CHAPTER 2: ELEVATED BLOOD LEAD LEVELS (≥ 10 µg/dL)

In 1991, the Centers for Disease Control and Prevention recommended monitoring and retesting of children with blood lead levels of 10 µg/dL or greater. Their recommendation was based on a substantial body of medical evidence that suggested blood lead levels of 10 µg/dL and higher are associated with decreased performance on IQ tests and impaired neurocognitive development and growth.

The NYC Health Code requires reporting by health care providers and laboratories of all blood lead levels ≥ 10 µg/dL within 24 hours.

When the New York City Department of Health Lead Poisoning Prevention Program receives a report of a child newly identified with a blood lead level of 10-19 µg/dL, letters are sent to the child's parent/guardian and medical provider in order to provide information on lead poisoning prevention and stress the importance of regularly scheduled follow-up blood lead tests.[19] After this, 'follow-up' letters are sent if a new blood lead test result is not received within four months or if a new blood lead test shows that the child's blood lead level has increased.

This chapter presents information on children with elevated (≥ 10 µg/dL) blood lead levels in a given year. Two measurements are presented: all children with elevated blood lead levels in a given year (referred to as "prevalence"); and children identified in a given year who were never previously identified as having elevated blood lead levels ("newly identified"). (See Appendix, Technical Notes: Selection of children - newly identified versus prevalence.)

Similar to Chapter 1, Testing For Lead Poisoning, the data in this section include children with venous, capillary, or unspecified test types. If a child had more than one blood lead test in a calendar year, only one test per child was represented for the year. For each child, an elevated (≥ 10 µg/dL) blood lead test was selected based on the following hierarchy: the venous test with the highest blood lead level, the capillary test with the highest blood lead level when no venous test was available, and finally the highest blood lead level reported when no test-type was specified. Selecting test results based on this schema could result in a slight inflation of the true prevalence of elevated blood lead levels. However, the schema was used for tests for all years and thus, any bias would not affect the observed trend. (For more discussion, see Appendix, Technical notes: selection of blood lead tests and Appendix, Technical notes: blood lead levels, limitations)

[19]This protocol was initiated in 1999.

Between 1995 and 2000, both the prevalence rate and the rate of children newly identified with elevated (≥ 10 µg/dL) blood lead levels declined dramatically. The prevalence rate declined 61% (from 61.1 to 23.8 per 1,000 tested) and the rate of children newly identified with elevated blood lead levels declined 64% (from 53.4 to 19.4 per 1,000 tested). On average, each year, there was a 20% decline in the number of children ages 6 months to less than 6 years newly identified with a blood lead level ≥ 10 µg/dL.

Nevertheless, lead poisoning continues to be a problem in NYC. In 2000, 7,657 children ages 6 months to less than 6 years had blood lead levels ≥ 10 µg/dL and 19% (n=1,426) of these children had an elevated blood lead level in a previous year.

Figure 9. **Prevalence of children with blood lead levels ≥ 10 µg/dL (number and rate per 1,000 tested), ages 6 months to less than 6 years, by year: New York City, 1995 - 2000.**

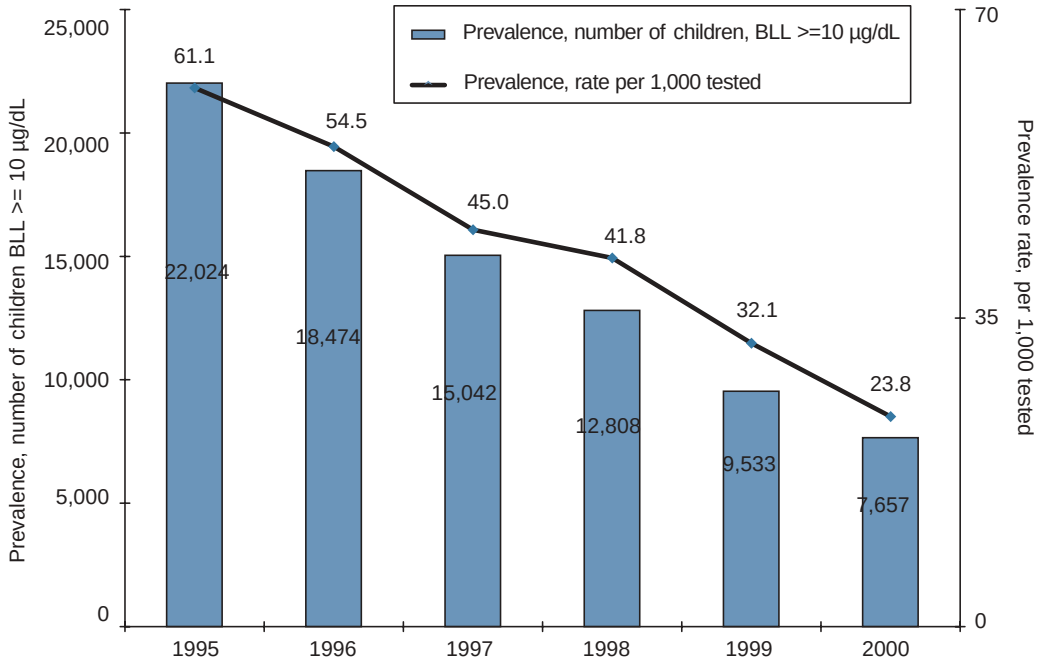
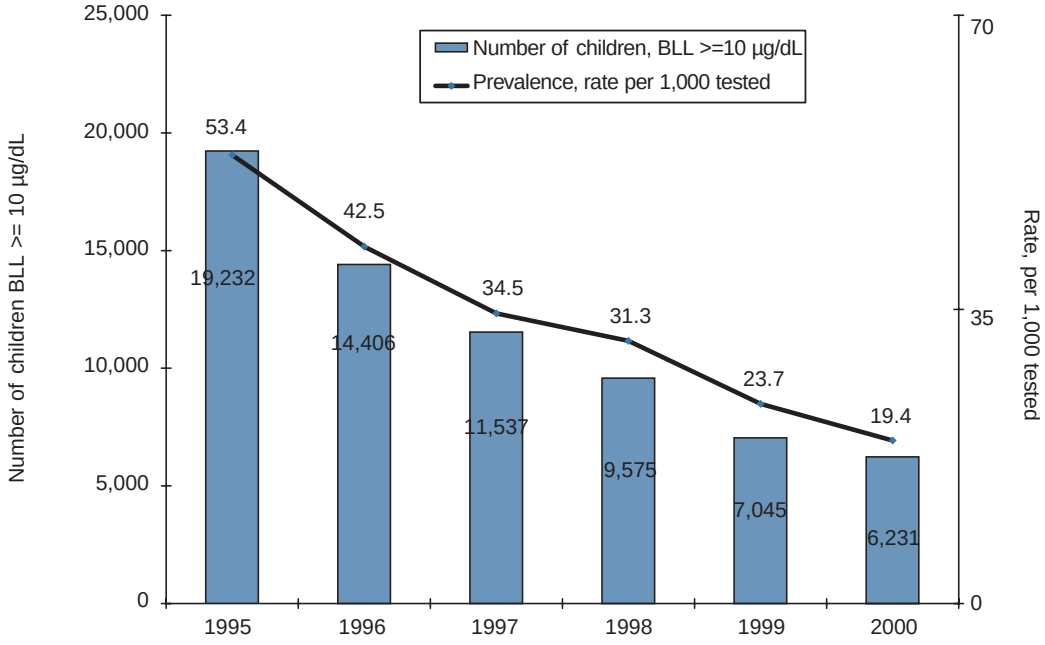


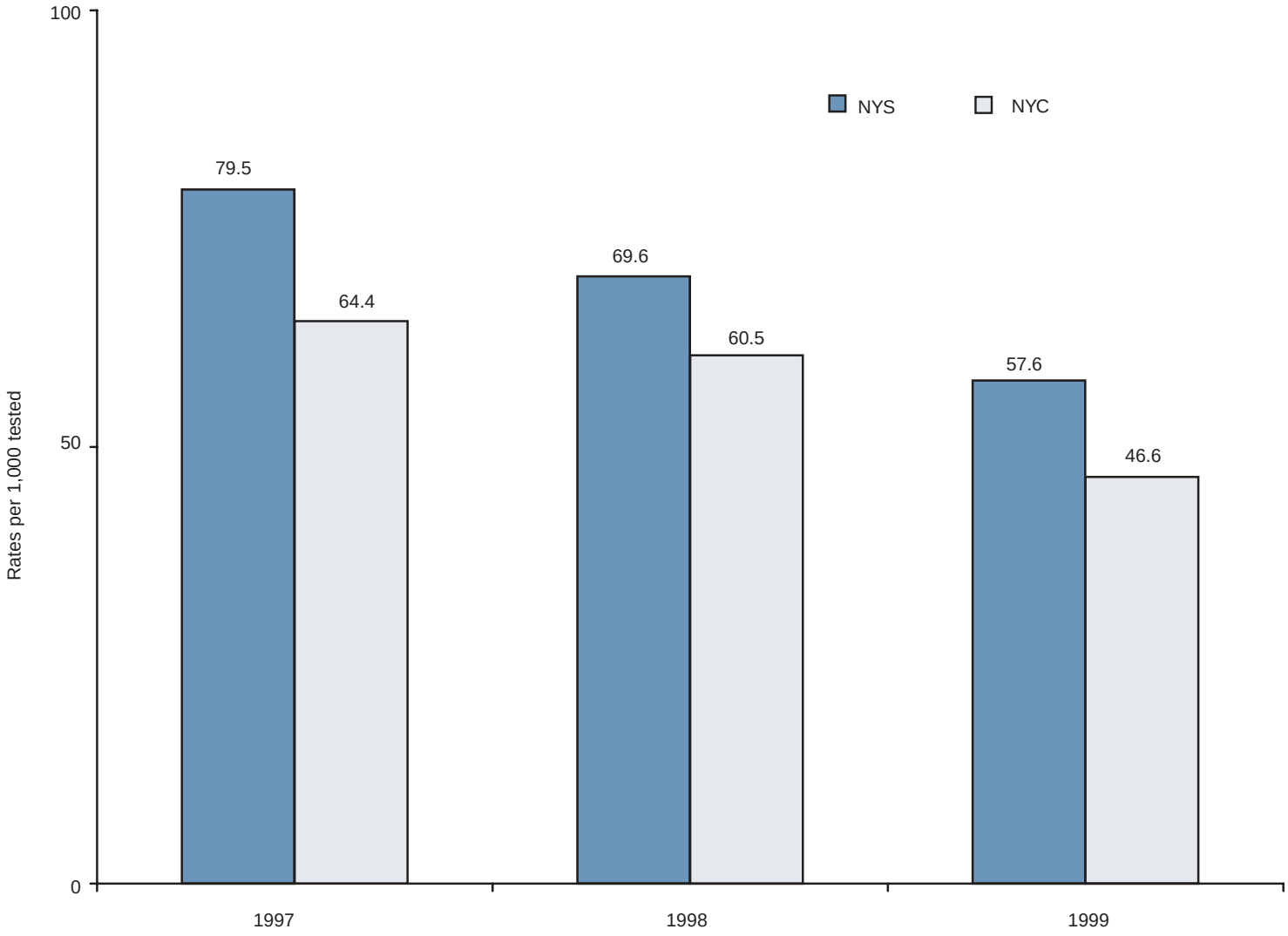
Figure 10. **Children newly identified with blood lead levels ≥ 10 µg/dL (number and rate per 1,000 tested), ages 6 months to less than 6 years, by year: New York City, 1995-2000.**



This figure represents children with elevated blood lead levels, as defined by the New York State Department of Health. The numerator represents children tested in a given year who had a blood lead level of 10 µg/dL or higher in that year or in a previous year. Thus, the data in this figure reflects children with current and past elevated blood lead levels.

For each of the years between 1997 and 1999, the rate of children (ages 0 to less than 6 years) with elevated blood lead levels (≥ 10 µg/dL) was lower in NYC than in the rest of New York State. In 1999, rates were 23% higher in New York State than in NYC (57.6 versus 46.6 per 1,000 screened). Some of this difference may be due to NYC's higher screening rates[20] (see Appendix, Table 1b), NYC's early ban on leaded paint and initiation of a lead poisoning prevention program prior to other jurisdictions in New York State.

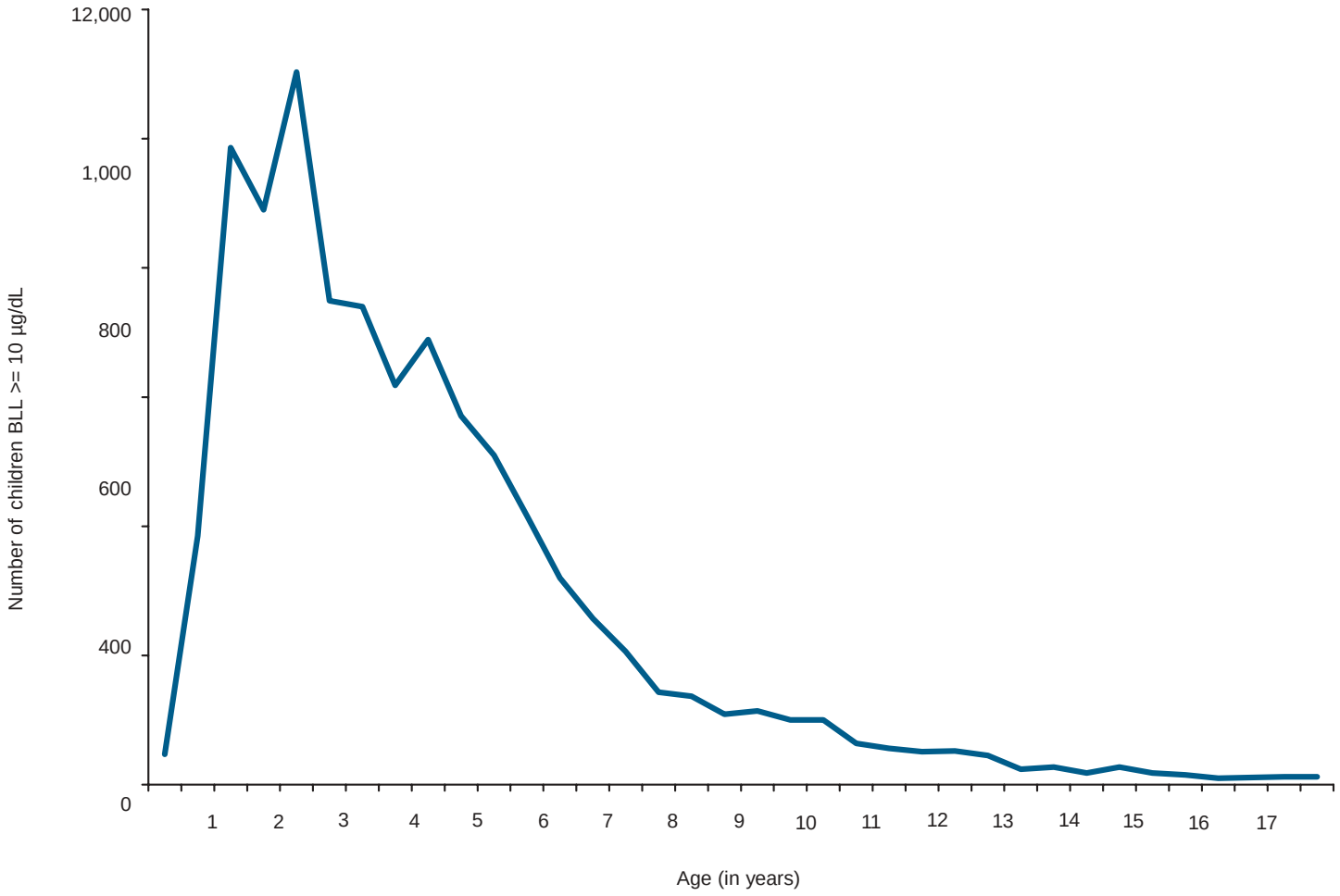
Figure 11. **Children tested in a given year with blood lead levels ≥ 10 µg/dL in that year or a previous year (rate per 1,000 tested), ages 0 years to less than 6 years; a comparison of New York City versus New York State (excluding New York City) by year, 1997 - 1999.**



[20]Data for NYC showed that 68% of children born in 1997 were tested by their second birthday (e.g., by 24 months) while data for NYS showed the proportion was 62%.

Blood lead levels were higher for younger children than for older children. In 2000, among children ages 0 to less than 18 years with blood lead levels ≥ 10 µg/dL (n= 9,632), the majority (80%) of these children were less than 6 years old. Blood lead testing peaked between ages 12 and 17 months (see Figure 6) and the peak age for children with blood lead levels ≥ 10 µg/dL was between ages 12 and 29 months.

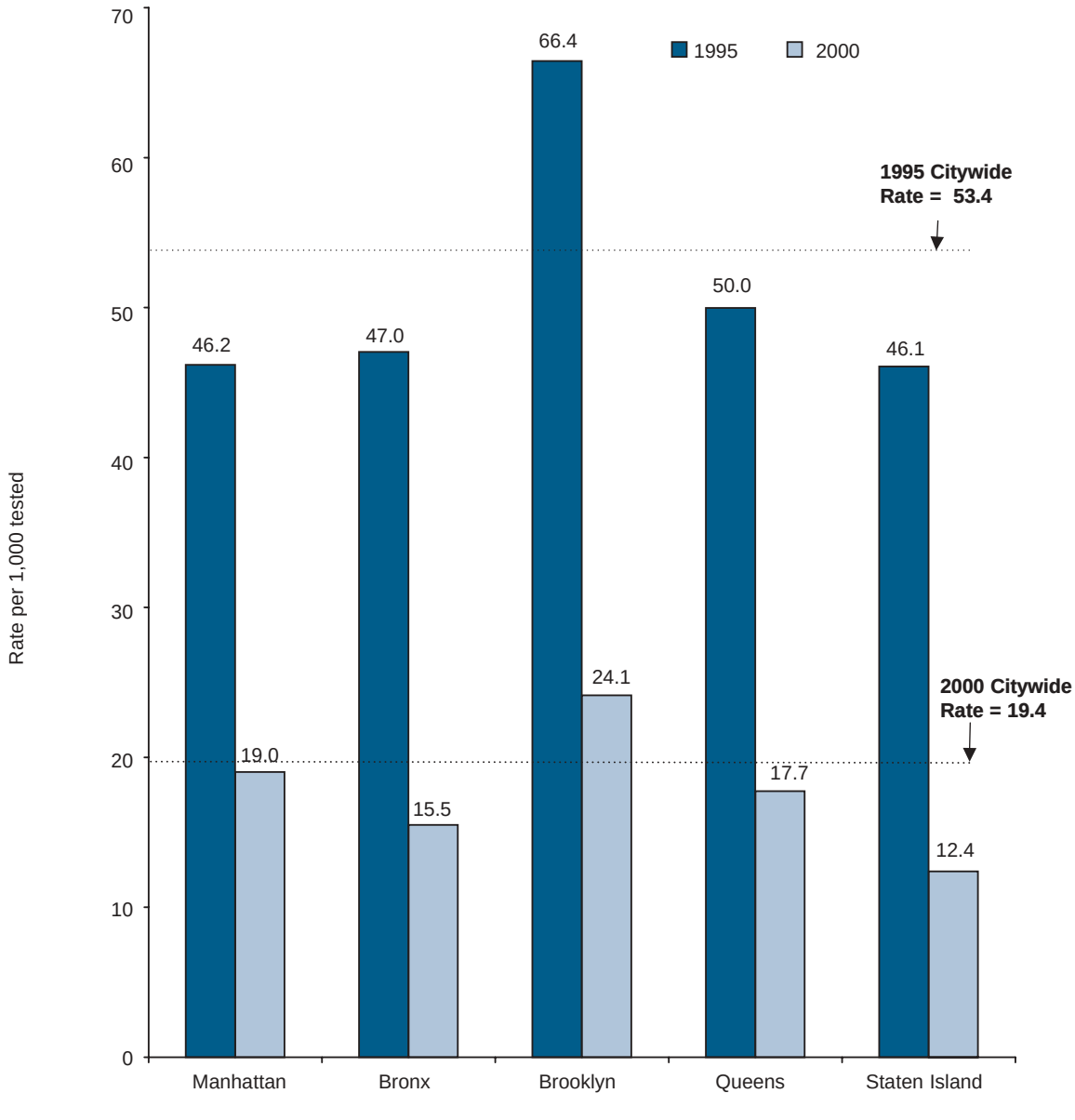
Figure 12. **Prevalence of children with blood lead levels ≥ 10 µg/dL, ages 0 to less than 18 years, by age: New York City, 2000. (Total = 9,632)**



Lead poisoning disproportionately affects children in different NYC boroughs. In both 1995 and 2000, Brooklyn had the highest rate of children newly identified with elevated blood lead levels (66.4 and 24.1 per 1,000 tested, respectively) and Staten Island had the lowest[21] rate.

However, all boroughs experienced a dramatic decline between 1995 and 2000. The rate of decline was greatest for Staten Island (a 73% decline, 46.1 to 12.4) and least for Manhattan (a 59% decline, 46.2 to 19.0). The rate of declines in the Bronx, Brooklyn, and Queens approximated the citywide decline (rates of decline 67%, 64%, and 64%, respectively).

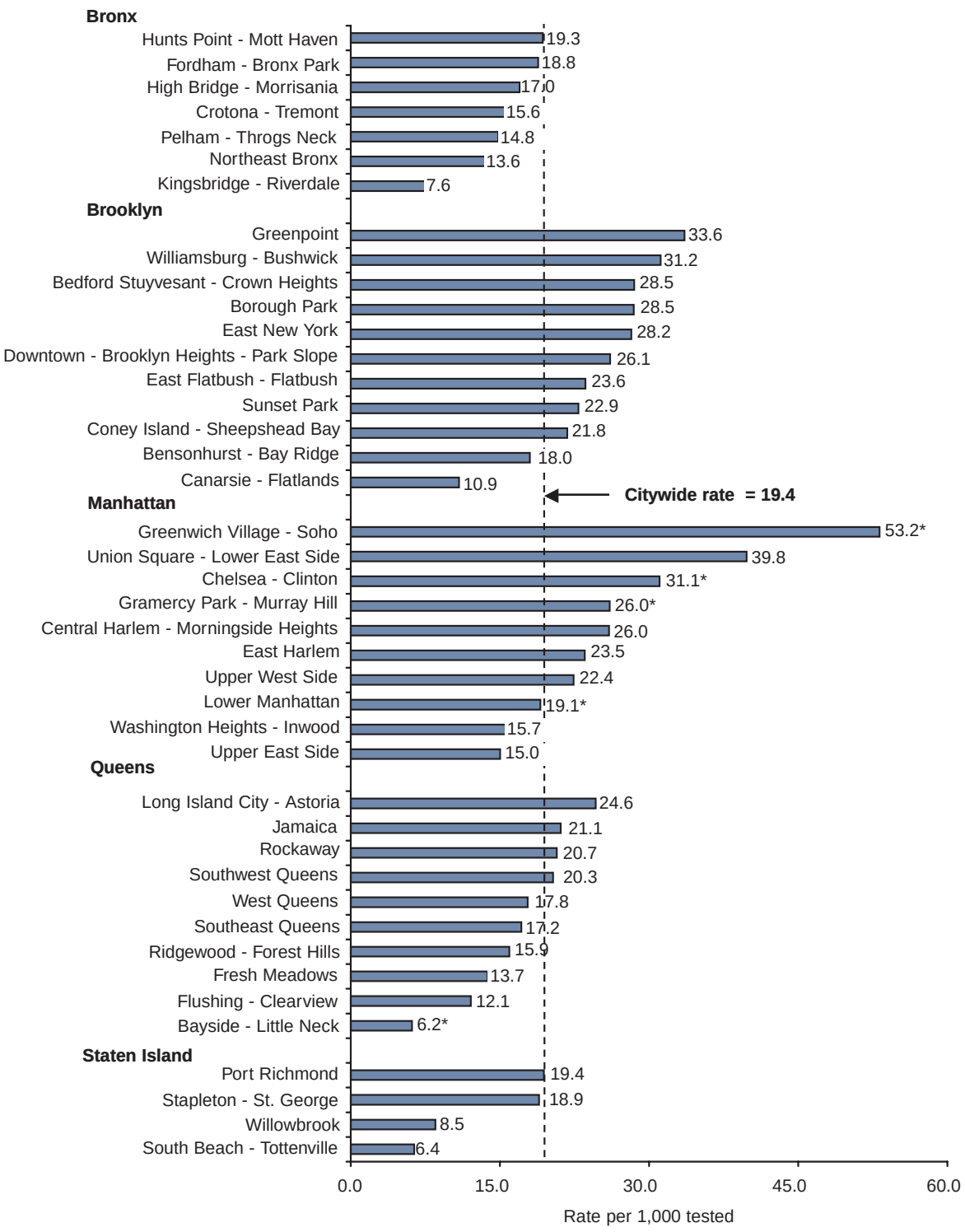
Figure 13. **Rates of children newly identified with blood lead levels ≥ 10 µg/dL (per 1,000 tested), ages 6 months to less than 6 years, by borough: New York City, 1995 and 2000.**



[21]In 1995, Manhattan had approximately the same rate of children newly identified with elevated blood lead levels as Staten Island (46.2 and 46,1 per 1,000 tested, respectively).

In 2000, the rate of children newly identified with elevated blood lead levels varied widely, ranging from 6.2 to 53.2 per 1,000 tested.[22] Higher than average rates were found in Brooklyn, Manhattan, and Queens.[23]

Figure 14. **Rates of children newly identified with blood lead levels ≥ 10 µg/dL (per 1,000 tested), ages 6 months to less than 6 years, by United Hospital Fund neighborhood (sorted highest to lowest within each borough): New York City, 2000.**



* [22]The rates for Greenwich Village-Soho, Chelsea-Clinton, Gramercy Park-Murray Hill, Lower Manhattan and Bayside-Little Neck were affected by relatively low numbers of children in the population. Each of these neighborhoods had fewer than 6,000 children ages 6 months to less than 6 year in the population, each had fewer than 1,700 children tested in 2000 and had relatively low testing rates. For more discussion regarding calculating small area rates, see Appendix, Technical Notes: calculation of rates - elevated blood lead level rates and EIBLL rates.

[23]Citywide, between 1995 and 2000, rates of children newly identified with elevated blood lead levels had sharply declined (not shown, see Appendix, Table 4) yet some neighborhoods persisted in having the highest rates. Eleven of the 15 neighborhoods with rates of children newly identified with elevated blood lead levels higher than the citywide average in 1995 (53.4 per 1,000 tested) were again higher than the citywide average in 2000 (19.4 per 1,000 tested): Greenwich Village-Soho, Central Harlem-Morningside Heights, Greenpoint, Williamsburg-Bushwick, Bedford Stuyvesant-Crown Heights, East New York, Downtown-Brooklyn Heights-Slope, East Flatbush-Flatbush, Jamaica, Rockaway, Southeast Queens.

In 2000, the citywide rate of children ages 6 months to less than 6 years newly identified with blood lead levels ≥ 10 µg/dL was 19.4 but ZIP code rates ranged from 0.0 to 70.9 per 1,000 tested.[24] Within each borough, ZIP codes with the highest rates were[25]: in Manhattan, ZIP codes 10012 and 10014 in Greenwich Village-Soho[26] (70.9 and 69.2, respectively) and 10002 and 10003 in Union Square-Lower East Side (44.5 and 42.6, respectively). In Brooklyn, ZIP code 11216 in Bedford Stuyvesant (44.6); in Queens, ZIP code 11418 in Southwest Queens (40.2); and in the Bronx, ZIP code 10474 in Hunts Point-Mott Haven (37.0).

Four of the top-ten ZIP codes in 1995 with rates of children newly identified with blood lead levels ≥ 10 µg/dL remained in the top-ten for 2000 (11216 and 11238 in Bedford-Stuyvesant, 11418 in Southwest Queens, and 11221 in Williamsburg-Bushwick). (1995 data are not shown, see Appendix, Table 4.)

[24] United Hospital Fund neighborhoods (UHFs) are aggregations of ZIP codes. Due to the variation in rates for ZIP codes within UHFs, the top rates for ZIP code areas and the top rates for UHF areas do not always exactly correspond.

[25] The rates for some ZIP codes were affected by relatively low numbers of children in the population. We have restricted our discussion here to ZIP codes with populations of at least 1,000 children (ages 6 months to less than 6 years) and at least 400 children tested (see discussion in Appendix: Technical Notes: Calculating rates - elevated blood lead level rates and EIBLL rates). For instance, ZIP Code 10018 had the third-highest rate of children newly identified with blood lead levels ≥ 10 µg/dL (68 per 1,000 tested) but was not included in the ranking since only 44 children were tested and there were only 133 children in the ZIP code area. ZIP code 10007 had a high rate of children with blood lead levels ≥ 20 (19 per 1,000 tested) but was not included in the ranking because only 53 children were tested out of a population of 168.

[26] Each of these Greenwich Village-Soho ZIP codes had a relatively small number of children living in the ZIP code (less than 1,200 children ages 6 months to less than 6 years).

Figure 15. **Rates of children newly identified with blood lead levels ≥ 10 µg/dL, ages 6 months to less than 6 years, by ZIP Code: New York City, 2000.**