Florida Department of Health
Childhood Lead Poisoning Prevention Program
Calendar Year 2002 Annual Report

INTRODUCTION

Florida is the fourth largest state in the nation, has the nation's fourth largest live birth rate, is home to an estimated one million children less than 72 months of age, and has over 300,000 Medicaid-eligible children in the same age range. The many subtle demographic and socioeconomic differences in this pediatric population underscore the importance of addressing the preventable condition of childhood lead poisoning. The Centers for Disease Control and Prevention's (CDC's) Lead Poisoning Prevention Branch and the national health plan, Healthy People 2010, have established an objective for the elimination of elevated blood lead levels in children. The Florida Department of Health is preparing to meet this challenging objective in a number of ways.

For calendar year 2002, 129,899 children less than 72 months of age provided 176,209 blood samples for lead screening. These reports were submitted by the Department of Health, Bureau of Laboratories (state laboratory) and by private laboratories. Of those children tested, 647(.05%) were confirmed as cases. The case definition of childhood lead poisoning is a venous blood sample result of ≥10 micrograms per deciliter (µg/dL), or two capillary results ≥10 µg/dL taken within 12 weeks of each other, from a child less than 72 months of age.

Lead poisoning became a notifiable disease in Florida in 1992. In the same year, the Childhood Lead Program was established to conduct laboratory-based surveillance with funding from the CDC. The first laboratory data were collected in 1993. The database is housed in the Department of Health, Bureau of Environmental Epidemiology in Tallahassee.

In 2002 two people staffed the program. Trina Thompson, M.A., is Coordinator, and Susan Limbaugh, L.P.N., is Assistant Coordinator. The program's Supervisor, Alan Rowan Ph.D., and Principal Investigator David Johnson, M.D. oversaw the activities and consulted with the staff. Program staff maintained laboratory data in Microsoft Access. Blood lead level results and accompanying information were routinely entered, checked for quality, and merged to the main database.

The state laboratory and 19 reporting private laboratories submited records on a weekly or monthly basis. The Florida Statutes, Chapter 381, "Report of Diseases of Public Health Significance to Department", and Chapter 64D-3, of the *Florida Administrative Code*, "Control of Communicable Diseases and Conditions Which May Significantly Affect Man", address the reporting of notifiable diseases by laboratories.

Laboratories have a 72-hour time frame in which to report an elevated blood lead level with the following identifying information:

- Name and date of birth of the patient from whom the specimen was taken;
- Name, address, and telephone number of the processing laboratory; and
- Diagnostic test performed, specimen type and result.

In addition to the above, they must supply **either** of the following:

- Address, telephone number, race, sex, ethnicity and social security number of the patient,
  or, if these are not available then
- Name, address, and telephone number of the submitting physician or health care provider.

In addition to these minimum mandatory requirements outlined in the Florida Administrative Code, the Program also requests:

- An indication if the individual is receiving Medicaid;
- That all blood lead test results (not only those greater than or equal to 10
- micrograms per deciliter) be reported; and
- That all reports be submitted via regular mail service on computer diskette or
- encrypted and emailed.

The statute does not require blood lead levels less than 10 µg/dL to be reported, although these data are available for specimens analyzed by the State Laboratory. Florida does not have a law mandating that laboratories submit all identifying information for the purpose of notifying the program of blood lead levels. The state laboratory requires that all parties responsible for the collection of blood samples submit complete identifying information. In turn, the state laboratory provides the program with the most complete records (including Medicaid status). Nineteen private laboratories regularly submitted data to the program during 2002. The FL DOH Bureau of State Laboratories, submitting 11% of the total screened. Quest Diagnostics began electronic reporting in 2002, submitting 42% of total screened. The program coordinator attempts to contact private laboratories to request that reports be submitted within 72-hours and that complete identifying information for elevated and non-elevated tests be submitted. Private laboratory reporting continued to improve and is an important source of data.

The program has not regularly produced rates because many children are not screened and private laboratories submit data that exclude results less than 10 µg/dL. Therefore, a reliable denominator has not been available. Although the public laboratory submits complete records, this subset of children may not be representative for estimating statewide prevalence.

Lead is an Important Pediatric Health Problem

The CDC has termed excessive absorption of lead as "one of the most common pediatric health problems in the United States today and it is entirely preventable" (1). Children 9 months of age to 2-1/2 years of age are at greatest risk of lead poisoning with the risk decreasing gradually until they are six years of age. Younger children have greater hand-to-mouth activity, their brains are more sensitive to the toxic effects of lead, and they absorb a greater percentage of the lead that is ingested. Ingested lead is also more readily available to a child's body during early growth and development. For comparison, where an adult will absorb 10 percent of ingested lead, a toddler will absorb 50 percent of ingested lead (2).

Children are also physiologically different from adults in other ways. Pound for pound, young children breathe more, eat more and drink more than adults and double their weight in their first four months of life (2). For example, proportionately, an average one-year-old eats two to seven times more grapes, bananas, pears, carrots and broccoli than an adult (2). Children have greater need for calcium than do adults for developing bones and will absorb more of this element when it is ingested. If lead is ingested, the body will mistake it for calcium and absorb the lead in place of calcium.

Other effects of lead poisoning may include diminished intelligence, learning disabilities, interference with calcium metabolism, reduced heme syntheses (or the body's ability to manufacture red blood cells), reduced kidney function, and damage to the central nervous system. The damage to the central nervous system is not reversible. Lead easily crosses the placenta and if pregnant women are exposed to lead, their developing fetuses can be exposed. This can result in delayed congenital development. The extent to which these effects will be present in a child depends on a number of factors, including the duration and intensity of exposure. Findings from a recent study published in the New England Journal of Medicine (5) indicate that deleterious effects on IQ happen in children with blood lead levels below 10 µg/dL.

Lead-based paint hazards in older homes remain the primary source of high-dose lead exposure for preschool-aged children. The dust from deteriorating paint is easily ingested and is a significant source of exposure to children.

SELECTED PROGRAM ACTIVITIES CALENDAR YEAR 2002

The program conducts grant business by the fiscal year July 1 to June 30, but produces quarterly and annual reports on the calendar year. Below is a bulleted summary of activity highlights from calendar year 2002.

- The program distributed funds ($30,000 or less, each) to five County Health Departments (CHDs) (Broward, Hillsborough, Orange, Palm Beach and Polk) with large numbers of older housing units and at-risk children. The funds were used toward the purchase of part-time employees to assist with case management and other activities, and for the direct purchase of health fair displays or other outreach materials or services.

- Program staff procured a Governor's Proclamation for Lead Poisoning Prevention Week (see attachment 1).
    a. The program worked collaboratively with the Agency for Health Care Administration (AHCA), the state Medicaid office, to develop and distribute a press release announcing the Governor's Proclamation for Lead Poisoning Prevention Week (see attachment 2).
    b. Staff prepared and set up a Health-fair style display at Department of Health.
    c. Ms. Thompson was interviewed by a local television station, which aired interview footage and scenes from the display the same evening.
- Program staff attended the CDC Lead Poisoning Surveillance meeting in Clearwater.
- Program staff produced material for, and subsequently published a website: a. http://www.doh.state.fl.us/environment/hsee/lead/index.html
    b. Plans are underway to refine currently posted information and to add material on adult and take-home lead poisoning.
- The program finalized a Memorandum of Understanding (MOU) with ACHA, which houses the State Medicaid office.
    a. The MOU ensures that ACHA can provide Medicaid eligibility data to the lead program.
    b. The lead program conducts matching routines to ascertain if Medicaid children have been screened for blood lead and assess performance of Medicaid providers.
    c. The finalized MOU assists the lead program in fulfilling a number of objectives related to screening at-risk children, improving surveillance, and working directly with the State Medicaid office.
- The program developed a working relationship with the Department of Health, Maternal and Child Health Section (MCH).
    a. A Case Management Workgroup was formed, with key staff from MCH, Women, Infants, Children (WIC), and CHDs.
    b. The Workgroup further lead to the establishment of a relationship with WIC.
        i. Lead program staff and WIC staff are planning to develop a statewide referral protocol for lead screening.
        ii. Program staff worked collaboratively with WIC to revise and release a brochure, designed for parents, on lead and nutrition
- Ms. Thompson gave a presentation at the Basic Environmental Health Orientation.
    a. The orientation serves as an introduction to CHD staff hired within the preceding 12 months, on all programs overseen by the Department of Health, Division of Environmental Health.

b. Presenting at this meeting served as an opportunity to inform new local-level staff about lead poisoning and encourage them to be aware of potential lead exposures in their communities.

- The program produced a poster on lead poisoning and the importance of hand washing.
    a. CHDs and other partners assist in distributing them to private providers and day care facilities
- Ms. Thompson was invited to participate in the CDC conference calls to develop the CDC Lead Branch's strategic plan for elimination of elevated blood lead levels in children.
- The program worked with the Pesticide Surveillance Program to mail large quantities of the Reportable Disease list to CHDs
    a. Lead and Pesticide poisoning were highlighted on the hard stock form.
    b. CHD staff further distributed them to private providers to remind them about their statutory obligation to report elevated blood lead levels and pesticide poisoning to the CHD.

DATA REVIEW

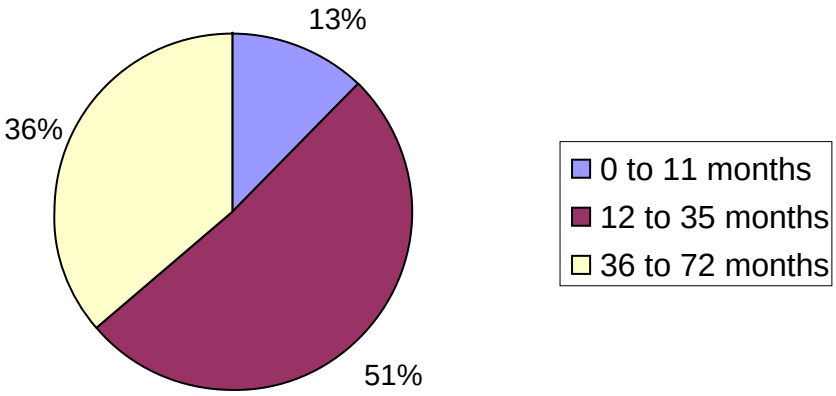
A total of 647 (0.05%) of 129,899 tested children were confirmed as lead poisoned in 2002 (Table 1). These results are less than the figures from 2000 and 2001 when 0.7 percent and 1.0 percent of the children tested positive for lead. This may be due to the large increase in the electronic reporting of all blood lead test results from Quest Laboratories occurring in 2003. The incidence of elevated blood lead levels among children between one and five years of age is lower in Florida than in the nation as a whole. Less than one percent of the children tested in Florida had blood lead levels of 10 µg/dL or higher versus 3.1 percent of children in the same age group nationwide (6). The total number of children reported screened for lead in the state has increased by 147 percent of the reported screened in 2001 (n=69,264 in 2001 and n=52,438 in 2000).

Table 1. Number of children <72 months screened by test type and cases of lead poisoning in Florida, 2002.

A: Number of children screened for lead poisoning with test type unreported.
C: Number of children screened for lead poisoning by a capillary blood lead test.
V: Number of children screened for lead poisoning by a venous blood lead test.
Cases: Number of children with confirmed elevated blood lead levels

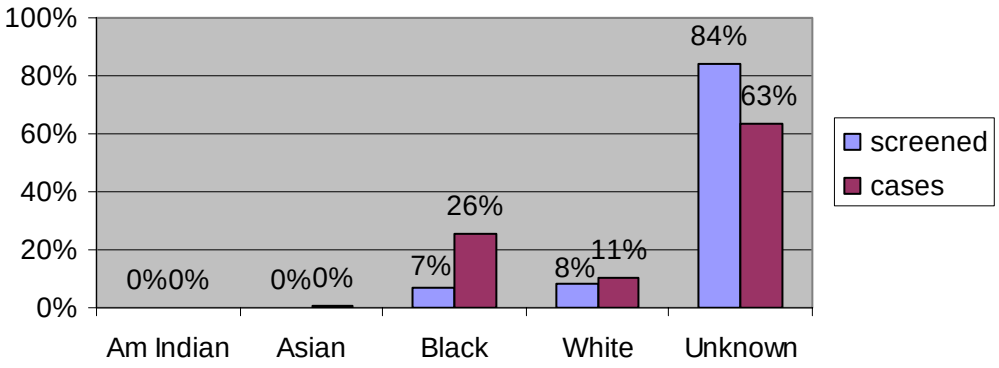
County	A	C	V	Total	Cases
ALACHUA	509	1204	27	1740	5
BAKER	46	69	11	126	1
BAY	241	13	61	315	4
BRADFORD	14	277	4	295	0
BREVARD	512	337	160	1009	5
BROWARD	13851	2235	1770	17856	57
CALHOUN	21	14	5	40	0
CHARLOTTE	292	209	62	563	1
CITRUS	12	219	5	236	0
CLAY	262	412	62	736	2
COLLIER	111	119	1498	1728	25
COLUMBIA	73	506	19	598	7
DADE	28823	1864	4517	35204	215
DESOTO	193	43	19	255	0
DIXIE	7	185	3	195	0
DUVAL	3049	4038	433	7520	57
ESCAMBIA	585	167	668	1420	8
FLAGLER	19	202	9	230	1
FRANKLIN	28	89	4	121	1
GADSDEN	222	7	49	278	2
GILCHRIST	13	165	9	187	0
GLADES	36	5	9	50	0
GULF	10	90	2	102	1
HAMILTON	5	179	1	185	0
HARDEE	371	94	71	536	1
HENDRY	363	18	56	437	0
HERNANDO	170	98	22	290	1
HIGHLANDS	457	51	25	533	3
HILLSBOROUGH	8633	548	961	10142	42
HOLMES	24	41	3	68	0
INDIAN RIVER	80	1119	36	1235	5
JACKSON	17	29	0	46	0
JEFFERSON	34	1	2	37	0
LAFAYETTE	11	35	2	48	0
LAKE	495	385	134	1014	2
LEE	2342	87	216	2645	6
LEON	899	86	341	1326	5
LEVY	45	225	2	272	0
LIBERTY	11	7	11	29	0
MADISON	77	11	22	110	1
MANATEE	1195	21	190	1406	6
MARION	151	942	30	1123	3
MARTIN	210	404	115	729	0
MONROE	165	1	11	177	1
NASSAU	42	4	2	48	0
OKALOOSA	551	83	92	726	1
OKEECHOBEE	11	30	295	336	4
ORANGE	3979	1419	1109	6507	19
OSCEOLA	661	326	88	1075	1
PALM BEACH	5233	1355	561	7149	43
PASCO	1568	352	94	2014	5
PINELLAS	1750	3394	1137	6281	15
POLK	2447	1560	229	4236	30
PUTNAM	370	109	50	529	5
SAINT JOHNS	33	406	27	466	12
SAINT LUCIE	523	531	865	1919	30
SANTA ROSA	112	5	133	250	3
SARASOTA	871	563	118	1552	3
SEMINOLE	562	530	83	1175	3
SUMTER	49	342	20	411	0
SUWANNEE	27	199	12	238	0
TAYLOR	113	36	6	155	1
UNION	12	43	0	55	0
VOLUSIA	781	338	173	1292	3
WAKULLA	98	19	14	131	1
WALTON	27	15	4	46	0
WASHINGTON	23	90	3	116	0
Total	**84527**	**28600**	**16772**	**129899**	**647**

Graph 1. Percentage of children <72 months screened for lead poisoning by age group Florida, 2002



Fifty-one percent of children tested were between one or two years (12 to 35 months) of age, the age group recommended for screening by the CDC (7) (Graph1). Approximately 36% percent of screened children were in the 36 to 72 months age group, the second age group recommended for lead screening.

Graph 2. Percentage of children <72 months screened for lead and cases of lead poisoning, Florida, 2002



It is important to note that information on race was missing for more than 84 percent of all laboratory screening results. Nonetheless, a disproportionate amount of African American children tested were identified as cases of lead poisoning (Graph 2). While African Americans represented only 7 percent of all children screened, they made up 26% of all lead poisoning cases.

Program staff are aware that not all at-risk children are screened. About 300,000 children are eligible for Medicaid in Florida, four times the number of lead screening results processed by the Lead Surveillance Program each year. Increasing screening of at-risk children remains one of the most important program goals. Program staff continue to distribute the statewide screening guidelines document first released in late year 2000. As private providers are stimulated to screen children for blood lead according to the guidelines, an increased number of elevated blood lead levels may be uncovered.

Program staff are pleased to report an overall increase in the number of screening test results submitted to the program in 2002, as compared to 2001. This increase fulfills portions of several closely related program objectives for screening and surveillance. The increase in screening tests results reported is likely due to an increase in the number of children screened combined with an increase in laboratory reporting. Program staff distributed large quantities of screening guidelines and maps to county health department contact persons, who in turn provided them to private physicians and practices. This distribution is an ongoing, important step in increasing providers' awareness about childhood lead poisoning and encouraging them to screen.

As stated, improvements in laboratory reporting may also be responsible for the increase in reports received by the program, i.e., in the number of usable records that program staff can query. Although the quality of laboratory records improves incrementally each year, records with unknown birth dates and null race fields remain a problem. Program staff continues to ask laboratories to provide complete demographics and also for an indicator of whether a child is on Medicaid.

References

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3. "An Introduction to Children's Environmental Health", Children's Environmental Health Network, http://www.cehn.org/cehn/ (May 2003)

4. Klaassen, Curtis D. Cassarett & Doull's Toxicology .The Basic Science of Poisons. 5th ed. New York: McGraw Hill Health Professions Division; 1996. p. 705-706.

5. Canfield, RL, et al. Intellectual Impairment in Children with Blood Lead Concentrations Below 10 Microg per Ceciliter. N Engl J Med 2003 April 17;348(16):1517-26.

6. Centers for Disease Control and Prevention. (September 12, 2003). Surveillance Among Blood Lead Levels Among Children, United States 1997-2001. Morbidity and Mortality Weekly Report. Atlanta: Department of Health and Human Services. Vol. 52, No. SS-10. p 1.