collects health information from a representative sample of the population. The survey provides data on children exposed to ETS in the home on four or more days per week for the years 1994, 2005, and 2010. The focus is on children ages 6 years and under because these younger children have been specifically identified as more susceptible to the effects of tobacco smoke.

National Health Interview Survey

Comparable, nationally representative data on children living in homes where someone smokes regularly come from the National Health Interview Survey (NHIS) for 1994, 2005, and 2010. The NHIS is a large-scale household interview survey of a representative sample of the civilian noninstitutionalized U.S. population, conducted by the National Center for Health Statistics. In 1994, interviews were conducted with household adults representing about 5,450 children ages 0 to 6 years, and ETS exposure information was reported for about 5,390 of those children. In 2005, interviews were conducted with household adults representing about 10,100 children ages 0 to 6 years, and ETS exposure information was reported for about 7,800 of those children. In 2010, interviews were conducted with household adults representing about 9,350 children ages 0 to 6 years, and ETS exposure information was reported for about 6,900 of those children. Questions related to smoking in the home are included in the NHIS only in selected years. In 1994, the NHIS asked, "Does anyone who lives here smoke cigarettes, cigars, or pipes anywhere inside this home?" Similarly, in 2005 and 2010, the NHIS asked, "In a usual week, does ANYONE who lives here, including yourself, smoke cigarettes, cigars, or pipes anywhere inside this home?" If the answer was positive, participants were asked how many days per week smoking usually occurred anywhere inside the home. The NHIS also included questions about smoking in the home in the 1998 survey, but the questions used in 1998 provide data that are not directly comparable to the 1994, 2005, and 2010 data.

Data Presented in the Indicator

Indicator E5 presents data from NHIS for the percentage of children ages 0 to 6 years living in homes where someone smokes on a regular basis (defined as four days or more per week). Studies have found that questionnaire data on smoking in the home are relatively accurate in predicting serum levels of cotinine (a metabolite of nicotine used as a marker of ETS exposure) in children,[80,81] and researchers have used these data to associate ETS exposure with adverse effects on childhood lung function and other health outcomes.[32] However, comparisons of questionnaire data with measures of serum cotinine in children suggest that questionnaires may underestimate actual exposure to ETS, particularly in multi-unit housing or in cases where visitors and other non-family members may smoke in the home.[32,39,82-84]

While the indicator provides information on the presence and number of days per week of smoking in the home, it does not indicate the intensity of smoking (e.g., the number of cigarettes smoked in the home per day). Furthermore, children exposed to ETS at home fewer than four days per week are not included in this indicator, but may also experience adverse health effects since no level of exposure to ETS is without a risk to health.

We focus on children ages 0 to 6 years because these younger children have been specifically identified as more susceptible to the effects of tobacco smoke and are targeted by the indicator used in the federal government's Healthy People 2010 initiative.[85] Children ages 6 years and under also have less control over their environment and are likely to spend more time in close proximity to adult caregivers.[32] Children of all ages, however, may be affected by exposure to ETS.

The indicator presents data on children's exposures to ETS in the home for 1994, 2005, and 2010, based on family income level. Additional information regarding ETS exposures for different race/ethnicity groups is presented in Table E5a.

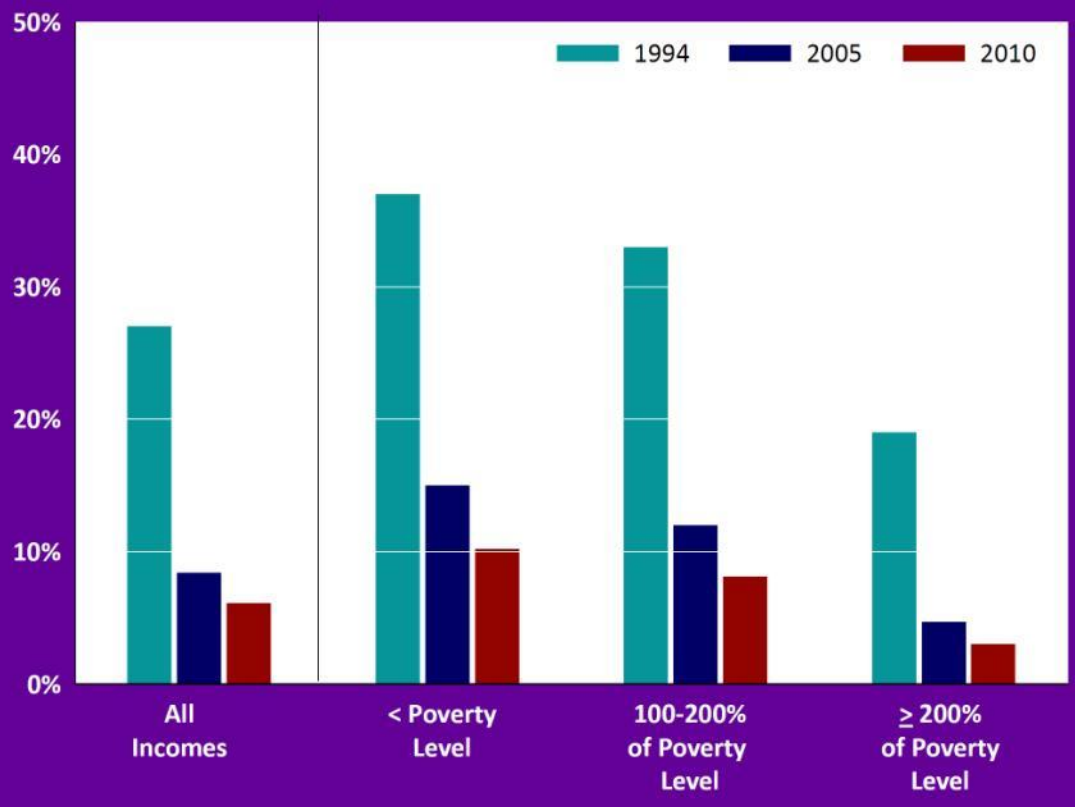
Statistical Testing

Statistical analysis has been applied to the 2010 data to evaluate differences in indicator values between demographic groups. These analyses use a 5% significance level, meaning that a conclusion of statistical significance is made only when there is no more than a 5% probability that the observed difference occurred by chance ($p \leq 0.05$). A finding of statistical significance depends on the numerical difference in the indicator value between two groups, the number of observations in each group, and various aspects of the survey design. For example, the statistical test is more likely to detect a difference between two groups when data have been obtained from a larger number of people in those groups. It should be noted that when statistical testing is conducted for differences among multiple demographic groups (for example, considering both race/ethnicity and income level), the large number of comparisons involved increases the probability that some differences identified as statistically significant may actually have occurred by chance.

A finding of statistical significance is useful for determining that an observed difference was unlikely to have occurred by chance. However, a determination of statistical significance by itself does not convey information about the magnitude of the difference in indicator values or the potential difference in risk of associated health outcomes. Furthermore, a lack of statistical significance means only that occurrence by chance cannot be ruled out. Thus a conclusion about statistical significance is only part of the information that should be considered when determining the public health implications of differences in indicator values.

Indicator E5

Percentage of children ages 0 to 6 years regularly exposed to environmental tobacco smoke in the home, by family income, 1994, 2005, and 2010



Data: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey

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Data characterization

- Data for this indicator are obtained from an ongoing annual survey conducted by the National Center for Health Statistics.
- Survey data are representative of the U.S. civilian noninstitutionalized population.
- In 1994, 2005, and 2010, an adult survey participant in each sampled household was asked whether any resident smokes inside the home and the number of days per week that smoking occurred.

- In 2010, 6% of children ages 0 to 6 years lived in homes where someone smoked regularly, compared with 27% in 1994.
- Children living in homes with family incomes below the poverty level were more likely than their peers at higher income levels to be living in homes where someone smoked regularly. In 2010, 10% of children below the poverty level lived in homes where someone smoked

regularly, compared with 8% of children in homes with incomes between 100–200% of poverty level, and 3% of children in homes with incomes at least twice the poverty level.
    - The differences between children in homes with family incomes below the poverty level and children in homes with family incomes at or above the poverty level were statistically significant.
- In 2010, 20% of White non-Hispanic children below poverty lived in homes where someone smoked regularly, compared with 10% of Black non-Hispanic children and 2% of Hispanic children living below poverty. (See Table E5a.) These differences were statistically significant.

Indicator E6: Percentage of children ages 0 to 5 years living in homes with interior lead hazards, 1998–1999 and 2005–2006

About the Indicator: Indicator E6 shows the percentage of children ages 0 to 5 years who lived in homes with interior lead-based paint hazards. The data are from two nationally representative surveys of homes conducted in 1998–1999 and 2005–2006. The surveys involved collection of dust, soil, and paint samples from homes and measurement of the lead levels in these samples. The focus of the indicator is on children ages 0 to 5 years, due to the elevated exposures that occur during early childhood and the sensitivity of the developing brain to the effects of lead.

NSLAH/AHHS

The United States Department of Housing and Urban Development (HUD) has conducted two nationally representative surveys of housing in the United States to assess children's potential household exposure to lead and other contaminants. The American Healthy Homes Survey (AHHS) was conducted from 2005–2006 to update the National Survey of Lead and Allergens in Housing (NSLAH), which was conducted from 1998–1999. AHHS also included measurements of arsenic, pesticides, and mold; however, these substances were not measured in the earlier NSLAH.

Samples of paint, dust, and soil were taken from 831 total housing units (184 units with children ages 0 to 5 years) in NSLAH, and 1,131 total housing units (206 units with children ages 0 to 5 years) in AHHS. The lead sampling components of AHHS were designed to be very similar to NSLAH so that results of the two studies could be compared.

Lead-Based Paint Hazards

Samples collected from the housing units surveyed in NSLAH and AHHS were analyzed to determine their lead content. HUD then compared these measured lead levels to federal guidelines to identify homes with lead-contaminated dust, deteriorated lead-based paint, and lead-contaminated soil hazards.

EPA has established Residential Lead Hazard Standards under Title X of the Toxic Substances Control Act (TSCA), section 403, for identifying lead-based paint hazards in all housing built before 1978. These standards were adopted by HUD under the Lead Safe Housing Act, which applies to all federally owned or assisted housing in the United States. According to these regulations, a lead-based paint hazard is the presence of deteriorating lead-based paint, lead-contaminated dust, or lead-contaminated soil above federal standards.

For lead-contaminated dust, there are separate standards for dust on the floor and dust on windowsills. Floor dust samples should not have more than 40 micrograms of lead per square foot ($\mu g/ft^2$) and window dust samples should not have more than 250 $\mu g/ft^2$.[61,86]

Additionally, current federal standards qualify a significantly deteriorated lead-based paint hazard as the deterioration of an area of lead-based paint greater than 20 square feet (exterior) and 2 square feet (interior) for large-surface items, such as walls and doors; or damage to more than 10% of the total surface area of small-surface components—such as windowsills, baseboards, and trim—with lead-based paint.

The level of deterioration is an important variable in determining exposure. The presence of lead-based paint alone is not necessarily indicative of a significant hazard; except during renovations, maintenance, and similar disturbances, intact lead-based paint is believed to pose very little risk to occupants.[87] However, deteriorated lead-based paint that is cracked, peeling, or chipped can be ingested directly by children or can contaminate house dust that can be inhaled or ingested by children.[61]

Data Presented in the Indicator

Indicator E6 presents the percentage of children ages 0 to 5 years who lived in homes with interior lead-based paint hazards, using data from NSLAH and AHHS and three hazard definitions.

The first hazard definition, "interior lead dust," presents the percentage of children ages 0 to 5 years living in homes with a lead dust hazard, based on the number of homes with dust containing levels of lead that exceeded the levels defined by EPA's Residential Lead Hazard Standards (established under Title X of TSCA, section 403). The second hazard definition, "interior deteriorated lead-based paint," displays the percentage of children ages 0 to 5 years who lived in homes with significantly deteriorated lead-based paint indoors as defined by EPA's Residential Lead Hazard Standards. The last definition, "either interior lead dust or interior deteriorated lead-based paint," represents the percentage of children living in homes with an interior dust hazard, a deteriorated lead-based paint hazard, or both.

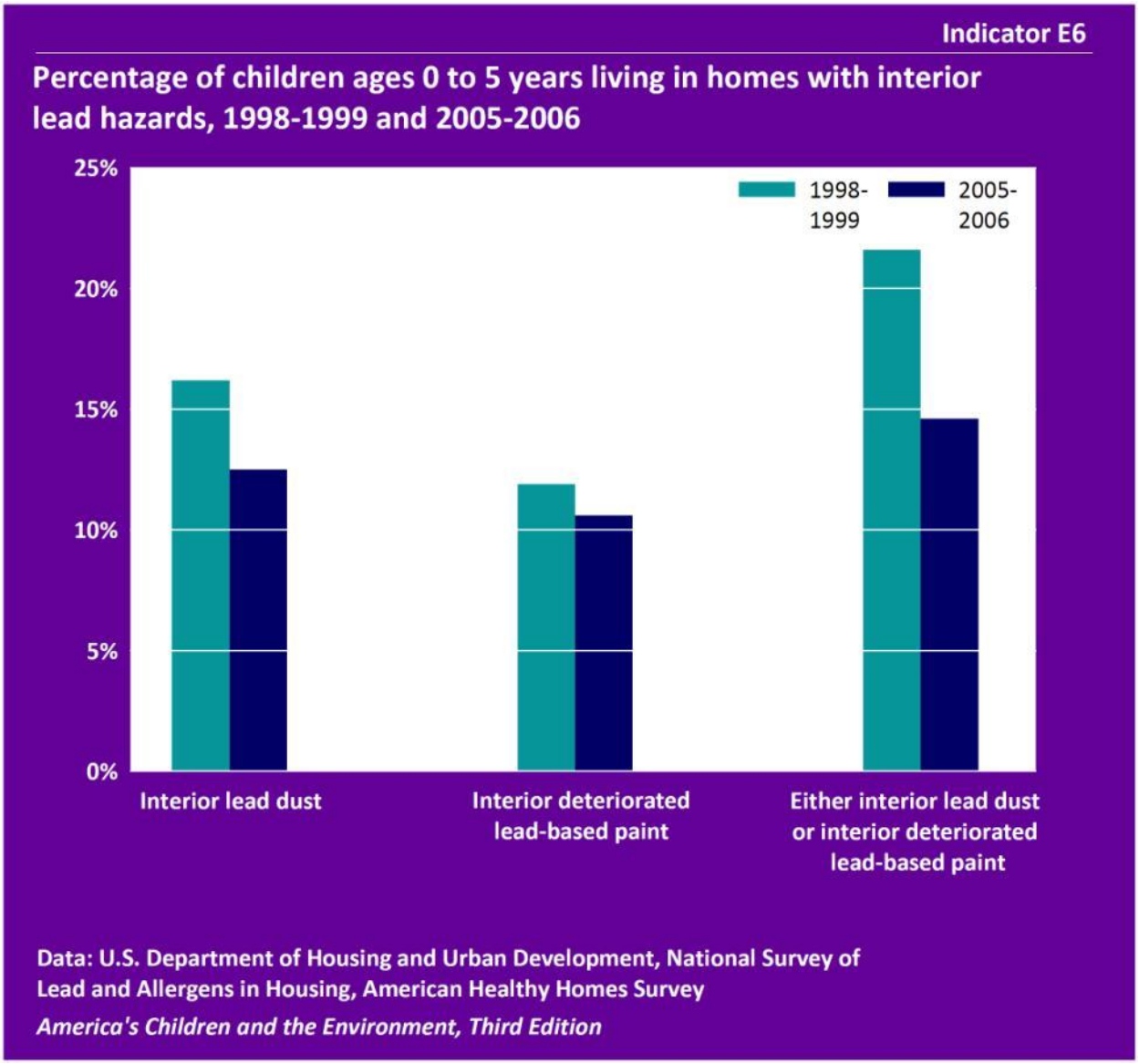
This indicator represents the potential for children's indoor exposure to lead based solely on the percentage of children ages 0 to 5 years living in homes with levels of lead-based paint and dust above federal standards. The indicator does not represent differences in paint lead levels, paint deterioration levels, or the amount of lead in the dust above the standards. It also does not account for the possibility that children living in homes with levels of lead-based paint and dust below federal standards may still have some exposure to lead. Furthermore, while this indicator focuses on children ages 0 to 5 years, older children may also experience health effects from exposure to lead.

Survey records identify the race/ethnicity and income level of survey respondents; however, estimates of lead hazards in the home for children ages 0 to 5 years broken out by race/ethnicity and income are not statistically reliable, due to the relatively small number of homes in each group. Therefore, the indicator provides data only for all children ages 0 to 5 years combined.

Statistical Testing

Statistical analysis has been applied to Indicator E6 to evaluate differences over time in the indicator values (for example, percentage of children living in homes with lead-contaminated dust). These analyses use a 5% significance level, meaning that a conclusion of statistical significance is made only when there is no more than a 5% probability that the observed difference occurred by chance ($p \leq 0.05$). The statistical analysis depends on the numerical difference in the indicator value over time, the number of observations in each time period, and various aspects of the survey design. For example, the statistical test is more likely to detect a change over time when data have been obtained from a larger number of people in each time period.

A finding of statistical significance is useful for determining that an observed difference was unlikely to have occurred by chance. However, a determination of statistical significance by itself does not convey information about the magnitude of the difference in indicator values or the potential difference in risk of associated health outcomes. Furthermore, a lack of statistical significance means only that occurrence by chance cannot be ruled out. Thus a conclusion about statistical significance is only part of the information that should be considered when determining the public health implications of changes over time.



Data characterization

- Data for this indicator are obtained from two surveys of U.S. homes conducted by the Department of Housing and Urban Development.
- Surveyed homes were representative of permanently occupied, non-institutional housing units in the United States in which children may live. Only surveyed homes with children ages 0 to 5 years were included in calculation of this indicator.
- Lead was measured in samples of paint and dust collected from the surveyed homes.

- In 2005–2006, 13% of children ages 0 to 5 years lived in homes with an interior lead dust hazard, compared with 16% in 1998–1999.
- In 2005–2006, 11% of children ages 0 to 5 years lived in homes with an interior deteriorated lead-based paint hazard, compared with 12% in 1998–1999.

- In 2005–2006, 15% of children ages 0 to 5 years lived in homes with either an interior lead dust hazard or an interior deteriorated lead-based paint hazard, compared with 22% in 1998–1999.
- Changes in percentages between the two surveys were not statistically significant.

Indoor Environments

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Table E5: Percentage of children ages 0 to 6 years regularly exposed to environmental tobacco smoke in the home, by family income, 1994, 2005, and 2010

Year	All Incomes	< Poverty Level	100-200% of Poverty Level	≥ 200% of Poverty Level
1994	27.3	37.1	32.7	18.5
2005	8.4	14.6	11.7	4.7
2010	6.1	10.2	8.1	3.0

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey

Table E5a: Percentage of children ages 0 to 6 years regularly exposed to environmental tobacco smoke in the home, by race/ethnicity and family income, 2010

Race / Ethnicity	All Incomes *(n=6,890)*	< Poverty Level *(n=2,072)*	≥ Poverty Level *(n=4,818)*	> Poverty (Detail) 100-200% of Poverty Level *(n=1,787)*	> Poverty (Detail) > 200% of Poverty Level *(n=3,030)*
All Races/Ethnicities *(n=6,890)*		10.2	4.7	8.1	3.0
White non-Hispanic *(n=2,662)*	7.5	19.9	5.2	11.5	3.1
Black or African-American non-Hispanic *(n=1,049)*	8.5	10.4	7.0	7.8	6.3
Asian non-Hispanic *(n=381)*	NA**	NA**	NA**	NA**	NA**
Hispanic *(n=2,492)*	2.2	2.5*	2.1	2.5*	1.6*
Mexican *(n=1,687)*	2.2	2.6*	1.9*	NA**	NA**
Puerto Rican *(n=209)*	4.8*	NA**	NA**	NA**	NA**
All Other Races† *(n=306)*	9.5	13.7*	8.3*	2.5*	NA**
American Indian/Alaska Native non-Hispanic *(n=22)*	NA**	NA**	NA**	NA**	NA**

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey

† The "All Other Races" category includes all other races not specified, together with those individuals who report more than one race.

* The estimate should be interpreted with caution because the standard error of the estimate is relatively large: the relative standard error, RSE, is at least 30% but is less than 40% (RSE = standard error divided by the estimate).

**Not available. The estimate is not reported because it has large uncertainty: the relative standard error, RSE, is 40% or greater (RSE = standard error divided by the estimate).

Table E6: Percentage of children ages 0 to 5 years living in homes with interior lead hazards, 1998-1999 and 2005-2006

Year	Interior Lead Dust	Interior Deteriorated Lead-Based Paint	Either Interior Lead Dust or Interior Deteriorated Lead-Based Paint
1998-1999	16.2	11.9	21.6
2005-2006	12.5	10.6	14.6

DATA: U.S. Department of Housing and Urban Development, National Survey of Lead and Allergens in Housing, American Healthy Homes Survey

NOTE: Lead hazards are defined here by current federal standards indicating that floor and window lead dust should not exceed 40 micrograms of lead per square foot ($\mu g/ft^2$) and 250 $\mu g/ft^2$, respectively, in order to protect children from developing "elevated" blood lead levels as defined by the CDC at the time the standards were issued. EPA is currently reviewing the lead dust standards to determine whether they should be lowered.