Childhood Lead Poisoning in The City of Saint Louis

2013

City of St. Louis
Department of Health
Childhood Lead Poisoning Prevention Program

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The 2013 CLPP Annual Report can be downloaded from:
https://www.stlouis-mo.gov/government/departments/health/documents/annual-lead-poisoning-reports.cfm

Executive Summary

From 1996 to 2009, the City of St. Louis Department of Health has published annual reports on childhood lead poisoning (CLP). In this, the 16th edition, we are proud to report continued progress.

This report follows the format of the 2011 report, which included two years' worth of data (2010-2011). In the interest of consistency, this report will include 2012-2013 data, but present 2013 numbers only in full detail. If there is a need for more detailed 2012 data, please contact the author listed above.

This report differs from previous ones due to changes to the definition of lead poisoning. Prior to 2012, the CDC used blood lead levels (BLL) $\geq$ 10 micrograms per deciliter (mcg/dL) as a "level of concern." Our previous Annual Reports have calculated childhood lead poisoning (CLP) rates using this cutoff. In 2012, the CDC updated its guidelines, implementing a "reference level" of BLL $\geq$ 5 mcg/dL to identify children with elevated exposure to lead. This report will present CLPs using both the new "reference level" and the original "level of concern" to allow for comparison with prior reports and other data sources.

The CLP rate in St. Louis City exceeds state and national levels, though great progress has been made. CLP has declined dramatically in City over the past decade, with an 86 percent drop from 2001 to 2011. The CLP rate, using the original measure, fell again from 2.3% in 2011 to 1.98% in 2013.

These results are the product of a collaborative approach by four City agencies: the Department of Health, the Building Division, the Community Development Administration, and the Problem Properties Court. In addition, numerous community partners have contributed via the Lead Safe St. Louis Task Force.

As its predecessors, this report will describe many aspects of CLP in St. Louis. Several factors appear to have effect on exposure to lead. Age, socioeconomic status, physical geography, and time of year are some of the variables that play a role in the likelihood of children being exposed to environmental lead.

We hope this report contributes valuable information to the discussion surrounding childhood lead poisoning in the City of St. Louis.

Contents

What is Childhood Lead Poisoning?

How it Happens, Symptoms, and State and National Statistics

Childhood lead poisoning (CLP) occurs when a child's blood test result meets or exceeds a specific threshold. In 2012, the Centers for Disease Control and Prevention (CDC) revised their guidelines for assessing blood lead levels (BLLs) from a "level of concern" threshold of 10 micrograms of lead per deciliter of blood (mcg/dL) to a "reference level" of 5 mcg/dL. The rationale for this change was that 5 mcg/dl refers to the 97.5th percentile of children according to a national health survey, and that even low concentrations of lead in the blood can have detrimental effects. A lower threshold helps identify lead-exposed children earlier.

Historically, the main source of lead exposure was automobile exhaust. Since lead was removed from gasoline in the 1970's, the major source of lead exposure among U.S. children now is lead-based paint and dust found in deteriorating buildings.

Lead often enters the body when children put their hands or other objects covered with lead dust into their mouths or, less commonly, eat paint chips or soil containing lead. Lead poisoning may also result from breathing in lead dust created during renovation or home repair.

Lead-based paints were banned for use in housing in 1978. However, approximately 24 million housing units in the United States have deteriorated lead paint and elevated levels of lead-contaminated dust. More than 4 million of these dwellings are home to one or more young children.

Almost 90% of the housing stock in St. Louis was built before 1980 (approximately when lead paint was banned). While not all pre-1980s housing has lead paint hazards in them, the risk for lead exposure is elevated. In a considerable portion of St. Louis dwellings, paint is chipping and turning into dust, which creates a dangerous situation.

Lead poisoning can affect nearly every system in the body. It can cause learning disabilities, behavioral problems, and at very high levels, seizures, coma, and even death. It is also difficult to detect without a blood test. Rarely are symptoms evident, even at high levels.

The screening prevalence rate (SPR) is the most common way to measure how widespread CLP is. In the United States, the SPR is estimated at 0.6%. This means that approximately 0.6% of children who had a blood test for lead had a level at or above 10 mcg/dL.

In Missouri, the SPR is about 0.8% of children screened. In 2013, the City of St. Louis had an SPR of 1.98%.

Who Was Tested for Childhood Lead Poisoning in 2013?

Testing Guidelines

There are approximately 25,000 children under the age of six residing in the City of St. Louis. In order to effectively monitor CLP, the Department of Health receives both monthly and annual data on every child screened for CLP in the City. Because the entire City of St. Louis is classified as a high-risk area, Missouri guidelines state that all children under six years of age must be screened for CLP annually (**Table 1**).

Table 1
Missouri Lead Testing Plan

Universal Testing (High Risk Areas)	Targeted Testing (Non-High Risk Areas)
• Annual blood lead test for all children less than six years of age. • If a child has no documented blood test, a blood test should be performed immediately.	• Regardless of risk area, Medicaid children require a blood lead test at 12 & 24 months of age. • If a Medicaid child has no documented test anytime before 72 months of age, a blood test should be performed immediately. • Any child spending more than ten (10) hours a week in areas identified as high-risk for lead poisoning shall be blood lead tested annually. • All other children shall be assessed by the patient lead questionnaire found in the Missouri Department of Health and Senior Services "Lead Manual" and blood lead tested accordingly.

Citywide Numbers

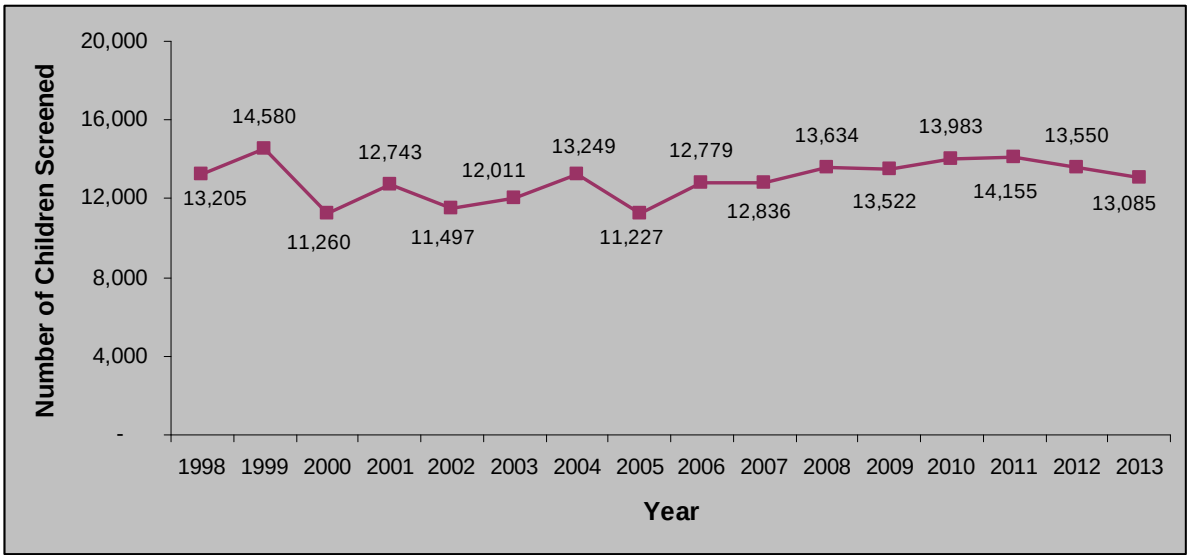
In 2013, there were 13,085 children screened for CLP in the City of St. Louis, reflecting a slight decrease in recent years. A total of 13,550 and 14,155 children were screened in 2012 and 2011 respectively (**Figure 1**).

Although the state of Missouri mandates that all St. Louis City children under 6 must be screened, significantly increasing the screening rates has been difficult. The Department of Health (DOH) provides some screening, but lacks the capacity to test all 25,000 City children and relies on primary care physicians to screen for CLP.

One of the difficulties in screening all City children is a perception by physicians that some children are not at risk. Some areas of the City, particularly the southwestern regions, have had historically lower rates of CLP. Not all homes in the areas with low prevalence rates are free of lead hazards, however; it cannot be assumed that these children do not face a risk of lead exposure.

Additionally, many physicians assume there is no need to screen for CLP past the age of 2, since that is the age at which children are most likely to be lead poisoned. This is also dangerous. A City of St. Louis cohort study found that 8.1% of children not lead poisoned at age 2 were found to be lead poisoned at a later age. Of children with undetectable levels of lead in their blood at ages 1 and 2, 30% had a level of at least 5 mcg/dL later. A need exists to screen all children through age 6.

Figure 1
Number of Children Screened for Lead Poisoning, 1998-2013



Who Was Lead Poisoned in 2013?

Citywide Numbers

Using the original "level of concern" (BLL $\geq$ 10 mcg/dL), 259 children were found to have elevated lead levels in 2013. The screening prevalence rate (SPR) of 1.98% is the number of children screened with BLL $\geq$ 10 mcg/dL divided by the total number of children screened (259 ÷ 13,085). It includes those who test elevated for the first time (incident cases) and those who had been previously diagnosed (prevalent cases). It is difficult to reduce the lead body burden in children, especially if continued exposure occurs; elevated levels may persist for some time unless aggressive measures are taken.

Additionally, of the 259 cases of lead poisoning in 2013, 156 (60.2%) of those children were new or "incident" cases. These are children who have either never been tested before or had been tested and had a blood lead level below the threshold. The screening incidence rate (SIR) is the number of new cases of lead poisoning divided by the tested population who had never been poisoned before. The SIR for 2013 is 1.2%.

The City of St. Louis began to see a marked decrease in the rate of both lead poisoning prevalence and incidence in 2001. More decreases have occurred in 2003-2011, though rates of CLP have leveled off in recent years (**Figures 2 & 3**).

It is likely that, as programs continue to succeed, the rate of CLP decline will slow over time. It is more difficult to reach areas where lead is either entrenched or emerging, for reasons ranging from language barriers and poverty to distrust of government.

Figure 2
Screening Prevalence Rate (10 mcg/dL), 2003-2013

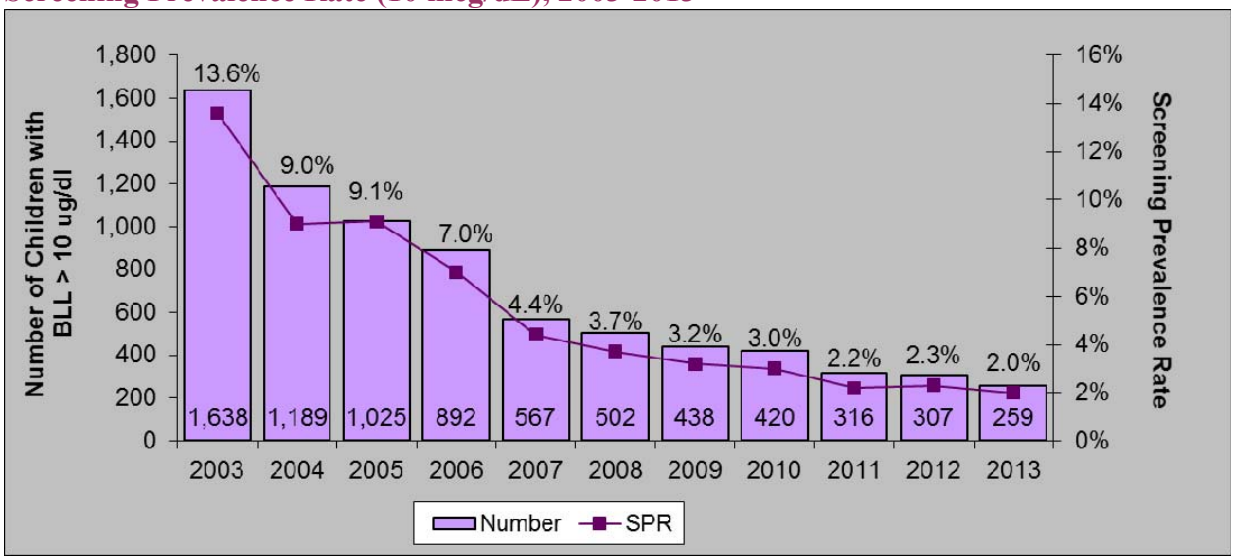
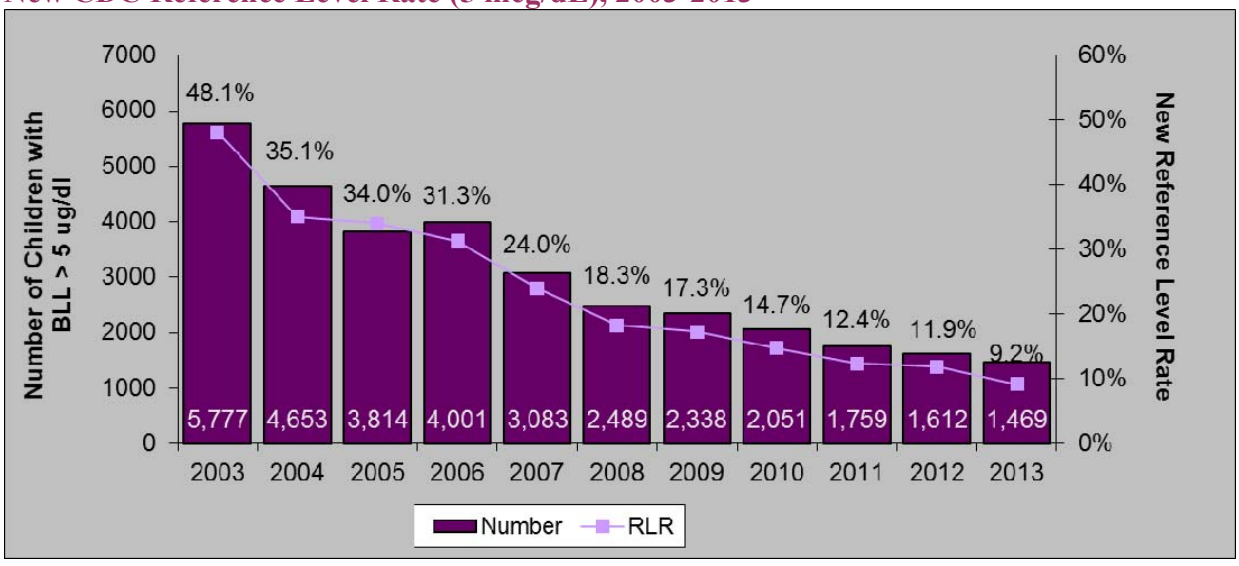


Figure 3
New CDC Reference Level Rate (5 mcg/dL), 2003-2013



Demographic Profile

CLP varies across several demographic variables. Age, race, and socioeconomic status all have correlations with lead poisoning. **Table 2** outlines some of these variables for CLP in 2013. Each of these variables will be discussed in further detail throughout the report.

Table 2
Demographic Profile of CLP, 2013

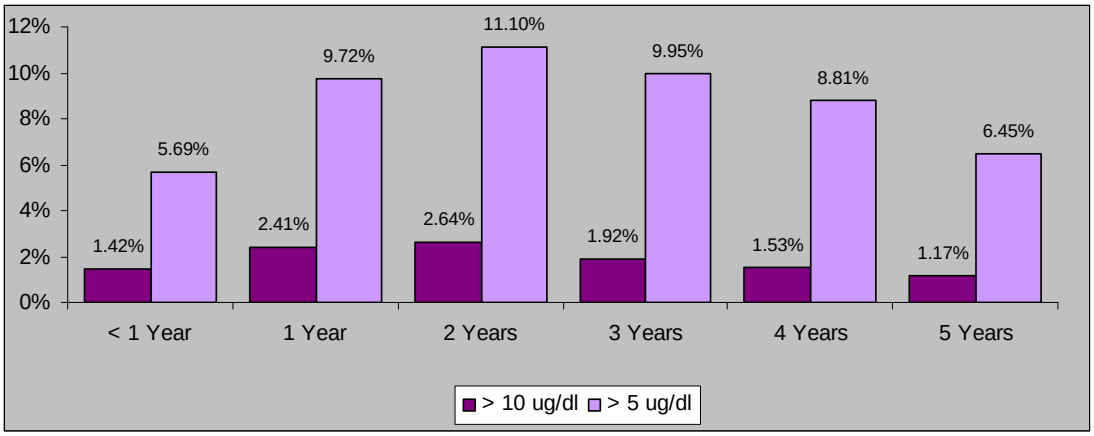
	Demographic	Number Screened	Percent of Total Screened	0-4 mcg/dL		5-9 mcg/dL*		≥ 10 mcg/dL†	
				N	%	N	%	N	%
Age	Less than 1 year	422	3.2	398	94.31	18	4.27	6	1.42
	1 year	3,282	25.1	2,963	90.28	240	7.31	79	2.41
	2 years	2,460	18.8	2,187	88.90	208	8.46	65	2.64
	3 years	2,503	19.1	2,254	90.05	201	8.03	48	1.92
	4 years	2,542	19.4	2,318	91.19	185	7.28	39	1.53
	5 years	1,876	14.3	1,755	93.55	99	5.28	22	1.17
Gender	Female	6,355	48.6	5,800	91.27	430	6.77	125	1.97
	Male	6,730	51.4	6,075	90.27	521	7.74	134	1.99
Race	African American	8,341	63.7	7,470	89.56	681	8.16	190	2.28
	White	2,682	20.5	2,527	94.22	125	4.66	30	1.12

* CDC "reference level" beginning in 2012
† CDC "level of concern" through 2011

Age and CLP

A child's risk of lead poisoning varies by age. Two-year-olds had the highest SPR in 2013 using both the original and new threshold measures (**Figure 4**). This age is marked by increased mobility as children begin exploring their environments, yet often have poor hand-washing skills. Two-year-olds may have higher screening prevalence rates than one-year-olds because lead stays in a child's bloodstream and is difficult to get rid of once a child becomes poisoned.

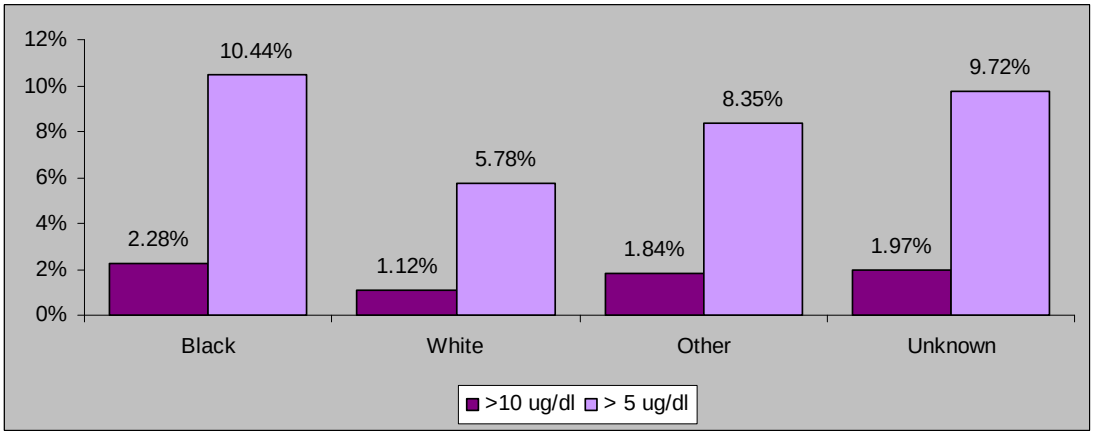
Figure 4
SPR by Age



Race and CLP

Race itself is not an indicator of CLP. Other factors associated with minority status, however, such as poverty, poor housing stock, insufficient access to medical care, and inadequate quality medical care, contribute to CLP. In 2013, almost 64% of the children screened for CLP were African American. However, African American children accounted for over 71% (871/1,210) and over 73% (190/259) of all lead poisoned children in 2013 using the cutoffs of $\geq$ 5 mcg/dL and $\geq$ 10 mcg/dL respectively (**Figure 5**).

Figure 5
SPR by Race



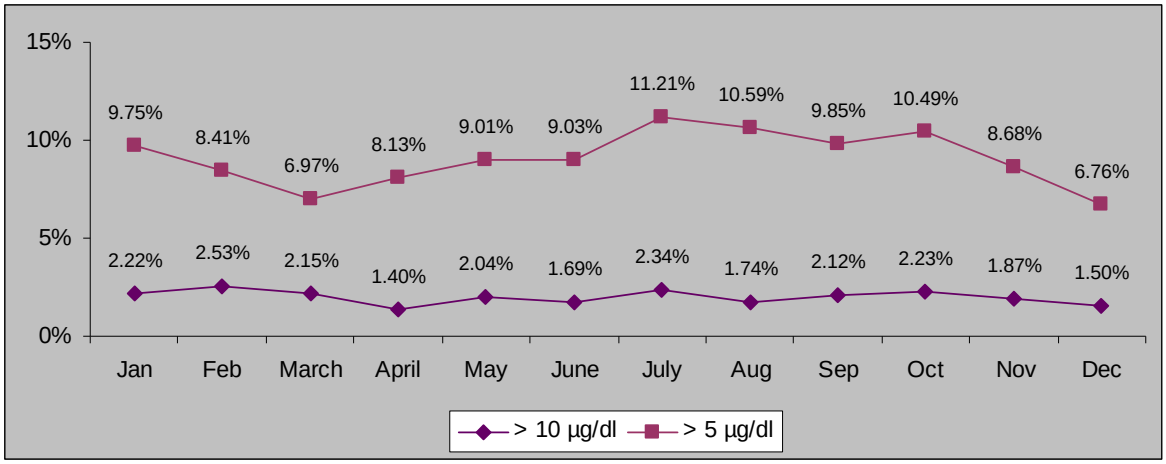
When Does Childhood Lead Poisoning Occur?

Seasonality and CLP

CLP can occur any time of year, but higher rates are typically seen in the warmer months (**Figure 6**). Several factors may contribute to this pattern. Playing outside may expose children to lead dust in the soil. Contaminated dirt tracked into the house by others may lead to higher rates.

Additionally, many families - especially those without air conditioning - open the windows in warmer months. This could lead to higher CLP rates in two ways. First, the friction of opening and closing windows painted with lead paint can create additional lead paint chips and dust. Second, opening windows allows wind to blow through a house, which could exacerbate exposure to airborne lead dust.

Figure 6
SPR by Month



Where Does Childhood Lead Poisoning Occur?

Geography and CLP

The use of geography in lead poisoning surveillance assists the Health Department in developing targeted programs in high-prevalence areas, as well as analysis of CLP on a more local scale. Maps can help local leaders understand the problem as it affects their communities and motivate them to develop, promote, and participate in prevention activities.

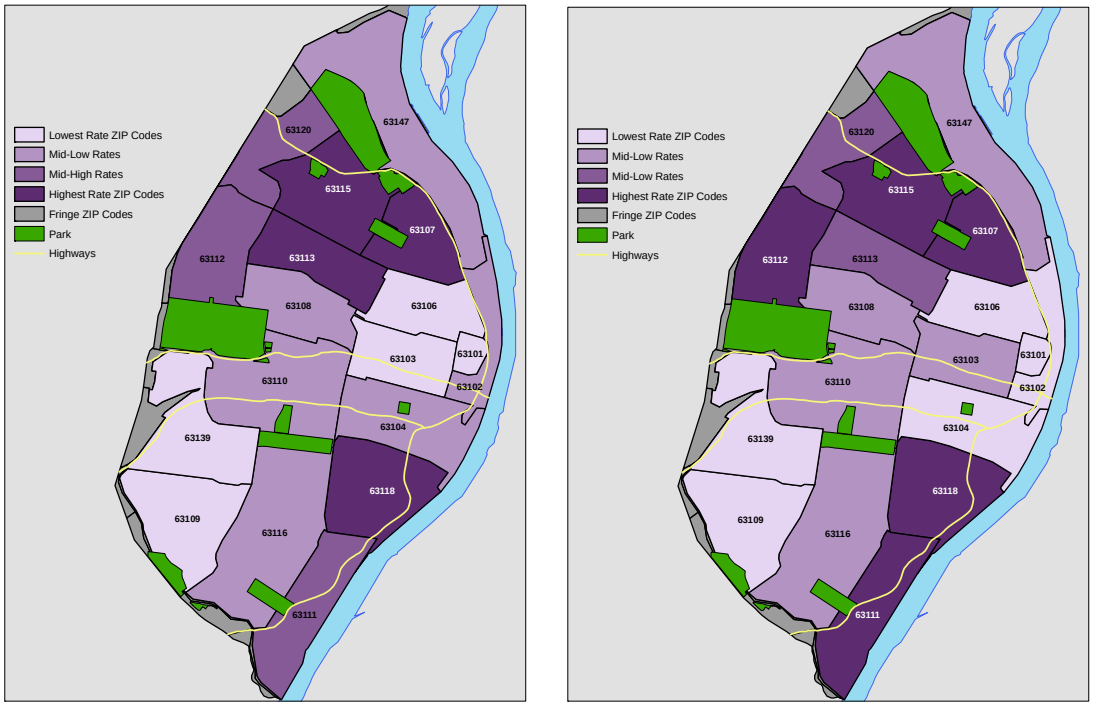
Areas of lower socioeconomic status with older, deteriorated housing stock generally have higher rates of CLP than more affluent areas. The maps below (**Figures 7-9**) provide views of CLP based on both the original "level of concern" and new "reference level" in St. Louis with increasing levels of acuity: ZIP Codes, aldermanic wards, and neighborhoods. More detailed maps are included in the appendix.

ZIP Codes and CLP

There are 18 ZIP Codes completely in the City of St. Louis (**Figure 7**). In 2013, the ZIP Codes with the highest rates of BLL ≥ 5 mcg/dL were 63107 (16.5%), 63118 (15.8%), 63113 (13.9%), and 63115 (13.6%). The ZIP Codes with the highest rates of BLL ≥ 10 mcg/dL were 63118 (3.8%), 63107 (3.5%), 63112 (3.4%), 63115 (2.9%), and 63111 (2.9%). Some ZIP Codes—including 63101 and 63102—have very small populations of children under age 6, and rates of CLP must be interpreted with caution.

Historically, ZIP Codes in the northern parts of the City have had higher concentrations of poverty and worse performance on a number of health indicators. Underprivileged areas tend to have higher rates of screening and prevalence for childhood lead poisoning.

Figure 7
CLP by ZIP Code*



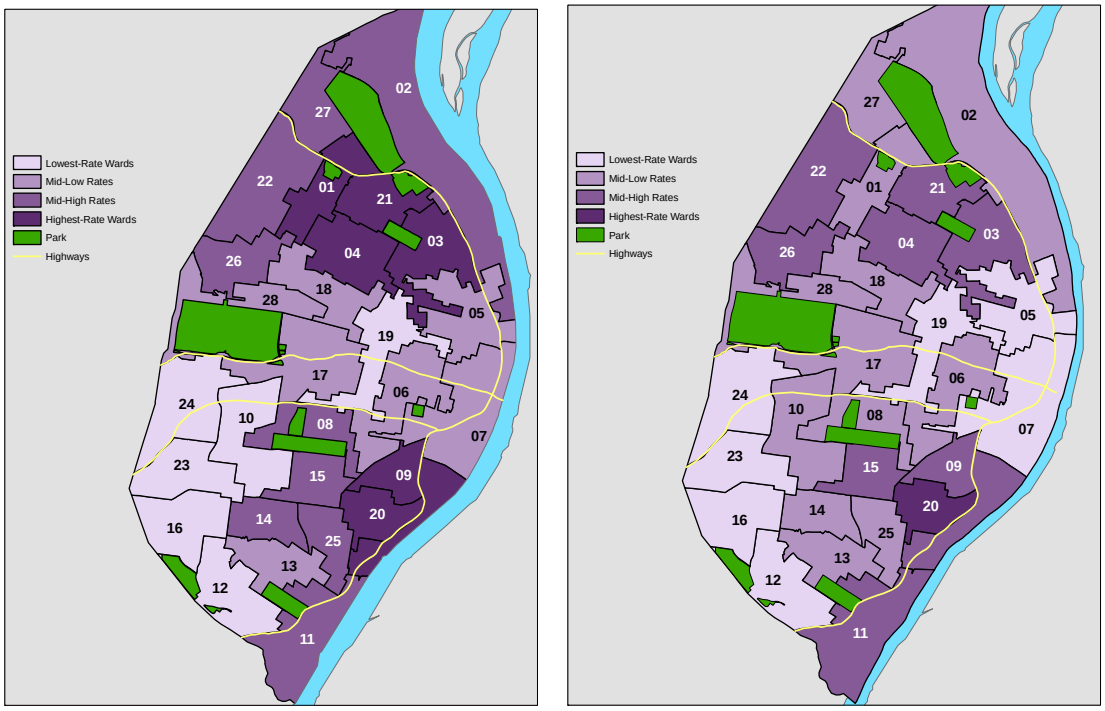
***Left: BLL ≥ 5 mcg/dL**
Right: BLL ≥ 10 mcg/dL

Wards and CLP

There are 28 aldermanic wards in St. Louis City (**Figure 8**). Wards with the highest rates of CLP using the new reference level (BLL ≥ 5 mcg/dL) in 2013 were Ward 20 (16.8%), Ward 9 (15.3%), Ward 4 (15.1%), Ward 1 (14.7%), Ward 21 (13.21%), and Ward 3 (12.35%). Only Ward 20 (4.88%) fell into the highest quartile using the original "level of concern" of BLL ≥ 10 mcg/dL.

Again, the highest rates of CLP can be seen in northern and southeastern sections of the City, which tend to be lower-income and have older, more deteriorated housing stock.

Figure 8
CLP by Ward*



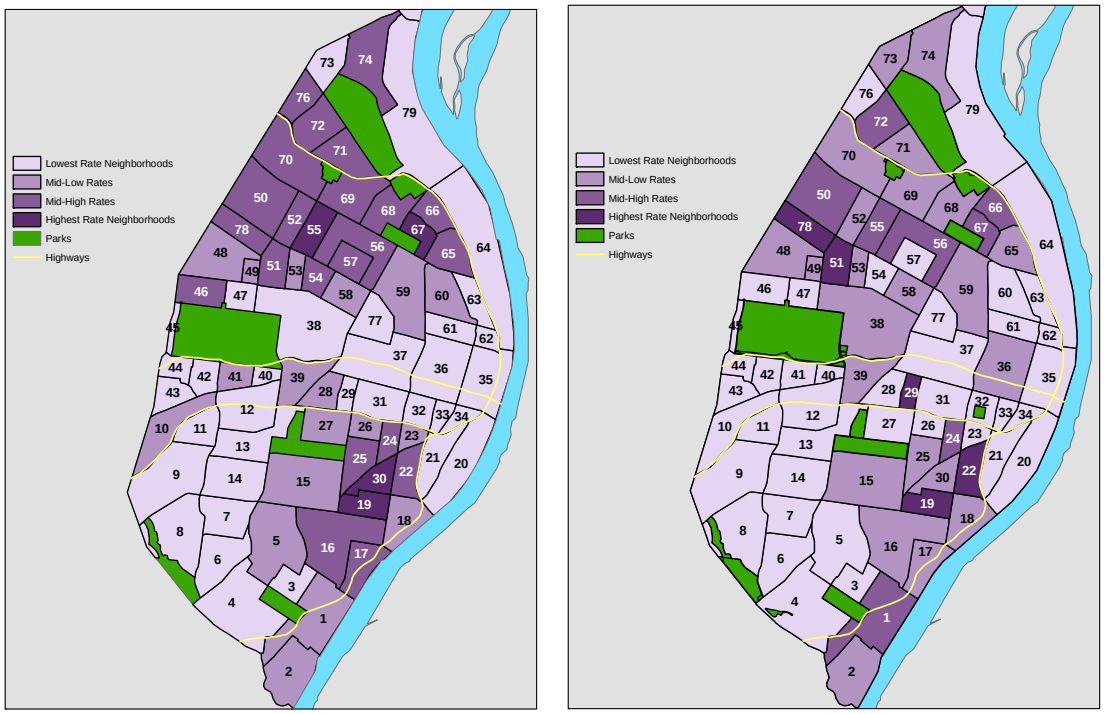
***Left: BLL ≥ 5 mcg/dL**
Right: BLL ≥ 10 mcg/dL

Neighborhoods and CLP

There are 79 official neighborhoods in the City of St. Louis. Due to population factors, the number of children screened in City neighborhoods ranges from 1 to 955 (**Figure 9**). Accordingly, rates in neighborhoods where small numbers of children were screened must be interpreted with caution, as small numbers make for volatile rates due to statistical reasons. Among neighborhoods with adequate numbers of children screened, however, prevalence rates ranged from zero in several neighborhoods to six percent (using BLL ≥ 10 mcg/dL) and over 20 percent (using ≥ 5 mcg/dL)

The neighborhoods with the highest rates of CLP using the new reference level (BLL ≥ 5 mcg/dL) were Kingsway East (21.38%), Fairground (20.88%), Gravois Park (20.38%), and Benton Park West (17.47%). Neighborhoods with the highest rates of CLP using the original level of concern (≥ 10 mcg/dL) were Gravois Park (5.96%), Hamilton Heights (5.92%), Benton Park (5.68%), Tiffany (4.88%), and Academy (4.55%).

Figure 9
CLP by Neighborhood*



***Left: BLL ≥ 5 mcg/dL**

Right: BLL ≥ 10 mcg/dL

Limitations and Discussion

Surveillance data are subject to limitations in measurement and analysis, and the reported findings must be interpreted with caution. Children are not randomly tested for lead exposure. Screening for lead poisoning in the City of St. Louis is weighted towards those at greatest risk, and the rates in this report are likely higher than true population rates. True childhood lead poisoning prevalence rates require that all children at risk have an equal chance of selection, but only 53% of St. Louis City children at risk for lead poisoning are included in the surveillance database. While it is possible that some of the missing 47% could include children tested but not reported to the Health Department, it is likely that the majority of these missing children were not screened for lead exposure in 2013.

Traditionally, children of lower socioeconomic status have been more likely to be screened for lead exposure in the City of St. Louis, largely due to the screening practices of experienced community health centers. Poor areas tend to be targeted for lead screening and education more than affluent areas due to higher screening prevalence rates in underprivileged areas.

A screening rate of 53% in 2013, while much higher than most other parts of the country, indicates that parents and private providers are still failing to screen children for lead poisoning in the City of St. Louis. Even though the prevalence of CLP appears to be declining, not enough is known about whether the entire high-risk population is being reached.

Furthermore, providers may choose not to test children in later years because they do not consider them to be at great risk. Dissemination of the aforementioned cohort study's two findings that (1) 8.1% of children retested in later years following a "negative" screening at age 2 were lead poisoned; and (2) 30% of children with undetectably low levels at these ages would later have a blood lead level of 5 mcg/dL or greater, could mitigate the reluctance of some providers to test in later years.

The City's decreasing prevalence rate is extremely encouraging, though certain areas of the City still have high rates and there remains work to be done.

Summary

Using the CDC's original "reference level" of 10 mcg/dL, the rate of childhood lead poisoning in the City of St. Louis decreased again to an all-time low of 1.98% in 2013. This is due to the efforts of several City agencies and private partnerships working in outreach, education, policy, and collaboration.

While the City has had many successes in combating childhood lead poisoning, universal screening remains a hurdle. Slightly more than half of City children under 6 years of age were screened for lead poisoning in 2013. This figure represents negligence on behalf of healthcare providers, pediatric physicians, and parents. Failure to screen all of their patients less than 6 years of age must be remedied. The entire City of St. Louis is designated "high-risk." As such, guidelines call for universal testing of children through age 6.

Until all City children receive the recommended annual screening from their primary health care provider, surveillance data will not reflect a true picture of childhood lead poisoning in the City of St. Louis. That picture would likely be one of a healthier environment for our children, as more children screened would result in a wider net cast to find children exposed to lead, mitigate its effects, and prevent further exposure.

The preferred remedy for the lead poisoning problem is to prevent children from ever being poisoned in the first place through primary prevention. Methods include providing lead-safe homes and play areas (preferably before children are born), educating people about lead hazards and how to protect children from them, and improving childhood nutrition to prevent the absorption of lead by their bodies.

When we cannot prevent initial lead poisoning, we must turn to the second best method for controlling the problem, secondary prevention. This is the early detection and treatment of poisoned children and the removal or reduction of lead hazards from their environment. Early detection and treatment can help health care providers reduce a child's lead body burden and can help the community and parents identify lead hazards and work to remove them. However, early detection is possible only if children receive lead tests.

Since a large portion of our children still do not receive lead tests, we must assume that many health care providers and families are still uninformed about the risks and long-term effects of lead poisoning.

Appendix A:
Data Tables

Table I
Childhood Lead Poisoning Rates, 1971-2013

Year	Lead Poisoning Threshold	# Screened	% Positive
1971	40 mcg/dL	4,334	28.0%
1972	40 mcg/dL	1,819	34.0%
1973	40 mcg/dL	7,426	32.3%
1974	40 mcg/dL	5,835	27.0%
1975	40 mcg/dL	11,041	22.9%
1976	30 mcg/dL	13,246	28.0%
1977	30 mcg/dL	14,375	24.5%
1978	30 mcg/dL	13,687	15.2%
1979	30 mcg/dL	12,511	12.5%
1980	30 mcg/dL	12,469	11.4%
1981	30 mcg/dL	11,449	12.4%
1982	30 mcg/dL	11,778	10.9%
1983	30 mcg/dL	11,406	7.6%
1984	30 mcg/dL	12,982	8.2%
1985	30 mcg/dL	12,308	11.0%
1986	25 mcg/dL	11,324	16.4%
1987	25 mcg/dL	13,314	10.3%
1988	25 mcg/dL	14,364	9.1%
1989	25 mcg/dL	12,317	7.4%
1990	25 mcg/dL	12,202	6.5%
1991	25 mcg/dL	12,799	4.4%
1992	10 mcg/dL	17,715	48.5%
1993	10 mcg/dL	17,850	26.8%
1994	10 mcg/dL	18,541	28.1%
1995	10 mcg/dL	20,573	23.5%
1996	10 mcg/dL	13,305	27.6%
1997	10 mcg/dL	13,833	24.2%
1998	10 mcg/dL	13,205	24.8%
1999	10 mcg/dL	14,580	22.9%
2000	10 mcg/dL	11,260	31.1%
2001	10 mcg/dL	12,743	16.2%
2002	10 mcg/dL	11,497	14.6%
2003	10 mcg/dL	12,011	13.6%
2004	10 mcg/dL	13,249	9.0%
2005	10 mcg/dL	11,227	9.1%
2006	10 mcg/dL	12,779	7.0%
2007	10 mcg/dL	12,836	4.4%
2008	10 mcg/dL	13,634	3.7%
2009	10 mcg/dL	13,522	3.2%
2010	10 mcg/dL	13,983	3.0%
2011	10 mcg/dL	14,155	2.2%
2012	5 mcg/dL	13,550	11.9%
2013	5 mcg/dL	13,085	9.2%

Table 2
Healthcare Providers of Blood Lead Screenings, 2013

Provider	Number Screened	Percent Screened	# ≥ 5 mcg/dL	% ≥ 5 mcg/dL	# ≥ 10 mcg/dL	% ≥ 10 mcg/dL
St. Louis City Health Department	276	2.1%	42	15.2%	13	4.7%
Community Health Centers	5,347	40.9%	671	12.5%	126	2.4%
Hospitals	1,777	13.6%	127	7.1%	50	2.8%
Group Practice/Private Physician	5,685	43.4%	370	6.5%	70	1.2%
Grand Total	**13,085**	**100.0%**	**1,210**	**9.2%**	**259**	**2.0%**

Table 3
Childhood Lead Poisoning by ZIP Code, 2013

ZIP Code	Population < 6 Years	Number Screened	Percent Screened	# ≥ 10 mcg/dL	% ≥ 10 mcg/dL	# ≥ 5 mcg/dL	% ≥ 5 mcg/dL
63107	973	693	71.2%	24	3.5%	114	16.5%
63118	2,626	1,430	54.5%	54	3.8%	226	15.8%
63113	955	618	64.7%	15	2.4%	86	13.9%
63115	1,665	1,021	61.3%	30	2.9%	139	13.6%
63120	993	536	54.0%	13	2.4%	61	11.4%
63112	1,639	880	53.7%	30	3.4%	97	11.0%
63111	1,953	885	45.3%	26	2.9%	96	10.8%
63147	806	479	59.4%	9	1.9%	42	8.8%
63116	3,608	1,860	51.6%	28	1.5%	152	8.2%
63102	27	14	51.9%	0	0.0%	1	7.1%
63110	1,224	540	44.1%	6	1.1%	35	6.5%
63104	1,561	741	47.5%	8	1.1%	44	5.9%
63108	701	321	45.8%	4	1.2%	19	5.9%
63106	1,622	915	56.4%	3	0.3%	30	3.3%
63109	1,944	964	49.6%	5	0.5%	28	2.9%
63139	1,461	605	41.4%	1	0.2%	13	2.1%
63101	119	71	59.7%	0	0.0%	1	1.4%
63103	198	77	38.9%	1	1.3%	1	1.3%
Fringe ZIPs	570	363	63.7%	2	0.6%	23	6.3%
Unknown	-	72	-	0	0.0%	2	2.8%
Total	**24,645**	**13,085**	**53.1%**	**259**	**2.0%**	**1,210**	**9.2%**

*ZIP codes with small populations of children under 6 should be interpreted with caution
**Fringe ZIPs are those on City's western edge that overlap a small part of the City from the County
***Population estimates are based on the 2010 Census

Table 4
Childhood Lead Poisoning by Ward, 2013

Ward	Population < 6 Years	Number Screened	Percent Screened	# ≥ 10 mcg/dL	% ≥ 10 mcg/dL	# ≥ 5 mcg/dL	% ≥ 5 mcg/dL
20	1,294	738	57.0%	36	4.9%	124	16.8%
9	1,101	554	50.3%	15	2.7%	85	15.3%
4	917	557	60.7%	17	3.1%	84	15.1%
1	809	471	58.2%	10	2.1%	69	14.6%
21	831	530	63.8%	16	3.0%	70	13.2%
3	954	688	72.1%	18	2.6%	85	12.4%
25	1,245	701	56.3%	16	2.3%	79	11.3%
27	874	534	61.1%	12	2.2%	60	11.2%
22	1,077	713	66.2%	20	2.8%	80	11.2%
26	833	457	54.9%	16	3.5%	47	10.3%
15	984	496	50.4%	13	2.6%	47	9.5%
8	831	391	47.1%	6	1.5%	37	9.5%
2	763	461	60.4%	8	1.7%	43	9.3%
14	948	504	53.2%	7	1.4%	44	8.7%
11	1,052	438	41.6%	11	2.5%	37	8.4%
28	419	129	30.8%	2	1.6%	10	7.8%
13	1,009	448	44.4%	6	1.3%	32	7.1%
18	604	384	63.6%	6	1.6%	27	7.0%
6	1,165	596	51.2%	9	1.5%	41	6.9%
17	438	186	42.5%	3	1.6%	12	6.5%
7	636	287	45.1%	1	0.3%	13	4.5%
5	1,182	635	53.7%	5	0.8%	26	4.1%
24	708	252	35.6%	0	0.0%	10	4.0%
10	725	324	44.7%	4	1.2%	12	3.7%
19	762	380	49.9%	2	0.5%	14	3.7%
12	859	345	40.2%	0	0.0%	9	2.6%
23	858	428	49.9%	0	0.0%	9	2.1%
16	767	386	50.3%	0	0.0%	2	0.5%
Unknown	-	72	-	0	0.0%	2	2.8%
Total	**24,645**	**13,085**	**53.1%**	**259**	**2.0%**	**1,210**	**9.2%**

***Population estimates are based on the 2010 Census

Table 5
Childhood Lead Poisoning by Neighborhood, 2013

#	Name	Population < 6 Years	Number Screened	Percent Screened	# ≥ 10 mcg/dL	% ≥ 10 mcg/dL	# ≥ 5 mcg/dL	% ≥ 5 mcg/dL
19	Gravois Park	567	319	56.3%	19	6.0%	65	20.4%
78	Hamilton Heights	262	169	64.5%	10	5.9%	26	15.4%
22	Benton Park	224	88	39.3%	5	5.7%	10	11.4%
29	Tiffany	119	41	34.5%	2	4.9%	2	4.9%
51	Academy	237	132	55.7%	6	4.5%	20	15.2%
67	Fairground Neighborhood	103	91	88.3%	4	4.4%	19	20.9%
24	Fox Park	291	124	42.6%	5	4.0%	16	12.9%
56	The Greater Ville	532	319	60.0%	12	3.8%	49	15.4%
66	College Hill	197	165	83.8%	6	3.6%	19	11.5%
72	Walnut Park East	386	227	58.8%	8	3.5%	36	15.9%
55	Kingsway East	311	145	46.6%	5	3.4%	31	21.4%
1	Carondelet	774	358	46.3%	12	3.4%	33	9.2%
50	Wells/Goodfellow	653	487	74.6%	15	3.1%	56	11.5%
71	Mark Twain	307	202	65.8%	6	3.0%	23	11.4%
16	Dutchtown	1,664	955	57.4%	28	2.9%	119	12.5%
68	O'Fallon	468	279	59.6%	8	2.9%	43	15.4%
70	Mark Twain/I-70 Industrial	65	36	55.4%	1	2.8%	4	11.1%
25	Tower Grove East	454	290	63.9%	8	2.8%	42	14.5%
17	Mount Pleasant	434	218	50.2%	6	2.8%	30	13.8%
2	Patch	266	110	41.4%	3	2.7%	9	8.2%
65	Hyde Park	241	184	76.3%	5	2.7%	25	13.6%
15	Tower Grove South	1,060	533	50.3%	12	2.3%	44	8.3%
69	Penrose	471	299	63.5%	6	2.0%	33	11.0%
58	Vandeventer	127	102	80.3%	2	2.0%	7	6.9%
39	Forest Park Southeast	221	104	47.1%	2	1.9%	8	7.7%
48	West End	623	313	50.2%	6	1.9%	23	7.3%
73	North Point	272	157	57.7%	3	1.9%	5	3.2%
18	Marine Villa	299	158	52.8%	3	1.9%	16	10.1%
30	Benton Park West	485	269	55.5%	5	1.9%	47	17.5%
49	Visitation Park	99	58	58.6%	1	1.7%	4	6.9%
38	Central West End	407	175	43.0%	3	1.7%	9	5.1%
74	Baden	583	351	60.2%	6	1.7%	38	10.8%
36	Downtown West	144	59	41.0%	1	1.7%	1	1.7%
53	Fountain Park	139	125	89.9%	2	1.6%	10	8.0%
59	JeffVanderLou	511	322	63.0%	5	1.6%	31	9.6%
52	Kingsway West	235	130	55.3%	2	1.5%	19	14.6%
54	Lewis Place	142	69	48.6%	1	1.4%	9	13.0%
60	St. Louis Place	248	149	60.1%	2	1.3%	11	7.4%
5	Bevo Mill	1,044	527	50.5%	7	1.3%	47	8.9%
46	Skinker/DeBaliviere	227	77	33.9%	1	1.3%	9	11.7%
31	The Gate District	303	157	51.8%	2	1.3%	6	3.8%
76	Walnut Park West	246	164	66.7%	2	1.2%	18	11.0%

#	Name	Population < 6 Years	Number Screened	Percent Screened	# ≥ 10 mcg/dL	% ≥ 10 mcg/dL	# ≥ 5 mcg/dL	% ≥ 5 mcg/dL
14	North Hampton	566	269	47.5%	3	1.1%	7	2.6%
3	Holly Hills	275	97	35.3%	1	1.0%	5	5.2%
13	Southwest Garden	294	113	38.4%	1	0.9%	3	2.7%
27	Shaw	545	243	44.6%	2	0.8%	18	7.4%
63	Old North St. Louis	250	123	49.2%	1	0.8%	3	2.4%
7	South Hampton	559	306	54.7%	2	0.7%	13	4.2%
61	Carr Square	482	303	62.9%	1	0.3%	10	3.3%
4	Boulevard Heights	638	252	39.5%	0	0.0%	11	4.4%
6	Princeton Heights	551	220	39.9%	0	0.0%	6	2.7%
8	St. Louis Hills	428	216	50.5%	0	0.0%	2	0.9%
9	Lindenwood Park	680	308	45.3%	0	0.0%	5	1.6%
10	Ellendale	96	39	40.6%	0	0.0%	3	7.7%
11	Clifton Heights	218	98	45.0%	0	0.0%	5	5.1%
12	The Hill	117	59	50.4%	0	0.0%	2	3.4%
20	Kosciusko	2	0	0.0%	0	0.0%	0	0.0%
21	Soulard	145	44	30.3%	0	0.0%	2	4.5%
23	McKinley Heights	104	55	52.9%	0	0.0%	5	9.1%
26	Compton Heights	83	31	37.3%	0	0.0%	2	6.5%
28	Botanical Heights	123	55	44.7%	0	0.0%	3	5.5%
32	Lafayette Square	118	35	29.7%	0	0.0%	1	2.9%
33	Peabody, Darst, Webbe	408	227	55.6%	0	0.0%	4	1.8%
34	Lasalle	125	58	46.4%	0	0.0%	1	1.7%
35	Downtown	72	44	61.1%	0	0.0%	1	2.3%
37	Midtown	40	19	47.5%	0	0.0%	0	0.0%
40	Kings Oak	15	4	26.7%	0	0.0%	0	0.0%
41	Cheltenham	42	15	35.7%	0	0.0%	1	6.7%
42	Clayton/Tamm	106	36	34.0%	0	0.0%	0	0.0%
43	Franz Park	163	42	25.8%	0	0.0%	0	0.0%
44	Hi-Point	119	33	27.7%	0	0.0%	1	3.0%
45	Wydown/Skinker	28	2	7.1%	0	0.0%	0	0.0%
47	DeBaliviere Place	129	60	46.5%	0	0.0%	0	0.0%
57	The Ville	125	103	82.4%	0	0.0%	13	12.6%
62	Columbus Square	247	105	42.5%	0	0.0%	2	1.9%
64	Near North Riverfront	4	1	25.0%	0	0.0%	0	0.0%
75	Riverview	24	29	120.8%	0	0.0%	0	0.0%
77	Covenant Blu/Grand Center	276	131	47.5%	0	0.0%	7	5.3%
79	North Riverfront	7	1	14.3%	0	0.0%	0	0.0%
	Unknown	-	72		0	0.0%	2	2.8%
Total		**24,645**	**13,085**	**53.1%**	**259**	**2.0%**	**1,210**	**9.2%**

*Neighborhoods with small populations of children under 6 appear to have high screening prevalence rates due to fewer children screened.

Table 6
Childhood Lead Poisoning by Census Tract, 2013

Census Tract	Population <6 Years	Number Screened	Percent Screened	# ≥ 10 mcg/dL	% ≥ 10 mcg/dL	# ≥ 5 mcg/dL	% ≥ 5 mcg/dL
101100	173	64	37.0%	0	0.0%	4	6.3%
101200	249	106	42.6%	0	0.0%	0	0.0%
101300	331	119	36.0%	1	0.8%	5	4.2%
101400	234	100	42.7%	4	4.0%	5	5.0%
101500	309	134	43.4%	1	0.7%	7	5.2%
101800	286	118	41.3%	4	3.4%	15	12.7%
102100	186	74	39.8%	0	0.0%	0	0.0%
102200	380	159	41.8%	0	0.0%	3	1.9%
102300	129	50	38.8%	0	0.0%	2	4.0%
102400	198	74	37.4%	1	1.4%	6	8.1%
102500	155	64	41.3%	0	0.0%	7	10.9%
103100	202	93	46.0%	0	0.0%	2	2.2%
103400	128	58	45.3%	0	0.0%	3	5.2%
103600	81	50	61.7%	0	0.0%	2	4.0%
103700	192	76	39.6%	0	0.0%	3	3.9%
103800	265	129	48.7%	0	0.0%	3	2.3%
104200	178	52	29.2%	0	0.0%	1	1.9%
104500	104	36	34.6%	0	0.0%	1	2.8%
105198	146	35	24.0%	0	0.0%	1	2.9%
105200	157	66	42.0%	1	1.5%	8	12.1%
105300	189	119	63.0%	3	2.5%	10	8.4%
105400	287	129	44.9%	1	0.8%	6	4.7%
105500	257	130	50.6%	4	3.1%	12	9.2%
106100	215	129	60.0%	5	3.9%	20	15.5%
106200	284	199	70.1%	1	0.5%	12	6.0%
106300	180	131	72.8%	8	6.1%	21	16.0%
106400	210	130	61.9%	3	2.3%	18	13.8%
106500	218	157	72.0%	5	3.2%	24	15.3%
106600	130	107	82.3%	10	9.3%	23	21.5%
106700	307	145	47.2%	5	3.4%	31	21.4%
107200	131	72	55.0%	2	2.8%	14	19.4%
107300	364	238	65.4%	4	1.7%	21	8.8%
107400	255	155	60.8%	6	3.9%	22	14.2%
107500	195	142	72.8%	4	2.8%	15	10.6%
107600	168	101	60.1%	2	2.0%	11	10.9%
108100	284	147	51.8%	1	0.7%	11	7.5%
108200	148	96	64.9%	4	4.2%	10	10.4%
108300	180	122	67.8%	1	0.8%	11	9.0%
109600	280	158	56.4%	6	3.8%	24	15.2%
109700	243	204	84.0%	6	2.9%	24	11.8%
110100	241	170	70.5%	9	5.3%	26	15.3%
110200	223	134	60.1%	2	1.5%	18	13.4%
110300	198	102	51.5%	2	2.0%	13	12.7%
110400	214	126	58.9%	6	4.8%	26	20.6%
110500	91	78	85.7%	4	5.1%	17	21.8%

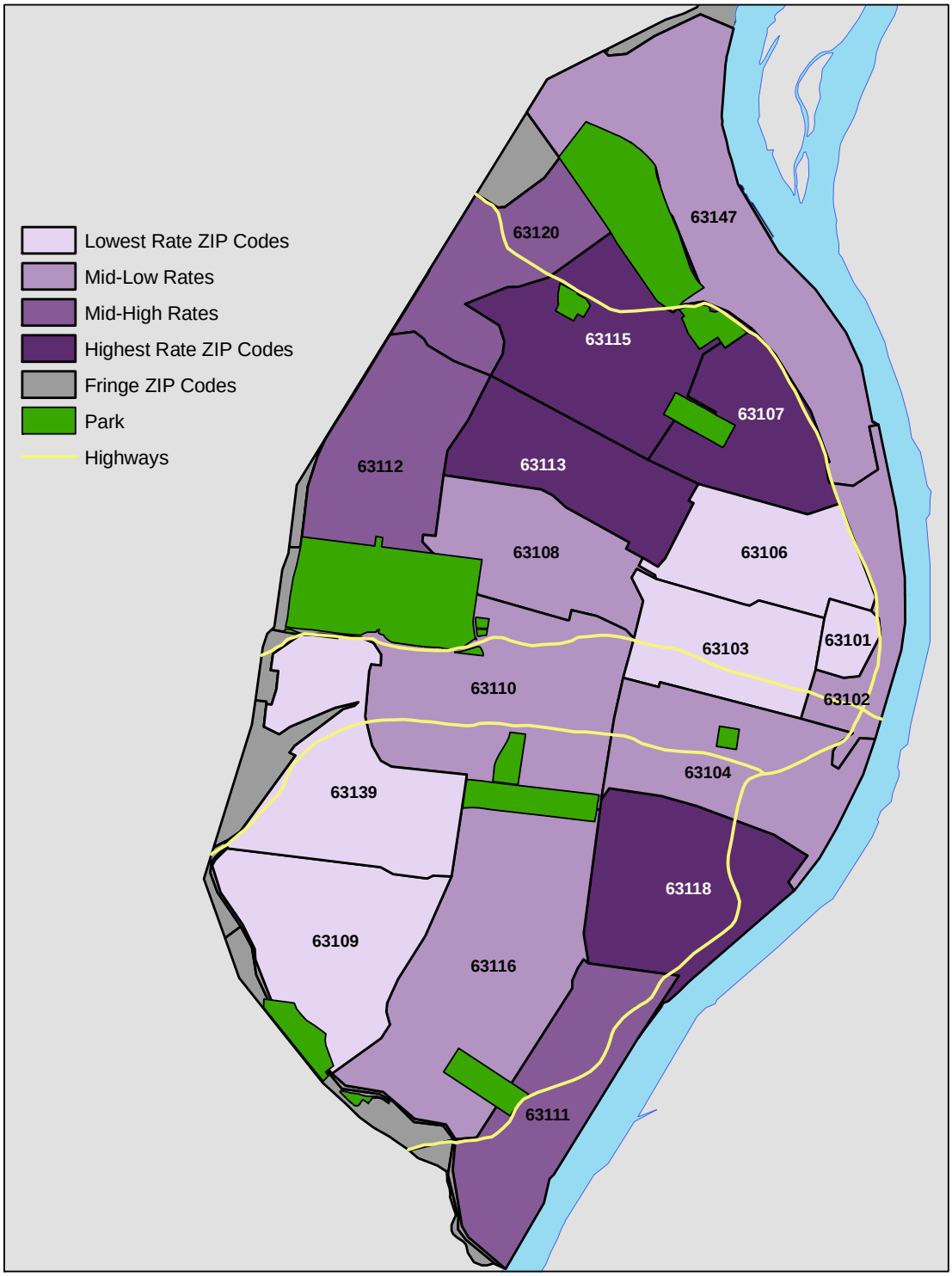
Census Tract	Population <6 Years	Number Screened	Percent Screened	Number ≥ 10 mcg/dL	SPR (% ≥ 10 mcg/dL)	Number ≥ 5 mcg/dL	SPR (% ≥ 5 mcg/dL)
111100	103	80	77.7%	1	1.3%	4	5.0%
111200	92	51	55.4%	1	2.0%	8	15.7%
111300	105	85	81.0%	0	0.0%	11	12.9%
111400	140	88	62.9%	1	1.1%	13	14.8%
111500	84	45	53.6%	0	0.0%	4	8.9%
112100	150	63	42.0%	1	1.6%	3	4.8%
112200	156	75	48.1%	1	1.3%	4	5.3%
112300	231	156	67.5%	2	1.3%	13	8.3%
112400	121	54	44.6%	1	1.9%	2	3.7%
113500	117	55	47.0%	0	0.0%	2	3.6%
114101	365	187	51.2%	4	2.1%	12	6.4%
114102	280	144	51.4%	0	0.0%	1	0.7%
114200	322	154	47.8%	0	0.0%	2	1.3%
114300	462	244	52.8%	1	0.4%	7	2.9%
115100	293	139	47.4%	0	0.0%	6	4.3%
115200	285	194	68.1%	5	2.6%	20	10.3%
115300	467	294	63.0%	4	1.4%	21	7.1%
115400	281	128	45.6%	2	1.6%	10	7.8%
115500	582	282	48.5%	10	3.5%	35	12.4%
115600	494	251	50.8%	7	2.8%	34	13.5%
115700	388	231	59.5%	12	5.2%	41	17.7%
116100	278	141	50.7%	1	0.7%	8	5.7%
116200	314	152	48.4%	2	1.3%	10	6.6%
116301	227	105	46.3%	3	2.9%	7	6.7%
116302	334	190	56.9%	8	4.2%	31	16.3%
116400	536	292	54.5%	6	2.1%	50	17.1%
116500	342	207	60.5%	7	3.4%	28	13.5%
117100	72	22	30.6%	0	0.0%	1	4.5%
117200	498	224	45.0%	1	0.4%	16	7.1%
117400	257	142	55.3%	3	2.1%	17	12.0%
118100	118	62	52.5%	2	3.2%	6	9.7%
118400	4	5	125.0%	0	0.0%	0	0.0%
118600	158	66	41.8%	0	0.0%	3	4.5%
119101	57	23	40.4%	0	0.0%	1	4.3%
119102	63	26	41.3%	0	0.0%	0	0.0%
119200	86	43	50.0%	0	0.0%	2	4.7%
119300	54	25	46.3%	1	4.0%	4	16.0%
120200	116	75	64.7%	1	1.3%	7	9.3%
121100	73	67	91.8%	0	0.0%	2	3.0%
121200	384	204	53.1%	0	0.0%	6	2.9%
123100	322	141	43.8%	6	4.3%	17	12.1%
123200	156	78	50.0%	0	0.0%	4	5.1%
123300	159	71	44.7%	0	0.0%	4	5.6%
124100	476	281	59.0%	19	6.8%	54	19.2%
124200	333	193	58.0%	3	1.6%	38	19.7%
124300	214	81	37.9%	5	6.2%	11	13.6%
124600	219	126	57.5%	2	1.6%	12	9.5%

Census Tract	Population <6 Years	Number Screened	Percent Screened	Number ≥ 10 mcg/dL	SPR (% ≥ 10 mcg/dL)	Number ≥ 5 mcg/dL	SPR (% ≥ 5 mcg/dL)
125500	103	37	35.9%	1	2.7%	1	2.7%
125600	117	70	59.8%	0	0.0%	2	2.9%
125700	561	268	47.8%	1	0.4%	8	3.0%
126600	365	181	49.6%	1	0.6%	8	4.4%
126700	101	88	87.1%	4	4.5%	13	14.8%
126800	242	63	26.0%	0	0.0%	0	0.0%
126900	314	203	64.6%	6	3.0%	27	13.3%
127000	156	99	63.5%	1	1.0%	8	8.1%
127100	181	121	66.9%	2	1.7%	10	8.3%
127200	247	113	45.7%	1	0.9%	2	1.8%
127300	318	129	40.6%	3	2.3%	10	7.8%
127400	652	332	50.9%	0	0.0%	4	1.2%
127500	191	150	78.5%	0	0.0%	4	2.7%
127600	154	39	25.3%	0	0.0%	1	2.6%
Unknown	-	72	-	0	0.0%	2	2.8%
City Total	**24,645**	**13,085**	**53.1%**	**259**	**2.0%**	**1,210**	**9.2%**

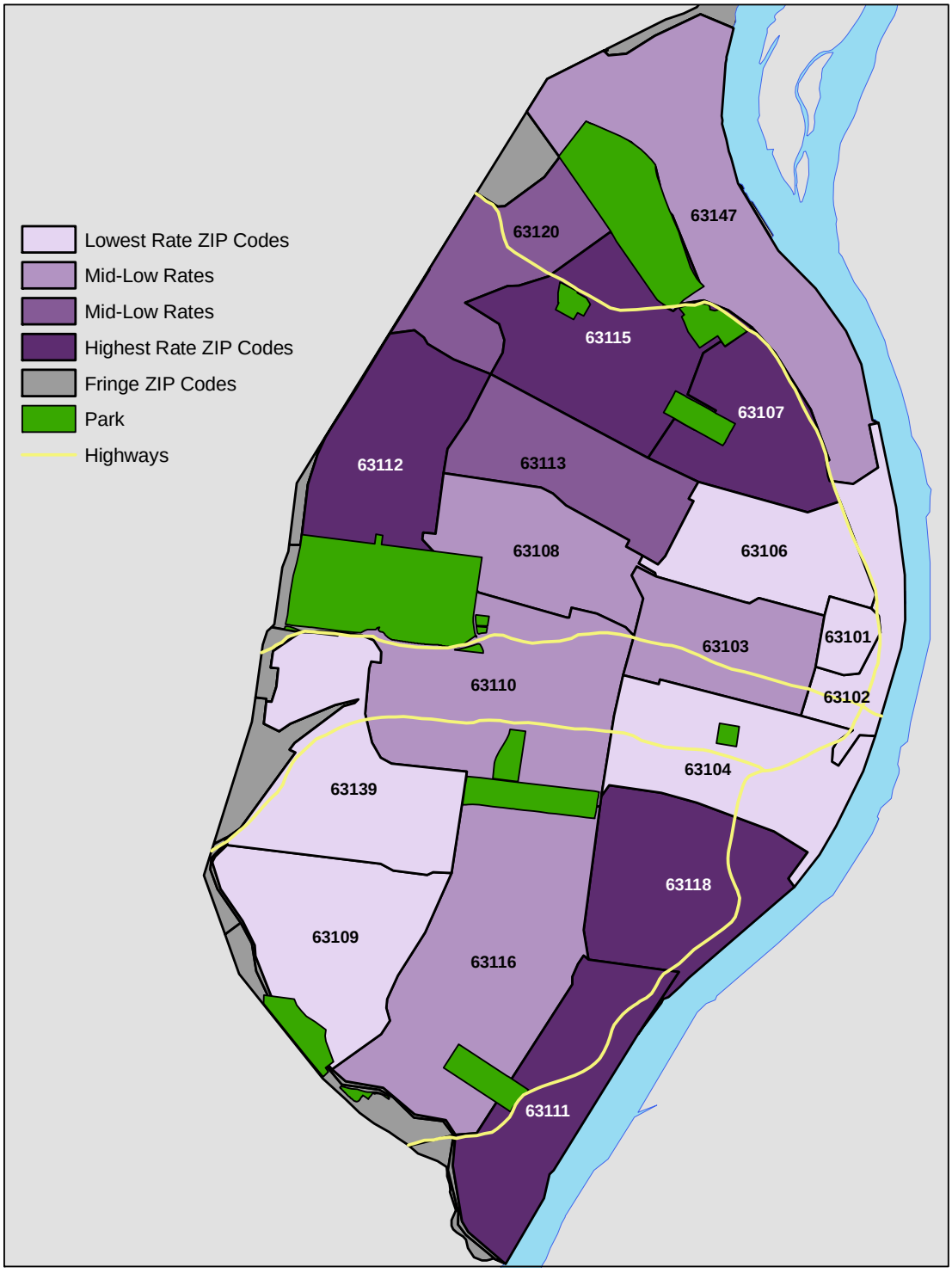
*Census tracts with small populations of children under age 6 can appear to have high screening prevalence rates due to fewer children screened
**Percent screened may exceed 100% due to use of 2010 Census population data

Appendix B: Maps

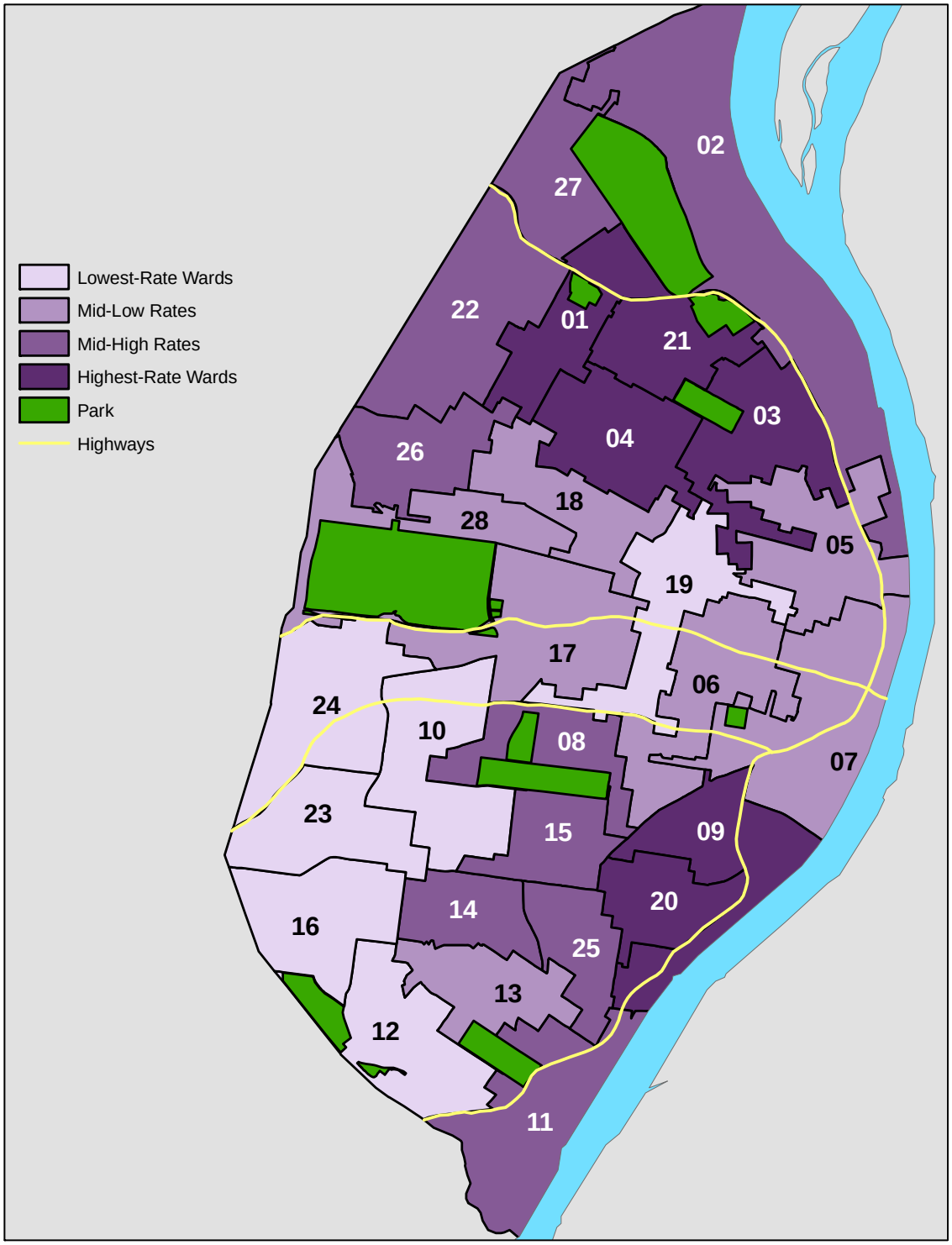
Map 1
Screening Prevalence Rates by ZIP Code, 2013 (≥ 5 mcg/dL)



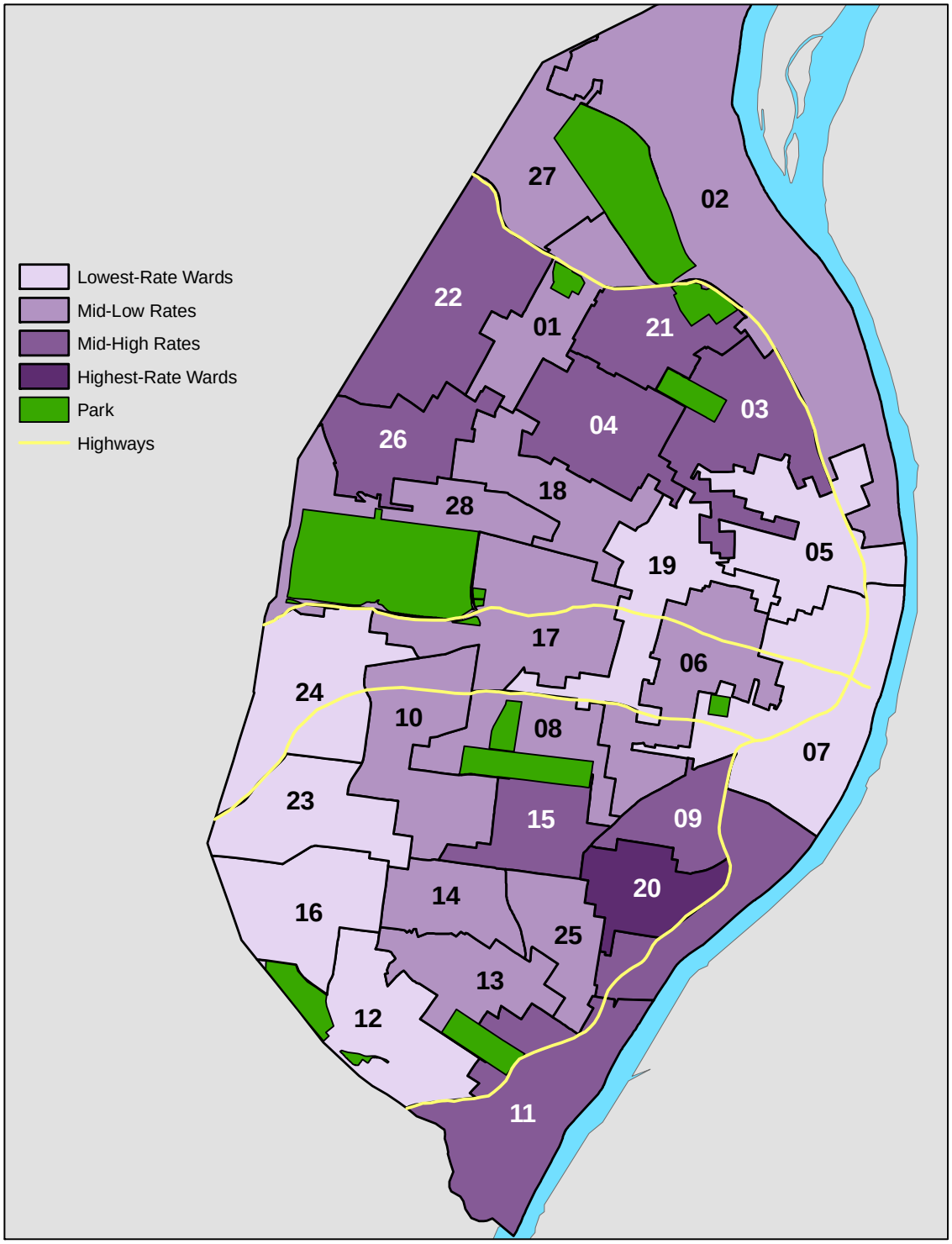
Map 2
Screening Prevalence Rates by ZIP Code, 2013 (≥ 10 mcg/dL)



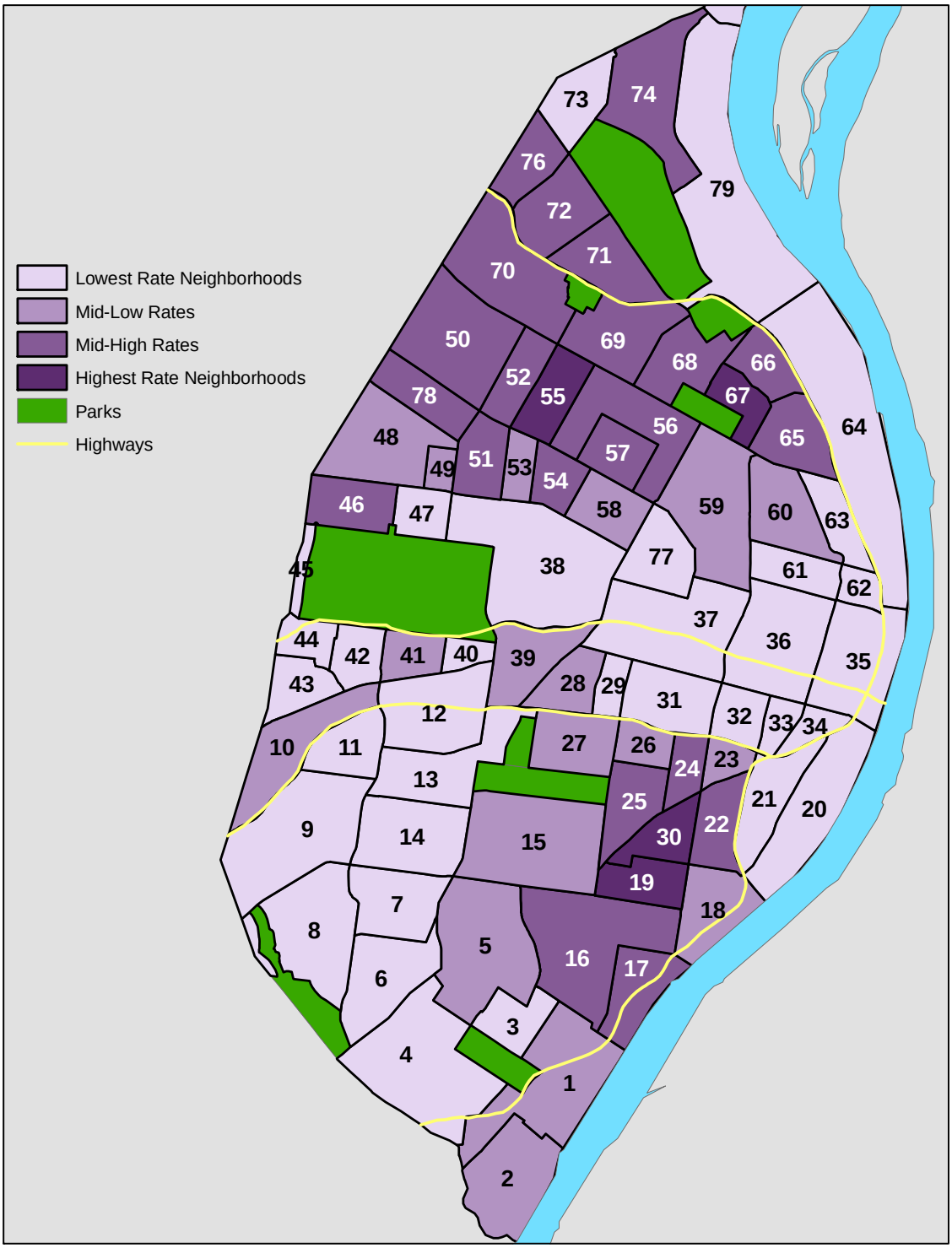
Map 3
Screening Prevalence Rates by Ward, 2013 (≥ 5 mcg/dL)



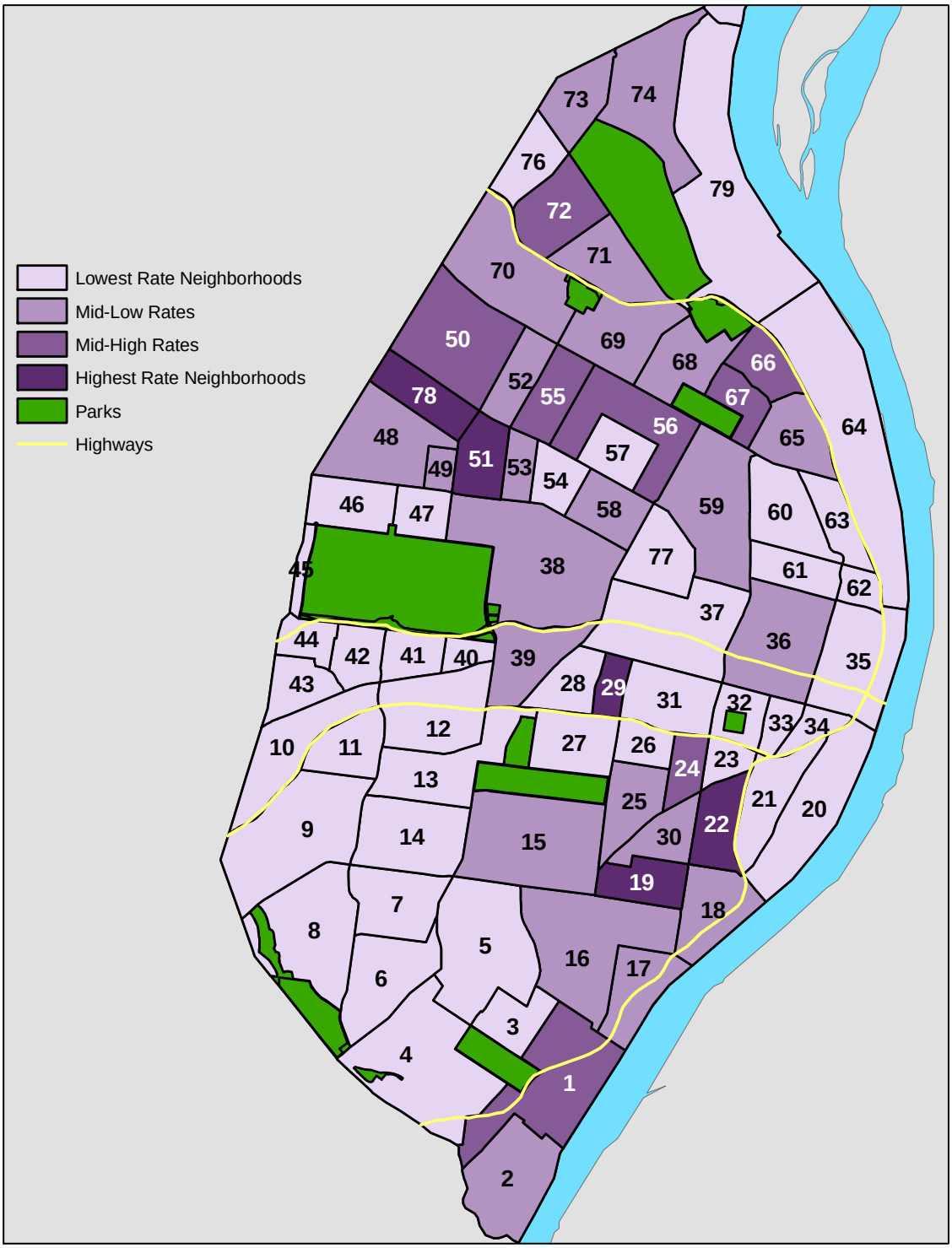
Map 4
Screening Prevalence Rates by Ward, 2013 (≥ 10 mcg/dL)



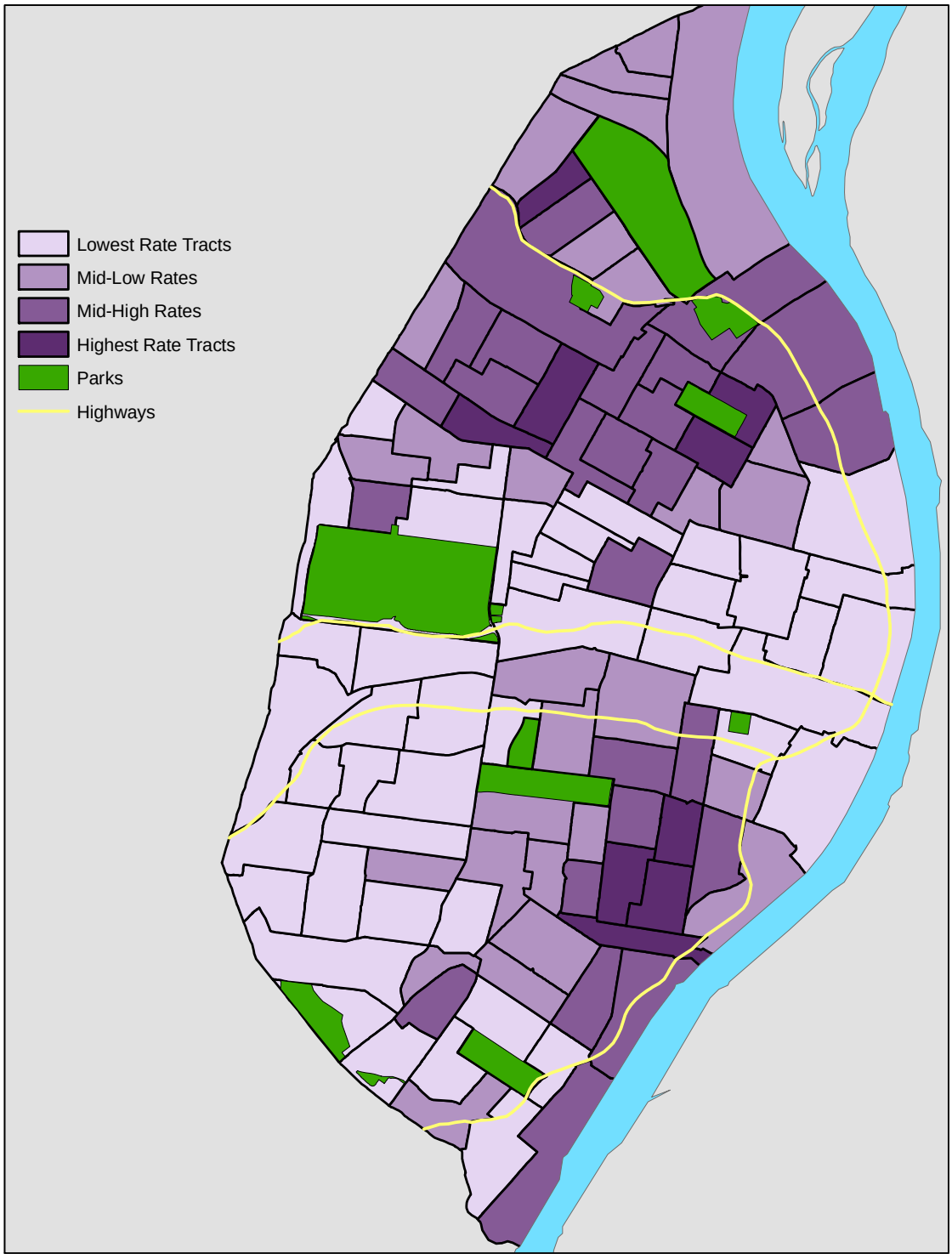
Map 5
Screening Prevalence Rates by Neighborhood, 2013 (≥ 5 mcg/dL)



Map 6
Screening Prevalence Rates by Neighborhood, 2013 (≥ 10 mcg/dL)



Map 7
Screening Prevalence Rates by Census Tract, 2013 (≥ 5 mcg/dL)



Map 8
Screening Prevalence Rates by Census Tract, 2013 (≥ 10 mcg/dL)