MARYLAND DEPARTMENT OF THE ENVIRONMENT

Lead Poisoning Prevention Program

Childhood Blood Lead Surveillance in Maryland

2002 Annual Report

November, 2003

MARYLAND CHILDHOOD LEAD REGISTRY

2002 ANNUAL SURVEILLANCE REPORT

EXECUTIVE SUMMARY

The Maryland Department of the Environment's statewide Childhood Lead Registry (CLR) performs childhood blood lead surveillance for Maryland. The CLR receives the reports of all blood lead tests done on Maryland children 0 - 18 years of age, and provides blood lead test results to local health departments as needed for case management and planning.

Since 1995, the registry has released a comprehensive annual report on statewide childhood blood lead testing. This current report presents the childhood blood lead test results for calendar year 2002 (CY 2002). All numbers are based on blood lead testing on children. The CLR does not receive any reports on lead screening based on the lead risk assessment questionnaire.

CY 2002 Surveillance Highlights:

Testing statewide, particularly at ages 1 year and 2 years. The actual number of children tested at age 1 year and 2 years increased compared to 2001 (from 26,671 to 27,480 for age 1, and from 16,646 to 17,793 for age 2).

The number of children with elevated blood leads in 2002 decreased compared to 2001. Children with blood lead levels above 10 μg/dL, CDC's level of concern, decreased to 2,297 or 2.9% of children tested statewide from 2,841 or 3.7% in 2001. Children with blood lead levels of 20 μg/dL and above, or "lead poisoning", decreased to 260 or 0.3% of children tested statewide from 288 or 0.4% in 2001.

OVERVIEW

LEAD POISONING IN MARYLAND

Lead is one of the most significant and widespread environmental hazards for children in Maryland. Children are at the greatest risk from birth to age six while their neurological systems are being developed. Exposure to lead can cause long-term neurological damage that may be associated with learning and behavioral problems and with lowered intelligence.

There has been a steady decline in childhood lead poisoning in Maryland over the past decade at all levels of exposure (Fig. 1, 2). The reduction has occurred both statewide and in areas of highest risk such as Baltimore City.

Sources of Childhood Lead Exposure

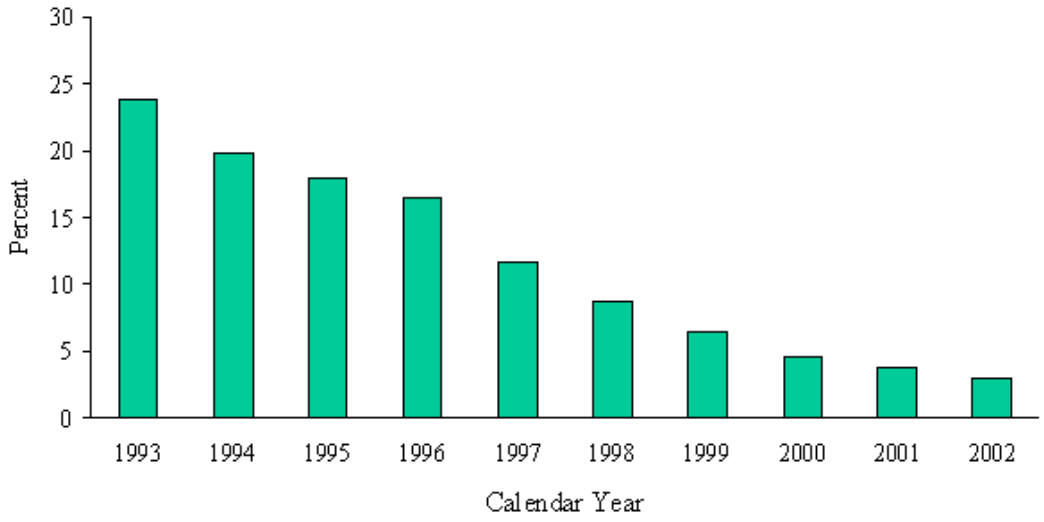
Lead paint dust from deteriorated lead paint or from renovation is the major source of exposure for children in Maryland. According to the US 2000 census, there are about 439,000 residential houses built before 1950 (95% likely to contain lead paint) and 692,000 houses built between 1950-1978 (75% likely to have lead paint.

Water, air, and soil, may provide low-level, "background" exposure, but rarely may cause childhood lead poisoning.

Imported products, parental occupations, hobbies, and imported traditional medicines occasionally may cause lead exposure among children.

Figure 1

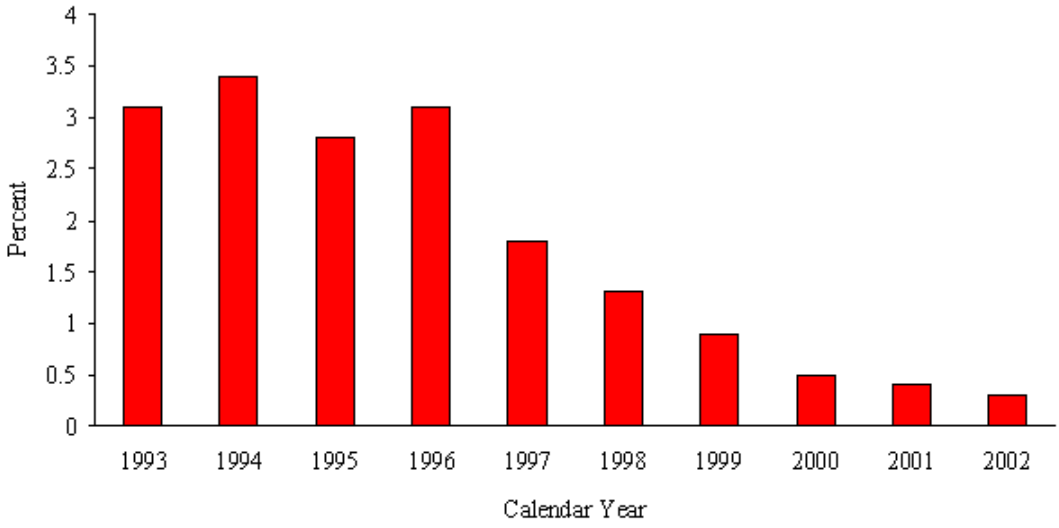
Percent of Children Tested With Elevated Blood Lead Level*



* Children 0-72 months old with highest venous blood lead test (capillary if no venous) ≥10 µg/dL for each year.
Source: Maryland Department of the Environment, Lead Poisoning Prevention Program, Childhood Lead Registry, Statewide data: 1993-2003

Figure 2

Percent of Children Tested With Lead Poisoning*



* Children 0-72 months old with a venous blood lead test ≥20 µg/dL for each year.
Source: Maryland Department of the Environment, Childhood Lead Registry, Statewide data: 1993-2002

Much of the decline in blood lead levels is the result of lead poisoning prevention efforts. Increased enforcement of the state law "Reduction of Lead Risk in Housing", increased awareness by parents and property owners of the hazards of lead poisoning, improved maintenance and prevention of lead exposure, moving away from older housing into more recently built city or suburban housing, and outreach and education to families and health care providers all contribute to fewer children with elevated blood lead levels.

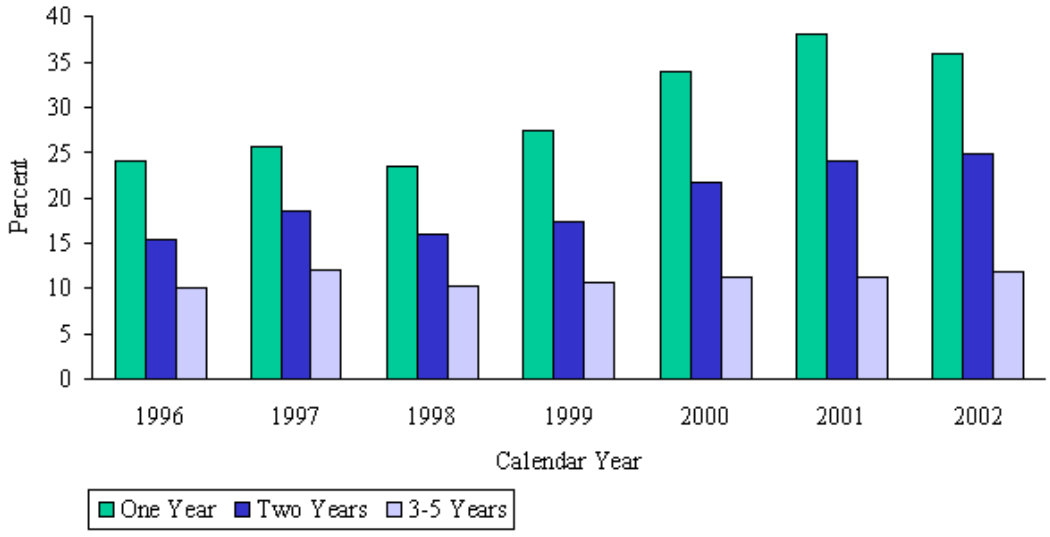
State Laws and regulations with impact on childhood lead poisoning

- ✓ Requirements to perform lead hazard reduction at each turnover in rental housing built before 1950. [Environment Article (EA) §6-8]
- ✓ Outreach programs to parents, health care providers, and property owners, especially in at-risk areas. [EA§ 6-8, Health Article §18-106]

Maryland requires that children living in at risk areas be tested at ages one and two years. The State has a targeted testing plan that identifies at risk areas. Universal blood lead testing applies to Baltimore City children (Ordinance 20 effective July 2000) and children on Medicaid (covered by EPSDT). The percentage of one and two year old children tested increased for the last 5 years. (Fig. 3).

Figure 3

Percent of children one and two years tested for lead vs. children of other ages*



* Children 0-72 months old with highest blood lead test for each year.
Source: Maryland Department of the Environment, Childhood lead Registry, Statewide data: 1996-2002.

Identifying children with lead exposure

The critical issue in childhood lead poisoning is early detection. Because there are no specific clinical symptoms, a blood lead test is the most reliable technique to identify children with elevated blood lead levels. If there is any suspicion that a child is exposed to lead, do a blood lead test.

Maryland's Lead Poisoning Prevention Program has well-established case management and environmental investigation protocols for follow-up of lead poisoned children. In 2002, a graduate student at MDE conducted an evaluation to assess the performances in the process of case management in 156 childhood lead poisoning cases opened for an environmental investigation in 2000 and 2001 in the Maryland counties. The findings were as follows: all children with very high blood lead levels received prompt services; a majority of the children received home visits and environmental investigations within the current protocol; and children in the case management program had blood lead levels that significantly decreased over time. Table Oneis a 1-page summary of Maryland's case management protocol.

Table One: Case Management Protocol

Environmental investigations are required at 2 consecutive venous levels of ≥ 15 – 19 µg/dL or 1 venous level at ≥ 20 µg/dL.

Blood Lead Level	Local Health Department	Health Care Provider	Statewide Law Enforcement
< 9 µg/dL	Anything above zero indicates some exposure or contact with lead. No Community Health Nurse case management services are indicated.	• General education about lead and lead poisoning • Risk Assessment Questionnaire at all routine child health visits • Repeat blood lead level according to protocol	Footnote 2
10 – 14 µg/dL	This is the CDC level of concern. Provide education to decrease exposure, including information about Special Loans Housing Program.	As above plus • Educate to decrease exposure • Track blood lead levels according to CDC protocol	
15 – 19 µg/dL	If capillary test, coordinate with provider and guardian to validate with a venous blood lead test within 1 month. If venous test • Make telephone contact and do home visit • Provide educational materials to family (mail or in person) • Send Official Notice of Elevated Blood Lead, when applicable, to Tenant and Rental Property Owner • Coordinate with the provider and guardian for follow-up activities, such as housing and follow-up blood tests If two consecutive venous tests between 15-19 µg/dL at least 90 days of each other, treat as next level.	As above plus • Evaluate for iron deficiency • Take environmental history	As in footnote 2, plus MDE enforcement of Lead Risk in Housing law's subsections on Notice of Elevated Blood Lead
20 – 44 µg/dL	If capillary test, coordinate validation of level with a venous blood lead level within 1 week If venous test. • Contact and make a home visit in coordination with the Environmental Lead Sanitarian who will complete an environmental investigation within 10 working days • Discuss with the health care provider possible referral to tertiary care centers specializing in management of childhood lead poisoning • Provide appropriate referrals to other agencies (Social Services, Housing, etc.)	As above plus • Complete medical/nutritional history and physical examination • Obtain developmental / psychological evaluation • Consider chelation consultation	As above, plus MDE and local health department enforcement of • Notice of Violations • Lead Risk in Housing law, subsections on Qualified Offer
≥ 45 µg/dL	If capillary, contact provider within 2 working days. Inform provider to mark all specimens STAT (Highest Priority) and request immediate processing and report from laboratory. If venous, contact provider within 1 working day. Same as above.	As above plus • Consult with lead specialist • Perform urgent chelation	
> 70 µg/dL	Contact the health care provider within 24 hours. If capillary, confirm the result immediately with a STAT venous test. If venous, verify hospitalization as a medical emergency. Same as above.	**Hospitalize: Medical emergency**:	

1) Maryland Department of the Environment Protocol, based on Centers for Disease Control and Prevention guidance
2) Environment Article §6-8, "Reduction of Lead Risk in Housing" subsections on Rental Property Registration, Risk Reduction Treatments at Turnover and Notice of Defect are ongoing primary prevention activities not triggered by blood lead levels.

Improving Surveillance Data

The amended law and regulations* of 2001 and 2002 require that:

1-Following child's demographic data should be included in each blood lead test reported:

- Date of Birth
- Sex
- Address
- Test date
- Sample type
- Blood lead level

2- Blood lead results ≥20 μg/dL to be reported (fax) within 24 hours after result is known. All other results to be reported every two weeks.

3- Reporting format should comply with the format designed and provided by the Registry.

4- Data should be provided electronically.

* EA 6-303, Blood lead test reporting (COMAR 26.02.01, Blood lead test reporting)

In calendar year 2002, 79,507 children 0-72 months were tested for lead exposure statewide, 2,765 more than 2001. Table Two provides summary statewide statistics of blood lead testing in 2002, and Table Three provides the breakdown of blood lead testing and the status of lead poisoning by jurisdiction in 2002. Table Three-A provides numbers of children by age groups of 0-35 months and 36-72 months. Table Four shows summary results for 8 years at the State, Baltimore City and Counties levels.

Address Completeness Most Probable Reason for Differences Between 2001 and 2002 Annual Reports

Address completeness improved in 2002 as a result of new laboratory reporting regulations with improved enforcement capacity. In 2001, less than one-third of the reports had an address with sufficient completion for accurate assignment of a census tract. When a child address was missing, the address of the Health Care Provider was used to assign the child to a jurisdiction. Baltimore City has a high concentration of Health Care Providers, so it is likely that children's reports without an address were assigned to Baltimore City even though their residence might have been in one of the surrounding counties. In contrast, more than one-half of all reports in 2002 had an address with sufficient completion for accurate assignment of a census tract. In summary, in 2001, more children were assigned to the jurisdiction in which their Health Care Provider was located which resulted in the 2001 data showing a higher rate of testing in Baltimore City than in 2000 and 2002.

Table Two
Calendar Year (CY) 2002 Statistical Report

Item	Number	Percent (%)
Number to tests	99,626[1]	
Number of children	79,507	100.0
Age		
Under One	11,475	14.4
One Year	27,480	34.6
Two Years	17,793	22.4
Three Years	9,576	12.0
Four Years	8,412	10.6
Five Years	4,754	6.0
Age Unknown[3]	17	0.0
Medicaid Status[4]		
Yes	38,617	48.6
No	40,890	51.4
Highest Blood Lead Level (µg/dL)		
0-9	77,210	97.1
10-14	1,561	2.0
15-19	432	0.5
20-24	157	0.2
>=25	147	0.2
Mean BLL (Geometric mean)	2.4	
Blood Specimen		
Capillary	11,115	14.0
Venous	62,609	78.7
Undetermined[5]	5,783	7.3

1. For detailed analysis and breakdown of data refer to Supplementary Data Tables 1-6.
2. The 99,626 tests were from 89,636 children 0-18 years, of whom 79,507 were 0-72 months old. Data in this statistical table is based on children 0-72 months.
3. Children with wrong or missing date of birth were assumed to be under six years of age.
4. The Registry file was matched against Medicaid file using multistage matching process.
5. In further analyses, the undetermined blood specimens were counted as capillary.

Table Three
MARYLAND DEPARTMENT OF THE ENVIRONMENT
Lead Poisoning Prevention Program: Childhood Lead Registry
Blood Lead Testing of Children 0-72 months by Jurisdiction in 2002

County[1]	Population of children 0-72 months old[2]	Children Tested[3]		Children with Elevated Blood Lead Level[4]		Children with Lead Poisoning[5]	
		Number	Percent	Number	Percent	Number	Percent
Allegany	4,618	1,183	25.6	29	2.5	2	0.2
Anne Arundel	40,257	5,944	14.8	30	0.5	4	0.1
Baltimore	55,444	10,499	18.9	148	1.4	12	0.1
Baltimore City	52,744	16,595	31.5	1,558	9.4	183	1.1
Calvert	6,252	899	14.4	8	0.9	2	0.2
Caroline	2,168	699	32.2	48	6.9	3	0.4
Carroll	11,888	978	8.2	10	1.0	1	0.1
Cecil	7,104	1,018	14.3	9	0.9	2	0.2
Charles	10,812	1,790	16.6	8	0.4	0	0.0
Dorchester	1,902	513	27.0	36	7.0	5	1.0
Frederick	17,434	1,584	9.1	22	1.4	2	0.1
Garrett	2,046	297	14.5	3	1.0	0	0.0
Harford	18,530	2,216	12.0	26	1.2	2	0.1
Howard	22,090	1,796	8.1	16	0.9	2	0.1
Kent	1,095	149	13.6	1	0.7	0	0.0
Montgomery	75,588	12,082	16.0	61	0.5	8	0.1
Prince George's	73,365	14,930	20.4	98	0.7	10	0.1
Queen Anne's	3,079	444	14.4	7	1.6	1	0.2
Saint Mary's	7,533	1,059	14.1	10	0.9	0	0.0
Somerset	1,461	512	35.0	21	4.1	0	0.0
Talbot	2,173	441	20.3	19	4.3	4	0.9
Washington	9,552	1,500	15.7	19	1.3	4	0.3
Wicomico	6,714	1,747	26.0	74	4.2	9	0.5
Worcester	2,968	542	18.3	34	6.3	4	0.7
County Unknown		90		2	2.2	0	0.0
Statewide	**436,817**	**79,507**	**18.2**	**2,297**	**2.9**	**260**	**0.3**

1. County assignment in the order of priority was based on child's census tract, child's zip code address, and provider's zip code address.
2. Adapted from US Census population estimate for 2002.
3. Blood lead reports with missing or wrong date of birth were assumed to be from children under six (6) years of age with exact age unknown.
4. Any blood lead level ≥10 μg/dL
5. Defined as a venous blood lead level ≥20 μg/dL

Table Three-A
MARYLAND DEPARTMENT OF THE ENVIRONMENT
Lead Poisoning Prevention Program: Childhood Lead Registry
Blood Lead Testing of Children 0-72 months by Jurisdiction in 2002

Age Group	Population of children	Children Tested		Children with Elevated Blood Lead Level		Children with Lead Poisoning	
		Number	Percent	Number	Percent	Number	Percent
Allegany County							
0-35 Months	2,383	1,073	45.0	21	2.0	1	0.1
36-72 Months	2,235	110	4.9	8	7.3	1	0.9
Age Unknown		0		0		0	
Total	4,618	1,183	25.6	29	2.5	2	0.2
Anne Arundel County							
0-35 Months	20,711	4,788	23.1	25	0.5	3	0.1
36-72 Months	19,546	1,156	5.9	5	0.4	1	0.1
Age Unknown		0		0		0	
Total	40,257	5,944	14.8	30	0.5	4	0.1
Baltimore County							
0-35 Months	28,397	8,215	28.9	106	1.3	6	0.1
36-72 Months	27,046	2,282	8.4	42	1.8	6	0.3
Age Unknown		2		0		0	
Total	55,444	10,499	18.9	148	1.4	12	0.1
Baltimore City							
0-35 Months	27,523	11,690	42.5	939	8.0	109	0.9
36-72 Months	25,221	4,902	19.4	617	12.6	73	1.5
Age Unknown		3		2		1	
Total	52,744	16,595	31.5	1,558	9.4	183	1.1
Calvert County							
0-35 Months	3,126	741	23.7	6	0.8	2	0.3
36-72 Months	3,126	158	5.1	2	1.3	0	0.0
Age Unknown		0		0		0	
Total	6,252	899	14.4	8	0.9	2	0.2
Caroline County							
0-35 Months	1,085	525	48.4	34	6.5	2	0.4
36-72 Months	1,082	174	16.1	14	8.0	1	0.6
Age Unknown		0		0		0	
Total	2,168	699	32.2	48	6.9	3	0.4
Carroll County							
0-35 Months	5,942	750	12.6	10	1.3	1	0.1
36-72 Months	5,945	228	3.8	0	0.0	0	0.0
Age Unknown		0		0		0	
Total	11,888	978	8.2	10	1.0	1	0.1

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Lead Poisoning Prevention Program: Childhood Lead Registry
Blood Lead Testing of Children 0-72 months by Jurisdiction in 2002

Age Group	Population of children	Children Tested		Children with Elevated Blood Lead Level		Children with Lead Poisoning	
		Number	Percent	Number	Percent	Number	Percent
Cecil County							
0-35 Months	3,591	709	19.7	6	0.8	2	0.3
36-72 Months	3,513	309	8.8	3	1.0	0	0.0
Age Unknown		0		0		0	
Total	7,104	1,018	14.3	9	0.9	2	0.2
Charles County							
0-35 Months	5,494	1,256	22.9	4	0.3	0	0.0
36-72 Months	5,318	533	10.0	4	0.8	0	0.0
Age Unknown		1		0		0	
Total	10,812	1,790	16.6	8	0.4	0	0.0
Dorchester County							
0-35 Months	959	390	40.7	27	6.9	5	1.3
36-72 Months	943	123	13.0	9	7.3	0	0.0
Age Unknown		0		0		0	
Total	1,902	513	27.0	36	7.0	5	1.0
Frederick County							
0-35 Months	8,879	1,206	13.6	17	1.4	2	0.2
36-72 Months	8,555	378	4.4	5	1.3	0	0.0
Age Unknown		0		0		0	
Total	17,434	1,584	9.1	22	1.4	2	0.1
Garrett County							
0-35 Months	1,023	245	23.9	3	1.2	0	0.0
36-72 Months	1,022	52	5.1	0	0.0	0	0.0
Age Unknown		0		0		0	
Total	2,046	297	14.5	3	1.0	0	0.0
Harford County							
0-35 Months	9,382	1,634	17.4	22	1.3	2	0.1
36-72 Months	9,148	581	6.4	4	0.7	0	0.0
Age Unknown		1		0		0	
Total	18,530	2,216	12.0	26	1.2	2	0.1
Howard County							
0-35 Months	11,166	1,251	11.2	14	1.1	2	0.2
36-72 Months	10,924	545	5.0	2	0.4	0	0.0
Age Unknown		0		0		0	
Total	22,090	1,796	8.1	16	0.9	2	0.1

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Lead Poisoning Prevention Program: Childhood Lead Registry
Blood Lead Testing of Children 0-72 months by Jurisdiction in 2002

Age Group	Population of children	Children Tested		Children with Elevated Blood Lead Level		Children with Lead Poisoning	
		Number	Percent	Number	Percent	Number	Percent
Kent County							
0-35 Months	556	123	22.1	1	0.8	0	0.0
36-72 Months	538	26	4.8	0	0.0	0	0.0
Age Unknown		0		0		0	
Total	1,095	149	13.6	1	0.7	0	0.0
Montgomery County							
0-35 Months	39,113	7,919	20.2	38	0.5	4	0.1
36-72 Months	36,476	4,160	11.4	23	0.6	4	0.1
Age Unknown		3		0		0	
Total	75,588	12,082	16.0	61	0.5	8	0.1
Prince George's County							
0-35 Months	37,823	9,261	24.5	61	0.7	7	0.1
36-72 Months	35,542	5,664	15.9	37	0.7	3	0.1
Age Unknown		5		0		0	
Total	73,365	14,930	20.4	98	0.7	10	0.1
Queen Anne's County							
0-35 Months	1,556	322	20.7	6	1.9	1	0.3
36-72 Months	1,523	122	8.0	1	0.8	0	0.0
Age Unknown		0		0		0	
Total	3,079	444	14.4	7	1.6	1	0.2
Saint Mary's County							
0-35 Months	3,831	933	24.4	8	0.9	0	0.0
36-72 Months	3,701	126	3.4	2	1.6	0	0.0
Age Unknown		0		0		0	
Total	7,533	1,059	14.1	10	0.9	0	0.0
Somerset County							
0-35 Months	747	372	49.8	15	4.0	0	0.0
36-72 Months	715	140	19.6	6	4.3	0	0.0
Age Unknown		0		0		0	
Total	1,461	512	35.0	21	4.1	0	0.0
Talbot County							
0-35 Months	1,104	331	30.0	14	4.2	3	0.9
36-72 Months	1,069	110	10.3	5	4.5	1	0.9
Age Unknown		0		0		0	
Total	2,173	441	20.3	19	4.3	4	0.9

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Blood Lead Testing of Children 0-72 months by Jurisdiction in 2002

		Children Tested		Children with Elevated Blood Lead Level		Children with Lead Poisoning	
Age Group	**Population of children**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Washington County							
0-35 Months	4,882	1,146	23.5	12	1.0	1	0.1
36-72 Months	4,670	354	7.6	7	2.0	3	0.8
Age Unknown		0		0		0	
Total	9,552	1,500	15.7	19	1.3	4	0.3
Wicomico County							
0-35 Months	3,463	1,377	39.8	59	4.3	8	0.6
36-72 Months	3,251	368	11.3	15	4.1	1	0.3
Age Unknown		2		0		0	
Total	6,714	1,747	26.0	74	4.2	9	0.5
Worcester County							
0-35 Months	1,525	422	27.7	26	6.2	3	0.7
36-72 Months	1,443	120	8.3	8	6.7	1	0.8
Age Unknown		0		0		0	
Total	2,968	542	18.3	34	6.3	4	0.7
County Unknown							
0-35 Months		69		1	1.4	0	0.0
36-72 Months		21		1	4.8	0	0.0
Age Unknown		0		0		0	
Total		90		2	2.2	0	0.0
Statewide							
0-35 Months	224,263	56,748	25.3	1,475	2.6	164	0.3
36-72 Months	212,554	22,742	10.7	820	3.6	95	0.4
Age Unknown		17		2		1	
Total	436,817	79,507	18.2	2,297	2.9	260	0.3

1. Population of children was adapted from US Census Bureau.
2. Blood lead reports with missing or wrong date of birth were assumed to be from children under six (6) years of age with exact age unknown.
3. Elevated blood lead level defined as any blood lead level ≥10 μg/dL.
4. Lead poisoning defined as a venous blood lead level ≥20 μg/dL.
5. County assignment was in the order of child's census tract address, child's zip code address, and provider's zip code address.

Table Four

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Childhood blood lead surveillance in Maryland: 1995-2002

Children 0-72 months old

Calendar Year		Population of Children	Blood Lead Tests		Elevated Blood Lead		Lead Poisoning	
			Number	Percent	Number	Percent	Number	Percent
1995								
	City	65,958	38,794	58.8	10,258	26.4	1,633	4.2
	Counties	383,210	25,600	6.7	1,327	5.2	199	0.8
	Total	449,168	64,394	14.3	11,585	18.0	1,832	2.8
1996								
	City	60,834	29,630	48.7	7,816	26.4	1,646	5.6
	Counties	369,538	27,006	7.3	1,264	4.7	160	0.6
	Unknown		3,110		804		24	
	Total	430,372	59,746	13.9	9,884	16.5	1,830	3.1
1997								
	City	58,262	21,423	36.8	5,983	27.9	1030	4.8
	Counties	362,935	44,546	12.3	1654	3.7	202	0.5
	Unknown		1,149		126		1	
	Total	421,197	67,118	15.9	7,763	11.6	1233	1.8
1998								
	City	56,759	17,753	31.3	3,949	22.2	669	3.8
	Counties	359,726	40,164	11.1	1,082	2.7	103	0.3
	Unknown		668		37		0	
	Total	416,485	58,585	14.1	5,068	8.7	772	1.3
1999								
	City	55,401	17,414	31.4	2,902	16.7	446	2.6
	Counties	363,511	43,524	12.0	925	2.1	102	0.2
	Unknown		591		77		7	
	Total	418,912	61,529	14.7	3,904	6.4	555	0.9
2000								
	City	50,380	18,033	36.8	2,198	12.2	266	1.5
	Counties	377,559	51,210	13.6	847	1.7	85	0.2
	Unknown		5,273		357		2	
	Total	427,939	74,516	17.4	3,402	4.6	353	0.5
2001								
	City	50,380	21,231	42.1	2,027	9.5	230	1.1
	Counties	377,559	55,470	14.7	814	1.5	58	0.1
	Unknown		41		0		0	
	Total	427,939	76,742	17.9	2,841	3.7	288	0.4
2002								
	City	52,744	16,595	31.5	1,558	9.4	183	1.1
	Counties	384,073	62,822	16.4	737	1.2	77	0.1
	Unknown		90		2		0	
	Total	436,817	79,507	18.2	2,297	2.9	260	0.3

Notes:

1. Population for 1995-1999 is based on US Census Bureau annual population estimate for states and counties. Population for 2000 and 2001 both use the US 2000 population count, as the Census Bureau did not release population estimate for 2001 by 11/2002. Population for 2002 is adapted from Census Bureau population estimate for 2002.
2. Elevated blood lead is defined as a venous or a capillary blood lead level ≥10 μg/dL.
3. Lead poisoning is defined as a venous blood lead level ≥20 μg/dL.
4. City/county assignment is based on zip code address. USPS zip code county file was used for the assignment. In the absence of a valid zip code, the jurisdiction was considered unknown. For 2002 census tract was the first order of priority to assign county.