Lead Surveillance
Kent County
2019-2020

HEALTH
DEPARTMENT
Caring today for a healthy tomorrow

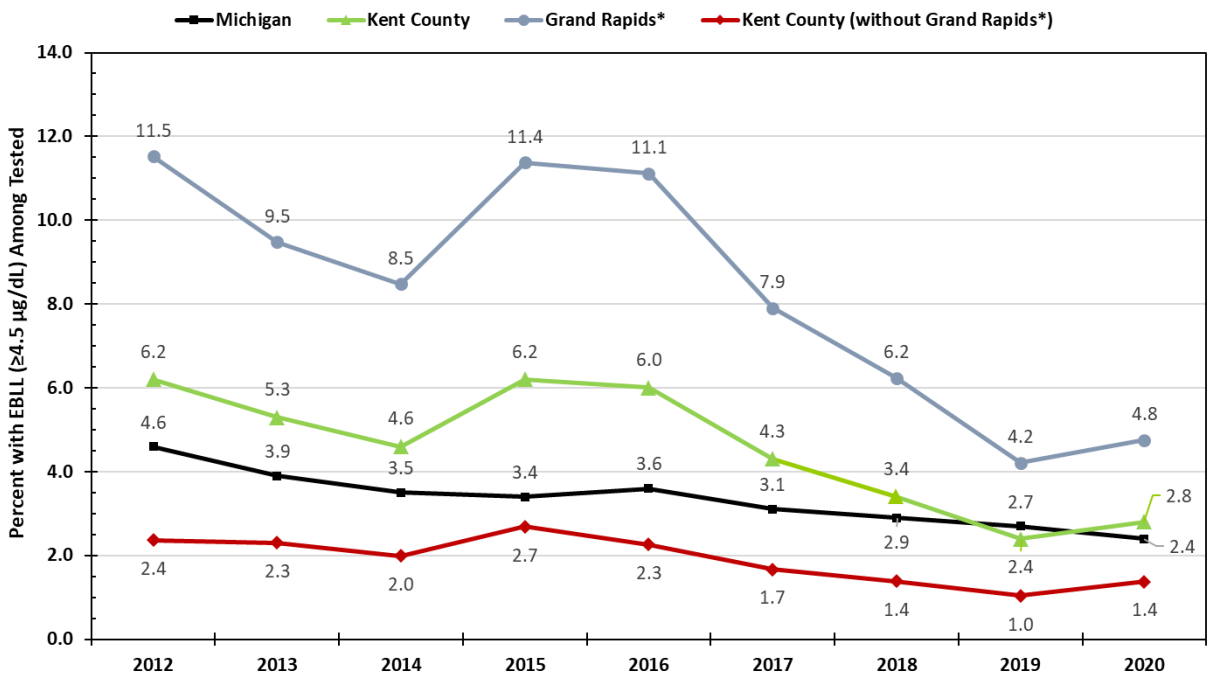
Section 1: Intro

This report reflects both 2019 and 2020 data for children who were poisoned by lead. The COVID 19 global pandemic significantly reduced accessibility of testing of children's blood lead levels due to reduced access to primary care offices and the move to virtual appointments for the Women, Infant, and Children program. As a result, we observed a large drop in the children tested for lead during this period. Because of the reduced access to testing in 2020, the data for 2019 and 2020 was combined to give the best representation of lead activities during this time period.

Data within this report has been deduplicated and all figures and tables within are made with this standard. This means each child is represented by one test result per year. If there was more than one test per child per year, the test with the highest venous blood lead level (BLL) was kept. If there was no venous BLL, the test with the highest capillary BLL was kept.

Section 2: Comparison of Michigan and Kent County Elevated Blood Lead Levels by Year

Figure 1. Proportion of Children[i] < 6 Years Old with Elevated Blood Lead Levels (EBLLs, ≥4.5 µg/dL), for Michigan, Kent County and Grand Rapids*, 2012-2020



Data current as of 10/14/2021

[i] Each child is represented by one test result per year. If there was more than one test per child per year, the test with the highest venous BLL was kept. If there was no venous BLL, the test with the highest capillary BLL was kept.

* Grand Rapids is defined as Census Tracts 1-46 in Kent County.

Figure 1. Year-to-year comparison of the Proportion of children under 6 years old with elevated blood lead levels stratified by census tracts.

Figure 1 shows an overall decrease in the proportion of children with elevated blood lead levels (EBLLs) among those who are tested for lead since 2012, with slight increases in certain categories in 2015, 2016, and 2020. The year 2020's percentage increase is likely due to the decrease in the number of lead tests performed locally and statewide during the COVID-19 pandemic. While this may appear to be counterintuitive, a low amount of testing can highlight those who are testing above the blood lead reference value (BLRV) of 4.5 µg/dL. Historically, Kent County has had a higher proportion of children with EBLLs when compared to the state of Michigan, with 2019 being the only year that Kent County (2.4%) was lower than Michigan (2.7%).

Section 3: Trends Over the Last 10 Years in Kent County, Michigan

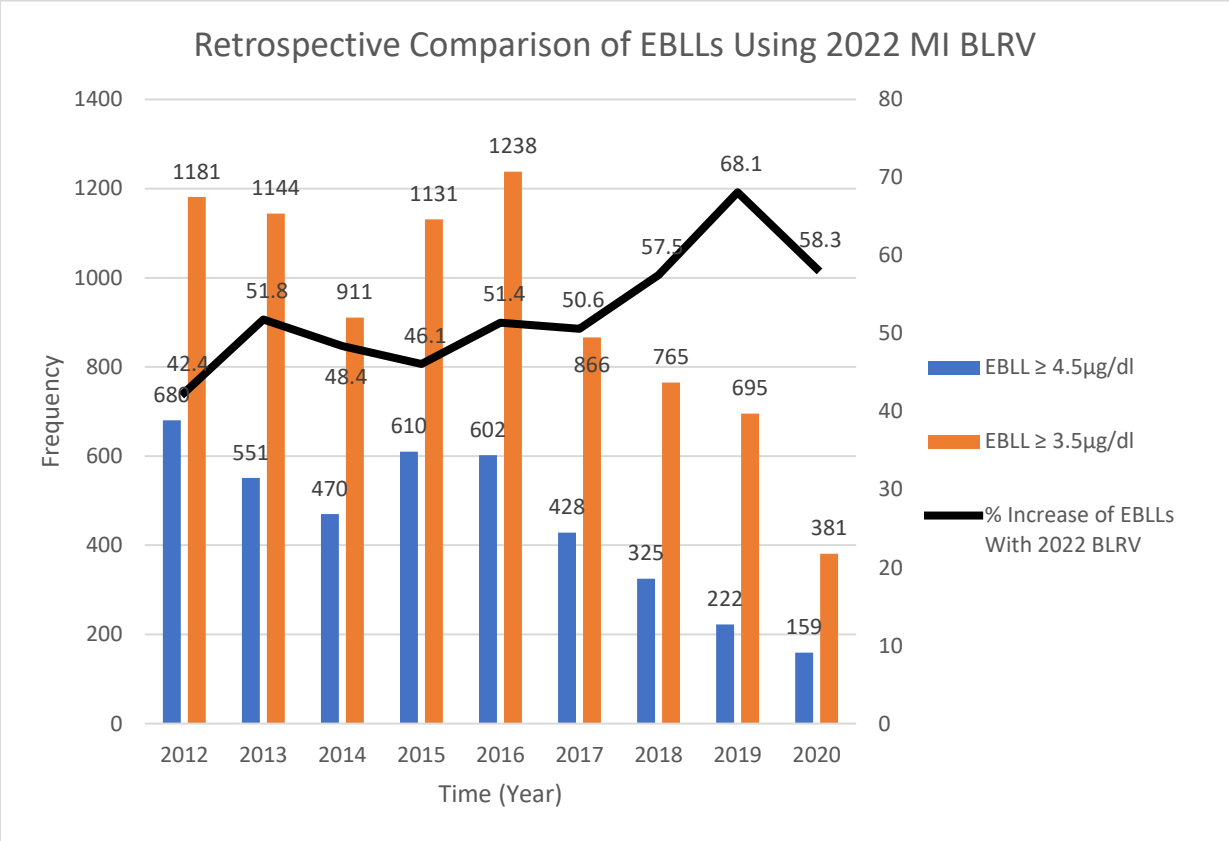
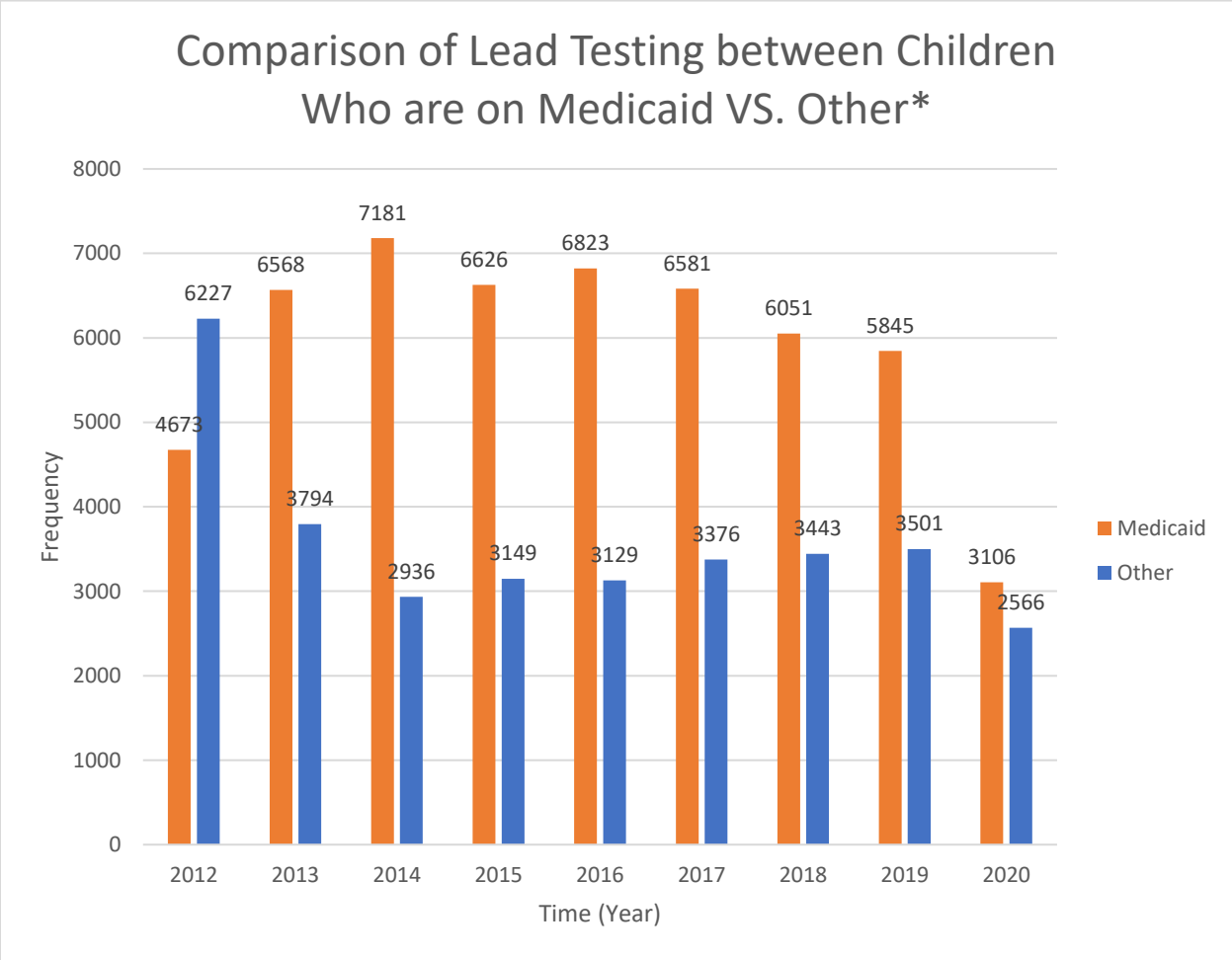


Figure 2. A Retrospective look at EBLL's Tested within Kent County Using New 2022 MI Lead Standard.

In October 2021, the Centers for Disease Control and Prevention announced the reduction of the blood lead reference value (BLRV) from 4.5 µg/dL to 3.5 µg/dL. This is the most recent BLRV update since 2012. Michigan is in the process of adopting this lower BLRV. Historically, a BLL above 10 µg/dL was needed for a referral from our Community Wellness Division to our Environmental Health Division for an evaluation to be made—meaning not every case from previous years was referred for a formal lead inspection/risk inspection. It is expected that this will be promulgated into law in the spring or summer of 2022. After in Michigan, children with blood lead test measures 3.5 µg/dL or higher will be considered to have an EBLL. Figure 7 shows how, when looking at past years, this new EBLL measure will impact children in Kent County. This change will result in a large increase in the number of children with an EBLL, ranging from 42.4% to 68.1% increases in EBLLs between 2012 and 2020. This also indicates an upcoming increase in

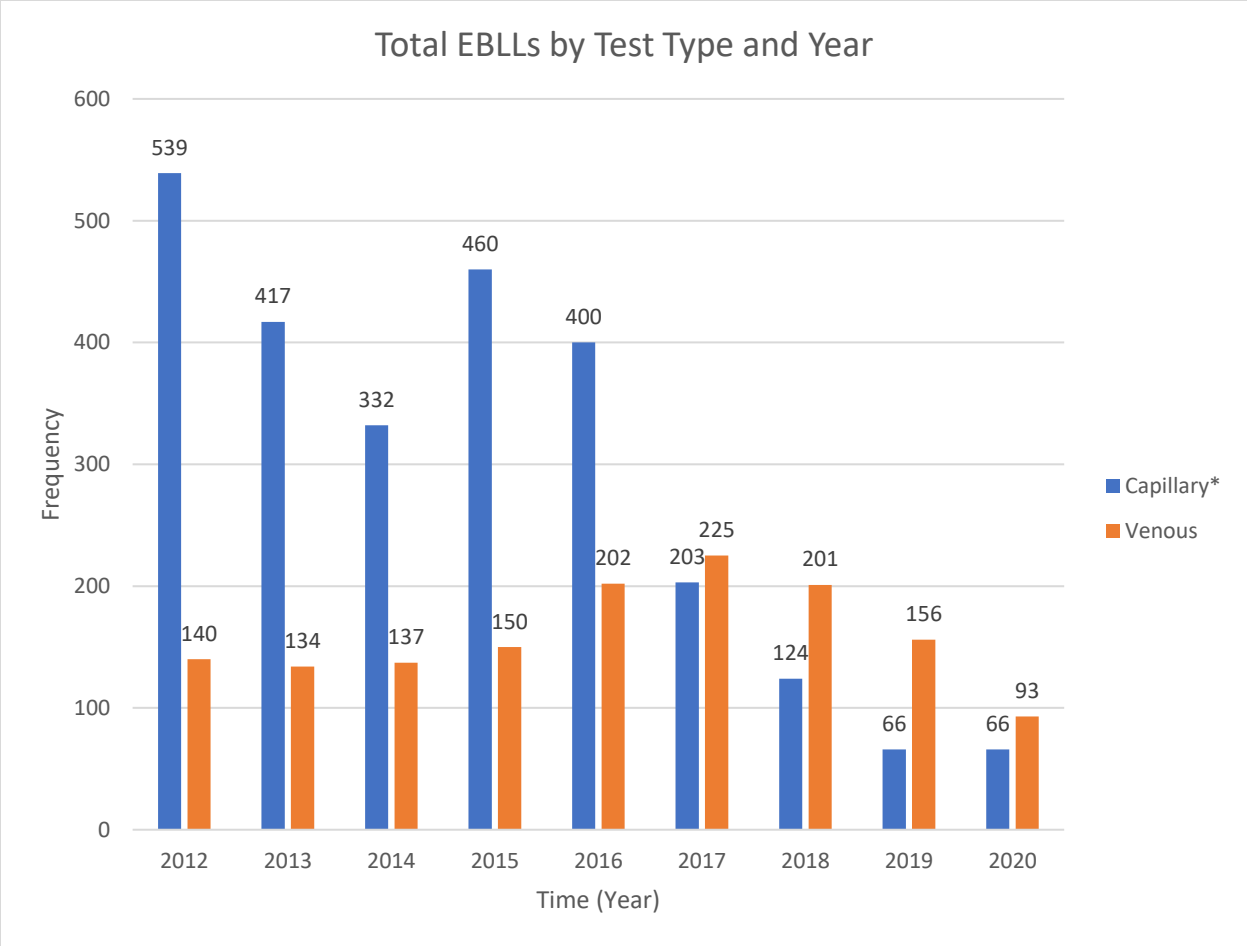
the workload of those in working in lead, such as case management, environmental evaluations/investigations, and lead hazard control.



*Other indicates those privately insured and those who did not report insurance status.

Figure 3. A Comparison of Lead Testing Between Children who are on Medicaid VS. Other Insurance Status.

In most years since 2012, children covered by Medicaid make up the largest proportion of children tested for lead in Kent County; this is due to requirements by Medicaid that all children be tested for lead at 12 and 24 months. Despite recommendations from the CDC and MDHHS that all children ages 1 and 2 receive a lead test no matter their insurance status, privately insured children in Kent County are often screened and tested for lead less frequently.



*Capillary is only reported if no confirmatory venous test was performed.

Figure 4. EBLL Comparison Between Capillary and Venous Tests by Year.

Capillary tests are often used for an initial lead screening of children. This test is less invasive but can also lead to false positives. A venous test is more accurate but also more invasive. When a child has a capillary test result >4.5 µg/dL, a venous test is used to confirm the result. If a child had a venous test during the year, the highest result was reported. For children with no venous test, their highest capillary result was reported.

Figure 4 shows the frequency of capillary results compared to venous results among EBLLs. Since 2012, the number of venous tests being performed has increased and has made up an increasing proportion of EBLL cases. In 2012, only 20.6% of EBLLs were confirmed with a venous test. The year 2017 was the first time that the majority of EBLLs were confirmed by a venous test (52.6%) and continued to increase in 2018 (61.8%) and 2019 (70.3%). In 2020, this number dropped to 58.5%, likely due to the overall decrease in lead testing during the COVID-19 pandemic.

Section 4: Demographics of Lead Testing in Kent County, Michigan

Table 1. Frequency and Percentage of Blood Lead Levels by Age Stratified by Year

2019				
Age	**Frequency of children tested by age**	**Frequency of EBLL by age**	**Percent of EBLL out of all tested by age**	**Percent of total EBLL by age**
<1	515	3	0.58	1.35
1	4984	90	1.81	40.54
2	2810	74	2.63	33.33
3	519	31	5.97	13.96
4	332	14	4.22	6.31
5	186	10	5.38	4.50
All Ages	**9346**	**222**	**2.38**	**-**
2020				
Age	**Frequency of children tested by age**	**Frequency of EBLL by age**	**Percent of EBLL out of all tested by age**	**Percent of total EBLL by age**
<1	212	4	1.89	2.52
1	3149	76	2.41	47.80
2	1716	52	3.03	32.70
3	264	12	4.55	7.55
4	189	12	6.35	7.55
5	142	3	2.11	1.89
All Ages	**5672**	**159**	**2.80**	**-**

In both 2019 and 2020, the largest frequency of blood lead tests occurred among children 1 and 2 years old, making up approximately 83% of all tests in 2019 and 86% in 2020. This is due to requirements that children covered by Medicaid are tested for lead at 12 and 24 months. Similarly, the largest frequency of EBLLs detected occurred among children 1 and 2 years old in 2019 and 2020. Due to the COVID-19 pandemic and its resulting restrictions on WIC clinics and other medical offices, 39.3% less children were tested for lead in 2020 when compared to 2019, with a 28.4% decrease in EBLLs detected.

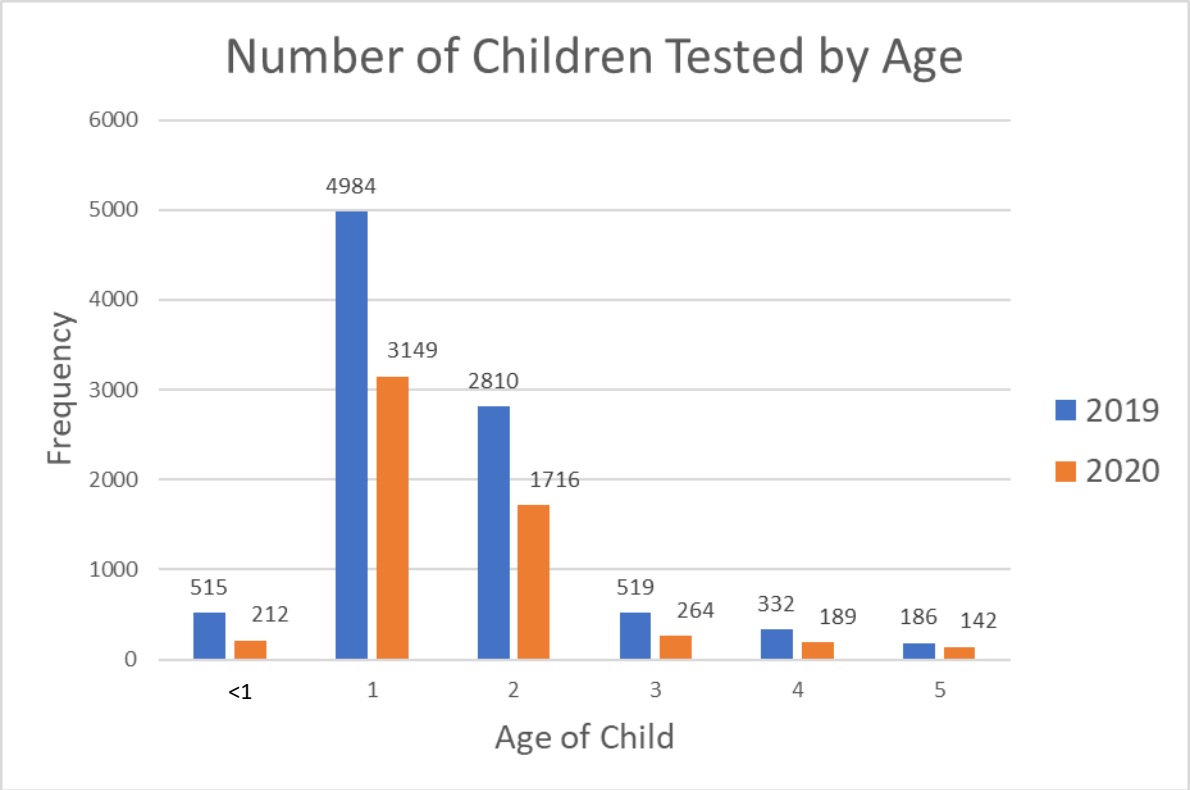


Figure 5. Frequency of Children Tested by Age and Year

Highest frequency of testing occurs within years 1 and 2. This is due to testing recommendations within Michigan being to test children at 12 and 24 months of age. It is a requirement for children on Medicaid but not for other children within Kent County that may be privately insured.

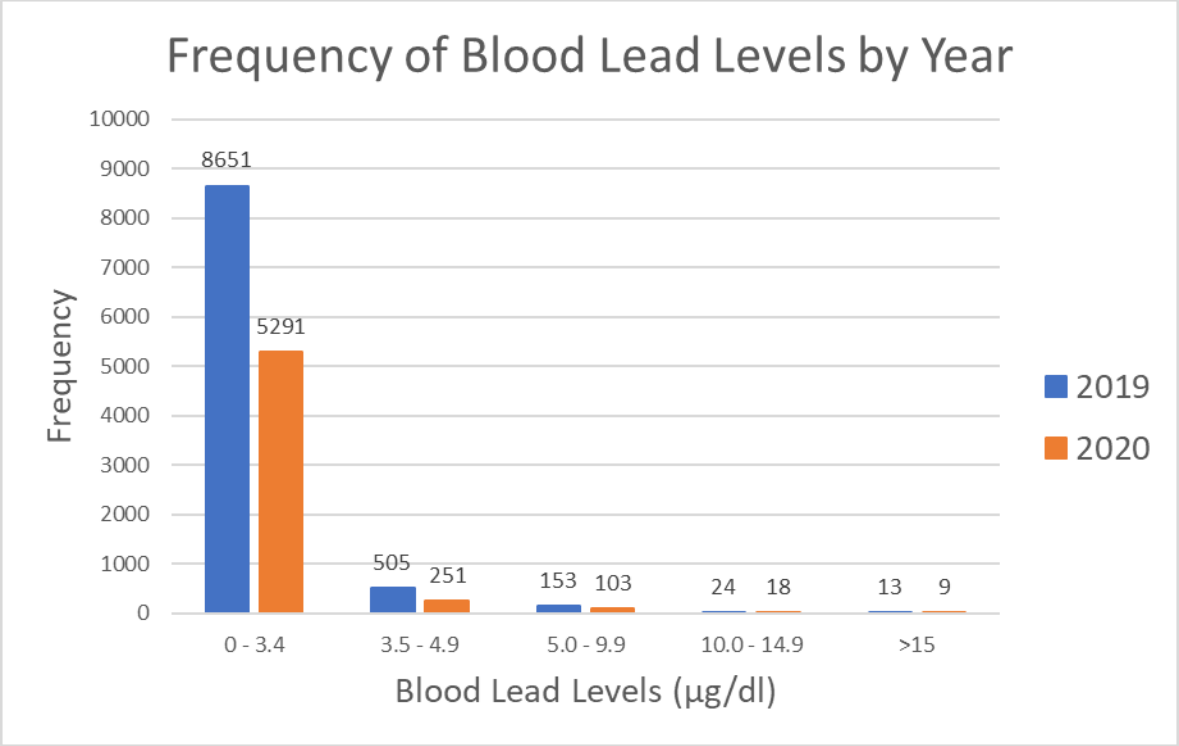


Figure 6. Frequency of Children Tested by Blood Lead Level and Year

Of the blood lead tests performed among Kent County children in 2019 and 2020, levels most frequently occur between 0 and 3.4 µg/dL. In both years, approximately 93% of all blood lead levels fell in this range.

Table 2. Frequency and Proportions by Age and Sex

Child Age	Child Sex	2019			2020		
		Frequency of Children Tested	EBLL ≥ 4.5µg/dl	% EBL by age and sex	Frequency of Children Tested	EBLL ≥ 4.5µg/dl	% EBL by age and sex
<1	F	252	2	0.8	109	0	0.0
	M	261	1	0.4	101	4	4.0
	U	2	0	0.0	2	0	0.0
1	F	2472	47	1.9	1453	34	2.3
	M	2467	43	1.7	1553	33	2.1
	U	45	0	0.0	143	9	6.3
2	F	1334	33	2.5	796	13	1.6
	M	1447	41	2.8	809	33	4.1
	U	29	0	0.0	111	6	5.4
3	F	235	13	5.5	132	4	3.0
	M	281	18	6.4	128	8	6.3
	U	3	0	0.0	4	0	0.0
4	F	152	4	2.6	82	4	4.9
	M	178	10	5.6	104	8	7.7
	U	2	0	0.0	3	0	0.0
5	F	79	3	3.8	57	1	1.8
	M	106	7	6.6	82	2	2.4
	U	1	0	0.0	3	0	0.0
Total		**9346**	**222**	**2.4**	**5672**	**159**	**2.8**

U = Unknown

Of the blood lead tests performed among Kent County children in 2019 and 2020, no discernable difference was noted between sex when sorted by age.

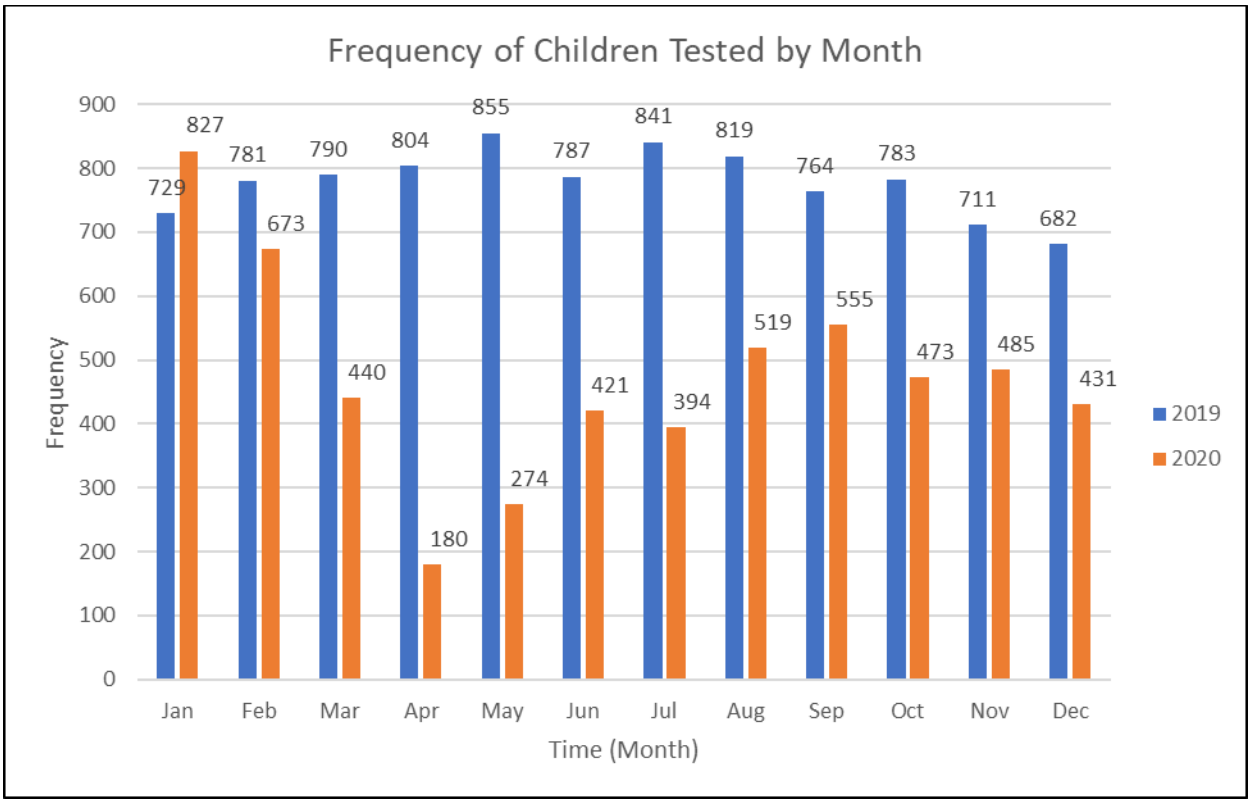


Figure 7. Number of Children Tested Each Month by Year.

Figure 7 shows the decrease in testing frequency in 2020 as SARS-CoV-2 became a global pandemic. WIC Clinics in Kent County are the largest provider of lead tests. Federal public health orders related to the delivery of WIC services, put into place in March 2020, halted then limited the WIC clinics' ability to operate and conduct lead testing and other services. Even as lead testing numbers increased through the end of the year, they remained lower than those in 2019.

Race	2019			2020		
	Frequency of Children Tested	EBLL ≥ 4.5µg/dl	% EBL by Race	Frequency of Children Tested	EBLL ≥ 4.5µg/dl	% EBL by Race
American Indian or Alaskan Native	37	1	2.7	18	1	5.6
Asian	306	2	0.7	104	3	2.9
Black or African American	1773	76	4.3	838	37	4.4
Native Hawaiian or Other Pacific Islander	4	1	25.0	4	0	0.0
White	3155	58	1.8	1820	40	2.2
American Indian or Native Alaskan/Native Hawaiian or Other Pacific Islander	6	0	0.0	0.0	0.0	0.0
Asian/Native Hawaiian or Other Pacific Islander	4	0	0.0	0.0	0.0	0.0
Asian/White	1	0	0.0	2	0	0.0
Black/White	1	0	0.0	3	0	0.0
American Indian/Asian/Black	8	0	0.0	0.0	0.0	0.0
American Indian/Black/White	134	4	3.0	81	2	2.5
Asian/Black/Native Hawaiian/White	6	0	0.0	0.0	0.0	0.0
Other	665	12	1.8	14	3	21.4
Unknown	3246	68	2.1	2788	73	2.6
Total	**9346**	**222**	**2.4**	**5672**	**159**	**2.8**

Table 3. Frequency and Proportions by Race

Incomplete race and ethnicity data gives significant limitations to drawing any conclusions within this data set. Children with an Unknown race makes up a large part of the data at 34.7% in 2019 and 49.2% in 2020. It is hypothesized that Kent County experiences a disproportionate amount of EBLLs among our diverse communities, and this data seems to indicate a potential correlation. However, with current data limitations, a conclusion is unable to be drawn.

Section 5: Geography of Lead Testing in Kent County, Michigan

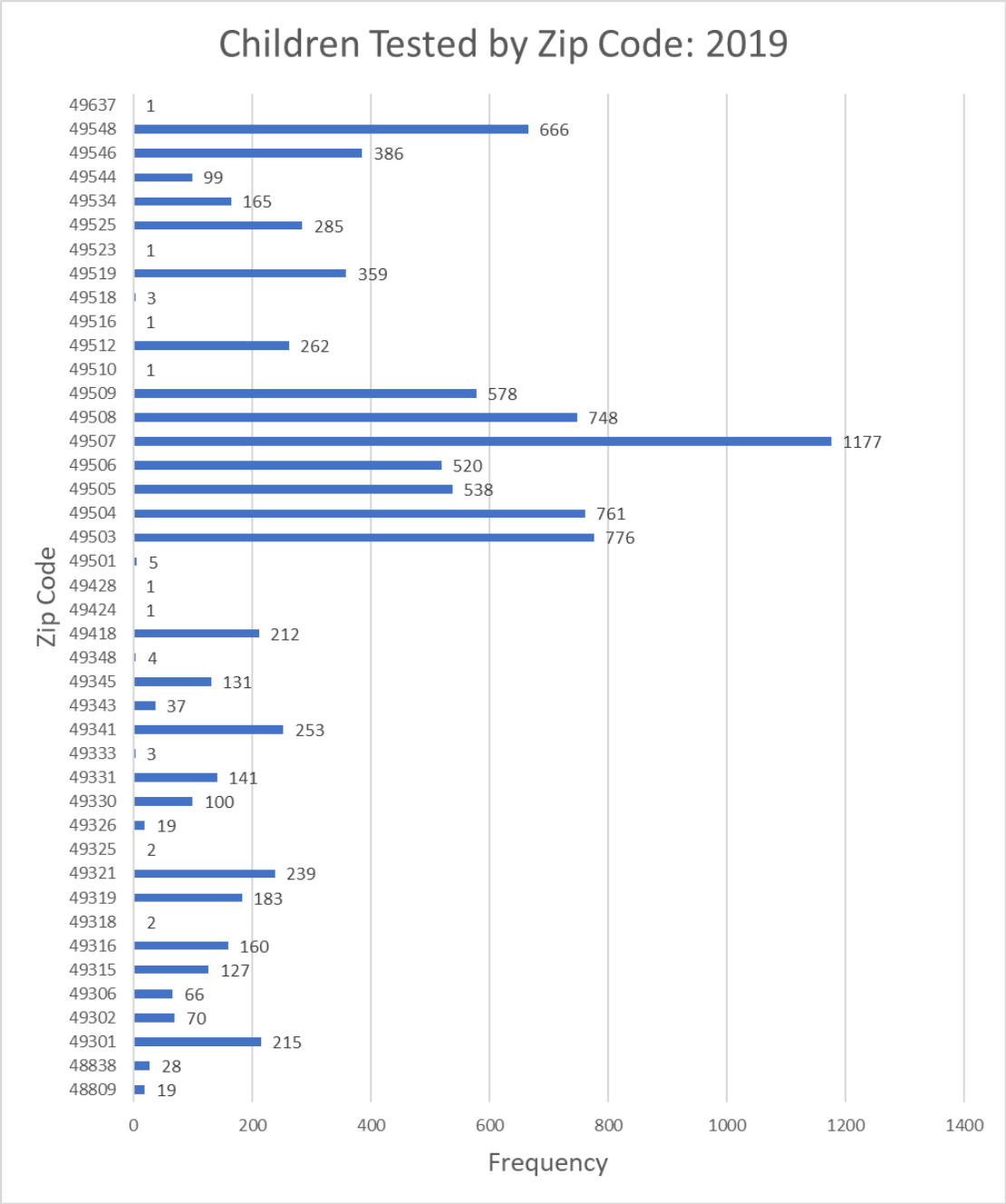


Figure 8. Number of Children tested by zip code in 2019.

Among children tested for lead in Kent County in 2019, the majority reside within zip codes in the city of Grand Rapids (62.5%). Most blood lead tests conducted in Kent County in 2019 occurred among children who lived in the 49507-zip code (12.6%), followed by 49504 (8.1%) and 49503 (8.3%).

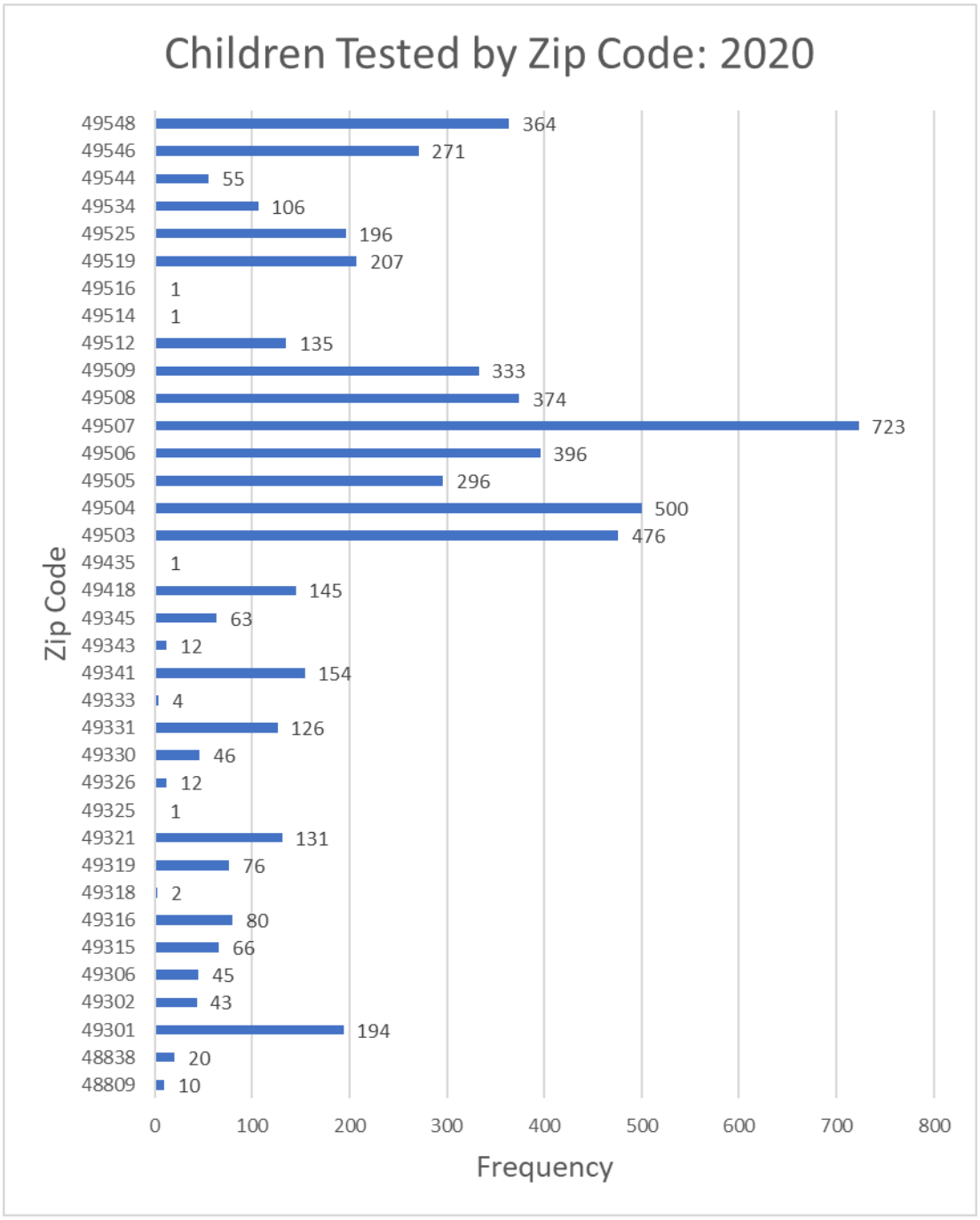


Figure 9. Number of Children tested by zip code in 2020.

Among children tested for lead in Kent County in 2020, the majority reside within zip codes in the city of Grand Rapids (63.3%). Most blood lead tests conducted in Kent County in 2020 occurred among children who lived in the 49507-zip code (12.7%), followed by 49504 (8.8%) and 49503 (8.4%).

Table 4. Number of Children Tested by Municipality

Municipality	2019	2020	Total
ADA	215	194	409
ALTO	70	43	113
BELDING	19	10	29
BELMONT	66	45	111
BYRON CENTER	127	66	193
CALEDONIA	160	80	240
CASCADE	13	3	16
CASNOVIA	2	2	4
CEDAR SPRINGS	183	76	259
COMSTOCK PARK	239	131	370
CUTLERVILLE	2	1	3
EAST GRAND RAPIDS	7	14	21
GOWEN	19	12	31
GRAND RAPIDS	5840	3591	9431
GRANDVILLE	183	121	304
GREENVILLE	28	20	48
KENT CITY	100	46	146
KENTWOOD	483	246	729
LOWELL	141	126	267
MARNE	0	1	1
MIDDLEVILLE	3	4	7
ROCKFORD	253	154	407
SAND LAKE	37	12	49
SPARTA	131	63	194
WALKER	50	27	77
WYOMING	967	583	1550
KENT COUNTY	**9338**	**5671**	**15009**

The city of Grand Rapids accounted for 62.5% of blood lead tests in 2019 and 63.3% in 2020. Wyoming had the second highest blood lead test count, making up 10.3% of all blood lead tests in Kent County in both 2019 and 2020. Some municipalities, although they fall outside of Kent County as a whole, have been included due to physical location of address—falling within or on Kent County borders. These children have all been included in MDHHS data sets and have been included in this report.

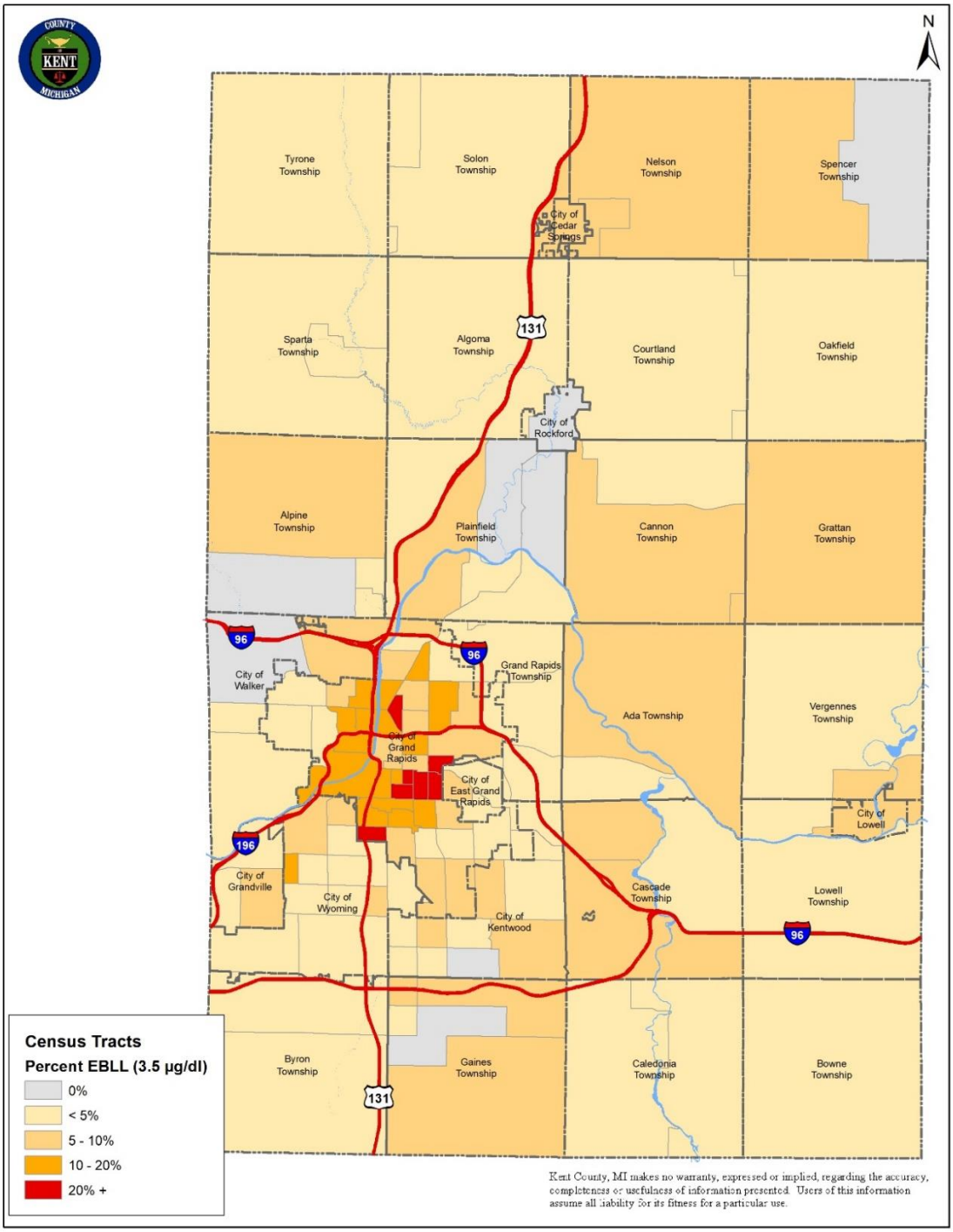


Figure 10. Kent County EBLL Percentage by Census Tracks

The largest known proportion of children with an EBLL are found within the urbanized area of Grand Rapids, however EBLLs are being found throughout the county. This map shows that even with drastically lower testing rates outside of the Grand Rapids area, children with EBLLs are still being found in almost all areas of the county. True proportions of children with EBLLs outside of the urbanized Grand Rapids area are unknown due to the limited testing.

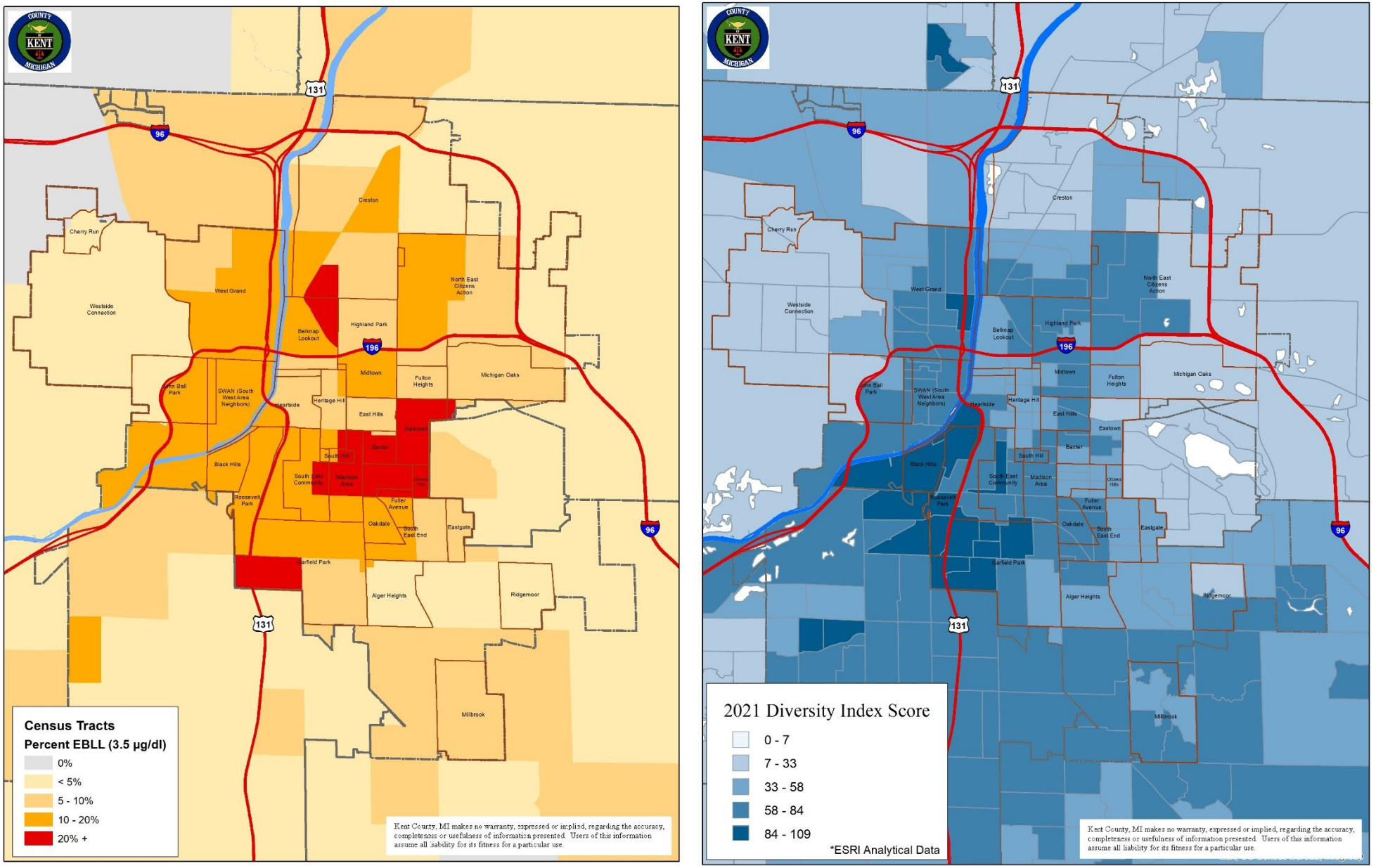


Figure 11. Comparison of ESRI's 2021 Diversity Index Score and EBLL's by Census Track in the Urbanized area of Grand Rapids, 2019 and 2020

ESRI uses a model of probability that two people, chosen at random, within a census track (CT) will be of the same race—meaning a higher diversity index score (DIS) indicates a more diverse area. When compared to the percentage of EBLL's, we see that CTs with a higher DIS have a higher Percentage of EBLL's.

Section 6: Conclusion

Although trends from the last decade show lead poisonings decreasing across the state, the changes in the BLRV in 2022 will likely show an increase in these numbers in future reports. Based on the data presented, we will likely see an increase of 50% or more in total children testing above the new BLRV and needing case management or home inspections. The American Academy of Pediatrics (AAP) and the CDC both conclude that there is no safe level of lead—indicating that this will likely not be the last time the BLRV drops. Each time this value drops, we will expect to see an increase in cases across the county. It is important to note that this change does not represent a changing goal or new level of concern, but the decreasing BLRV is a change of the prioritization level for response with a county wide BLL of 0 µg/dL as the long-term goal. With these increases we will also see an increased need for more case management, more referrals, and more home investigations.

Living in under maintained dwellings and housing units built before 1978 is one of the biggest risk factors for testing above the BLRV in Kent County. This is because these dwellings and housing units may contain peeling paint and lead dust which are the leading causes of lead poisoning in children in Kent County. According to a 2018 report, *Ending Childhood Lead Exposure in Kent County* created by the Kent County Lead Task Force:

> *"Drinking water is not the main source of lead contamination in Kent County. Instead, it is lead-based paint and dust found in older homes and in bare soil around them. Four of five homes in Grand Rapids, and nearly three of five homes in Kent County, were built before 1978, the year lead was banned from paint. Other sources also contribute to lead poisoning. However, Healthy Homes Coalition states that about 90% of all childhood lead poisoning cases in Kent County result from deteriorating lead-based paint and lead dust.8"*

Lead poisoning often happens without a lot of warning, and with such low testing rates outside of the urbanized area of Grand Rapids, we are not able to properly identify the number of children currently being affected by lead within these areas.