

# Lead Poisoning in New York City: Continued Decline in 2012

New York City Department of Health and Mental Hygiene

March 2014



For more information about the Lead Poisoning Prevention Program or the Adult Lead Poisoning Prevention Program of the New York City Department of Health and Mental Hygiene, call 311 and ask for the Lead Poisoning Prevention Program. This report can be accessed at [www.nyc.gov/lead](http://www.nyc.gov/lead).

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## Definitions Used in This Report

**Lead Poisoning Prevention Program (LPPP):** The program provides surveillance, environmental intervention, education and care coordination services to children younger than 18 years of age and pregnant women who have or are at risk for lead poisoning.

**Adult Lead Poisoning Prevention Program (ALP):** The program provides surveillance, environmental risk assessment and education to males and non-pregnant females aged 18 years or older who have or are at risk for lead poisoning.

**Blood Lead Level (BLL):** The concentration of lead in blood, measured in micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) of blood.

**Reference Blood Lead Level:** Until January 2012, Centers for Disease Control and Prevention (CDC) identified children as having a blood lead “level of concern” if their blood lead test result was  $10 \mu\text{g}/\text{dL}$  or greater. Because of a growing body of evidence that even lower blood lead levels may cause adverse health effects, CDC is no longer using the term “level of concern” and instead adopted the reference value of  $5 \mu\text{g}/\text{dL}$  to identify children who have blood lead levels higher than most children’s levels, and require public health action. The reference level is based on the 97.5th percentile of the National Health and Nutrition Examination Survey’s (NHANES) blood lead distribution in children ages 1 to 5 years, and is reviewed every 4 years.

**Elevated Blood Lead Level (EBLL):** A blood lead level of  $10 \mu\text{g}/\text{dL}$  or greater. The New York City Health Code defines lead poisoning as a blood lead level of  $10 \mu\text{g}/\text{dL}$  or greater.

**Environmental Intervention Blood Lead Level (EIBLL):** A blood lead level of  $15 \mu\text{g}/\text{dL}$  or greater. The New York City Health Code mandates environmental interventions at this level.

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# Introduction

## About This Report

This data report, issued by the New York City Department of Health and Mental Hygiene (DOHMH), describes childhood and adult lead poisoning in New York City in 2012\* and reviews New York City's progress over time in reducing this important public health problem. The progress has been dramatic. For both children and adults, the number and severity of poisonings has declined. At the same time, blood lead testing rates have increased, especially in populations at high risk for lead poisoning. This public health success is due to a combination of factors, most notably commitment to lead poisoning prevention at the federal, state and city levels. New York City and New York State have implemented comprehensive policies and programs that support lead poisoning prevention.

## Childhood Lead Poisoning Prevention: A Public Health Success Story

Childhood lead poisoning is a serious, but preventable health problem. In young children, exposure to lead can result in long-lasting neurologic damage that may cause learning and behavioral problems and lowered intelligence. Pregnant women and their fetuses may also be adversely affected. Preventing exposure to lead is the only effective way to protect children from the long term consequences of lead poisoning.

New York City's progress in reducing childhood lead poisoning has been striking. Not only has the number of children with lead poisoning declined —

a 68% drop from 2005 to 2012 — but the severity of poisonings has also declined. In 2005, there were 14 children newly identified with blood lead levels of 45 µg/dL and above, and in 2012 there were 5 children. At these levels, children require immediate medical intervention and may require hospitalization for chelation, a treatment that removes lead from the body.

Forty years ago, tackling childhood lead poisoning seemed a daunting task. In 1970, when New York City established the Health Department's Lead Poisoning Prevention Program, there were over 2,600 children identified with blood lead levels of 60 µg/dL or greater — levels today considered medical emergencies. Compared with other parts of the nation, New York City's children were at higher risk for lead poisoning primarily due to the age of New York City's housing stock, the prevalence of poverty and the associated deteriorated housing conditions. Older homes and apartments, especially those built before 1950, are most likely to contain lead-based paint. In New York City, more than 60% of the housing stock — around 2 million units — was built before 1950, compared with about 22% of housing nationwide.

New York City banned the use of lead-based paint in residential buildings in 1960, but homes built before the ban may still have lead in older layers of paint. Lead dust hazards are created when housing is poorly maintained, with deteriorated and peeling lead paint, or when repair work in old housing is done unsafely. Young children living in such housing are especially at risk for lead poisoning. They are more likely to ingest lead dust because they crawl on the floor and put their hands and toys in their mouths.

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\* The appendix of the report contains surveillance data for the period 2010-2012.

While lead paint hazards remain the primary source of lead poisoning in New York City children, the number and rate of newly identified cases and the associated blood lead levels have greatly declined.

## Strong Policies Aimed at Reducing Childhood Lead Exposure

Declines in blood lead levels can be attributed largely to government regulations instituted in the 1960s, 1970s and 1980s that banned or limited the use of lead in gasoline, house paint, water pipes, solder for food cans and other consumer products. Abatement and remediation of lead-based paint hazards in housing, and increased consumer awareness of lead hazards have also contributed to lower blood lead levels.

New York City developed strong policies to support lead poisoning prevention. Laws and regulations were adopted to prevent lead exposure before children are poisoned and to protect those with elevated blood lead levels from further exposure.

**Local Law 1 of 2004.** New York City has had policies in place aimed at reducing lead paint hazards in housing since 1960. These policies emphasize lead-based-paint hazard control in housing, with a focus on young children. The current law, known as Local Law 1 (the Childhood Lead Poisoning Prevention Act), went into effect in 2004. Local Law 1 requires owners of multiple dwellings (buildings with 3 or more units) to annually fix lead-based paint hazards using safe work practices in every apartment occupied by a child younger than 6 years of age. The law applies to all buildings built before 1960 (or between 1960 and 1978 if the building owner knows that the building contains lead paint). The New York City Department of Housing Preservation and Development (HPD) is primarily responsible for enforcing the law.

Local Law 1 also requires group day care operators to visually survey their facilities for peeling paint and other lead-based paint hazards at least once a year. Lead paint hazards must be repaired immediately, using safe work practices.

**New York City Health Code.** The New York City Health Code authorizes the Health Department to investigate lead hazards in the home of any child with a blood lead level of 15 µg/dL or greater as well as other addresses where the child spends a significant amount of time. When lead paint hazards are identified, DOHMH orders the building owner to abate the hazards. The blood lead level triggering these activities is known as the environmental intervention blood lead level (EIBLL) and is currently 15 µg/dL or greater.

The Health Code also requires the use of safe work practices when renovation and repair work disturbs lead paint, and grants authority to DOHMH to embargo and seize lead containing consumer products.

**Taking Action at Lower Blood Lead Levels.** In January 2012, Centers for Disease Control and Prevention (CDC) adopted the reference value of 5 µg/dL to track the number of children who have blood lead levels higher than most children's levels.

Even before CDC established this reference value, New York City had developed initiatives aimed at preventing further exposure of children with blood lead levels below the environmental intervention blood lead level, as well as primary prevention initiatives targeting high-risk children before they are lead poisoned.

DOHMH contacts families and medical providers of children with blood lead levels at or above 5 µg/dL to advise them to re-test the child and identify potential sources of lead exposure. Families are advised to report peeling or damaged paint to the

building owner and to call 311 if repairs are not made promptly and safely. DOHMH also offers environmental investigation and risk assessment to families with young children with blood lead levels between 10 µg/dL and 14 µg/dL. In addition, as part of primary prevention, families of newborns living in buildings where DOHMH has identified a child with an environmental intervention blood lead level are contacted, and offered environmental investigations and risk assessment.

#### **Mandatory Blood Lead Testing and Reporting.**

Blood lead testing is a key component of lead poisoning prevention. Most children with lead poisoning have no clinical symptoms, and blood lead testing is the only practical way to identify these children in order to make an effort to prevent further exposure. New York State law requires health care providers to test all 1-year-old and 2-year-old children for lead poisoning, and children at high risk for lead poisoning up to 6 years of age. New York State and New York City require laboratories to report all blood lead test results within 5 days. The New York City Health Code also requires doctors and laboratories to report blood lead levels of 10 µg/dL or greater to DOHMH within 24 hours.

### Progress in Adult Lead Poisoning Prevention

The progress in prevention of adult lead poisoning has also been striking. From 2005 to 2012, the rate of lead poisoning among those tested declined by more than 50% among men and by more than 60% among women. In the same period, testing increased by 25% and 65% for men and women, respectively.

The most common cause of adult lead poisoning is occupational exposure to lead in the construction industry. Workers are exposed by breathing lead

dust or lead fumes during construction activities such as renovations, repairs and demolitions that disturb old, lead-based paint on steel structures and in buildings. Occupational sources of lead exposure are more common among men than women. In addition to occupational exposure, adults can be exposed to lead through hobbies or by ingesting products contaminated with lead such as imported remedies, medicines and spices.

Although many adults exposed to lead have no symptoms, exposure to lead can result in many health problems ranging from neurological damage, high blood pressure, as well as reproductive problems, including miscarriages and premature births in pregnant women and low sperm count among men.

### Policies Aimed at Reducing Adult Lead Exposure

Laws and regulations have been implemented to help identify lead-poisoned adults and to protect those with elevated blood lead levels from further exposure.

**Blood Lead Testing and Reporting.** Both federal and New York State laws require employers to provide regular blood lead testing for workers exposed to lead on the job. In addition, New York State law requires health care providers to assess pregnant women for risk of lead poisoning during the initial prenatal visit and to perform blood lead testing for those at risk. Providers may choose to test all prenatal patients or patients with suspected lead exposure, such as from the use of imported health remedies or participation in hobbies associated with lead exposure (like target shooting or stained glass making). New York State and New York City require laboratories to report all blood lead test results within 5 days. The New York City Health Code requires doctors and

laboratories to report blood lead levels of 10 µg/dL or greater to DOHMH within 24 hours.

**New York City Health Code.** The Health Code gives authority to DOHMH to prohibit the sale or distribution of lead containing consumer products in New York City. Lead poisoning case investigations and surveillance activities help to identify contaminated products. Targeted enforcement actions have led to the removal of thousands of lead contaminated products from New York City businesses.

**Increasing Focus on Lower Blood Lead Levels.** In 2010, Adult Lead Poisoning Prevention Program lowered the blood lead level threshold for conducting risk assessment interviews with adults from 15 µg/dL to 10 µg/dL.

### Data Inform Policy and Prevention Efforts

DOHMH maintains child and adult registries of blood lead levels. The child blood lead registry contains over 9 million blood test results from New York City children and annually receives over 400,000 blood lead tests. Adult blood lead registry receives over 100,000 blood test results from New York City men and women.

Using these data, DOHMH monitors blood lead levels and blood lead screening across the city. These data are used to identify lead-poisoned individuals as well as geographic and demographic patterns of lead poisoning, target interventions to high-risk groups, assess effectiveness of interventions and support case coordination and environmental intervention services provided by DOHMH for children and adults. The DOHMH Lead Poisoning Prevention Program provides lead poisoning prevention services for children younger than 18 years of age; the DOHMH Adult Lead Poisoning Prevention Program provides services for adults 18 years and older. The two programs collaborate to identify and provide lead poisoning

prevention services for pregnant women.

### Focus on Primary Prevention and Healthy Housing

DOHMH's Lead Poisoning Prevention Program and Adult Lead Poisoning Program provide comprehensive lead poisoning prevention services to reduce lead hazards in homes and communities through public education and outreach; care coordination for lead-poisoned children and adults; and environmental investigation and enforcement for lead-poisoned children, as well as surveillance and research.

As the number of children and adults with lead poisoning began to decline, DOHMH has placed greater emphasis on primary prevention and efforts to integrate lead-poisoning prevention with initiatives aimed at building and maintaining green and healthy housing. Over the years, these initiatives have included:

- Expanding primary prevention efforts to reduce lead paint hazards in homes of newborns and children living in high-risk housing.
- Providing lead poisoning prevention services to children with elevated blood lead levels below the mandated intervention level of 15 µg/dL.
- Lowering blood lead levels that trigger risk assessment for adults, including lead poisoned pregnant women from 15 µg/dL to 10 µg/dL.
- Expanding interventions to other lead sources, especially lead-contaminated imported consumer products such as medications or remedies, cosmetics, foods or spices and jewelry.
- Expanding environmental inspections to include assessment of other housing-related health hazards.





# Childhood Lead Poisoning

# Progress in Preventing Childhood Lead Poisoning in New York City, 2005-2012

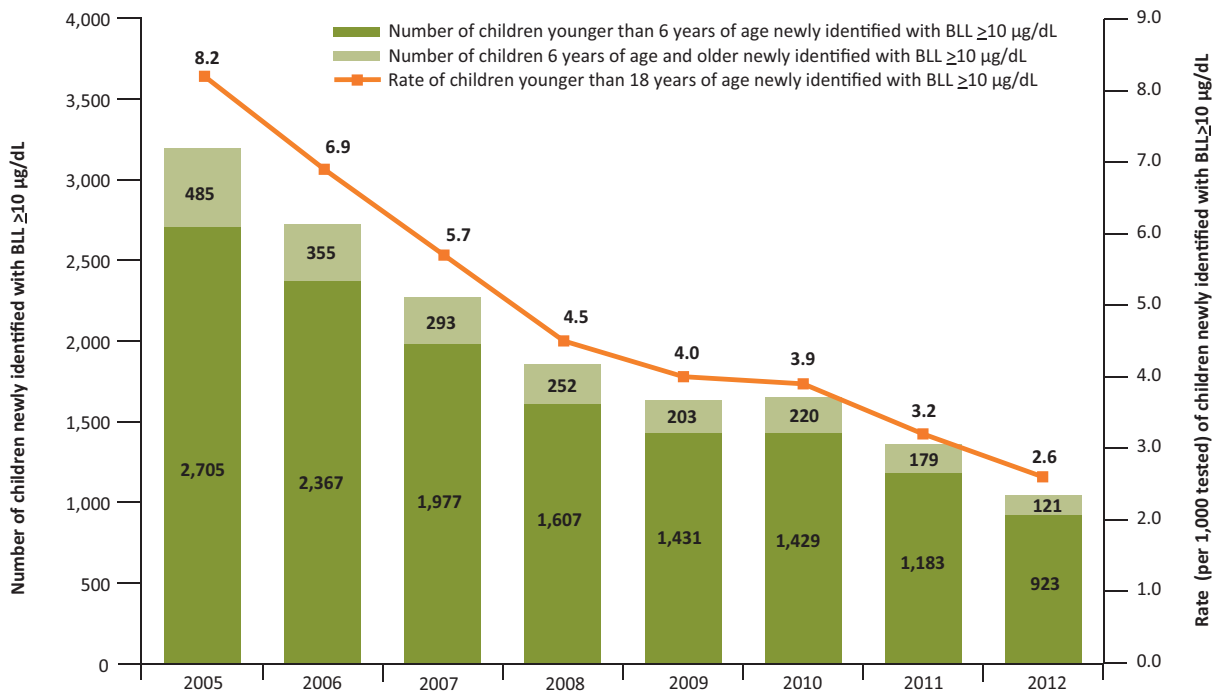
## Fewer Lead-Poisoned Children

New York City has had tremendous success in reducing both the number of children with lead poisoning and the severity of lead poisonings.

In 2012, there was a:

- 68% decline in the rate (per 1,000 tested) of children younger than 18 years of age newly identified with a blood lead level of 10 µg/dL or greater as compared with 2005 (2.6 in 2012 versus 8.2 in 2005; Figure 1).
- 68% decline in the rate (per 1,000 tested) of children younger than 6 years of age newly identified with a blood lead level of 10 µg/dL or greater as compared with 2005 (2.8 in 2012 versus 8.7 children in 2005).
- 64% decrease in the number of children newly identified with a blood lead level of 45 µg/dL or greater, a blood lead level requiring immediate medical intervention, from 14 children in 2005 to only five children in 2012.

**Figure 1. Number and Rate of Lead-Poisoned Children Continue to Decline**



Number of children younger than 6 years old, and children aged 6 years old to younger than 18 years old, and rate (per 1,000 tested) of children younger than 18 years old newly identified with a blood lead level (BLL) of 10 µg/dL or greater by year, New York City, 2005-2012.

## Fewer Children Required Environmental Intervention

The number of children younger than 18 years of age newly identified with an environmental intervention blood lead level (EIBLL), a blood lead level of 15 µg/dL or greater, has also declined dramatically. At this level, DOHMH is mandated to inspect children’s homes and order the abatement of identified lead-based paint hazards.

In 2012 there was a:

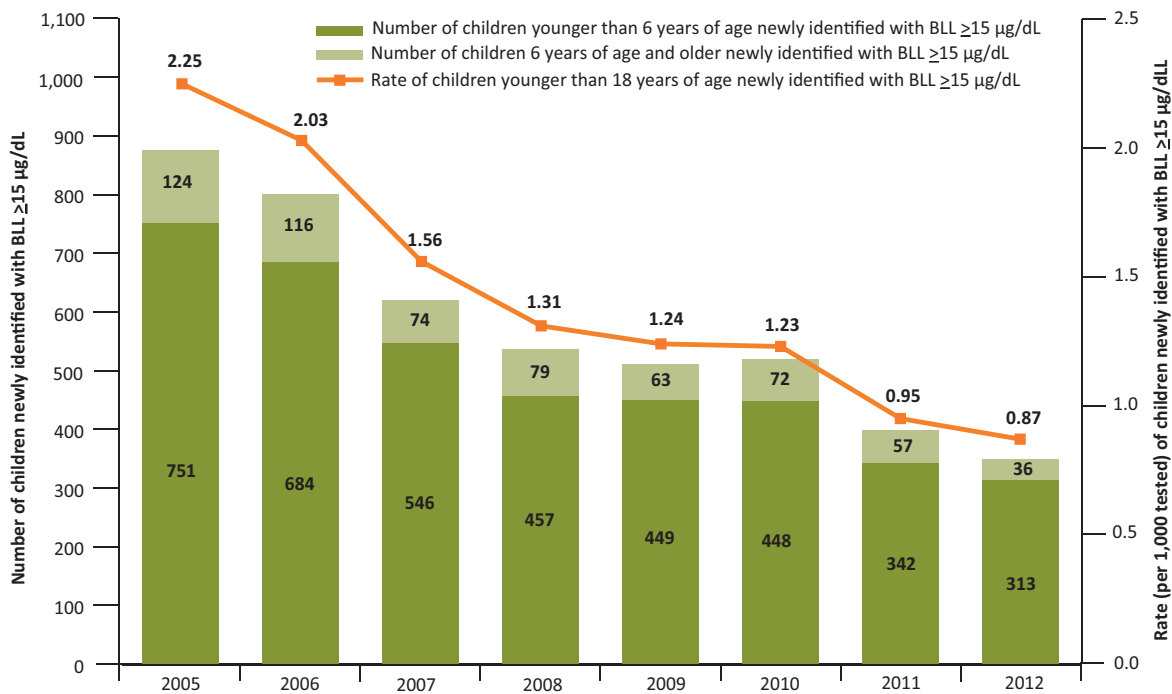
- 60% decline in the number of children younger than 18 years of age newly identified with an EIBLL compared with 2005 (349 children in 2012 versus 875 children in 2005; Figure 2).

## Decrease in Disparities

As lead poisoning among New York City children has declined, characteristics of children identified with environmental intervention blood lead levels have changed.

Hispanic, Black and Asian children continue to make up the largest proportion of children with blood lead levels of 15 µg/dL or greater. However, the percentage of Hispanic and Black children among children with lead poisoning decreased. In 2012, there were 31% Hispanic children and 23% Black children compared with 40% Hispanic children and 31% Black children in 2005. The percentage of White children increased from 9% in 2005 to 14% in 2012.

Figure 2. Fewer Children Require Environmental Intervention



Number of children younger than 6 years old, and children aged 6 years old to younger than 18 years old, and rate (per 1,000 tested) of children younger than 18 years old newly identified with a blood lead level (BLL) of 15 µg/dL or greater by year, New York City, 2005-2012.

## Lower Blood Lead Levels

In the period between 2005 and 2012 there was both a decline in the average blood lead levels of all New York City children tested for lead poisoning, as well as a decline in the percentage of children with blood lead levels at or above CDC’s reference level of 5 µg/dL.

In 2012:

- The average (geometric mean) blood lead level for children younger than 6 years of age was 1.9 µg/dL and for children younger than 18 years of age 1.8 µg/dL, compared with 2.1 µg/dL and 2.0 µg/dL, respectively, in 2005.
- There was a 78% decline in the number of children younger than 6 years of age with a blood lead level at or above 5 µg/dL compared with 2005 (8,179 in 2012 versus 37,344 in 2005). The same percentage decline was observed for children younger than 18 years of age.
- Only 2.5% of children younger than 6 had a blood lead level at or above 5 µg/dL compared with 12% in 2005.

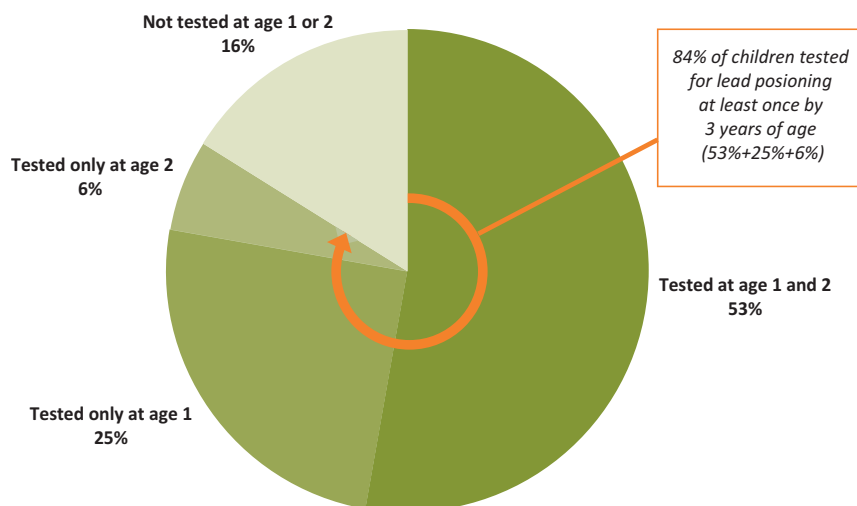
## More Children Tested for Lead Poisoning before Age 3

Between 2007\* and 2012, the percentage of children tested for lead poisoning at least once before age 3 increased by about 6%.

In 2012, among children turning 3 years of age (born in 2009):

- 84% were tested for lead poisoning at least once before their third birthday (Figure 3), a 6% increase compared with 2007, when 79% children were tested for lead poisoning before age 3.
- 53% had been tested at both age 1 and 2 (Figure 3), a 26% increase compared with 2007, when only 43% of children were tested at both age 1 and 2.
- Testing rates by the age of 3 varied by boroughs — from 80% in Manhattan to 89% in the Bronx.

**Figure 3. Most New York City Children Were Tested for Lead Poisoning at Least Once Before Age 3**



Percentage of children turning 3 years of age in 2012 (Total=118,262) tested for lead poisoning by age at test, New York City. Sources: NYC DOHMH, 2009-2012, and NYC DOHMH Office of Vital Statistics, 2009.

\* Testing rates were calculated by matching children born in New York City to children tested for lead poisoning. Data matching started with 2004 birth cohorts or children turning 3 years of age in 2007. Data are not available for children turning 3 years of age in 2005 or 2006.

# Profile of New York City Children with Lead Poisoning and Their Communities, 2012

## Community Characteristics

### Housing Age

The main source of childhood lead poisoning in New York City, as in most regions of the United States, is lead-based paint in older, deteriorated housing. More than 60% of New York City housing stock was built before 1950, when lead-based paint was widely used.

In 2012:

- 80% of 1,044 children younger than 18 years of age newly identified with blood lead levels of 10 µg/dL or greater lived in dwellings built before 1950.
- 81% of 349 children younger than 18 years of age newly identified with blood lead levels of 15 µg/dL or greater lived in dwellings built before 1950 (Appendix, Table A-1).

### Building Size

In New York City, 70% of housing units are in buildings with 3 or more units. Owners of these buildings are required by law to inspect and safely repair lead-based paint hazards.

In 2012:

- 66% of children younger than 18 years of age newly identified with blood lead levels of 10 µg/dL or greater lived in housing containing 3 or more dwelling units.
- 68% of 349 children younger than 18 years of age newly identified with blood lead levels of

15 µg/dL or greater lived in housing containing 3 or more dwelling units (Appendix, Table A-1).

### Borough

Brooklyn children are disproportionately affected by lead poisoning (Figure 4).

In 2012:

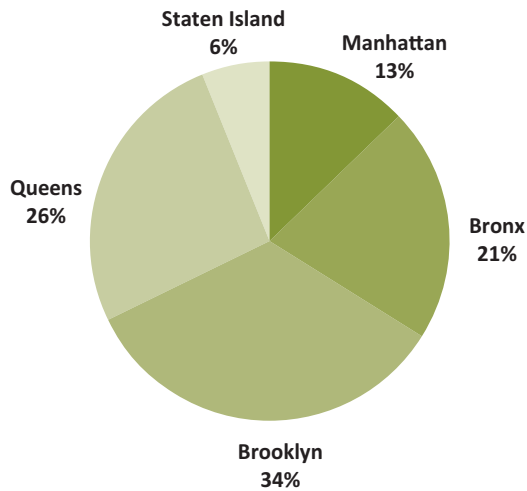
- Among 1,044 children younger than 18 years of age newly identified with blood lead levels of 10 µg/dL or greater (Figure 4):
  - 44% lived in Brooklyn, while only 34% of all New York City children live in Brooklyn.
  - 25% lived in Queens.
  - 17% lived in Bronx.
  - 9% lived in Manhattan.
  - 4% lived on Staten Island.
- Among 349 children younger than 18 years of age newly identified with blood lead levels of 15 µg/dL or greater (Appendix, Table A-1):
  - 38% lived in Brooklyn.
  - 30% lived in Queens.
  - 22% lived in the Bronx.
  - 7% lived in Manhattan.
  - 3% lived on Staten Island.

### Neighborhood

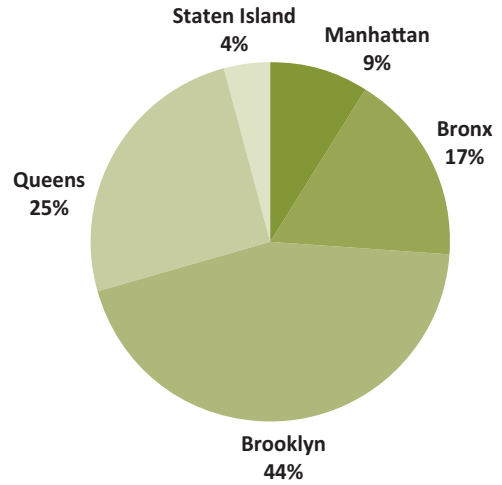
The disproportionate burden of lead poisoning in certain neighborhoods is evident when rates of elevated blood lead levels in each community in

**Figure 4. Brooklyn Children Continue to Be Overrepresented among Lead-Poisoned Children**

Percentage of All New York City Children by Borough, 2010  
(Total=1,768,100 )



Percentage of New York City Children Newly Identified with Blood Lead Levels of 10 µg/dL or Greater by Borough, 2012 (Total=1,044)



*Distribution of children younger than 18 years of age in the population and distribution of children younger than 18 years of age newly identified with blood lead levels of 10 µg/dL or greater by borough, New York City, 2012. Sources: NYC DOHMH LPPP 2012, and US Census, 2010.*

### Lead-Based Paint and Dust: A Health Hazard for Children

Homes built before the 1960 ban on lead-based paint may still contain lead in older layers of paint. These older paint layers can become a hazard if the paint chips, flakes or peels due to lack of routine maintenance or when friction on windows or doors abrades painted surfaces releasing lead contaminated dust. This dust can spread onto floors, windowsills, children’s toys and other items. Young children, who crawl on the floor and put things in their mouths, are at greatest risk for lead poisoning through ingestion of lead-contaminated dust.

Repair or renovation work in older homes, conducted without appropriate dust controls, can also release lead dust into an apartment.

the city are compared with the citywide average (Figure 5). Figure 6 shows a map of the rates of children younger than 18 years of age with blood lead levels of 10 µg/dL or greater by neighborhood; the neighborhoods with the highest rates of lead poisoning are shaded in dark green.

In 2012:

- 2.6 out of every 1,000 children younger than 18 years of age tested for lead poisoning in New York City were newly identified with a blood lead level of 10 µg/dL or greater (Figure 5).
  - In 14 of 42 neighborhoods, the rate was higher than the citywide rate. Six neighborhoods were located in Brooklyn, three in Manhattan,\* two each in Queens and Staten Island and 1 in the Bronx.

In the period 2010-2012:†

- 1.0 out of every 1,000 children younger than 18 years of age tested for lead poisoning in New York City were newly identified with a blood lead level of 15 µg/dL or greater (EIBLL) (Appendix, Figure A-1).
  - In 15 of 42 neighborhoods, the rate was higher than the citywide rate. Six neighborhoods were located in Brooklyn, four each in Queens and the Bronx and one on Staten Island.

## Characteristics of Children with Lead Poisoning

### Age

Young children (especially those younger than 3 years of age) are at greatest risk for lead poisoning. They are more likely to ingest lead-based paint or

lead-contaminated dust as they play on floors and put their hands and toys in their mouths. Lead is also more readily absorbed in the body of young children.

In 2012:

- Among 1,044 children younger than 18 years of age newly identified with blood lead levels of 10 µg/dL or greater:
  - 88% (923) were younger than 6 years of age.
  - 66% (693) were younger than 3 years of age.
- Among 349 children younger than 18 years of age newly identified with blood lead levels of 15 µg/dL or greater (Appendix, Table A-1):
  - 90% (313) were younger than 6 years of age.
  - 66% (232) were younger than 3 years of age.

### Poverty and Medicaid

Poverty contributes to the risk of childhood lead poisoning, as low-income families often reside in older, poorly maintained housing. LPPP collaborates with Medicaid Managed Care Organizations to promote appropriate blood lead testing and follow-up services for Medicaid-eligible children.

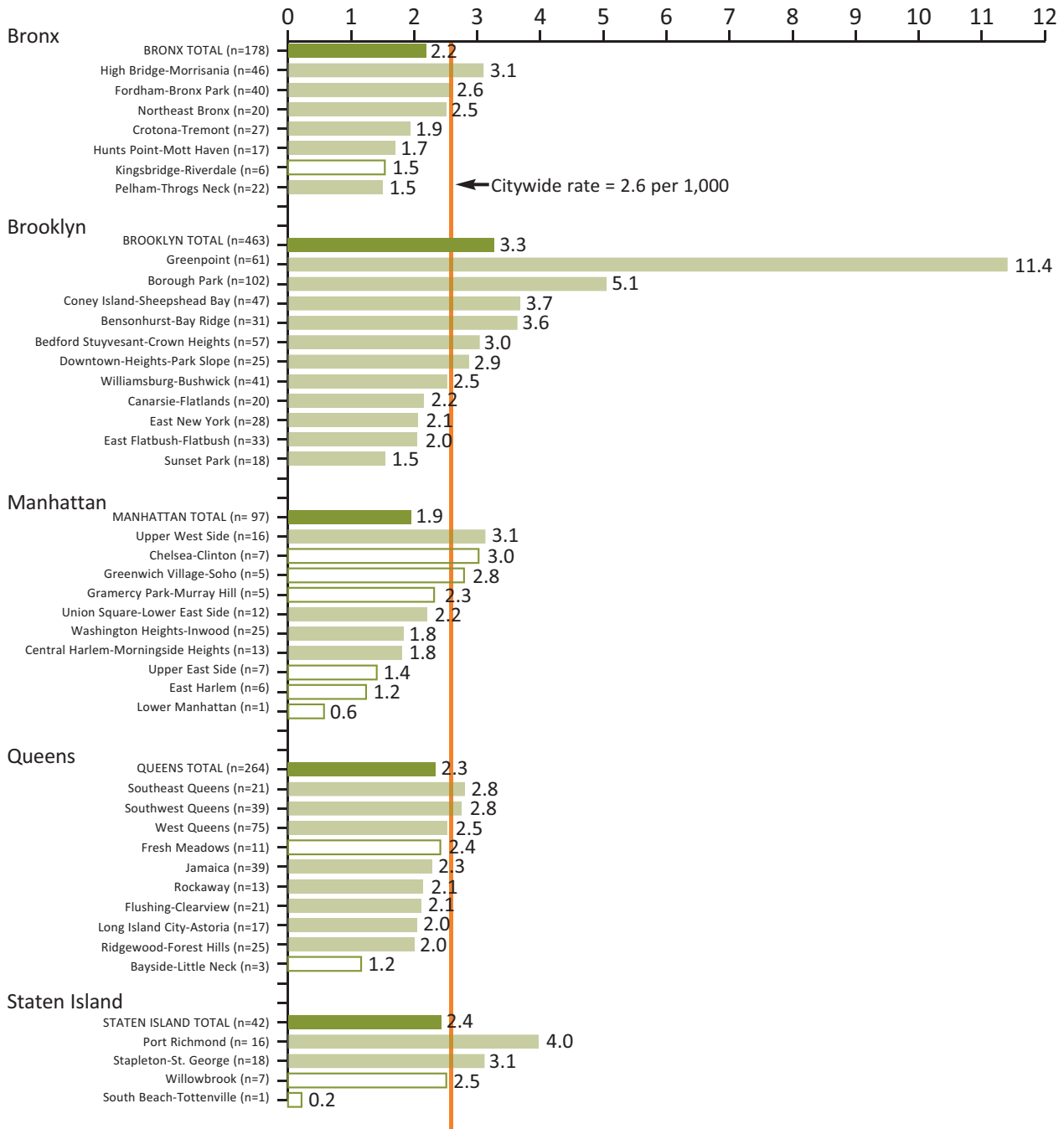
In 2012:

- 62% (647) of New York City children younger than 18 years of age newly identified with blood lead levels of 10 µg/dL or greater were enrolled in Medicaid.
- 76% (266) of children newly identified with blood lead levels of 15 µg/dL or greater were enrolled in Medicaid (Appendix, Table A-1).

\* Rates in two of the Manhattan neighborhoods should be interpreted with caution due to the small number of cases.

† To increase the reliability of the rate estimates, the neighborhood rates of children newly identified with an EIBLL were computed for the 3-year period 2010-2012.

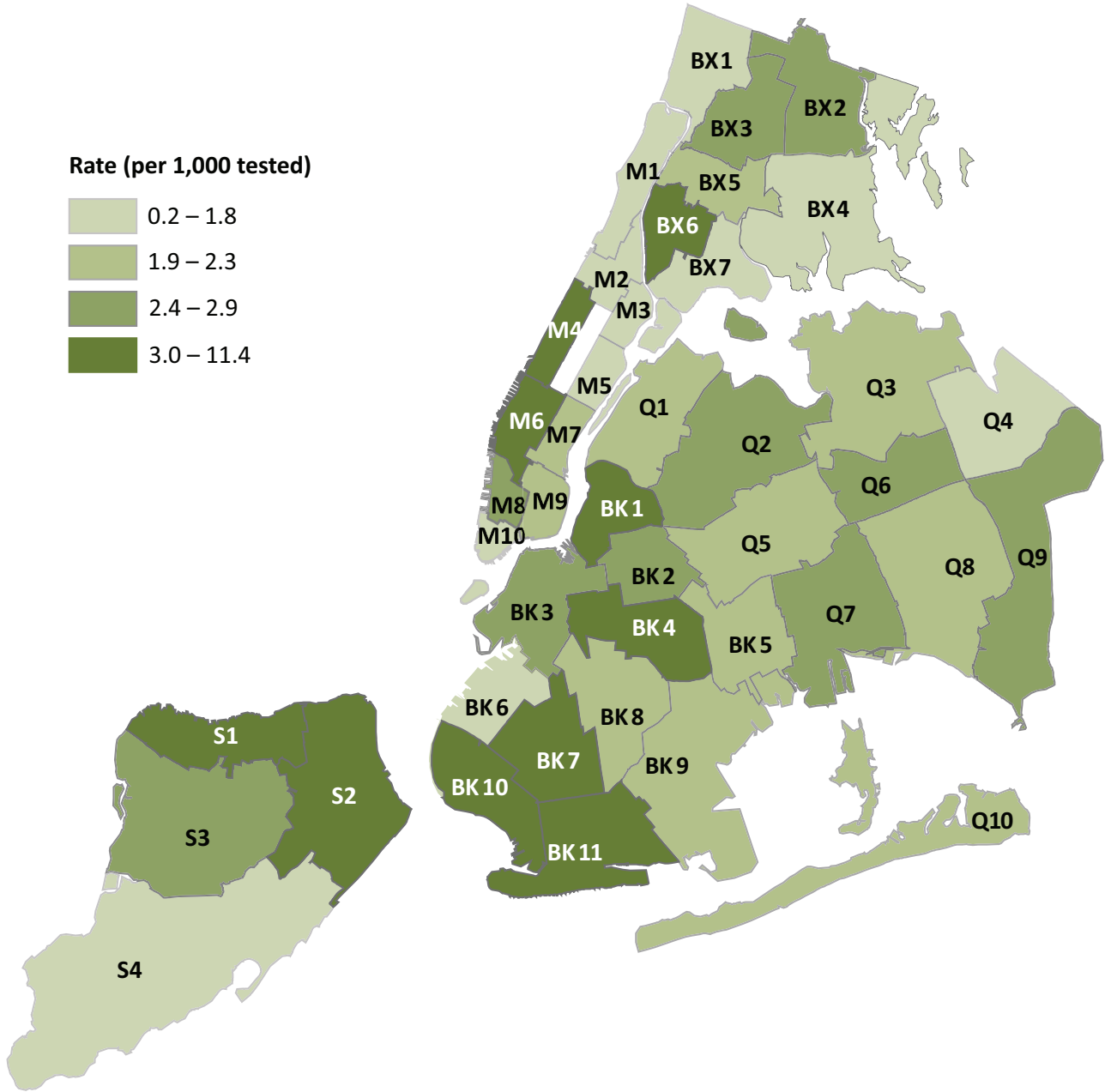
Figure 5. Rates of Children Newly Identified with Elevated Blood Lead Levels Vary across Neighborhoods



Number and rate (per 1,000 tested) of children younger than 18 years of age newly identified with an elevated blood lead level of 10 µg/dL or greater by United Hospital Fund Neighborhood, New York City, 2012. Rates represented by blank bars are less reliable (relative standard error of 30% or greater) due to the small number of cases. Caution should be used in interpreting these rates. Number of children with elevated blood lead levels in each neighborhood is reported in parentheses next to neighborhood name.



Figure 6. Distribution of Children with Elevated Blood Lead Levels by Neighborhood



Rates (per 1,000 tested) of children younger than 18 years of age, newly identified with blood lead levels of 10 µg/dL or greater, New York City, 2012. The United Hospital Fund classifies New York City into 42 neighborhoods, each comprising contiguous zip codes. Neighborhood codes and their corresponding names are provided in the Appendix, Table A-4.

### Race and Ethnicity

Although lead poisoning can affect all children, Asian, Black and Hispanic children in New York City are at higher risk than White children. Asian children are most overrepresented (Figure 7).

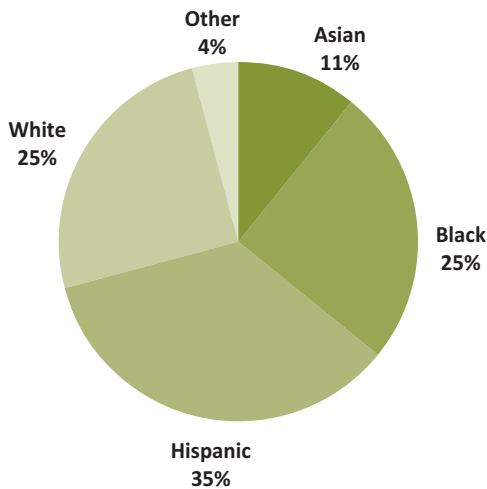
In 2012:

- Among 1,044 children younger than 18 years of age newly identified with blood lead levels of 10 µg/dL or greater:
  - 19% were Asian.
  - 25% were Hispanic.
  - 21% were Black.

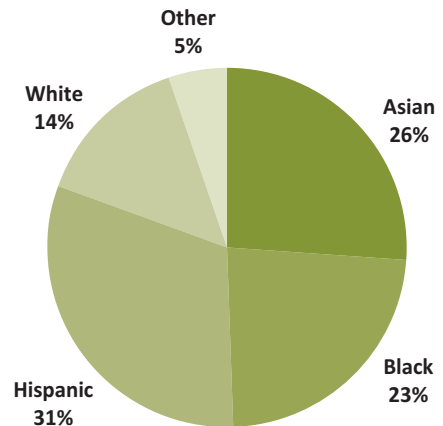
- 17% were White.
- 19% were other race/ethnicity or the information was not available.
- Among 349 children younger than 18 years of age newly identified with blood lead levels of 15 µg/dL or greater (Appendix, Table A-1):
  - 26% were Asian.
  - 31% were Hispanic.
  - 23% were Black.
  - 14% were White.
  - 5% were other race/ethnicity or the information was not available.

**Figure 7. Asian Children were Overrepresented among Lead-Poisoned Children**

Percentage of All New York City Children by Race, 2010  
(Total=1,768,100)



Percentage of New York City Children Newly Identified with Blood Lead Levels of 15 µg/dL or Greater by Race, 2012 (Total=349)



Distribution of children in the population and distribution of children newly identified with blood lead levels of 15 µg/dL or greater by race, New York City, 2010 and 2012. Sources: NYC DOHMH LPPP 2012 and US Census 2010.

## Place of Birth

Children born outside of the United States may have been exposed to lead in their countries of birth.

In 2012, among 349 children younger than 18 years of age newly identified with blood lead levels of 15 µg/dL\* or greater:

- 14% (50) were born outside of the United States. Among these children (Appendix, Table A-1):
  - 26% were born in Pakistan.
  - 20% were born in Bangladesh.
  - 6% each were born in the Dominican Republic, Uzbekistan and Nigeria.

## Risk Factors for Lead Exposure

Environmental interventions are provided for children with blood lead levels of 15 µg/dL or greater. These services include environmental inspections to determine presence of lead-based paint hazards in the child's home and secondary addresses, and an interview with the child's parents or guardians to assess other potential risk factors for lead poisoning in the child's environment. The risk assessment data are used to educate families about lead exposure risks and what they can do to reduce lead exposure of their children; it also informs and guides DOHMH intervention efforts. Each year, LPPP successfully conducts home paint inspections for more than 90% of children newly identified with a blood lead level of 15 µg/dL or greater, and conducts interviews with the guardians of 99% of children

newly identified with a blood lead level of 15 µg/dL or greater.

## Lead-Based Paint Hazards

Peeling lead-based paint or lead-based paint that covers friction surfaces such as windows and doors or impact surfaces such as doors and baseboards are considered a lead-based paint hazards.

In 2012, among 349 children newly identified with a blood lead level greater than or equal to 15 µg/dL:

- 92% (320) received a home paint inspection. Of these children:
  - 75% (239) had lead-based paint violations identified in their homes.
  - On average, 14 (range 1 to 89) lead-based paint hazards were identified in their homes.

## Other Potential Sources of Lead Exposure

In 2012, for 99% (345) of children newly identified with a blood lead level of 15 µg/dL or greater, LPPP was able to interview parents or guardians to assess other potential sources of lead exposure. Data collected from these interviews are useful in guiding education of parents and LPPP's intervention efforts.

More than 80% of the families reported one or more potential sources of the child's lead exposure, including:

- Mouthing toys and other non-food items.
- Traveling abroad, particularly to countries in South Asia (Pakistan, Bangladesh).

\* Reliable data on countries of birth were only available for children newly identified with a blood lead level of 15 µg/dL or greater (EIBLL).

- Using imported food, spices, medicine or remedies, cosmetics and pottery.
- Living in a home that had recent remodeling or renovation work.
- Living with a household member who worked in jobs or had hobbies that may have exposed them to lead, such as construction, home renovation or remodeling.
- Ingesting paint chips.



# Adult Lead Poisoning

# Progress in Preventing Adult Lead Poisoning in New York City, 2005-2012

## Fewer Adults with Lead Poisoning

The rate of lead poisoning among New York City adults decreased between 2005 and 2012.

In 2012:

- The rate of women who were identified with blood lead levels greater than or equal to 10 µg/dL decreased by more than 60% compared with 2005 (2.7 per 1,000 tested in 2012 versus 6.9 per 1,000 tested in 2005; Figure 8).
- The rate of men identified with blood lead levels greater than or equal to 10 µg/dL decreased by more than 50% compared with 2005 (39.2 per 1,000 tested in 2012 versus 85.4 per 1,000 tested in 2005; Figure 8).

The rates of New York City adults with lead poisoning in the Adult Lead Program's registry are higher than New York City Health and Nutrition Examination Survey (NYC HANES) estimates, particularly for men. The NYC HANES\* estimates that less than 1% of men and 0.1% of women aged 20 years and older have blood lead levels greater than or equal to 10 µg/dL.† This difference is

attributed to testing requirements that focus on individuals at highest risk. Individuals working in occupations with known lead exposure are required to be tested according to federal and New York State regulations. New York State law requires health care providers to assess pregnant women for risk of lead poisoning during their first prenatal visit and to perform blood lead testing for those at risk.

## More Adults Tested

During the period between 2005 and 2012, when lead poisoning among adults sharply declined, testing of adults for lead poisoning increased.

In 2012:

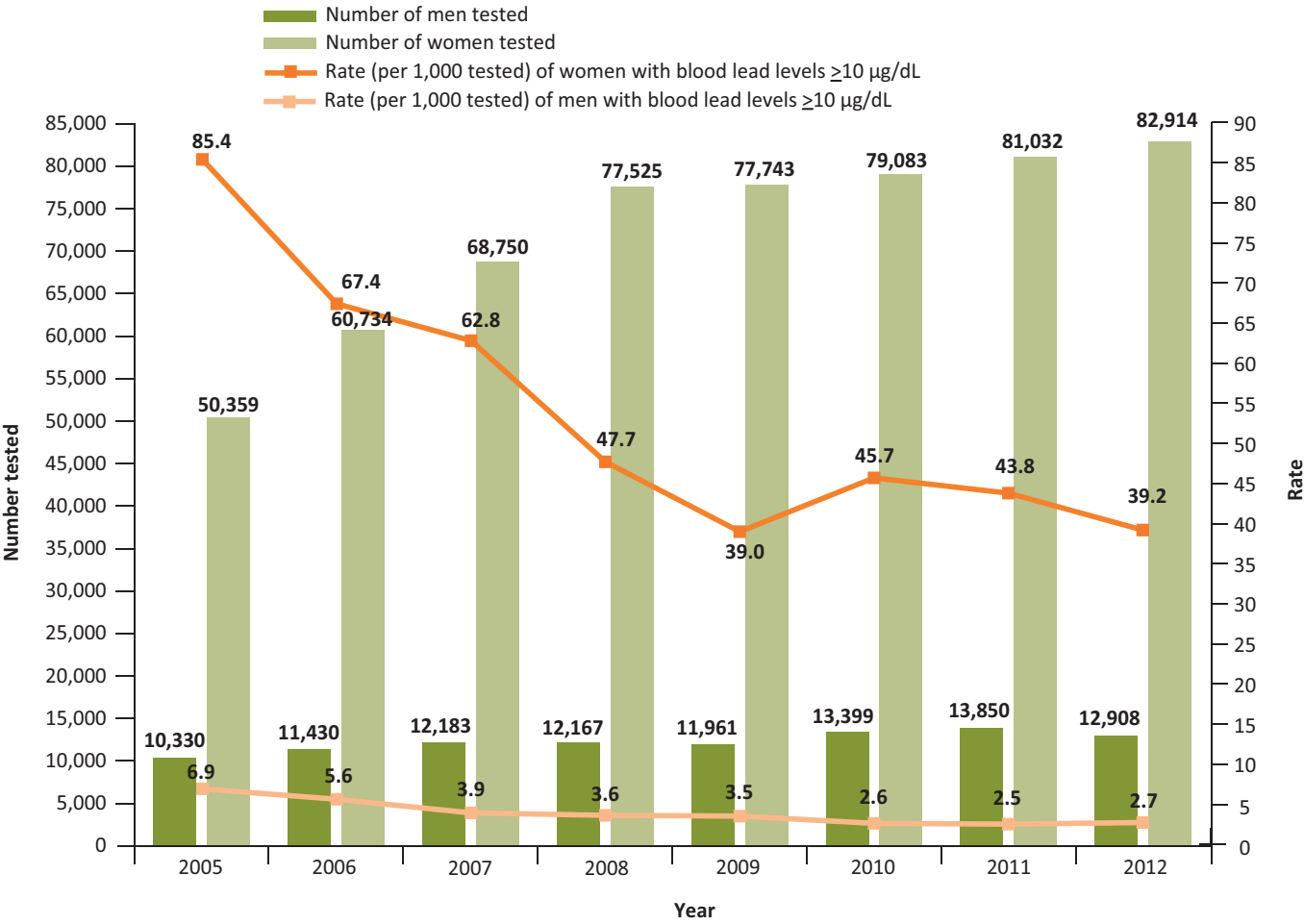
- The number of women tested for lead poisoning increased by 65% compared with 2005 (82,914 women in 2012 versus 50,359 women in 2005; Figure 8).
- The number of men tested for lead poisoning increased by 25% compared with 2005 (12,908 men in 2012 versus 10,330 men in 2005; Figure 8).

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\* Blood lead concentrations were measured in a representative sample of 1,811 NYC residents as part of NYC HANES, a community-based survey conducted by DOHMH from June through December 2004 and modeled after the National Health and Nutrition Examination Survey (NHANES). More information about NYC HANES is available at <http://www.nyc.gov/html/doh/html/data/nyc-hanes.shtml>.

† McKelvey W, Gwynn RC, Jeffery N, et al. A biomonitoring study of lead, cadmium, and mercury in the blood of New York City adults. *Environ Health Perspect.* 2007;115(10):1435-1441.

**Figure 8. Increase in Adults Tested for Lead Poisoning and Decline in Rate of Adults with Elevated Blood Lead Levels**



# Profile of New York City Adults with Lead Poisoning, 2012

## Characteristics of Men and Non-Pregnant Women with Lead Poisoning

Men and women have different risk factors for lead poisoning. The potential effects from lead poisoning are more harmful for women who are pregnant because lead can be passed to the fetus. The Adult Lead Poisoning (ALP) program provides risk assessment interviews to men and non-pregnant women with blood lead levels of 10 µg/dL or greater.\* LPPP provides services to pregnant women with blood lead levels of 10 µg/dL or greater.

In 2012:

- There were 506 men and 225 women, including 147 pregnant women, with blood lead levels greater than or equal to 10 µg/dL.
- ALP successfully conducted interviews about potential sources of lead exposure with a total of 144 adults (109 men and 35 non-pregnant women).† The main findings of these interviews are described in the sections below. Findings of the interviews with pregnant women, conducted by LPPP, are described in a separate section on pregnant women.

## Age

Most men identified with lead poisoning are tested because of occupational exposure. The age distribution of lead-poisoned men may reflect the age distribution of men working in construction industries where risk of lead exposure is high. According to the Bureau of Labor Statistics, the average age of construction workers in 2010 was 41‡ years old.

In 2012:

- Among men with blood lead levels of 10 µg/dL or greater interviewed by ALP, the average age was 42 years old, with a range of 20 to 77 years of age.
- Among non-pregnant women with blood lead levels of 10 µg/dL or greater interviewed by ALP, the average age was 43 years old with a range of 19 to 73 years of age.

## Country of Birth

The men and non-pregnant women interviewed by ALP come from all around the world, with more than 30 different countries represented.

In 2012, of 144 interviewed adults with lead poisoning (Appendix, Table A-2):

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\* In January 2010, ALP and LPPP lowered the blood lead level at which services for women are initiated from 15 to 10 µg/dL, and in July of the same year, ALP lowered the blood lead level at which services for men are initiated from 15 to 10 µg/dL.

† This number does not include individuals that ALP was unable to contact or individuals who refused or did not complete interviews.

‡ Source: [http://www.bls.gov/cps/occupation\\_age.xls](http://www.bls.gov/cps/occupation_age.xls).



- 38% were born in the United States.
- 19% were born in Mexico, Central and South American countries.
- 11% were born in European countries.
- 10% were born in Caribbean countries.
- 8% were born in Asian countries.
- 1% were born in African countries.
- 13% did not provide their country of birth.

### Sources of Exposure among Men with Lead Poisoning

The most common cause of lead poisoning among men interviewed by ALP is occupational exposure in construction-related jobs. Workers may be exposed by breathing in lead dust or lead fumes during construction activities that disturb old, lead-based paint, such as renovations, repairs and

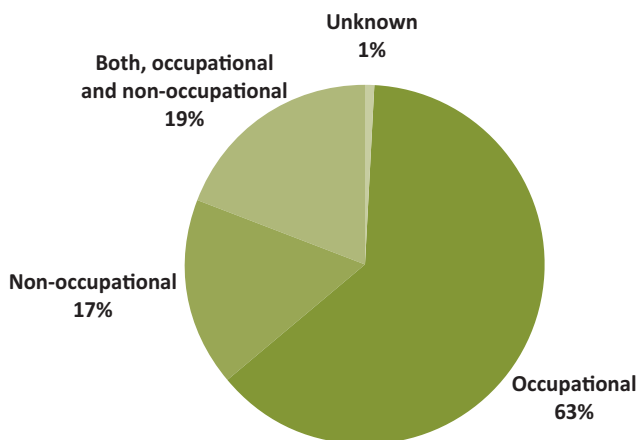
demolition. Workers may also ingest lead dust by eating without cleaning their hands. Workers in other industries, as well as hobbyists, may be at risk if they work with metal, paint, pigments or ceramic glazes that contain lead. Adults can also be exposed through the use of lead-contaminated products such as imported health remedies or medications, spices, foods, pottery and cosmetics. Non-occupational exposure is the most common cause of lead poisoning among women, regardless of pregnancy status.

In 2012, among 109 men with lead poisoning interviewed by ALP:

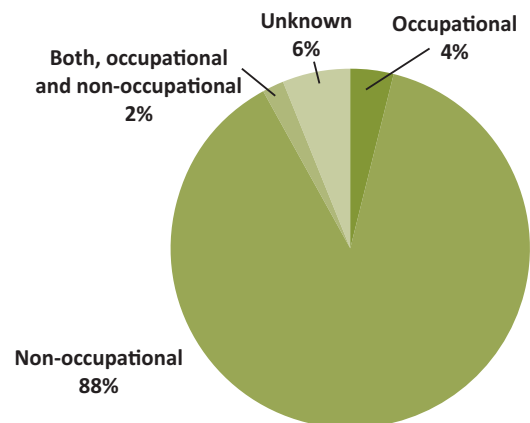
- 82% reported potential occupational sources of lead exposure (Figure 9).\*
  - 41% reported engaging in construction activities including building or home renovations, demolition and lead abatement.

**Figure 9. Potential Sources of Lead Exposure More Likely to Be Occupational among Men than Women**

Percentage of men with elevated blood lead levels by potential sources of lead exposure (Total=109)



Percentage of women (pregnant and non-pregnant) with elevated blood lead levels by potential sources of lead exposure (Total=142)



*Distribution of potential sources of lead exposure among men and women (pregnant and non-pregnant) newly identified with blood lead levels of 10 µg/dL or greater, New York City, 2012.*

\* Includes 63% of men interviewed by ALP who reported only occupational sources of exposure and 19% of men who reported both potential occupational and non-occupational sources of lead exposure. Interviewees may report more than one occupational activity.

- 32% of men exposed occupationally reported engaging in construction activities involving bridge or steel structures.
- 14% reported engaging in repair work, recycling or smelting activities.
- 13% reported engaging in other occupational activities.
- 17% reported only potential non-occupational sources of lead exposure.

Among non-pregnant women, the most common potential sources of exposure were non-occupational, similar to those among pregnant women. For that reason, potential sources of lead exposure for all women are described in the next section on pregnant women.

## Characteristics of Pregnant Women with Lead Poisoning

During pregnancy, a woman who has an elevated blood lead level can pass lead to her developing fetus. Elevated blood lead levels in pregnant women may be due to lead stored in the body from previous lead exposure. Pregnant women can also have elevated blood lead levels from current exposure, such as using imported health remedies, foods, spices and cosmetics; cooking with imported pottery; eating non-food items such as clay, pottery, soil or paint chips; and working in an occupation or engaging in a hobby that may involve contact with lead.

In 2012, LPPP in collaboration with ALP:

- Identified 147 pregnant women with blood lead levels greater than or equal to 10 µg/dL (Figure 10). Of these women:
  - 107 were interviewed about potential sources of lead exposure.

### Borough

The two boroughs where the largest proportion of pregnant women with lead poisoning resided were

Brooklyn and Queens. These boroughs have large immigrant populations from Mexico and South Asian countries. Women from these countries have a higher risk for lead poisoning.

In 2012 (Appendix, Table A-3):

- 38% of pregnant women identified with lead poisoning lived in Queens.
- 30% lived in Brooklyn.
- 20% lived in the Bronx.
- 7% lived in Manhattan.
- 4% lived in Staten Island.

### Age

The average age of pregnant women newly identified with blood lead levels of 10 µg/dL or greater was 29 years old, ranging from 17 to 46 years of age (Appendix, Table A-3).

### Country of Birth

Lead poisoning disproportionately affects foreign-born pregnant women. Overall, foreign-born pregnant women with lead poisoning were relatively recent immigrants, with a median length of residence in the United States of 6 years.

In 2012, among 107 pregnant women newly identified with a blood lead level of 10 µg/dL or greater interviewed by LPPP:

- 93% were foreign-born, yet approximately 50% of women who give birth in New York City each year are foreign-born.
- Among foreign-born pregnant women with lead poisoning (Appendix, Table A-3):
  - 45% were born in Mexico.
  - 13% were born in Bangladesh.
  - 6% were born in Georgia.
  - 6% were born in India.
  - 5% were born in Pakistan.

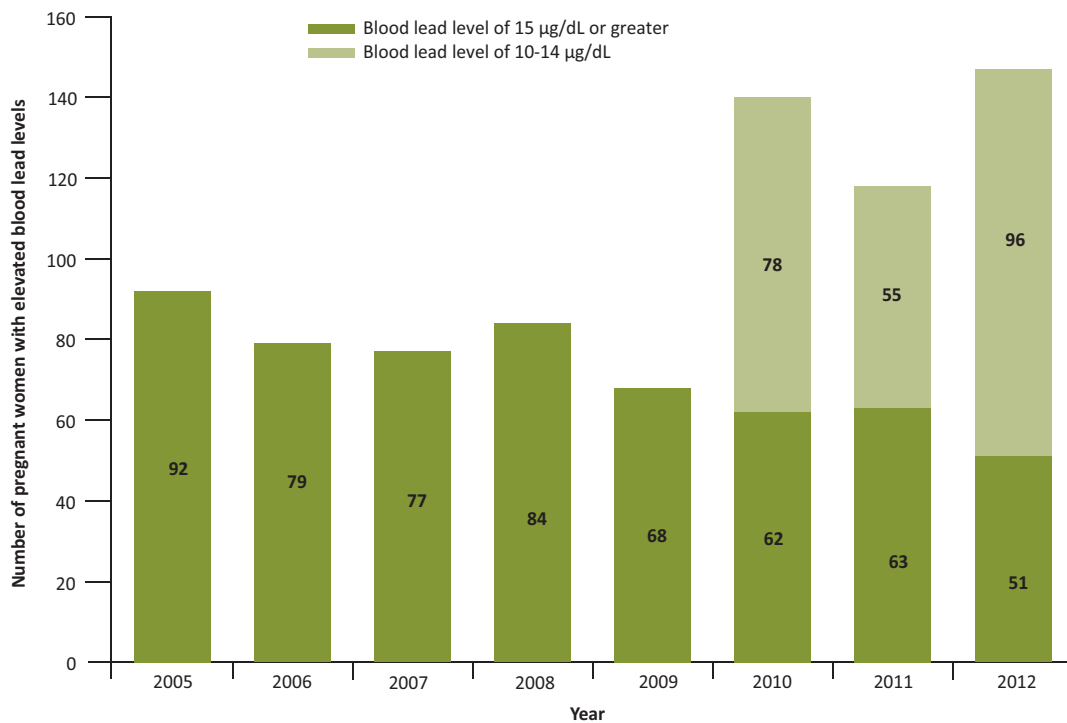
## Sources of Lead Exposure among Women with Lead Poisoning

Compared with the primarily occupational exposure seen in men with lead poisoning, women with lead poisoning are more likely to be exposed non-occupationally (Figure 9). An important potential risk factor for lead poisoning among women is their country of birth. Women from countries where lead exposure may be more common, such as Mexico and Bangladesh, may be at greater risk for lead poisoning through past exposure and use of products imported from their home countries. Women may also be exposed to lead through jobs and hobbies. In addition, when a woman is pregnant, lead from previous exposure that has been stored in the bones and other body tissues may be released into the bloodstream, resulting in elevated blood lead levels for the woman and her fetus.

In 2012:

- 88% of 142 non-pregnant and pregnant women identified with lead poisoning interviewed by ALP or LPPP reported potential non-occupational sources of lead exposure (Figure 9).
- Among 107 pregnant women with lead poisoning interviewed by LPPP, 92% reported potential non-occupational sources of lead exposure, including:
  - Recent travel to a foreign country.
  - Use of imported food or spices.
  - Use of imported pottery, cosmetics, remedies and medications.
  - Eating non-food items such as soil, clay or crushed pottery during pregnancy.

**Figure 10. Increasing Numbers of Pregnant Women Received Services for Lead Poisoning**



Number of pregnant women with blood lead levels of 15 µg/dL or greater and 10-14 µg/dL by year of blood lead test, New York City, 2005-2012. The increase in the number of pregnant women who received care coordination services seen in 2010 is due to lowering the level that triggers services from 15 µg/dL to 10 µg/dL in January 2010.

# Recommendations

## For Parents and Caregivers of Young Children

- Keep your child away from peeling paint and home repairs that disturb lead paint.
- Report peeling paint to your building owner/manager. If the repairs are not made, call 311. By law, building owners are required to safely repair peeling paint in homes with young children.
- Frequently wash hands, toys, pacifiers, bottles and other items your child puts in his or her mouth.
- Clean floors, window sills and dusty places often with a wet mop and wet cloth.

## What Your Child’s Blood Lead Test Means

Test Result ( $\mu\text{g}/\text{dL}$ )	Next Steps
0-4	<ul style="list-style-type: none"> <li>• There is very little lead in your child's blood.</li> <li>• The average test result for young children is about 2 <math>\mu\text{g}/\text{dL}</math>.</li> </ul>
5-9	<ul style="list-style-type: none"> <li>• Your child has more lead than most children. This level may indicate lead exposure.</li> <li>• Talk with your doctor to find out how your child might have come into contact with lead and ways to protect your child.</li> <li>• Your doctor should test your child again in 3 to 6 months.</li> </ul>
10-14	<ul style="list-style-type: none"> <li>• Your child's lead level is high. A result of 10 or higher requires action.</li> <li>• Talk with your doctor to help you find sources of lead and ways you can protect your child.</li> <li>• If blood was drawn from a vein (venous test), and your child is younger than 6 years of age, the Health Department may contact you to help you find sources of lead and provide information on ways to protect your child.</li> <li>• Your child should be tested again in 1 to 3 months.</li> </ul>
15-44	<ul style="list-style-type: none"> <li>• Your child's lead level is quite high. You and your doctor should act quickly.</li> <li>• Talk with your doctor or nurse about your child's diet, growth and development, and possible sources of lead.</li> <li>• If blood was drawn from a vein (venous test), the Health Department will contact you to talk with you about the ways to protect your child. Someone will visit your home to help you find potential sources of lead.</li> <li>• If the lead level is 15 to 24, your child should be tested again in 1 to 3 months.</li> <li>• If the lead level is 25 to 44, your child should be tested again in 2 weeks to 1 month.</li> </ul>
45 or higher	<ul style="list-style-type: none"> <li>• Your child needs medical treatment right away.</li> <li>• Your doctor or the Health Department will call you as soon as they get the test result.</li> <li>• Your child needs to be tested again as soon as possible and after medical treatment.</li> </ul>

- Avoid using health remedies and eye cosmetics (such as kohl, kajal, surma) from other countries. Some of these products may contain high levels of lead.
- Use caution when consuming candies, spices and snack foods, using children’s toys and wearing jewelry made in other countries. These items may contain lead.
- Use only cold tap water for making baby formula, drinking and cooking. Let the water run for a few minutes before use.
- Keep your child away from the work clothes and tools of household members who do construction work or other work and hobbies that may expose them to lead. Wash work clothes separately from other laundry. Remove work shoes and work clothes before entering your car or home.
- Use safe work methods when doing home repair that disturbs paint. For information on lead-safe work methods, call 311.

### For Pregnant Women and Women of Childbearing Age

- Ask your doctor about a lead test. A blood test is the only way to know how much lead is in your body. Lead poisoning usually does not make you look or feel sick.
- Avoid using health remedies and eye cosmetics (such as kohl, kajal, surma) from other countries. Some of these products have been found to contain high levels of lead.
- Use caution when using candies, spices and snack foods made in other countries. These items may contain lead and it is best to avoid them during your pregnancy.
- Avoid using imported clay pots and dishes to cook, serve or store food, and do not use pottery that is chipped or cracked.
- Never eat nonfood items, such as clay, soil, pottery or paint chips.
- Stay away from any repair work being done in the home.
- Avoid jobs or hobbies that may involve contact with lead, such as construction work, home renovation/repair, furniture refinishing, working with firearms and arts/crafts work involving ceramics, stained glass, metals or color pigments.

### For People With Jobs or Hobbies that May Expose them to Lead\*

- Use safe work practices when disturbing lead-based paint.
- Wash your hands and face before you eat, drink or smoke.
- Do not eat, drink or smoke or store food, drinks, cigarettes or cosmetics in areas near lead dust and fumes.
- Wear a properly selected and fitted respirator in all work areas that have lead dust or fumes.
- Change into work clothes and shoes before beginning work each day. Keep your street clothes and shoes in a clean place.
- Shower at work at the end of the day, before you go home.
- Keep all work clothes and equipment away from other family members. Wash and dry

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\* If you are working on some of the following jobs, or have these hobbies, you may be at higher risk of exposure to lead: construction, remodeling or renovation work; sanding, scraping or blasting lead-based paint; using heat guns to remove paint from doors, windows and other painted surfaces; cable splicing, and working on leaded cables or wires; handling scrap metal; breaking up old lead batteries; torch cutting coated and uncoated metal; soldering electronics, stained glass or radiators; shooting in and cleaning indoor firing ranges; smelting operations; handling artist pigments; making stained glass or pottery.

them separately from other family members' clothes. Lead dust can be brought into your home on work clothes and equipment.

- If young children live in your home and you work with lead, talk to your doctor about having them tested.

### For Construction Employers

- Inspect work areas and test the air for lead.
- Provide medical exams when blood lead level reaches 40 µg/dL or higher or if workers are concerned about lead exposure.
- Keep lead exposure low by complying with OSHA standards, including:
  - Providing engineering controls and safe work practices.
  - Providing proper respirators and work clothes.
  - Keeping work areas clean.
  - Providing hand-washing stations and showers.
  - Providing clean areas for breaks, lunch and changing clothes.
  - Training workers about lead hazards on the job and ways to prevent lead exposure.
  - Providing regular blood tests and informing workers of results.

- Removing workers from lead work if their blood lead level reaches the medical removal level of 50 µg/dL or higher.

- Adopt best practices to protect workers from lead exposure, including:
  - Providing monthly blood lead testing.
  - Investigating work conditions and implement improvements when a worker's blood lead level increases by 5 µg/dL or more.
  - Removing workers from lead exposure when their blood lead level is 25 µg/dL or higher.

### For Health Care Providers

#### For Pediatric Patients

- Educate parents on how to prevent lead exposure.
- Test all children at age 1 and 2, and other children at risk of lead exposure.
- Assess children up to 6 years of age annually for risk of lead exposure.

#### For Obstetric Patients

- Educate pregnant women on how to prevent lead exposure.
- Test pregnant women at risk for lead exposure.
- Assess pregnant women for risk of lead exposure at the first prenatal visit.
- Provide educational messages listed above for pregnant women and women of childbearing age.

# Appendix

**Table A-1. Profile of Children Younger Than 18 Years of Age Newly Identified with Environmental Intervention Blood Lead Levels,\* by Year of Test, New York City, 2010-2012**

Characteristic**	Year of EIBLL* Test										Total				
	2010			2011			2012			2010-2012		Number	Percent	Rate per 1,000 tested	
	Number	Percent	Rate per 1,000 tested	Number	Percent	Rate per 1,000 tested	Number	Percent	Rate per 1,000 tested	Number	Percent				
<b>Age</b>	<b>520</b>	<b>100%</b>	<b>1.2</b>	<b>399</b>	<b>100%</b>	<b>0.95</b>	<b>349</b>	<b>100%</b>	<b>0.87</b>	<b>1,268</b>	<b>100%</b>	<b>1.0</b>			
Less than 6 months old	18	3%	20.7	11	3%	14.6	15	4%	24.7	44	3%	19.7			
6 months to less than 1 year old	23	4%	1.0	13	3%	0.5	27	8%	0.8	63	5%	0.8			
1 year old	179	34%	1.9	115	29%	1.2	98	28%	1.2	392	31%	1.4			
2 years old	116	22%	1.4	93	23%	1.1	92	26%	1.2	301	24%	1.2			
3 years old	63	12%	1.2	58	15%	1.1	41	12%	0.8	162	13%	1.0			
4 years old	29	6%	0.6	36	9%	0.7	19	5%	0.4	84	7%	0.6			
5 years old	20	4%	0.6	16	4%	0.4	21	6%	0.6	57	4%	0.5			
6 to less than 18 years old	72	14%	0.9	57	14%	0.7	36	10%	0.5	165	13%	0.7			
<b>Gender</b>															
Male	273	53%	1.3	201	50%	0.9	183	52%	0.9	657	52%	1.1			
Female	247	48%	1.2	198	50%	1.0	166	48%	0.9	611	48%	1.0			
<b>Borough</b>															
Brooklyn	199	38%	1.4	162	41%	1.1	134	38%	0.9	495	39%	1.1			
Queens	171	33%	1.5	117	29%	1.0	104	30%	0.9	392	31%	1.1			
Bronx	98	19%	1.1	65	16%	0.8	76	22%	0.9	239	19%	0.9			
Manhattan	42	8%	0.8	39	10%	0.7	24	7%	0.5	105	8%	0.7			
Staten Island	10	2%	0.5	16	4%	0.9	11	3%	0.6	37	3%	0.7			
<b>Race/ethnicity</b>															
Hispanic	179	34%		147	37%		109	31%		435	34%				
Asian, Non-Hispanic	128	25%		82	21%		92	26%		302	24%				
Black, Non-Hispanic	133	26%		92	23%		81	23%		306	24%				
White, Non-Hispanic	66	13%		70	18%		50	14%		186	15%				
Other/Unknown	14	3%		8	3%		17	5%		39	3%				
<b>Blood lead level at identification (µg/dL)</b>															
15 to 19	307	59%		222	56%		200	57%		729	57%				
20 to 24	108	21%		88	22%		79	23%		275	22%				
25 to 29	57	11%		41	10%		43	12%		141	11%				
30 to 34	28	5%		21	5%		13	4%		62	5%				
35 to 39	9	2%		12	3%		7	2%		28	2%				
40 to 44	4	1%		10	3%		2	1%		16	1%				
45 or greater	7	1%		5	1%		5	1%		17	1%				



Table A-1 continued

Characteristic**	Year of EIBLL* Test						Total			
	2010		2011		2012		2010-2012			
	Number	Percent	Rate per 1,000 tested	Number	Percent	Rate per 1,000 tested	Number	Percent	Rate per 1,000 tested	
<b>Country of birth</b>										
United States	418	80%		335	84%		295	85%	1,048	83%
Foreign Born	102	20%		64	16%		50	14%	216	17%
Bangladesh	29	28%		22	34%		10	20%	61	28%
Pakistan	20	20%		14	22%		13	26%	47	22%
Haiti	12	12%		2	3%		2	4%	16	7%
Georgia	3	3%		5	8%		2	4%	10	5%
Dominican Republic	3	3%		2	3%		3	6%	8	4%
Uzbekistan	1	1%		4	6%		3	6%	8	4%
Mexico	5	5%		2	3%		0	0%	7	3%
India	2	2%		2	3%		2	4%	6	3%
Ivory Coast	1	1%		2	3%		2	4%	5	2%
Guinea	3	3%		0	0%		1	2%	4	2%
Nigeria	0	0%		1	2%		3	6%	4	2%
China	3	3%		0	0%		2	4%	5	2%
Other countries***	20	20%		8	13%		7	14%	35	16%
Unknown	0	0%		0	0%		4	1%	4	2%
<b>Medicaid</b>										
Medicaid ID on record	413	79%		298	75%		266	76%	977	77%
No Medicaid ID on record	107	21%		101	25%		83	24%	291	23%
<b>Year residence was built</b>										
1939 or earlier	405	78%		302	76%		272	78%	979	77%
1940 to 1949	18	3%		21	5%		11	3%	50	4%
1950 to 1959	26	5%		29	7%		15	4%	70	6%
1960 to 1969	30	6%		18	5%		29	8%	77	6%
1970 to present	40	8%		26	7%		18	5%	84	7%
Unknown	1	0%		3	1%		4	1%	8	1%
<b>Size of the building where the child resides</b>										
Less than 3 dwelling units	170	33%		142	36%		107	31%	419	33%
3 or more dwelling units	346	67%		252	63%		237	68%	835	66%
Unknown	4	1%		5	1%		5	1%	14	1%

\* Environmental intervention blood lead level (EIBLL) is defined as a venous blood lead level  $\geq 15$   $\mu\text{g}/\text{dL}$ , consistent with Local Law 1.  
 \*\* Data on some characteristics are not routinely reported with blood lead tests, and were only available for children with EIBLLs whose parents or guardians were interviewed during case investigations. Rates could not be estimated for all characteristics due to missing denominator data.  
 \*\*\* Other countries included: Algeria, Bulgaria, Congo, Ecuador, Egypt, France, Gambia, Ghana, Guatemala, Guyana, Italy, Jamaica, Mali, Morocco, Senegal, Sierra Leone, Sweden, Tajikistan, Togo, Ukraine and Yemen.

**Table A-2. Profile of Interviewed Men and Non-Pregnant Women Newly Identified with Elevated Blood Lead Levels,\* by Year of Test, New York City, 2010-2012**

Characteristic	Year of Elevated Blood Lead Test*						
	2010		2011		2012		
	Number	Percent	Number	Percent	Number	Percent	
<b>Total</b>	<b>192</b>	<b>100%</b>	<b>169</b>	<b>100%</b>	<b>144</b>	<b>100%</b>	
<b>Gender</b>	Male	152	79%	139	82%	109	76%
	Female	40	21%	30	18%	35	24%
<b>Age (years)</b>	Less than 21	4	2%	8	5%	3	2%
	21-30	35	18%	41	24%	23	16%
	31-40	51	27%	43	25%	42	29%
	41-50	54	28%	41	24%	36	25%
	51-60	27	14%	21	12%	21	15%
	61 and older	21	11%	15	9%	19	13%
	<i>Mean (years)</i>	42		40		43	
	<i>Median (years)</i>	41		39		42	
	<i>Range (years)</i>	18 to 95		19 to 79		19 to 77	
<b>Borough</b>	Queens	68	35%	63	37%	35	24%
	Brooklyn	66	34%	50	30%	42	29%
	Bronx	20	10%	24	14%	31	22%
	Manhattan	22	12%	19	11%	27	19%
	Staten Island	16	8%	13	8%	9	6%
<b>Race/Ethnicity</b>	Asian, Non-Hispanic	16	8%	11	7%	12	8%
	Black, Non-Hispanic	23	12%	29	17%	24	17%
	Hispanic	37	19%	44	26%	52	36%
	White, Non-Hispanic	77	40%	54	32%	47	33%
	Other	6	3%	5	3%	1	1%
	Unknown	33	17%	26	15%	8	6%
<b>Country of birth</b>	United States	83	43%	74	44%	54	38%
	Ecuador	9	5%	14	8%	10	7%
	Dominican Republic	6	3%	8	5%	7	5%
	Bangladesh	9	5%	4	2%	5	3%
	Mexico	6	3%	2	1%	9	6%
	Jamaica	6	3%	3	2%	2	1%
	Poland	6	3%	2	1%	3	2%
	Greece	6	3%	1	1%	2	1%
	Georgia	2	1%	2	1%	4	3%
	Guyana	3	2%	2	1%	2	1%
	Pakistan	4	2%	2	1%	1	1%
	Trinidad & Tobago	1	1%	4	2%	2	1%
	India	0	0%	3	2%	2	1%
	Other countries**	24	13%	23	14%	23	16%
	Unknown	27	14%	25	15%	18	13%
<b>Blood lead level (µg/dL)</b>	10 to 14	79	41%	65	39%	67	47%
	15 to 19	45	23%	47	28%	29	20%
	20 to 24	31	16%	30	18%	20	14%
	25 to 29	11	6%	10	6%	11	8%
	30 and higher	26	14%	17	10%	17	12%
	<i>Mean</i>	20		19		19	
	<i>Median</i>	16		17		15	
	<i>Range</i>	10 to 113		10 to 74		10 to 71	
<b>Potential lead exposure source</b>	Occupational	108	56%	94	56%	74	51%
	Non-occupational	42	22%	31	18%	45	31%
	Both	33	17%	29	17%	22	15%
	Unknown	9	5%	15	9%	3	2%

\* Elevated blood lead level was defined as a venous blood lead level of 10 µg/dL or greater.

\*\* Other countries included: Albania, Austria, Barbados, Brazil, China, Colombia, Croatia, Cuba, Egypt, Gambia, Germany, Grenada, Guatemala, Haiti, Honduras, Hong Kong, Israel, Italy, Nigeria, Paraguay, Peru, Philippines, Romania, Russian Federation, Senegal, Slovakia, South Africa, South Korea, Spain, St. Kitts and Nevis, Tunisia, Turkey, Ukraine, Vietnam, British Virgin Islands and Yemen.

**Table A-3. Profile of Pregnant Women Newly Identified with Elevated Blood Lead Levels,\* by Year of Test, New York City, 2010-2012**

Characteristic**	Year of Elevated Blood Lead Test*						
	2010		2011		2012		
	Number	Percent	Number	Percent	Number	Percent	
<b>Total</b>	<b>140</b>	<b>100%</b>	<b>118</b>	<b>100%</b>	<b>147</b>	<b>100%</b>	
<b>Age (years)</b>	Less than 20	6	4%	3	3%	7	5%
	20-24	36	26%	23	19%	25	17%
	25-29	41	29%	35	30%	50	34%
	30-34	37	26%	36	31%	40	27%
	35 and older	20	14%	21	18%	25	17%
	<i>Mean (years)</i>	28.4		29.0		29	
	<i>Median (years)</i>	28		29		29	
	<i>Range (years)</i>	18 to 43		16 to 44		17 to 46	
<b>Borough</b>	Brooklyn	43	35%	46	45%	32	30%
	Queens	40	33%	36	35%	41	38%
	Bronx	24	20%	13	13%	21	20%
	Manhattan	13	11%	5	5%	8	7%
	Staten Island	2	2%	3	3%	4	4%
<b>Race/Ethnicity</b>	Hispanic	63	52%	54	52%	56	52%
	Asian	32	26%	23	22%	28	26%
	White, Non-Hispanic	14	11%	19	18%	9	8%
	Black, Non-Hispanic	9	7%	6	6%	8	7%
	Unknown or other	4	3%	1	1%	6	6%
<b>Country of birth</b>	Mexico	48	39%	44	43%	48	45%
	Bangladesh	17	14%	15	15%	14	13%
	Georgia	7	6%	14	14%	6	6%
	Guatemala	3	2%	5	5%	2	2%
	India	1	1%	4	4%	6	6%
	Pakistan	8	7%	4	4%	5	5%
	Morocco	6	5%	2	2%	2	2%
	Dominican Republic	4	3%	-	-	1	1%
	Ecuador	4	3%	2	2%	3	3%
	Haiti	4	3%	1	1%	3	3%
	Other countries***	13	11%	9	9%	9	8%
	USA	6	5%	3	3%	3	3%
	Unknown	1	1%	-	-	5	5%
<b>Blood lead level (µg/dL)</b>	10 to 14	78	56%	55	47%	96	65%
	15 to 19	27	19%	30	25%	26	18%
	20 to 24	20	14%	18	15%	15	10%
	25 to 44	15	11%	10	8%	8	5%
	45 and higher	0	0%	5	4%	2	1%
	<i>Mean</i>	16.0		18.1		15.1	
	<i>Median</i>	13.8		15.0		13.0	
	<i>Range</i>	10 to 44		10 to 90		10 to 65	
<b>Potential lead exposure source</b>	Occupational	0	0%	1	1%	1	1%
	Non-occupational	106	87%	89	86%	98	92%
	Both	6	5%	2	2%	1	1%
	Unknown	10	8%	11	11%	7	7%
<b>Length of time in U.S. for foreign-born (years)</b>	Less than 1	23	20%	20	20%	19	19%
	1 to 4	35	30%	26	26%	19	19%
	5 to 8	32	28%	21	21%	27	27%
	9 to 12	16	14%	19	19%	11	11%
	13 or more	9	8%	13	13%	14	14%
	Unknown	1	1%	1	1%	9	9%
	<i>Mean</i>	5.6		6.5		6.2	
	<i>Median</i>	4.9		6.1		6.0	
	<i>Range (months to years)</i>	Less than 1 to 20		Less than 1 to 22		Less than 1 to 25	

\* Elevated blood lead level was defined as a venous blood lead level of 10 µg/dL or greater.

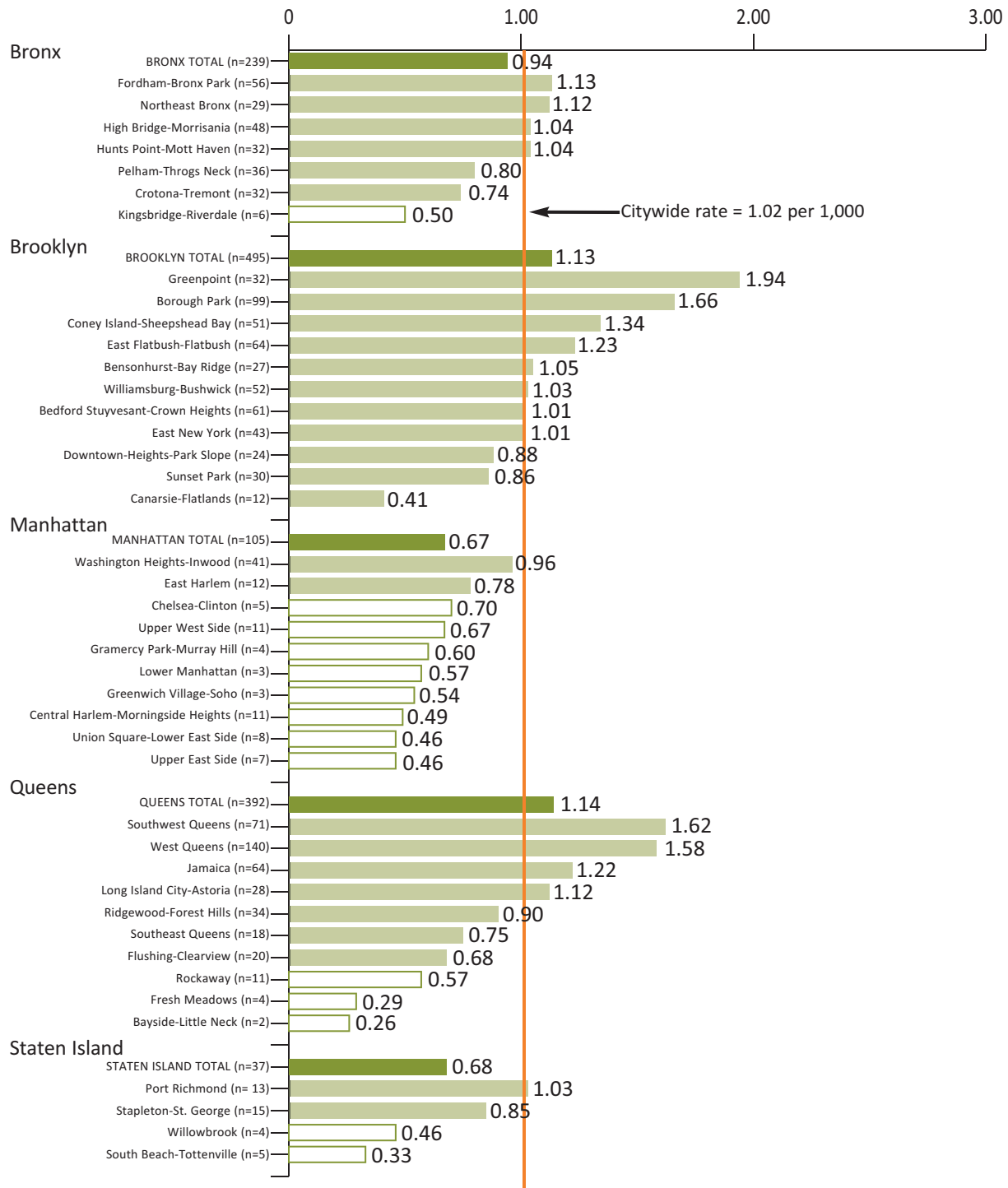
\*\* Age and blood lead level were available for all identified pregnant women. Other variables were available only for interviewed women. In 2012, 107 women were interviewed; in 2011, 103 women were interviewed; in 2010, 122 women with elevated blood lead levels were interviewed.

\*\*\* In 2012 included women from Egypt, Ethiopia, Honduras, Jamaica, Jordan, Liberia, Tunisia, Yemen; in 2011 included women from Albania, Colombia, France, Jamaica, Kazakhstan, Nigeria, Russia and Yemen; in 2010, included women from Belarus, China, Egypt, Grenada, Guinea, Hungary, Jamaica, Russia and Yemen.

Table A-4. Neighborhood Codes and Their Corresponding Names and ZIP Codes, New York City

Code	Neighborhood name	Zip codes
<b>Bronx</b>		
BX1	Kingsbridge-Riverdale	10463,10471
BX2	Northeast Bronx	10466,10469,10470,10475,10803
BX3	Fordham-Bronx Park	10458,10467,10468
BX4	Pelham-Throgs Neck	10461,10462,10464,10465,10472,10473
BX5	Crotona-Tremont	10453,10457,10460
BX6	High Bridge-Morrisania	10451,10452,10456
BX7	Hunts Point-Mott Haven	10454,10455,10459,10474
<b>Brooklyn</b>		
BK1	Greenpoint	11211,11222
BK2	Williamsburg-Bushwick	11206,11221,11237
BK3	Downtown-Heights-Park Slope	11201,11202,11205,11215,11217,11231,11251
BK4	Bedford Stuyvesant-Crown Heights	11212, 11213, 11216, 11233, 11238
BK5	East New York	11207,11208
BK6	Sunset Park	11220,11232
BK7	Borough Park	11204,11218,11219,11230
BK8	East Flatbush-Flatbush	11203,11210,11225,11226
BK9	Canarsie-Flatlands	11234,11236,11239
BK10	Bensonhurst-Bay Ridge	11209,11214,11228,11252
BK11	Coney Island-Sheepshead Bay	11223,11224,11229,11235
<b>Manhattan</b>		
M1	Washington Heights-Inwood	10031,10032,10033,10034,10040
M2	Central Harlem-Morningside Heights	10026,10027,10030,10037,10039
M3	East Harlem	10029,10035
M4	Upper West Side	10023,10024,10025,10069
M5	Upper East Side	10021,10028,10044,10128,10162,10075,10065
M6	Chelsea-Clinton	10001,10011,10018,10019,10020,10036
M7	Gramercy Park-Murray Hill	10010,10016,10017,10022
M8	Greenwich Village-Soho	10012,10013,10014
M9	Union Square-Lower East Side	10002,10003,10009
M10	Lower Manhattan	10004,10005,10006,10007,10038,10048,10280,10281,10282
<b>Queens</b>		
Q1	Long Island City-Astoria	11101,11102,11103,11104,11105,11106,11109
Q2	West Queens	11368,11369,11370,11371,11372,11373,11377,11378
Q3	Flushing-Clearview	11351,11352,11354,11355,11356,11357,11358,11359,11360
Q4	Bayside-Little Neck	11361,11362,11363,11364
Q5	Ridgewood-Forest Hills	11374,11375,11379,11385
Q6	Fresh Meadows	11365,11366,11367
Q7	Southwest Queens	11414,11415,11416,11417,11418,11419,11420,11421,11430
Q8	Jamaica	11412,11423,11424,11425,11431,11432,11433,11434,11435,11436
Q9	Southeast Queens	11001,11004,11005,11040,11411,11413,11422,11426,11427,11428,11429
Q10	Rockaway	11691,11692,11693,11694,11695,11697
<b>Staten Island</b>		
S1	Port Richmond	10302,10303,10310
S2	Stapleton-St. George	10301,10304,10305
S3	Willowbrook	10313,10314
S4	South Beach-Tottenville	10306,10307,10308,10309,10312

**Figure A-1. Rate of Children Newly Identified with Environmental Intervention Blood Lead Levels by UHF Neighborhood, New York City, 2010-2012**



Number and rate (per 1,000 children tested) of children younger than 18 years of age newly identified with an environmental intervention blood lead level (a blood lead level of 15 µg/dL or greater) by United Hospital Fund (UHF) Neighborhood, New York City, 2010-2012. Rates were computed based on three-year period because of small annual numbers in some neighborhoods. Rates represented by blank bars are less reliable (relative standard error ≥30%) due to small number of cases. Caution should be used in interpreting these rates. Number of children newly identified with an environmental intervention blood lead level in each neighborhood is reported in parentheses next to neighborhood name.



