

Lead Poisoning Prevention Education and Testing of OHP Children: Barriers and Practices

Final Report

**Submitted to the Ohio Department of Job and Family Services
May, 2004**

**Barbara J. Polivka, PhD, RN
The Ohio State University College of Nursing
Principal Investigator**

**Co-investigators:
Mary Margaret Gottesman, PhD, RN, CPNP
The Ohio State University College of Nursing**

**Marcel Casavant, MD, FACEP, FACMT
Children's Hospital**

**Donna Bush, LSW, MSW
Ohio Department of Job and Family Services**

**Consultants:
Pamela Salsberry, PhD, RN
The Ohio State University College of Nursing**

**Michael Elliott, PhD
The Ohio State University School of Public Health**

**Elizabeth Cho
The Ohio Department of Health**

**Graduate Research Assistant:
Daryl Darr, MPH**

This project was funded by:

**MEDTAPP
The Ohio State University, College of Nursing
The Ohio Department of Health**

The results and opinions expressed do not necessarily represent the official positions or opinions of ODJFS.

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I. Executive Summary

Current regulations require that all children 12 and 24 months enrolled in Ohio Health Plans (OHP) be tested for blood lead levels. Yet, only approximately one-third of these children are actually tested. This study sought to answer the following research questions:

- 1) What are the self-reported lead testing practices of OHP providers?
- 2) What are the barriers in the blood lead testing process for Ohio Health Plan (OHP) children from the perspectives of: Healthchek coordinators, laboratories, OHP providers, and parents/guardians?
- 3) What are the OHP providers' lead poisoning prevention education practices and sources and contents of their education on lead?
- 4) What are the sources and contents of lead poisoning prevention education received by parents/guardians of OHP children?

To address these research questions, this study used mailed surveys, phone interviews, and focus groups. Barriers in the blood lead testing process from the Healthchek coordinator's perspective were explored via phone surveys with seven Healthchek coordinators. Barriers in the blood lead testing process from a laboratory perspective were also assessed via phone surveys (n=22). Research questions focusing on OHP provider barriers to blood lead testing, provider lead education practices, and provider knowledge of lead education resources were addressed using mailed surveys (n=313). Research questions focusing on parent/guardian perceptions of barriers to blood lead testing, parent/guardian sources and contents of lead poisoning prevention education were addressed via three focus groups and mailed surveys (n=542) to parents of children enrolled in OHP. The following summarizes the results for each research question.

1. What are the self-reported blood lead testing practices of OHP providers?

Respondents were asked how often they obtained blood lead levels (BLL) on 12 and 24 month-old children. Half of the respondents noted they 'sometimes' obtained BLL on 12 month-old children, and about 44% 'always' obtain BLL. At 24 months, the percentage of those 'sometimes' obtaining a BLL increased to 63%, while those 'always' obtaining BLL decreased to 27%. Multivariate analysis revealed that the odds of 'always' testing for BLL at 12 months were greater if they were from an urban area, more than 25% of their patients were on Medicaid, they provided lead education to more than 50% of their patients, and they had been practicing for more than 16 years. The odds of 'always' testing for BLL at 24 months were greater if they were from an urban area, at least 25% of their patients were on Medicaid, a pediatrician, drew the blood in their office, and provided lead education to at least 50% of their patients.

2. What are the barriers in the blood lead testing process for Ohio Health Plan (OHP) children from the perspective of Healthchek coordinators, laboratories, OPH providers, and parents/guardians?

Healthchek coordinators. Healthchek coordinators reported parents are not aware of the importance of blood lead testing. Blood lead testing may not be a priority because there is no noticeable physical illness. The process is painful for children and may require long waits or travel to labs. Healthchek coordinators also noted that OHP providers tend to perceive that once they have ordered the blood lead test, they have done their part to comply. In addition, the paperwork is daunting.

Laboratories. According the respondents from the laboratories that process the blood lead tests, there are concerns with the Ohio Heavy Metal Reporting form. The two most common problems were determining the child's race and obtaining a completed form from the provider.

OHP Providers. The most often barriers to blood lead testing cited by OHP providers were: parents not following through with blood lead testing (66%), parents refusing the test (65%), parents not seeing the importance of testing (49%), the child tested elsewhere (46%), providers seeing too few

children in the office with elevated blood lead levels (EBL) to justify mandatory blood lead testing (37%), and parents not requesting testing (32%).

Parents/guardians. Parents were asked to identify reasons why their child had not had a blood lead level drawn. The major barriers identified were: not being told about needing a blood lead test (61%), not living in an older home (51%), not knowing the test was important (30%), and not being told were to go for the test (25%).

3. *What are the OHP providers' lead poisoning prevention education practices and sources and content of their education about lead?*

OHP providers' lead poisoning prevention education practices. Approximately 16% provided no education to parents, while about 43% educated most parents regarding lead poisoning prevention. The most common methods of educating parents included discussions with their healthcare provider (85%) and having printed materials available in the clinic (62%).

OPH providers' sources and content of their education about lead. The most common sources of information included both local (88%) and state health departments (74%) and the medical literature (72%). Additional sources of information included the American Academy of Pediatrics (AAP) (53%), a local physician specializing in lead poisoning (39%), CDC (38%), and ODH Lead Regional Resource Centers (31%).

4. *What are the sources and contents of lead poisoning prevention education received by parents/guardians of OHP children?*

Fifty-nine percent of parents reported they received information about lead poisoning. These parents primarily received their information on lead from health departments or WIC staff (59%) or their child's physician/nurse (56%). Respondents prefer to receive information about lead poisoning prevention via brochures/pamphlets (71%), from their child's doctor or nurse (51%), from the health department/WIC (32%), from the TV (31%), and from videos (25%). Most respondents (88%) identified two or three favorable methods of receiving information about lead poisoning ($M=2.5$, $SD=1.9$).

Recommendations. Recommendations were delineated for OHP providers, for parents, and at the system level. Provider recommendations included implementing of a well-child checklist that includes BLL testing; implementing an office-based tickler system to assure BLL are obtained and results are in the child's record; requiring OHP providers inform parents of BLL testing results, requiring OHP providers (including prenatal providers) educate parents regarding lead poisoning prevention and testing, using a free CME mechanism for OHP provider education, and focusing on provider sub-groups with the least knowledge regarding lead. Recommendations for parents deal primarily with education. Parental education needs to occur using brochures, but also other means such as direct conversations with healthcare providers, videos, and public service announcements. A low-literacy, high-impact educational campaign should be developed to inform parents about blood lead testing and to know the results of the testing. Priority system recommendations include continuing the development of a 'one-stop' approach to allow BLL to be drawn at WIC clinics and developing a mechanism for identifying children in need of a BLL. The tracking system may be aimed at providers, at parents, or both. Other system level recommendations include beginning lead poisoning education during pregnancy, enhancing the role of Healthchek coordinators and laboratories in blood lead testing process, reviewing the ODH Heavy Metal form, and coordinating with other states in the development of a nationally consistent lead reporting form.

Lead Poisoning Prevention Education and Testing of OHP Children: Barriers and Practices

II. Final Report

Lead poisoning remains the major environmental health problem for young children with approximately 900,000 US children having elevated blood lead levels (EBL) ($\geq 10 \mu\text{g/dL}$). Prevalence estimates indicate that almost 6% of children 1-2 years old have EBLs, as do 3.5% of children between 3-5 years old. Prevalence rates are higher for children who are poor, of non-Hispanic black race, or living in older housing. The GAO (U.S. General Accounting Office) estimates that 535,000 children (9%) on Medicaid have elevated blood lead levels (BLL), yet 65% of these children have not been tested. Data from NHANES indicated that the majority of children with EBL receive Medicaid. However, 81% of the children enrolled in Medicaid have not had a BLL drawn (MMWR, 2000). The Centers for Medicare and Medicaid Services (CMS) policies require that all children enrolled in Medicaid receive a blood lead testing at age 12 and 24 months. In addition, children between 36 and 72 months should be tested if they have not previously been tested. The GAO report concluded that the CMS mandatory testing policy has not adequately identified children with EBL (GAO, 1998). In Ohio, as in other states, the CMS blood lead testing requirements are not being met.

In Ohio, approximately 11,000 children had confirmed BLLs $\geq 10 \mu\text{g/dL}$ during 1998; 1729 of these children had BLLs greater than $20 \mu\text{g/dl}$. A data harmonizing project between the Ohio Department of Health (ODH) and the Ohio Department of Job and Family Services (ODJFS) revealed that only 32% of Medicaid enrolled children were tested for lead poisoning. A blood lead test is required of all children 12 and 24 months as part of the Early Periodic Testing, Diagnosis and Treatment Program (EPSDT) of the Ohio Health Plan (OHP). Approximately 14% of BLLs drawn on Medicaid children were not recorded in the ODH STELLAR database – a CDC designed database containing results of BLL tests by CLIA certified labs. Blood lead testing rates for children on Medicaid living in high risk zip codes were 46% for one year olds and 33% for 2 year olds (Report to Ohio General Assembly, 2000). Anticipatory guidance protocols include lead poisoning prevention education of parents/guardians of young children, yet only approximately one-third of parents report receiving such guidance (Chaisson & Glotzer, 1996; Mahon, 1997; Porter, 1996). Although it is yet unclear what barriers contribute toward low blood lead testing rates and low rates of poison prevention education, it is likely that barriers emanate from multiple areas including: health care providers, parents/guardians, and laboratories that process the blood lead specimens. The purpose of this study was to explore barriers to blood lead testing from multiple perspectives.

The specific research questions addressed were:

1. What are the self-reported blood lead testing practices of OHP providers?
2. What are the barriers in the blood lead testing process for Ohio Health Plan (OHP) children from the perspective of:
 - a. Healthchek coordinators?
 - b. Laboratories?
 - c. OHP providers?
 - d. Parents/Guardians?
3. What are the OHP providers':
 - a. Lead poisoning prevention education practices?
 - b. Sources and contents of their education about lead?
4. What are the sources and contents of lead poisoning prevention education received by parents/guardians of OHP children?

A. Literature Review

Provider blood lead testing practices and barriers. Previous research related to blood lead testing practices of physicians found that pediatric residents tended to have higher rates of testing (75% report testing all patients 6-36 months) (Schaffer, et al, 1998). Data on practicing physicians and Advanced Practice Nurses indicates that between 12%-53% test all of their patients between 1-3 years old (Bar-on & Boyle, 1994; Campbell, et al. 1996; Choate & Polivka, 2000; Fairbrother et al., 1996, Goldman, et al., 1998;). No differences were found in blood lead testing rates for New York physicians participating in Medicaid managed care and non-managed care providers (Hanson et al, 1998).

Blood lead testing has been reported to occur most often when providers were female, practicing in urban areas, recent graduates of medical school, pediatricians, pediatric nurse practitioners, believed the benefits of testing outweigh the costs, believed insurers pay for testing, felt it was easy to conduct testing, or believed that state and local laws required testing. Providers were also more likely to test children perceived to be at high-risk, on Medicaid, living in an older home, with a sibling with an EBL, or with a history of pica (Binns & LeBailly, 1997; Campbell, et al, 1996; Choate & Polivka, 2000; Schaffer, et al, 1998). Reasons for not testing children included: belief that blood lead levels were low in their patients, there were other more important issues to discuss, there were minimal intervention options for those with EBL, it was too difficult to obtain the blood sample, the costs outweighed the benefits, and it was not easy to conduct lead blood testing (Campbell, et al, 1996).

Twenty to seventy percent of providers have used risk assessment questionnaires. Reasons for using the risk assessment tool included parental education and initial testing mechanism. Most providers (50%-80%) reported providing educational materials to parents (Binns & LeBailly, 1997; Campbell et al, 1996; Choate & Polivka, 2000; Goldman, et al, 1998; Mermelstein et al, 1998).

Parental barriers to blood lead testing and parental lead poisoning prevention education. Although parental refusal or parents not requesting a blood lead test for their child has been identified as a barrier by health care providers and anticipatory guidance protocols generally include lead poisoning prevention education of parents/guardians of young children, most parents do not recall receiving such guidance (Goldman et al, 1998; Mahon, 1997; Porter, 1997). Mahon (1997) found that only 11% of the 80 Philadelphia caregivers interviewed identified lead poisoning as major health concern. Over half of the respondents incorrectly identified Philadelphia as a city at low-risk for lead poisoning. Of the 32 participants who recalled someone talking to them about lead poisoning, over 70% reported the information was from a physician or other health care provider. Approximately 40% of the respondents recalled having read some information on lead poisoning prevention. Similarly, Mehta and Binns (1998) reported 34% of the 2,225 Chicago area parents responding to a survey on lead knowledge, recalled receiving information on lead poisoning prevention from a health care provider and Porter (1997) found that 63% of respondents attending a blood lead testing clinic had prior information on lead risks; having prior information on lead risks was related to having an exposure risk (Porter, 2000). In the only published study that addressed barriers to blood lead testing, Kegler et al (1999) explored the topic in an American Indian community. Identified barriers for the 332 respondents included caregivers not wanting to see their child hurt (10.5%), lack of transportation or money for the test (5.1%), lack of time (4.8%), forgetting about the need for a blood lead test (3.0%), and not knowing where to get the test (1.5%). Multivariate analysis revealed the odds of a child having an annual blood lead test were 1.5 times greater if the parent/caregiver was self-confident in their ability to obtain the blood lead testing.

B. Research Design and Methods

To address the research questions, this study used mailed surveys, phone interviews, and focus groups. Barriers in blood lead testing processes from a laboratory and Healthchek coordinator perspective were addressed via phone surveys. Research questions focusing on OHP provider barriers to blood lead testing, provider lead education practices, and provider knowledge of lead education resources were addressed using mailed surveys. Research questions focusing on parent/guardian perceptions of barriers to blood lead testing, parent/guardian sources and content of lead poisoning prevention education were addressed via focus groups of parents/guardians of OHP children, using mailed surveys to parents of children enrolled in an OHP, and from Medicaid claims data and STELLAR data. Research methods and results pertaining to each data source are described in each section.

Limitations. Like all surveys low response rates, recall bias, non-current addresses, missing data, and lack of certainty regarding who completed the survey may reduce the reliability and validity of the results. Nonetheless, the sample sizes for this study were believed to be adequate for estimating descriptive statistics.

C. HEALTHCHEK Coordinators

i. Methods

In Ohio, Healthchek coordinators work in local Department of Job and Family Services offices to implement Health Checks at the local level. A component of their responsibilities includes providing parental information regarding the EPSDT screens (which include blood lead testing).

Design. Initially, the Ohio Department of Job and Family Services identified 10 Healthchek coordinators as being in their position for at least 1 year and thus having adequate knowledge regarding blood lead testing. These 10 coordinators were sent a letter explaining the study and requesting participation in a phone survey to assess their perceptions of barriers to blood lead testing. One week after the letter was mailed, each Healthchek coordinator was contacted to determine interest in participation and to schedule a time to complete the phone survey. Three were incorrectly identified and disqualified (one had been employed less than a year, and two were no longer Healthchek coordinators). The remaining 7 Healthchek coordinators were contacted at the pre-scheduled time and completed the phone survey. The phone surveys took approximately 15 minutes. The response rate was 100% for all eligible, available Healthchek coordinators.

Instrument. Healthchek coordinators were asked to identify barriers to blood lead testing from the perspective of the parents/guardians, children, and the OHP providers. Healthchek coordinators were asked about problems with blood lead testing related to laboratories, completion of required forms, health departments, departments of job and family services, and landlords/property owners. Finally, Healthchek coordinators were asked to identify the one thing they would like to see changed in the blood lead testing process (Appendix A).

ii. HEALTHCHEK Coordinator Survey Results

The following is a summary of the responses from Healthchek coordinators to the phone survey questions.

Parental Barriers - According to Healthchek coordinators, parents are not aware of the importance of blood lead testing because it is not a highly publicized topic. In contrast to the information they receive regarding immunization requirements, lead does not appear in the mainstream media and thus, is not perceived as important. Parents of Medicaid eligible children have many issues with which to deal with on a daily basis and preventive care is not a priority. If a noticeable physical illness is not

present, a parent will not seek medical care. There are just too many other things to worry about. Parents are also resistant to having their child exposed to the trauma of blood draws. The process is painful and upsetting to children, not only during the visit, but also throughout the day. Since the well-child visits are typically time consuming, the children and siblings end up tired, hungry, and ready to leave. The thought of having to wait longer to have a blood test is overwhelming. Furthermore, many physicians do not provide blood lead testing on their premises. This means making another stop or having to arrange an additional appointment to have the blood drawn. The process is time-consuming and not parent friendly. Other issues include lack of funds to remediate a lead hazard problem, inability to pay for treatment, and fear of being evicted from their home. Some parents have been able to move, yet the moves are lateral and they have ended up in another lead hazardous home. According to Healthchek coordinators, parents cannot afford to upgrade their living conditions, and as a result, moving to another home presents the child and family with the same problems.

Provider Barriers- Based on interviews with Healthchek coordinators, Ohio Health Plan providers are aware of blood lead testing requirements. Physician's report they order a blood lead test, but the parents leave their facility and never have it completed. Providers feel that they have done their part in ordering the lab work and that it is the parent's responsibility to comply. Also, the providers are burdened by the paper work required; they claim it takes too long to fill out the needed form.

State and Local Health Department Barriers-There are very few issues in this area. The only concern was that some county departments were not receiving their lead poisoning prevention education materials. This made it difficult to disseminate lead education information to the parents.

State and County Job and Family Service Barriers - Since the role of a Healthchek coordinator has changed and they no longer educate the parents face to face, the parents do not take the time to read the materials. According to Healthchek coordinators, parents do not possess the skills required to read the multitude of materials provided.

Landlord Barriers - Property owners are supplying tenants with a pamphlet on lead hazards, but parents do not take the time to read the pamphlet. Property owners are not required to supply more information than the pamphlet, despite any knowledge of a particularly lead hazardous environment. Landlords have too many lead burdened housing units to remediate the problem in all of them, especially since there are few resources available to help with abatement. Finally, property owners are aware of the scarcity of low-income housing units. It is a very competitive market for the tenant, in that they cannot be too selective or demand too much from a landlord, or they will not have a place to live. Parents are afraid of losing their homes and feel that any home is better than no home. Finally, landlords know that parents do not know their rights and that if they (the parents) cause any problems they can evict them without recourse.

Recommendations by Healthchek coordinators – Healthchek coordinators recommended a 'one-stop' system in which parents could take their children to one facility to have a complete Healthchek exam (including the blood lead test). Parents should not have to visit a separate laboratory for this service. Other suggestions include making Healthchek exams mandatory (this is unlikely to occur), increasing education via schools, public service announcements, and TV ads, and increasing compliance among physicians.

D. Laboratory Directors

i. Methods

Design. All 35 laboratories identified as processing blood lead samples for Ohio were identified by the Ohio Department of Health. Initially, a letter was mailed to the director of the laboratory explaining the study and requesting participation in the phone survey. One week after the letter was mailed, we attempted to contact the laboratory director to determine interest in participation and to schedule a time to complete the phone survey. Lab directors agreeing to participate were contacted at a

pre-determined time and the phone survey was completed. Out of the 35 letters originally sent, one letter was sent back as non-deliverable and 6 labs were not interviewed because they did not do blood lead tests on children. Twenty-two interviews were completed, yielding a 79% (22/28) response rate.

Instrument. Laboratory directors (or designees) were asked to answer both open and closed ended questions (Appendix B) related to the steps used by the lab to process the Heavy Metal Form. Barriers related to providers, the lab, and ODH were explored. Because no research has been done in this area, questions were developed for this project. Survey questions were reviewed by staff from ODH and ODJFS, and by 14 members of the ODH Lead Education Committee. The survey requested information related to processing the blood lead specimens, completing the Heavy Metal Reporting Form, receipt of follow-up information on EBL, and reimbursement for blood lead levels. The survey took approximately 20 minutes to complete.

ii. Laboratory Directors Survey Results

Table 2.1 summarizes the survey findings from the Laboratory Directors. All respondents worked in a CLIA certified laboratory; 82% were lab directors, 9% were lab technicians who specialized in processing blood lead levels; respondents had been in their position an average of 11.6 years (SD = 8.6 years). Over 80% of respondents reported they were aware of the ODH Heavy Metal Reporting Form, had been oriented to the form, were submitting the form electronically to ODH, and had experienced no problems submitting the forms. However, only 68% were currently using the form. The two most common problems encountered when completing the form included determining the child's race and getting a completed form from the provider. All respondents were aware of Medicaid, but only half were aware of Healthy Start, and only 18% were aware of SCHIP (State Children's Health Insurance Program).

Approximately one-third of the responding laboratories completed less than 1,000 blood lead tests per year, and 25% completed more than 5,000 tests per year. Reimbursement for blood lead tests ranged from \$5/sample to \$55/sample. Eighteen percent of respondents noted their lab always notified the provider of the blood lead results; approximately 14% notified the provider only if the blood lead level was above 20 µg/dL, and 9% did not notify the provider until the blood lead level reached 40µg/dL. When asked at what blood lead level the lab notified ODH, 86% stated they notified ODH of all blood lead levels. Yet all respondents stated all the blood lead levels they processed were reported to ODH.

When asked if the laboratory felt a part of the blood lead poisoning surveillance team, only about one third noted they 'always' felt a part of the team. Sixty-three percent of the respondents had never been shown any appreciation for their services in processing blood lead levels.

The majority of respondents (77%) stated there were no quality problems in blood lead level analysis. One respondent noted there were methods of getting around quality control measures; another stated they can't recheck samples because the blood quantity is too small, two noted frequently samples were from contaminated sites such as cleanliness was not always adhered to in obtaining blood samples.

Suggestions from laboratory respondents. Respondents were asked for suggestions to improve the processing of samples for blood lead levels. Several suggestions focused on providers and included educating providers regarding how to complete the Heavy Metal Form so that all required data elements would be reported and paying providers to complete the form. Suggestions also included evaluating the necessity of including all demographic information since many times that information is not known or readily available, especially Medicaid eligibility and race. Laboratory respondents also suggested including blood lead testing with immunizations, increasing quality control for blood lead samples, and increasing communication with ODH. Respondents noted they want to be involved in the lead blood process and not contacted only when there are problems (See Appendix C for all responses).

Table 2.1. Laboratory directors' responses to interview questions (n=22).

Variable	%
Aware of ODH Heavy Metal Reporting Form	86.4%
Received orientation on completing Heavy Metal Reporting Form	81.8%
Currently using Heavy Metal Reporting Form	68.2%
If yes, using most current version	73.3%
In completing the Heavy Metal Reporting Form, have you had problems with:	71.4%
Determining child's race	50.0%
Including Medicaid number	50.0%
Determining child's Medicaid eligibility/enrollment status	63.6%
Incomplete parent/contact information	81.8%
Getting a completed form from the provider	
Other problems:	4.5%
Address	9.0%
Birth date	9.0%
Capillary or venous sample	4.5%
Gender	
Time to process a Heavy Metal Reporting Form	
0-4 min	68.8%
5-9 min	18.8%
10 or more min.	12.5%
Submit Heavy Metal Reporting Form	
Electronically	72.7%
Hard copy	27.3%
Problems encountered when submitting Form to ODH	
None	90.9%
Transmittal	4.5%
Blood lead processing method used	
Atomic Absorption	45.5%
ACV	27.3%
ICP	4.5%
Lead Care Analyzer	4.5%
Other	18.2%
Number of blood leads done annually	
Less than 1000 tests	30.0%
1001-3000 tests	30.0%
3001-5000 tests	15.0%
5001 – 26,4000	25.0%
At what blood lead level do you notify the provider?	
All	18.2%
9 or less	13.6%
10-15	36.4%
20-25	13.6%
40-45	9.1%
At what blood lead level do you notify ODH?	
All	86.4%
10	9.1%
20	4.5%
How many blood lead levels does your lab process, but not report to ODH?	100%
None	
Received follow-up information on a child with an EBL?	36.4%
Reimbursement per blood lead specimen? (n=8)	

Variable	%
\$5-\$14	25.0%
\$15-\$20	37.5%
\$35	12.5%
\$40-\$55	25.0%
Feel part of the blood lead surveillance team?	
Always	36.4%
Sometimes	40.9%
Never	22.7%
Anyone shown appreciation for your services in processing BLL?	36.4%
Aware of:	
Healthy Start?	50.0%
SCHIP?	18.2%
Medicaid	100%

E. Ohio Health Plan (OHP) Providers

i. Methods

Design. A stratified (rural, urban, suburban) random sample of OHP providers was surveyed via mail. Initially, a packet including a cover letter explaining the survey, the survey form, stamped addressed return envelope (addressed to the Principal Investigator (PI)), and a small incentive (card with lead risk assessment questions) was mailed. A week after the initial mailing, a post-card reminder was mailed thanking those that responded and requesting those that have not respond to do so. Three weeks after the initial mailing, another survey packet was mailed to all non-respondents (Dillman, 1978). Beginning five weeks after the initial mailing, we attempted to call non-respondents to request the survey be completed either by mail or via phone. However, because phone numbers were not accurate or available, this became a time intensive endeavor that did not result in many additional completed surveys.

Sample. During Calendar Year 1999 there were 3,242 providers who filed an OHP claim for an EPSDT testing or a comprehensive visit for 12-24 month old children enrolled in an OHP. The ODJFS provided an electronic file from the Medicaid Provider Database of these providers. The file contained the following information: name, address, zip code, and provider type (public, group practice, individual practice). The sampling frame was delimited by excluding those with a non-Ohio zip code (n=105) and those with a provider code that was not indicative of an EPSDT/well child provider (e.g., dentist, hospice, dialysis, pharmacy, medical equipment supplier, laboratory, ambulance, skilled nursing facility) (n=445), leaving 3,092 in the frame. A stratified random sample was drawn based on the geographic distribution of the frame: 58% urban, 15% suburban, and 27% rural.

There were 1149 OHP provider surveys mailed. Of these, 3 were no longer practicing in Ohio, 35 returned an uncompleted survey with a note stating they could not complete the survey for reasons such as: they did not provide care to children, were retired, or worked in an Emergency Department; 30 surveys were returned marked address unknown and no current address could be located. Therefore there were a potential of 1,082 respondents. Two (0.2%) refused to respond to the survey, one noted it was too long, the other noted they were not interested in completing the survey. Responses were obtained from 313 OHP providers for a 29% response rate. With a 95% confidence interval and a 5.5% margin of error, the sample size of 313 is representative of the universe of 1149 OHP providers.

Instrument. The Health Care Provider Lead Testing Practices Questionnaire was developed for this study based on several existing tools (Campbell, et al, 1996; Chaisson, & Glotzer, 1996; Choate & Polivka, 2000), data gathered from focus groups, input from ODJFS staff, ODH staff, and members of the

ODH Lead Education Committee. The ODH has conducted approximately 23 focus group discussions about barriers to the implementation of the CDC Guidelines. These focus groups were held with a diverse group of healthcare professionals as well as several smaller groups of WIC and Head Start personnel around the state. Several consistent groups of barriers emerged from the data. These included the perception of low prevalence of elevated blood lead levels (EBL) among children; access as a function of insurance, transportation and cost; education of parents and professionals; limitations of current environmental management strategies; frustration with the current reporting and tracking system. Of note, the focus groups highlighted the negative impact of managed care on the healthcare professional's ability to provide necessary follow-up services as well as a disincentive to providing testing within a capitated system.

The OHP Provider Lead Testing Practices Questionnaire was pilot tested with 2 physicians. Based on their input, changes were made until research team members, ODJFS staff, and ODH staff were satisfied that the tool collected the needed information. The instrument is primarily closed-ended with questions related to the following topics: practice and personal demographics, lead risk-assessment practices, blood lead testing practices, barriers to blood lead testing, provider practice experience related to blood lead levels, lead poisoning prevention education provided by OHP providers, and sources of lead poisoning information accessed by OHP providers. Several open-ended questions were included to allow for comments and suggestions (Contact PI for copy of instrument). Pilot testing revealed the survey took approximately 20-25 minutes to complete.

Non-respondents. Comparisons were made between respondents and non-respondents on variables available from the Provider Database (e.g., geographic area, provider type). There were no significant differences between the percentage of respondents and non-respondents from urban areas (38% & 41.3% respectively), suburban areas (27.2% & 25.6% respectively), or rural areas (34.8% & 33.1% respectively). There were no significant differences between respondents and non-respondents in percentage of respondents working in a clinic (9.7% & 7.8%, respectively), a physician office (85.4% & 91%, respectively), or a miscellaneous provider type (0.6% & 0.7%, respectively). However, significantly more respondents than non-respondents were from local public health agencies (4.2% & 0.5%, respectively). In fact, 13 of the 17 local health departments surveyed (76.5%) responded to the provider survey.

Data Analysis. Results from the OHP Provider survey are presented in total and by subgroup analysis when subgroup differences were statistically significant. The following subgroup comparisons were made: geographic area (rural, urban, suburban), medical specialty (pediatrics, all other specialties), percent of children in practice on Medicaid ($\leq 25\%$, $> 25\%$), length of time Medicaid provider (≤ 10 years, > 10 years), length of time in practice (1-10 years, 11-20 years, 21-50 years), self-report practicing in an area at high risk for lead poisoning (yes, no/don't know). Univariate differences were determined using Pearson chi-square analysis; due to the large number of chi-square analyses in order to minimize Type 1 error, only p-values equal to or less than 0.01 were considered significant. For each significant chi-square result, determination of significant cell standardized residuals were at least 2.0. Multivariate differences were assessed where appropriate with logistic regression using a backwards stepwise Wald procedure. Odds ratios and confidence intervals were calculated.

ii. OHP Provider Survey Results

Respondent Characteristics. The 313 respondents were primarily physicians, male, practicing pediatrics, in a group practice, a Medicaid provider for over 10 years, in practice for an average of 16 years (SD = 9.8), from an urban area, and work with families from areas at high risk for lead poisoning (13% of respondents did not know if they were in a high risk area). Most respondents noted that less than 50% of the children in their practice receive Medicaid (Table 3.1). Comparison of respondents with all 1999 Ohio OHP providers meeting the inclusion criteria revealed more rural respondents in the sample and fewer urban respondents. As is evident in Table 3.1, the provider type designation in the Medicaid Provider database was inconsistent with the self-reported Type of Practice.

Table 3.1. Ohio Health Provider Survey Respondent Characteristics (n=313)

Characteristic	Respondents	All Ohio OHP Providers N=3092
	Frequency (%)	Frequency (%)
Practice setting:		
Urban	119 (38.0)	1809 (58.5)
Rural	109 (34.8)	455 (14.7)
Suburban	85 (27.2)	828 (26.8)
Provider Type (per provider database)		
Clinic	110 (9.8)	291 (9.4)
Individual practice	972 (86.1)	2645 (85.5)
Group practice	33 (2.9)	124 (4.0)
Nurse	9 (0.8)	19 (0.6)
Unspecified	4 (0.4)	13 (0.4)
Type of Practice* (per survey)		
Group Practice	171 (63.6)	
Solo Practice	73 (28.5)	
Public Health Department	34 (14.5)	
Public Clinic	27 (11.4)	
Hospital Clinic	21 (8.8)	
Length of time Ohio Medicaid provider		
< 1 year	3 (1.0)	
1-5 years	54 (18.1)	
5-10 years	58 (19.5)	
> 10 years	183 (61.4)	
Medical specialty		
Pediatrics	143 (47.2)	
Family practice	135 (44.6)	
Internal Medicine	7 (2.3)	
General Practice	6 (2.0)	
Other	12 (4.0)	
Gender		
Male	159 (52.3)	
Female	145 (47.7)	
Discipline		
Physician	240 (78.4)	
Registered Nurse/LPN	36 (11.8)	
Nurse Practitioner	17 (5.6)	
Other	13 (4.2)	
Years in practice		
1-10 yrs.	106 (35.2)	
10-20 yrs.	108 (35.9)	
21-50 yrs.	87 (28.9)	
Percent of children on Medicaid in practice		
< 25	139 (46.3)	
26-50	79 (26.3)	
51-75	57 (19.0)	
76-100	25 (8.3)	
Practice in area at high risk for lead poisoning		
Yes	145 (48.0)	
No	117 (38.7)	
Don't know	40 (13.2)	

*Note: Respondents could answer 'Yes' to more than one type of practice.

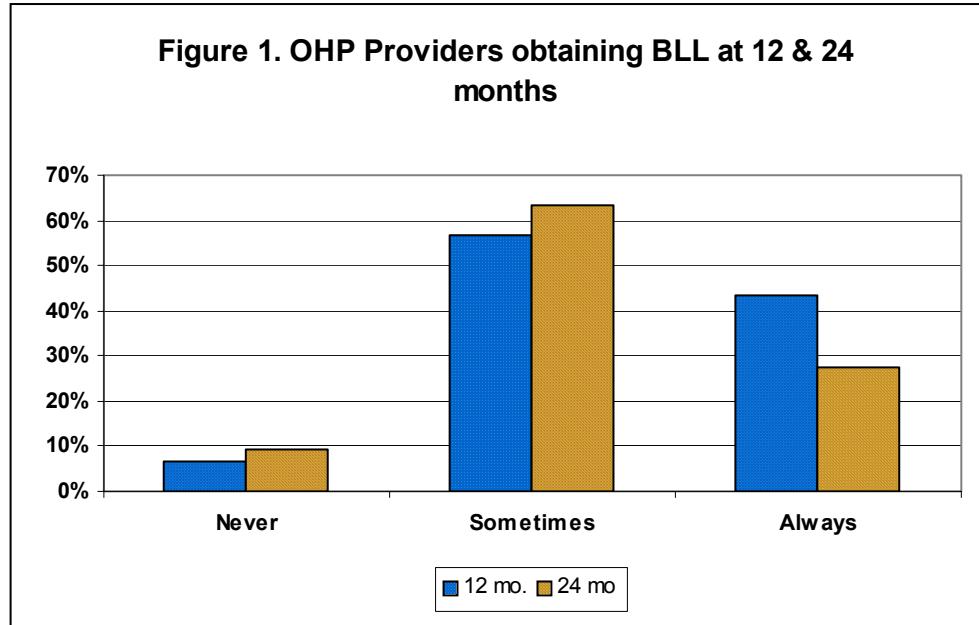
OHP Provider Lead Risk Assessment Use. One-third of the respondents (33%) reported not administering a standardized lead risk-assessment questionnaire to parents/guardians of 12 and 24-month old children and slightly more than one-third (37%) administered a risk-assessment questionnaire to the majority of parents/guardians (Table 3.2). Pediatric specialists administered a risk-assessment questionnaire significantly more often than other specialists (53% & 23% respectively, $p=0.000$).

OHP Provider Blood Lead Testing Practices. The majority of respondents (66%) noted their well-child form listed blood lead level (BLL) as a routine testing test. However, for 17% of respondents, BLL was not listed on the their well-child form. For those that do use a well-child form, a BLL was more likely to be listed as a routine testing test if 25% or more of the respondent's practice was comprised of children on Medicaid (87% vs. 69%, $p=0.001$), or they provided care in a high-risk area for lead poisoning (90% vs. 68% $p = 0.000$).

Less than half (42%) of the respondents reported drawing a BLL in their office. Blood lead levels were significantly more likely to be drawn in an office if 25% or more of the respondent's practice was comprised of children on Medicaid (57% vs. 35%, $p=0.000$). For those drawing a BLL in the office, approximately 48% only drew capillary samples, while 44% only drew venous samples. For those drawing a BLL in the office, the majority (84%) had the blood analyzed in an Ohio lab. For those not drawing BLL in the office, the lab was within 1 block of the office for 39% of respondents; for an additional 26% of respondents, the lab was within 1 mile of the office. Most provider offices (60%) did not schedule an appointment with the lab for the BLL.

Table 3.2. Provider Office Practices Related to Lead Testing

OHP Office Practice	N (%)
Percent of children receiving a lead screening questionnaire in office	
None	98 (32.9)
1-25%	57 (19.1)
26-50%	13 (4.4)
51-75%	21 (7.0)
> 75%	109 (36.6)
Well child form lists blood lead level as routine testing test	
Yes	203 (66.3)
No	52 (17.0)
Don't use a form	51 (16.7)
Do you draw blood lead levels in your office?	
Yes	128 (41.8)
No	178 (58.2)
Type of blood draw for those drawing BLL in office (n=120):	
Fingerstick only	
> 90% of the time	57 (47.5)
60-80% of the time	10 (8.3)
Venous blood (n=87)	
>90% of the time	53 (44.2)
75% of the time	1 (0.8)
How blood analyzed, for those that draw blood in office:	
In office, using ESA	8 (6.0)
Ohio lab	117 (84.2)
Non-Ohio lab	12 (3.8)
For those not drawing BLL in office, distance from office to usual lab (n=196):	
Within 1 block	76 (38.8)
Within 1 mile	50 (25.5)
> 1 mile	70 (35.7)
Staff always schedule appointment with lab	114 (59.7)
Staff never schedule appointment with lab	38 (19.9)
Staff sometime schedule appointment with lab	39 (20.4)



Respondents were asked how often they obtained BLL on 12 and 24 month-old children. Half of the respondents noted they ‘Sometimes’ obtained BLL on 12 month-old children, and about 44% ‘Always’ obtain BLL. At 24 months, the percentage of those ‘Sometimes’ obtaining a BLL increased to 63%, while those ‘Always’ obtaining BLL decreased to 27% (Figure 1).

Two logistic regressions were performed to identify factors associated with ‘always’ drawing a BLL on children 12 and 24 months (Table 3.3 & 3.4). The independent variables assessed included: urban vs. rural/suburban, having > 25% of practice be children on Medicaid (yes:no), being in practice >15 years (yes:no), pediatric specialty (yes:no), gender, drawing BLL in office (yes:no), self-reported practicing in a high-risk area (yes:no), and educating at least 50% of parents of young children about lead poisoning (yes:no).

Results of the logistic regressions indicated that the odds of providers ‘always’ testing for BLL at 12 months were 4.7 times greater if they provided lead education to more than 50% of their patients, 2.6 times greater if more than 25% of the patient population were on Medicaid, 2.3 times greater for those in urban areas, and 1.6 times greater if they had been in practice more than 16 years (confidence interval for this variable contained 1.0, indicating a lack of statistical significance). The odds of ‘always’ testing for BLL at 24 months was 4.2 times greater if at least 25% of their patients were on Medicaid, 2.6 times greater if the respondent was from an urban area, 2.6 times greater if they drew the blood in their office, 2.2 times greater if they were a pediatrician, and 1.8 times greater if they provided lead education to at least 50% of their patients (confidence interval contained 1.0, indicating a lack of statistical significance) (See Appendix E for initial regressions iteration that includes all variables entered).

Table 3.3 Logistic regression for ‘always’ getting a BLL at 12 months (n=280)

Variable	β	SE	Wald	OR (95% CI)
Provide lead education to \geq 50% of patients	1.556	0.275	31.90	4.7 (2.8, 8.1)
> 25% of patients on Medicaid	0.954	0.276	11.94	2.6 (1.5, 4.5)
Geographic area (urban)	0.814	0.279	8.54	2.3 (1.3, 3.9)
16 or more years in practice	0.483	0.274	3.10	1.6 (0.9, 2.8)
Constant	-3.021	0.512	34.78	

Table 3.4. Logistic regression for ‘always’ getting a BLL at 24 months (n=277)

Variable	β	SE	Wald	OR (95% CI)
> 25% of patients on Medicaid	1.435	0.369	15.11	4.2 (2.0, 8.7)
Geographic area (urban)	0.944	0.319	8.75	2.6 (1.4, 4.8)
Draw blood in office	0.959	0.321	8.91	2.6 (1.4, 4.9)
Pediatric specialty	0.783	0.325	5.82	2.2 (1.6, 4.1)
Provide lead education to $\geq 50\%$ of patients	0.565	0.318	3.16	1.8 (1.0, 3.3)
Constant	-4.988	0.715	48.70	

Respondents noting they ‘Sometimes’ draw BLL for children 12 and 24 months were asked what prompted them to obtain a BLL from a list of 11 options. The primary reasons identified were: Medicaid requirement, sibling with EBL, parent request, child lives in an older home, child has anemia, parental hobby/job involving lead, and pica. Additional reasons that were written in by providers included ‘living in a high-risk zip code’, ‘missed earlier or no record of a BLL’, ‘evidence of even low level exposure at 12 months’, ‘if patient has had a chance since 12 months’, ‘if lead normal at 1 year it was not done again at 24 months’, ‘lag in development’, ‘lives by a well traveled road’, ‘preschool requirement’, and ‘routine at 9 months’ (Table 3.5).

Table 3.5. Prompts to obtain a BLL at 12 & 24 months.

If Sometimes obtain BLL, what prompted to obtain BLL? (check all that applied)	N (%)
1. Medicaid testing requirement	185 (86.4)
2. Sibling with elevated blood lead levels	177 (82.3)
3. Parent request	174 (81.3)
4. Child lives/visits home build before 1960	171 (80.7)
5. Child has anemia	161 (75.9)
6. Parents have job/hobby that involves lead exposure	159 (75.0)
7. Child exhibits pica	153 (72.9)
8. Child lives near smelter, battery recycling plant, etc	134 (63.5)
9. Child has symptoms of lead poisoning	130 (61.3)
10. Medicaid pays for the test	115 (56.1)
11. Child had behavior problems	119 (38.0)

OHP Providers Perceived Barriers to Blood Lead Testing. Providers were asked to identify reasons why they might not obtain a BLL. Lists of barriers were grouped into 4 categories: Parent/guardian barriers, office barriers, system barriers, and other barriers. Barriers related to parents/guardians most often cited by respondents were ‘Parents not following through with blood lead testing’ (66%) and ‘parental refusal’ (65%) (Table 3.6). The primary office related barrier was ‘having too few children with EBL in the practice to justify mandatory testing’ (37%). Less than one-quarter of respondents identified any system barriers. The most identified system barrier was the ‘burdensome state reporting system’ (23%). Almost half (46%) of respondents identified having ‘patients tested elsewhere’ as a major ‘other’ barrier to obtaining BLL from their patients.

Exploration of barriers to blood lead testing by sub-groups revealed the following. Significantly fewer ($p=0.01$) providers from urban areas (25%) agreed with the statement “parents don’t follow through” compared with rural (39%) and suburban providers (43.5%). Significantly fewer respondents providing health care services in an area at high risk for lead poisoning (20% vs. 42%) and pediatricians responded ‘parents do not request testing’ (22% vs. 39.5%) ($p=0.000$). Providers responding that ‘parent’s don’t show up for follow-up EBL visits’ were more likely to have 25% or more of their practice comprised of children on Medicaid (39.5% vs. 11%; $p=0.000$), serve areas at high risk for lead poisoning (37% vs. 18%; $p=0.000$), and be female (39% vs. 17.5%; $p=0.000$). Providers from urban areas were more likely to respond ‘parents afraid Children’s Services will be contacted’ than parents from rural/suburban areas (11% vs. 3%; $p=0.003$).

Office barriers identified by respondent sub-groups are listed. Significantly more respondents from the following sub-groups identified ‘there are too few children with EBL in my practice to justify testing’ as a barrier: those with less than 25% of their practice comprised of children on Medicaid (50% vs. 23%; $p=0.000$), those that perceived they were not practicing (or didn’t know) in an area at high risk for lead poisoning (50% vs. 19%, $p=0.000$), and males (44.5% vs. 26%; $p=0.001$). Respondents having less than 25% of their practice comprised of children on Medicaid (37% vs. 10%; $p=0.000$) and non-pediatric practitioners (31% vs. 13%; $p=0.000$) were significantly more likely to identify as a barrier the statement “I do not see enough children on Medicaid to justify staff for lead draws”. Significantly fewer respondents with offices in areas at high risk for lead poisoning (12% vs. 30%; $p=0.000$) and those specializing in pediatrics (14% vs. 28%; $p=0.003$) responded positively to ‘compare to other issues, lead is less important’. Male respondents (33% vs. 15%; $p=0.000$) were significantly more likely to positively respond to the statement ‘Medicaid does not pay enough for blood lead draws’.

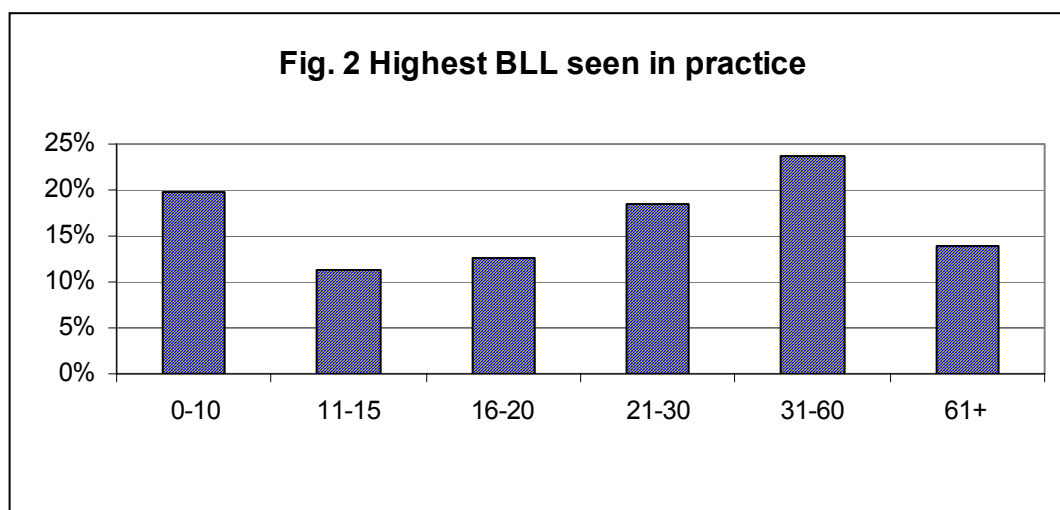
Other significant barriers by sub-group included pediatricians (14.5% vs. 29%; $p=0.002$) and those working in areas at high risk for lead poisoning (11% vs. 34%; $p<0.000$) less likely to note as a barrier the statement “I do not know which areas served by my practice are at high risk for lead exposure”. “Using a risk assessment tool and only obtain BLL for those identified at risk” was identified as a barrier significantly more often by those with less than 25% of their practice comprised of children on Medicaid (42.5% vs. 18.5%; $p<0.000$) and those not providing (or did not know) services to areas at high risk for lead poisoning (38% vs. 19%; $p<0.000$). Not knowing it was necessary to routinely do BLL tests was identified as a barrier significantly more often by those with less than 25% of their patients on Medicaid (19% vs. 6%; $p=0.001$) and not serving (or not knowing) patients living in an area at high risk for lead poisoning (19% vs. 4%; $p<0.000$).

Table 3.6. OHP Providers Perceived Barriers to Blood Lead Testing (n=313)

Barriers to Blood Lead Testing	N (%)
Barriers related to parents/guardians:	197 (66.3)
Parents don’t follow through with blood lead testing	194 (64.9)
Parents refuse	145 (49.0)
Parents don’t see importance	95 (31.9)
Parents do not request testing	61 (28.9)
Parents don’t show up for follow-up EBL visits	84 (20.9)
Lack of transportation to lab	49 (16.6)
Too expensive for parent	38 (13.1)
Parent’s don’t have money for remediation of lead	25 (8.5)
Parents don’t want to be evicted	17 (5.8)
Parents afraid Children’s Services will be contacted	
Barriers related to office:	108 (36.9)
Too few children with EBL in practice to justify mandatory testing	83 (28.0)
Lack of staff to draw bloods	80 (27.6)
Don’t bill for blood leads	76 (26.8)
Medicaid doesn’t pay enough for blood lead draws	70 (24.0)
I don’t see enough children on Medicaid to justify having staff person to draws	68 (23.1)
Lead exposure is best handled by the health department	66 (22.2)
Compared to other issues, lead less important	51 (17.6)
OSHA requirements too difficult for in-office draws	35 (12.3)
Practice not CLIA certified	12 (4.1)
Unaware of lab services that will analyze blood for lead	10 (3.4)
Medicaid will not pay for blood lead testing	6 (2.0)
Follow-up visits for EBL are too hard to schedule	

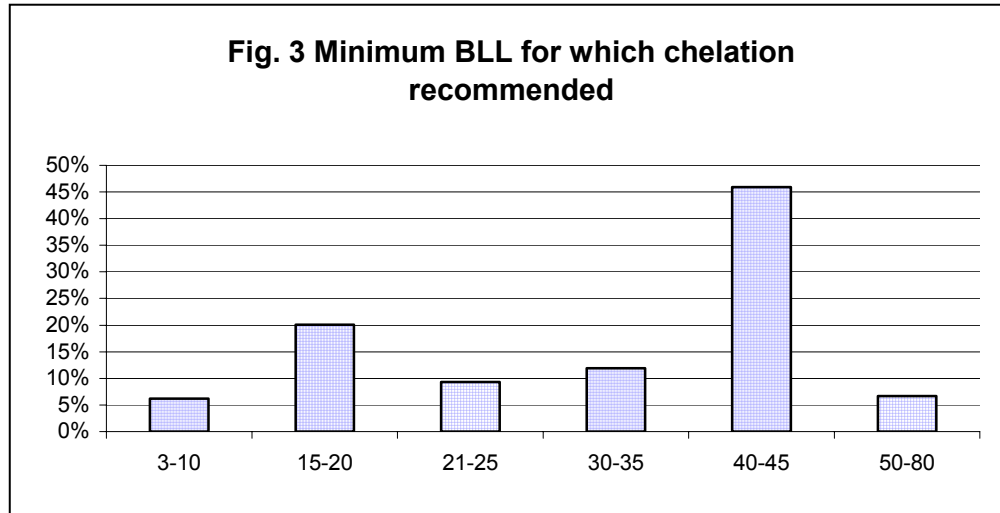
Barriers to Blood Lead Testing	N (%)
	65 (22.6)
System barriers to blood lead testing:	52 (18.0)
State reporting system is burdensome	45 (15.4)
Blood lead testing recommended for children on Medicaid, not required	44 (14.9)
There are not practical ways to remove lead from environment	35 (12.2)
Uncertainty about guidelines for blood lead testing & management	10 (3.4)
No available referral resources for lead poisoning	
Lack of acceptable treatment for EBL	
Other barriers:	132 (46.3)
Patients are tested for BLL elsewhere	87 (30.1)
Use a risk assessment questionnaire and only obtain BLL for those at risk	67 (22.9)
Don't know which areas served by my practice are at high risk for lead exposure	37 (12.8)
Unaware it was necessary to routinely do blood lead tests	

OHP Provider Practice experiences related to Blood Lead Levels (BLL). Four open-ended questions were asked to assess current practices with regard to blood lead results. Respondents were asked the highest BLL they had ever seen in practice, the minimum capillary level for which they would obtain a venous BLL, at what BLL they would recommend a child receive chelation, and at what BLL they would recommend parents receive anticipatory guidance (parental education about blood lead hazards). Results are presented in Figures 2-5.

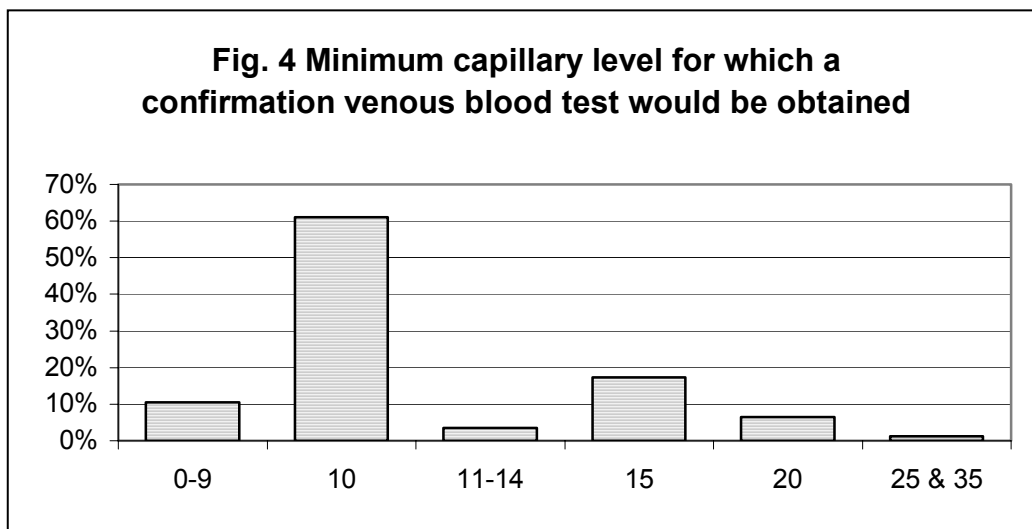


When asked the *highest BLL ever seen in practice*, responses ranged from 0-380 µg/dL, the mean response was 34.4 µg/dL (SD = 35.8); when the outlier (380) was omitted from the analysis, the average highest BLL seen in practice was 32.9 µg/dL (SD = 27.5). As is evident in Figure 2, the most common responses were 0-10 µg/dL and between 31-60 µg/dL. Significantly more respondents from urban areas reported seeing higher BLL, as did those with more than 25% of their client population on Medicaid, those with more than 10 years experience as a Medicaid provider, and those reporting they served an area at high risk for lead poisoning (Table 3.7).

Responses to the inquiry regarding the *minimum BLL they would recommend chelation*, ranged from 3-80 µg/dL (M=34.4, SD=13.7) (Figure 3). Consistent with ODH standards, about 46% of respondents noted they would recommend chelation between 40-45µg/dL. However, 6% reported recommending chelation at or below 10 µg/dL and 3.5% at or above 60µg/dL. There were no significant differences in responses by subgroups.



The average *minimum capillary BLL for which a confirmatory venous sample* would be obtained was 11.4 µg/dL (SD=4.0). Responses ranged from 0 to 35 µg/dL with the majority of respondents (61%) answering 10 mg/dL (consistent with ODH standards) and an additional 17% responding 15 µg/dL (Figure 4). There were no significant differences by subgroup comparisons for this question.



The majority of respondents (56%) reported they recommend *parental education* at a BLL of 10 µg/dL (M=8.6, SD=5.7) (Figure 5). Approximately 18% of respondents recommended education at a BLL of 0µg/dL, implying education is recommended for all patients. However, a small percentage (2%) did not recommend parental education until BLL were over 25µg/dL. Male respondents reported recommending BLL at significantly higher levels than female respondents (Table 3.7).

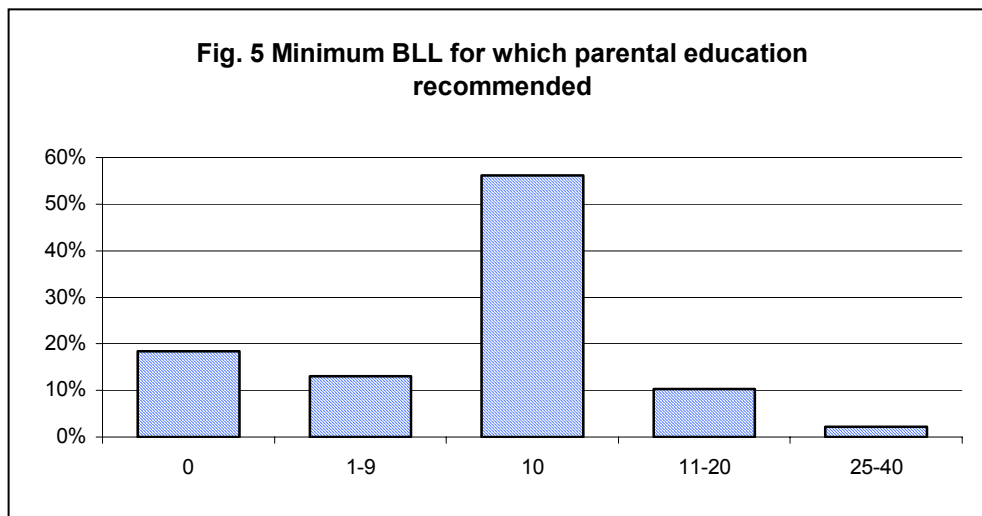


Table 3.7. Analysis of highest BLL ever seen in practice, by subgroup.

Characteristic	M (SD)	F	p
What is the highest BLL you have ever seen in your practice?			
Geographic area			
Urban (n=95)	42.8 (32.4)	14.0	<0.000
Suburban (n=60)	30.8 (25.2)		
Rural (n=72)	21.5 (14.8)		
Percent of practice on Medicaid			
<25% (n=89)	25.9 (24.6)	11.3	0.001
>25% (n=130)	38.5 (28.7)		
Length of time Medicaid provider			
< 10 years (n=89)	28.1 (24.5)	5.3	0.023
> 10 years (n=128)	36.7 (29.2)		
Serve high risk area for lead poisoning			
Yes (n=119)	43.0 (30.5)	37.8	<0.000
No/don't know (n=102)	21.7 (18.3)		
At what minimum BLL do you recommend parental lead education?	9.76 (6.3)	8.2	0.005
Male (n=107)	7.6 (5.0)		
Female (n=110)			

Current practice was also assessed by asking respondents to identify actions they would take in two hypothetical lead blood cases assessed. The first case was:

A 12-month old male presents for his well-child exam. His exam is normal and he lives in a low risk for lead zip code area. Medicaid covers his office visit. What actions would you most likely take? (Circle yes or no for each statement):

1. *Nothing needs to be done.*
2. *Administer a Lead Risk Assessment Questionnaire*
3. *Order a blood lead test to be drawn*
4. *Send him to the local health department for a blood lead test.*

Table 3.8. Responses to case concerning 12-month old.

Response option	N (%)
Nothing more needs to be done	32 (10.6)
Order a BLL to be drawn	202 (67.3)
Administer Lead Risk Assessment Questionnaire	116 (38.5)
Send him to the local health department for a BLL	24 (8.0)

The majority of respondents (67%) answered they would obtain a BLL (the most desired response). However, over one-third noted they would administer a risk assessment questionnaire. Less than 10% responded they would send the family to the local health department. About 70% of respondents answered 'Yes' to only one of the response options. For those that answered 'Yes' to more than one option (n=73), 3 respondents answered they would 'do nothing more', but also said 'yes' to another option (1 chose 'administering a risk assessment questionnaire', 1 chose 'yes' to all the items, and 1 chose to 'send the child to the health department'). Fifty-six (76%) noted they would both 'administer a lead risk' questionnaire and 'order a BLL be drawn'; 5 (7%) responded they would both 'administer a lead risk assessment' and 'send the child to a local health department for a BLL'; 3 (4%) would 'order a BLL' and 'send the child to a health department'; and 6 (8%) noted they would do all three activities.

Significant differences by subgroups are listed in Table 3.9. Males, those that do not perceive they practice in a high-risk area for lead poisoning, and non-pediatric specialists were more likely to respond that 'Nothing more needs to be done'. Respondents who practiced in an area at high risk for lead poisoning, or were pediatricians were more likely to order a BLL be drawn. No other differences by subgroups were identified.

Table 3.9. Significant subgroup responses to scenario concerning 12-month old

Response option	%	p
Nothing more needs to be done		
Females (n=140)	5.0	0.002
Males (n=157)	15.9	
High risk area for lead (n=143)	4.2	0.000
Not a high risk area for lead or don't know (n=153)	16.3	
Pediatric specialty (n=141)	5.0	0.002
Other specialty (n=155)	15.5	
Order a BLL to be drawn		
High risk area for lead (n=142)	80.3	0.000
Not a high risk area for lead or don't know (n=152)	55.3	
Pediatric specialty (n=139)	79.9	0.000
Other specialty (n=155)	55.5	

The second hypothetical case was:

A 24-month old female is new to your practice. She lives in an area that is low risk for lead exposure and her parents have answered ‘no’ to all of the Lead Risk Assessment questions except one, to which they have responded with a ‘don’t know’ since they are new to the area and are renting. She was just signed up for Medicaid 2 days ago. What actions would you most likely take? (Circle yes or no for each statement):

1. *Do nothing more.*
2. *Request that parents find out the age of their rental property*
3. *Obtain a blood lead level*
4. *Perform a Denver II screening test to be certain development is normal.*

Table 3.10. Responses to scenario concerning 24-month old.

Response option	N (%)
Do nothing more.	32 (10.6)
Obtain a blood lead level	215 (71.2)
Perform a Denver II screening test to be certain development is normal	49 (16.2)
Request that parents find out the age of their rental property	63 (20.9)

Over 70% of respondents noted they would ‘obtain a BLL’ (the desired response). However, about 27% of the respondents noted they would ‘perform a Denver II screening’ (not relevant to this case) or ‘do nothing’. Approximately 74% of respondents only answered one option for this case. Of those choosing more than one option (n=59), 17 (29%) noted they would both ‘find out the age of the property’ and ‘obtain a BLL’; 8 (14%) would both ‘find out the age of the property’ and ‘complete a Denver II screening’; 23 (39%) would ‘obtain a BLL’ and ‘complete the Denver II’; 10 (17%) would do all 3 activities; and one respondent noted they would ‘do nothing’ and ‘obtain a BLL’.

Analysis by subgroups revealed that significantly fewer respondents in high-risk areas responded ‘do nothing more’. Respondents that self-identified as being from an area at high-risk for lead answered they would ‘obtain a BLL’ significantly more often, as did pediatricians, and those with over 25% of their practice on Medicaid (Table 3.11).

Table 3.11. Significant subgroup responses to scenario concerning 24-month old

Response option	%	p
Do nothing more.		
High risk area for lead (n=142)	4.9	0.003
Not a high risk area for lead (n=154)	14.9	
Order a BLL		
High risk area for lead (n=142)	85.9	0.000
Not a high risk area for lead or don’t know (n=154)	57.8	
Pediatric specialty (n=140)		
Other specialty (n=156)	82.1	0.000
	60.9	
<25% of children in practice on Medicaid (n=136)		
>25% of children in practice on Medicaid (n=157)	60.3	0.000
	80.3	

Lead Poisoning Prevention Education by OHP Providers. Respondents were asked the percentage of parents/guardians of young children they educate about lead poisoning prevention. Approximately 16% provide no education to parents, while about 43% educated most parents regarding lead poisoning prevention (Table 3.12).

Table 3.12. Percentage of parents educated about lead poisoning prevention

Percentage of parents	N(%)
None	48 (15.6)
1-25%	89 (29.0)
26-50%	37 (12.1)
more than 50%	133 (43.3)

Based on chi-square analysis, female respondents reported educating more than 50% of their patients significantly more often than male respondents (55% vs. 33% respectively; $p=0.000$), as did those with more than 25% of the children in their practice on Medicaid (52.5% vs. 32%, respectively, $p=0.000$), those practicing in an area at high risk for lead poisoning (57% vs. 30%, respectively, $p=0.000$), and pediatricians (55% vs. 32%, respectively, $p=0.000$).

Respondents were then asked in what ways lead poisoning education occurred in their practice. Respondents could answer 'yes' to any of the eight items listed or write in a response (Table 3.13). The most common methods of educating parents included 'physician discussion' (85%) and 'having printed materials available in the clinic' (62%). Only about 30% of respondents 'routinely mailed/distributed materials to families', and seldom is a 'video running in the waiting room' (4%) or a 'recording used when callers are on hold' (3%). Additional educational methods written in by respondents included: bulletin boards, discussion during home visits, handouts/brochures, and articles in local newspapers.

Table 3.13. Educational methods used by OHP Providers for lead poisoning prevention

Educational Method	N (%)
Physician discusses during patient visit	228 (85.4)
Printed materials available in clinic for families to take home	163 (61.7)
Staff discussed during patient visit	91 (35.1)
Nurse practitioner discusses during patient visit	75 (30.5)
Printed materials mailed/routinely distributed to families	74 (28.9)
Educational video runs in waiting room	11 (4.3)
Recording is used when callers are on hold	7 (2.8)

Practices with more than 25% of the patients on Medicaid significantly more often had a 'staff member discuss lead poisoning prevention' with parents during an office visit (45% vs. 22%, $p=0.000$). Printed materials were reportedly 'mailed/routinely distributed to families' more often by practices with more than 25% of their patients on Medicaid (38% vs. 18%, respectively, $p=0.000$) and by pediatricians (39% vs. 19%, respectively, $p=0.001$). Printed materials were significantly more often available in clinics for families to take home when the practice included more than 25% Medicaid patients (71% vs. 50%, respectively, $p=0.000$) or respondents practiced in an area at high risk for lead poisoning (73% vs. 50%, respectively, $p=0.000$). Subgroup analysis was not completed for these last two options because of small numbers.

Sources of lead poisoning information accessed by OHP providers. Respondents were asked to denote sources of lead poisoning information they personally used from a list of 14 options (Table 3.14). The most common sources of information included both local (88%) and state health departments (74%) and the medical literature (72%). Additional sources of information included the American Academy of Pediatrics (AAP) (53%), a local physician specializing in lead poisoning (39%), CDC (38%), and ODH Lead Regional Resource Centers (31%). Less than one-fourth of the respondents utilized the state or local Department of Job and Family Services, local lead clinics, local grand rounds, the EPA, Poison Control Centers, or PLANet. Other sources of information written in by respondents included the American Association of Family Practice, and the Ohio Academy of Family Physicians.

Table 3.14. Sources of information for lead poisoning prevention used by OHP providers.

Information sources	N (%)
Local health department	261 (87.9)
Ohio Department of Health	216 (73.5)
Medical literature	213 (72.2)
American Academy of Pediatrics	154 (52.6)
Local physician specializing in lead poisoning	115 (39.1)
CDC	111 (37.9)
ODH Lead Regional Resource Center	91 (31.4)
Lead clinics	69 (23.5)
Ohio Dept. or Job and Family Services	54 (18.7)
Grand Rounds at local hospital	54 (18.7)
EPA	53 (18.3)
Poison Control Centers	51 (17.5)
PLANet (Pediatric Lead Assessment NETwork)	30 (10.4)
County Dept. of Job and Family Services	27 (9.3)

Subgroup analyses were completed only on those sources identified by at least 50% of respondents. The only significant subgroup difference revealed that pediatricians utilized the AAP significantly more often (71%) than providers from other specialties (36%).

Familiarity with state lead poisoning prevention initiatives. Respondents were asked if they had received correspondence from Ohio Medicaid regarding blood lead testing, if they were familiar with their local Healthchek Coordinator, the Ohio Childhood Lead Poisoning Prevention Program (OCLPP), the Heavy Metal Reporting form and the ODH program PLANet.

Ohio Medicaid and blood lead testing. About two-thirds of respondents (n=209, 68.8%) replied they had received correspondence from Ohio Medicaid regarding blood lead testing; 19.2% had not and 11.5% were unsure. There were no significant differences by subgroup with regard to recalling receiving such correspondence.

For those that did recall receiving correspondence (n=209), respondents were asked about the usefulness of the information (Table 3.15). About 82% noted the information enhanced their understanding of state blood lead testing requirements, 72% agreed the correspondence provided them with useful guidelines for blood lead testing, and 71% became aware of the reporting requirements. Less commonly cited uses for the correspondence included: facilitating a review of the blood lead testing in their practice (65%) and providing them with a contact source for further information (59%). No differences by subgroups were identified with regard to usefulness of the information from Ohio Medicaid.

Table 3.15. Usefulness of Ohio Medicaid correspondence (n=209)

Use of correspondence	N (%)
Became aware of state requirements related to blood lead testing	172 (81.9)
Provided me with useful guidelines for blood lead testing	147 (71.7)
Became aware of blood lead test reporting requirements	147 (71.0)
Facilitated a review of the blood lead testing for my practice	134 (64.7)
Provided a contact source for further information	123 (59.1)

Healthchek Coordinators. Respondents were asked if they were familiar with their local Healthchek Coordinators and if they had ever contacted their local Healthchek Coordinator to assist with compliance related to elevated blood lead levels. Only 21.5% (n=64) replied they were familiar with the Health Check coordinators. Thirty-three respondents (11.2%) had ever contacted the Healthchek coordinators. There were no significant differences by sub-groups.

OCLPP and PLANet. Respondents were asked if they were familiar with the OCLPP and with PLANet. About 45% (n=132) were familiar with OCLPP and 20.5% (n=62) were familiar with PLANet.

Of those familiar with PLANet, 22 (35.5%) had heard a presentation, 4 (6.5%) had a presentation scheduled, 4 (6.5%) did not want a presentation, and 32 (52%) had not had any contact with a PLANet provider. Of those that had attended a PLANet presentation 9% (n=2) did not find the presentation helpful, 27% (n=6) found it somewhat helpful, 32% (n=7) found it helpful, and 32% (n=7) very helpful.

Analysis by subgroup on familiarity of PLANet revealed that females were significantly more likely to be familiar with PLANet (31% vs. 11%, $p=0.000$), as were providers with more than 25% of their practice on Medicaid (29% vs. 10%, $p=0.000$), those that had been a Medicaid provider for more than 10 years (25% vs. 11%, $p=0.003$), and those that practiced in an area at high risk for lead poisoning (30% vs. 11%, $p=0.000$).

ODH Heavy Metal Reporting Form. Respondents were asked if they were familiar with the ODH Heavy Metal Reporting form. If they were familiar, respondents were asked to identify problematic areas with the form (Table 3.16). Only 19% of respondents (n=57) noted they were familiar with the form. No differences by subgroup were identified with regard to familiarity with the form. Of those that were familiar with the form, the most common problems identified included: determining the child's Medicaid eligibility (30%), parents misplacing the form (28%), the time it takes to complete the form (26%) and lack of having the form available electronically (25%).

Table 3.16. Problems with ODH Heavy Metal Reporting Form (n=57)

Problems	N (%)
Determining if the child is Medicaid eligible or enrolled	17 (29.8)
Parents misplace the form	15 (27.8)
Form is too time consuming	15 (26.3)
The form is not available electronically for easy printing	14 (25.0)
Including child's Medicaid number	10 (17.5)
Unsure which programs are not considered Medicaid	10 (17.5)
Having someone designated in practice to complete form	10 (17.5)
Difficulty including parent contact information	8 (14.0)
Determining child's race	6 (10.5)
Difficulty including provider information	6 (10.5)
Lab used will not accept the form	5 (8.9)
It is inconvenient to copy the form	5 (8.9)

OHP suggestions for improving the BLL testing process and/or lead poisoning prevention.

The last question on the survey asked providers to identify how they would improve BLL testing and/or the lead poisoning prevention process in Ohio. See Appendix F for verbatim responses. Education was a common theme for providers. A few providers requested additional information regarding testing requirements and treatment for those with EBL, others asked for brochures/flyers for parents that are simple, complete, and are provided immediately post-birth. One provider commented on the need to have a physician agree to be a state resource person for blood lead testing and treatment. Overall, providers identified a need for consistent, current, relevant, and timely information for both providers and parents. Another common theme related to easing the requirements for blood lead testing, such as allowing fingerstick samples, obtaining a BLL only on children with an identified risk via a risk assessment questionnaire, increasing reimbursement for testing, testing all children regardless of insurance (Medicaid) status, and adding blood lead testing to well child flow sheets. A final common thread among several providers revolved around the role of the health department. Providers wanted local health departments to consistently share the results of blood lead tests they perform with primary care providers; another suggestion was to have health departments complete the lead tests for all children.

F. Parents/Caregivers of Children Receiving Medicaid

The research questions pertaining to parents/guardians of 1 and 2 year old children enrolled in an OHP were addressed initially from three focus groups, then via a random sample mailed survey, and finally from an analysis of Medicaid claims data and Ohio Department of Health STELLAR data.

i. Focus Groups

a. Methods & Results

Design. Three focus groups were convened to identify current levels of parent awareness of the dangers of elevated blood lead levels (EBL) for young children and to identify barriers and facilitators to obtaining blood lead level testing. Data gathered from the focus groups also assisted in refining the instrument used in the mailed survey.

Ohio's 88 counties were divided into groups identified by the State as predominately urban, suburban, and rural. One rural, one urban, and one suburban county were randomly selected from the groups. Women, Infant, Children (WIC) and Help Me Grow offices were contacted in randomly selected counties and asked to participate in the study by organizing a group of parents for the focus group during a regularly scheduled parent group.

The first focus group was held in an urban area WIC office and included 6 African-American participants. The participants were asked by the WIC coordinator to come to the focus group. Ten individuals were asked to participate. One participant left after 15 minutes to pick up a child. The second focus group occurred in a rural area and included 15 women and 2 men recruited from the county's Help Me Grow program. One participant was African-American; the others were white. The final focus group took place in a suburban county WIC office. All participants were white females. Two of the participants were grandmothers caring for young children. There were a total of 28 participants in the three focus groups. All participants signed an informed consent form.

Participants were given a small incentive (school lunch box filled with educational materials) for participation. Parents were assured that nonparticipation would not incur consequences for parent or child. Refreshments were provided. An experienced moderator led the focus groups (M. Gottesman). An assistant moderator (B. Polivka or Graduate Research Associate) operated the tape recorder, took comprehensive notes, attended to environmental conditions and logistics, and responded to unexpected interruptions. Focus group tapes and notes were reviewed and data assessed for patterns to responses.

Focus Group Procedures. Focus groups began with a brief description of the group's purpose and signing of consent forms followed by a structured discussion around the following open-ended questions.

1. What have you heard about the dangers of high blood lead levels in very young children? How did you learn about this information?
2. Have you had your child's blood checked for lead?
 - If yes, where?
 - If no, can you talk about your decision? What factors (beliefs, people, potential, etc.) influenced your decision?
 - If everyone had their child checked for blood lead ask: What have you heard from others about not getting their child's blood level checked?
3. What things would make it easier for you to have your child's blood lead level checked?
4. How do you like best to learn about facts important to your child's health?

b. Focus Group Results

A detailed summary of responses to each focus group question will be presented initially. These summaries will include direct quotes from focus group participants in italics. An overall summary of the focus group findings will conclude this section of the report.

What have you heard about the dangers of high blood lead levels in very young children? How did you learn about this information?

Responses to this initial question revealed that many focus group attendees were unaware of the danger of lead in the environment *"I've never heard of a lead problem"*. Others commented about the impact of lead or sources of lead poisoning: *"Lead makes the child sick"*, *"You get lead poisoning from dirt, paint off the wall, pencils"*. *"Lead poisoning caused blood disorders, it can bother the heart, children can die from it, kids don't eat a lot when they have high blood lead levels."* Several participants noted they first heard about blood lead testing during a well-child visit. One woman said that she was given a lead hazard information pamphlet when she purchased her home. Another noted the landlord had them complete a survey that mentioned lead poisoning. Another stated *"HUD has to check your house for lead before you can move in."* Two mothers stated their children had BLL of 15 µg/dL. A mother of a child with a BLL of 29µg/dL noted her daughter had watched the Sesame Street video a number of times and was able to sing the song on lead prevention methods developed for the video. This mother also stated someone came out to her home once, but never returned as promised. There was a problem in getting the city to follow-through on what they said they would do. Two women from the suburban focus group mentioned that they learned about lead from the TV. All of the suburban participants said they had read about it in either a parenting magazine or from materials given at the hospital when they were discharged with their newborn.

Participants asked a number of questions about lead exposure, blood lead testing, and lead poisoning. They were very interested in learning. Parents asked if children should automatically be tested for lead or if they should look for signs/symptoms to alert them to have their children tested. Other questions included: *"Doesn't lead cause ADD?"* *"How often should I have my child tested?"* *"If children are diagnosed with ADD are they automatically tested?"* *"What do you do if your child is lead poisoned?"* *"Does lead keep a child from eating?"* This participant said her granddaughter was too small for her age and that she had no interest in eating. She thought it was due to lead poisoning. *"Do old trailers have lead paint?"* Participants were confused about the sources of lead. One father said he works with lead at his job, but he did not realize that he could be exposing his child to lead via his work clothes.

Participants were confused about which tests their child was given. They said the doctors just take blood but they don't know for which tests. Another participant commented that doctor's ask about the different environments in which a child plays or lives in order to determine if there are various routes of exposure. One provider even asked if the parents were separated. Another parent commented *"If your child doesn't get tested, you need to take your child to get screened"*

Have you had your child's blood checked for lead?

Many respondents indicated their child had been tested for blood lead levels. However one suburban participant noted *"How do we know if they have been tested? If the doctor tested them, he didn't tell me. I wish the doctor would tell me what he does to my child."* *"How do you test them?"* *"Is it covered under normal insurance?"* Several noted that they needed a medical form completed for Head Start and BLL is part of that testing (Note: this requirement is specific to each Head Start program, not all Head Starts require a BLL). One mother had a baby with her (~2 months old), she stated her child was checked for breathing problems, but not for lead. A few participants noted that they are unable to have the BLL completed at the WIC clinic, *"it would be easier if they could get their lead level at WIC"*. The mother with the child with a 29 µg/dL BLL stated her daughter went on a special diet high in iron. The *'blood*

test was OK.” Others commented: *“It’s no big deal to get a blood lead test”*. *“It’s scary to find out your child has lead poisoning”* not clear what lead poisoning means.” *“Child can get it from anywhere”*

One participant described her situation in which her daughter was peeling paint off the wall and biting into the mini blinds. She was hyperactive and the mother took the child to her provider. The mother described the behaviors to the doctor and inquired about lead poisoning. The doctor did not test the child, and stated the child did not have lead poisoning, but rather had ADHD. The child was now 6 years old and had not been tested for lead poisoning.

Rural participants noted that you could obtain a BLL at either the Health Department or a local hospital. The hospital employees were perceived to be much nicer to the parents and the children. Parents preferred to have their children tested at the hospital.

When participants were asked, “Would you ever refuse a blood lead test”, one rural participant replied, *“Why would you ever refuse something that you know is going to help your child? It’s such a small thing that could help so much”*. Another answered, *“It is my child and if I don’t want them to be stuck, then I will refuse. It’s my choice”*.

What things would make it easy for you to have your child’s blood lead level checked?

A number of suggestions to make the process of obtaining BLL easier were mentioned. One comment was: *“Important every child be tested”* *“Children can’t avoid crawling around”*. Several participants commented that BLL should be required: *“Blood lead testing should be part of the physical check-up”* *“Need mandatory screening”*. *“If you have Medicaid coverage, you have to use your Medical card.”* *“Blood lead testing should be free”*. *“The doctors need to be open on Saturdays.”* *“They need to have one facility where all services are provided.”*

Some of the clinics perceived as ‘nicer’ provided pacifiers or toys to divert the child’s attention while being stuck. This was perceived as very helpful. Other places give coloring books to the children after the blood is drawn. Having these types of diversions available helped the child forget about the traumatic event. Another suggestion was to have the provider come to their home to do the blood draw. Participants commented this would be less stressful for everyone.

Some suggestions adding BLL to standard WIC blood work, improving transportation, and easing the process for Medicaid recipients. Specific comments included: *“Hardest part of getting to the doctor – transportation.”* *“The lab was in the same building as the doctor’s office, that made it easy.”* A number of participants agreed it would be very helpful if the WIC test included the lead test so that the child did not have to be stuck more than once. Parents agreed it would be helpful if the enough blood could be obtained from one stick and used for various tests.

One urban mother with both biological and foster children said that getting her biological children tested was easy because she had private insurance. For the foster children, she had to go to different clinics. Foster children went to an urban public clinic. The wait was long and she had to be there at 9AM. At the public clinic you sit for a long time, even though the waiting room was empty. For the foster children, she had to take the children within a certain time frame, and then wait. Also, certain clinics took longer, the participants knew at which clinics there was a long wait, and at which they would receive prompt attention.

Many participants mentioned their frustrations with those who draw the blood. *“They just pin the child down and act as if they do not care at all. They make no effort to comfort the child, they just stick them and if they can’t find a vein, they continue to stick them until they do”*. They said it is very traumatic for the child. The parents recommend getting more skilled individuals to draw the blood so that they won’t have to stick the child several times. Parents would appreciate a little care and concern for their child who is being stuck. Another participant was disturbed by the provider wanting to have a BLL drawn when she took her child in for his shots. She said it was too much for a child to undergo in one day. *“They shouldn’t do it all at once”*.

How do you like best to learn facts important to your child's health?

Many parents agreed that lead education presented in pamphlets was fine, but the material needed to be readable. Others noted they preferred to speak with their provider. Respondents in the urban and rural focus groups preferred to learn about lead via videos. They said that they do not read pamphlets and if they do, they need to be concise. Also, billboards might be an effective option for educating the public about lead. Several participants noted they wanted to learn about lead poisoning when their child was still a newborn, not wait until their child was in pre-school. A few advocated for public services announcements on television. They commented the ones they had seen were too brief. They needed to be a little longer and include a phone number where more information could be obtained.

Suggestions from the suburban focus group included *“There needs to be a parenting night where everyone gets together one night a week, someone teaches parents about health topics”*. Suburban parents suggested receiving a checklist from the physician regarding the services provided during the visit. They preferred a sheet with immunizations, blood tests, etc. They want the provider to review all of the tests performed during a visit. They wanted the visit to be more personal.

Other comments and suggestions.

Other discussion items focused on landlords, inspections, and relocating. Several respondents commented they had issues with their landlord and that the home inspectors should come out to their homes. Some respondents stated landlords were part of the problem; they would not repair the problems. *“I had to move, my landlord didn't correct the problem”* *“Landlords need to keep their places up”* - *“Moving is hard”*. In contrast, one respondent stated *“Where I was living was an old house with lead paint, the landlord helped with painting and my child's BLL went down”*

A suggestion by an urban participant was to include a question on the WIC screening tool about blood lead testing and the results of the BLL test. If the child had not had a BLL then the WIC staff can encourage the parent/caregiver to obtain a BLL and provide a list of resources. A suburban participant was unclear as to who was responsible for assuring her child was tested for BLL *“Are we supposed to ask them to do a lead screen, or do they just do it? They should tell us what they do to our children.”*

c. Focus Group Summary

Parents revealed a great deal of misinformation related to methods of lead ingestion, symptoms, and blood lead testing requirements. Many parents did not know if their child had been tested, nor did they know the results of the testing if it had occurred. Parents clearly wanted more information on the blood lead testing process and the consequences of having a high level of lead in their child's blood. Parents requested the system be changed to more easily accommodate their multiple responsibilities. They preferred that blood be drawn during a WIC or other clinic visit and that they not be required to travel to an additional location for the testing. Parents also wanted well-trained phlebotomists. Parents appreciated healthcare workers who were able to distract the child with toys or activities during the blood drawing procedure. Although parents acknowledged they received pamphlets or brochures related to lead poisoning prevention, they wanted the materials at the appropriate literacy rate. They also wanted the educational information directly conveyed to them by their healthcare provider and to have videos available that could reinforce the messages.

ii. Random Sample Survey of Parents/Caregivers

a. Methods

Design. After focus group data were analyzed and the survey instrument refined, a sample of parents/guardians of children ages 12 and 24 months currently enrolled in an OHP was surveyed by mail. Using the Total Design Method (Dillman, 1978), a survey packet was mailed to randomly selected parents/guardians. The packet included a cover letter, the survey instrument, a bookmark, and a stamped pre-addressed envelope addressed to the PI. One week after the initial mailing, a postcard reminder was sent thanking respondents and requesting non-respondents complete the survey. At three and seven weeks after the initial mailing, another survey packet was mailed to non-respondents. Respondents to the survey were mailed a thank-you letter that included a reward of a 30-minute pre-paid phone card.

Sample. A stratified random sample was drawn from the 89,158 children enrolled in an OHP between the ages of 12-24 months as of January 30, 2002. The population of Medicaid parents/guardians was stratified by geographic area (urban/suburban vs. rural). ODJFS provided an electronic file of parents/guardians of these 89,158 children. All children had been enrolled in Medicaid for at least 6 of the previous 12 months. Having the child enrolled at least 6 of the previous 12 months assured uninsured status was not a major parental barrier to blood lead testing. The electronic file from which the random sample was drawn included: child's name, parent/guardian name, address, zip code, and child's age. A random sample of 1,656 parent surveys were mailed; of these, 284 were returned as non-deliverables (no forwarding address) and 2 refused to participate. There were 542 returned surveys for a 39.5% response rate.

The required number of parents/guardians from each stratum was determined by using the formula that provides the sample size needed to estimate a population proportion with a precision of plus or minus five percent ($\alpha=0.05$, variance maximized at .25). It was determined that 380 parents were needed from urban areas and the same amount from rural/suburban areas. The total number of parents/guardians needed 760. This sample size was not obtained. However, with a 95% confidence interval and 5% margin of error, a sample size of 400 was needed to enable generalizations to the population. The sample size of 542 exceeded that minimum.

Instrument. The survey instrument developed is based on several existing tools (Chaisson & Glotzer, 1996; Polivka, 1999; Kegler, et al, 1999) (Contact PI for copy of parent survey instrument). The original tool was refined based on input from ODJFS staff, ODH staff, M. Casavant (consultant), and members of the ODH Lead Education Committee. The tool was pilot tested at the end of the suburban focus group. Changes based on parent input were incorporated. Based on pilot testing, the tool was completed in 5-10 minutes.

The instrument includes 10 closed-ended questions with response options of yes/no/don't know and 'circling' all appropriate responses. One open-ended question at the end of the survey asked "Is there anything else you can tell us about blood lead testing?" Survey questions requested information pertaining to ever receiving information about lead poisoning, the individuals they had spoken with about lead poisoning (6 options listed), ever receiving a card/letter from a provider about lead blood testing, if their child had ever had a blood lead level completed, where the blood lead level was obtained, and if it was elevated. For children with an EBL, parents were asked what types of education they had received to decrease their child's BLL. If a child had not had a BLL, parents were asked about barriers to testing. Barriers listed related to the child (4 options), parents (9 options), and other (4 options). Respondents could check all the barriers that applied. Respondents were also asked the 5 standard CDC Lead Risk Assessment questions to determine potential risk for lead poisoning and the method they preferred to receive lead poisoning information (8 options). Demographic information was collected (age, gender, marital status, race/ethnicity, educational level, number of doctors child visited in past year). The Flesch-Kincaid reading level on the parent survey is at the 4.5 grade level.

ODJFS Medicaid claims data and ODH STELLAR data. The Ohio Department of Job and Family Services (ODJFS) Medicaid claims database and the Ohio Department of Health (ODH) STELLAR

database contain information on respondent characteristics that are key to interpretation of survey findings. The ODJFS provided both the STELLAR and the Medicaid claims data. The STELLAR database included blood lead laboratory tests for children less than 6 years of age in Ohio. Data were obtained for the years 1998, 1999, and 2000. Two additional file types were obtained from the ODJFS that contained claim information on outpatient and physician visits, as well as blood tests claims for children in the sample. Again these files were obtained for 1998, 1999, and the year 2000. From the ODJFS there were three key variables of interest that were examined: 1) the number of comprehensive or EPSDT visits per year; 2) the number of well-child visits made to the health care provider per year; and 3) the number of blood lead levels for each child in the sample per year. In the ODH Stellar data we were interested in the identification of children that had a blood level drawn in any one of the three years.

Variable Definition. CPT codes were used to identify EPSDT visits; to assure that the identification was consistent with ODJFS the appropriate CPT codes were identified with the assistance of the Office for Health Plans. The CPTs used to identify EPSDT visits were 99431, 99432, 99381, 99832, 99384, 99385, 99391, 99392, 99393, 99394, and 99395. Well child visits were identified (again with the assistance of ODJFS) with the following V codes: V202, V703, V705, V706, V708, and V709. Blood lead tests were identified using CPT code 83655. From the ODH file we identified children that had a blood level recorded.

Data base manipulation. Several edits had to be performed to count visits. First, if there were multiple EPSDT visits or multiple well-child visits for the same child on the same date we limited the number to 1. We then summed for each child the number of EPSDT and well child visit in each of the three years. We also identified a blood lead test and summed over this variable for the year. Next we merged the ODH STELLAR file and the created ODJFS files (containing visit and blood lead tests) by the recipient number. This then was the data set for analysis—giving us one line of data for each recipient for each year.

Non-respondents. Non-respondents were compared to respondents on key demographic characteristics from the Medicaid claims and STELLAR databases (Table 4.1). There were no statistical differences between respondents and non-respondents with regard to child's age, months of Medicaid eligibility, mean number of provider visits in 2000 and 2001. The child of respondents had significantly more provider visits in 1999 than the child of non-respondents; significantly more respondents were from rural areas, and significantly more children of respondents had had a blood lead level completed.

Table 4.1. Comparison of parent respondent/non-respondent characteristics (n=1372)

Characteristic	Respondents (n=542)	Non-Respondents (n=830)
	M (SD)	M (SD)
Child's age	1.95 years (0.6)	1.94 (0.6)
Months Medicaid eligible	11.5 (1.4)	11.5 (1.3)
Total provider visits		
1999*	3.13 (2.5) (n=173)	2.59 (2.2) (n=253)
2000	2.97 (2.3) (n=432)	2.87 (2.4) (n=669)
2001	2.42 (2.4) (n=529)	2.26 (2.2) (n=806)
	N (%)	N (%)
Geographic Area*		
Rural	203 (37.5)	254 (30.6)
Urban	235 (43.4)	432 (52.1)
Suburban	104 (19.2)	143 (17.2)
Lead test confirmed with Medicaid/STELLAR data*	223 (41.1)	291 (35.1)

*p<.05

Data Analysis. Data were initially analyzed descriptively. Results from the parent survey are presented in total and by subgroup analysis when differences were significant. The following subgroup

comparisons were made: geographic area (rural, urban, suburban), marital status (married, not married), age (16-25 years, 26-61 years), race (white, other), education (less than high school, high school, more than high school), gender of child, and months of Medicaid eligibility (6-11 months, 12 months). Significance was determined using Pearson chi-square analysis. Due to the large number of chi-square analyses in order to minimize Type 1 error, only results significant equal to or less than 0.01 were considered. For each significant chi-square result, determination of significant cell standardized residuals was at least 2.0. Multivariate differences were assessed where appropriate using logistic regression with a backwards stepwise Wald procedure. Odds ratios and confidence intervals were calculated.

b. Parental Survey Results

Respondent Demographics. Respondents were primarily female, between the ages of 20-30 years and white. About 44% were married and another 42% identified themselves as single. About 15% were African-American. The average age of respondents was 27.5 (SD=7.3) with ages ranging from 16 – 61 years. Approximately one-fifth of the parent respondents had less than a high-school education, slightly more than one-third had a high school education; the remaining 41% had at least some college or technical school. Most respondents were from an urban or rural area. With regard to the index child, about two-thirds saw only one physician in the past year, there were approximately equal numbers of male and female children in the sample. The child's race mimics that of the responding parent fairly closely. Most children were enrolled in Medicaid the entire preceding year (M=11.5, SD=1.4) and most (71%) were not eligible for an HMO (Table 4.2). Claims data revealed that about 28% of children had an EPSDT or other type of physician health visit in calendar year 1999, 68.1% in 2000, and 74.7% had a visit in 2001.

Table 4.2. Parent respondent demographic characteristics (n=542)

Characteristic	N (%)
Gender	
Female	514 (96.8)
Male	17 (3.2)
Age	
16-19 years old	31 (6.0)
20-30 years old	355 (68.3)
31-61 years old	134 (25.8)
Marital Status	
Married	231 (43.9)
Single	222 (42.2)
Divorced	38 (7.2)
Other	35 (6.7)
Racial/ethnicity	
White	402 (76.4)
Black	81 (15.4)
Hispanic	20 (3.8)
Asian/Pacific Islander	5 (0.9)
Native American	4 (0.8)
Other	14 (2.7)
Educational attainment	
Less than high school	112 (21.3)
High school	192 (36.5)
Some college	142 (27.0)
Technical school	39 (7.2)
College degree	41 (7.6)
Geographic area	
Urban	235 (43.4)
Rural	203 (37.5)

Characteristic	N (%)
Suburban	104 (19.2)
Number of doctors child visited in past year	1 (0.2)
None	334 (61.6)
One	127 (24.0)
Two	67 (12.7)
Three or more	
Gender of child*	
Female	260 (48.0)
Male	282 (52.0)
Child's race*	
White	404 (74.5)
Black	105 (19.4)
Hispanic	22 (4.1)
Other	11 (2.1)
Months of eligibility*	
6 months	13 (2.4)
7 months	12 (2.2)
8 months	14 (2.6)
9 months	12 (2.2)
10 months	15 (2.8)
11 months	15 (2.8)
12 months	461 (85.1)
Aid Category*	
ADCR	535 (98.7)
ADCU	7 (1.3)
HMO total eligibility months	
0 months	386 (71.2)
1-11 months	91 (16.8)
12 months	65 (12.0)
Calendar Year 1999	
Total with EPSDT visit	152 (28.0)
Total non EPSDT visit	11 (2.0)
Calendar Year 2000	
Total with EPSDT visit	367 (67.7)
Total non EPSDT visit	16 (3.0)
Calendar Year 2000	
Total with EPSDT visit	404 (74.5%)
Total non EPSDT visit	10 (1.8)

*Data from ODJFS claims files

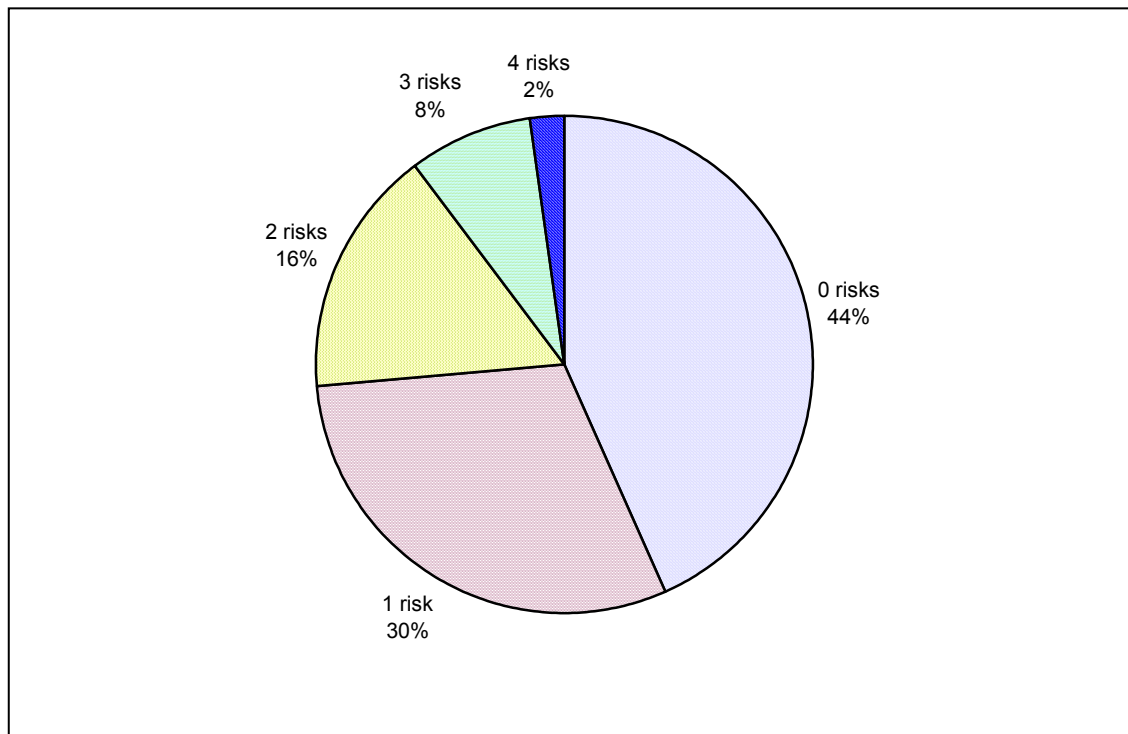
Risk of exposure to lead. Parents were asked to identify if their child could be exposed to lead using the standard CDC lead risk assessment questions (Table 4.3). The most common risk factor was living in a house built before 1950 (36%), followed by living in a house that has peeling, chipping, dusting or chalking paint (28%), and living in a home built before 1978 that is being remodeled (21%). Chi-square analysis by subgroups revealed that respondents between the ages of 16-25 years were significantly more likely to report living in or visiting a house that has peeling or chipping paint (28% vs. 17%, $p=0.002$), as did non-white respondents (33% vs. 20% of whites, $p=0.002$). Respondents with between 6-11 months of Medicaid eligibility were more likely to live in a house built before 1978 being remodeled (33% vs. 19%, $p=0.004$). Non-whites were more likely to report having a brother, sister, or playmate who has lead poisoning (8% vs. 3%, $p=0.008$). Younger respondents were more likely to report their child could come in contact with an adult who has a hobby or works with lead (20% vs. 9%, $p=0.000$).

Table 4.3. Risk factors for child lead poisoning (n=542)

Does your child:	N(%)
Live in or regularly visit a house built before 1950?	189 (36.0)
Live in or visit a house that has peeling, chipping, dusting, or chalking paint?	120 (22.7)
Live in or visit a house build before 1978 that is being remodeled?	112 (21.2)
Have a brother, sister or playmate who has or did have lead poisoning?	21 (3.9)
Often come in contact with an adult who has a hobby or works with lead?	76 (14.3)

The number of risk factors per child was summed. Results are displayed in the pie chart (Figure 6). About 43% of the parents did not report any risk factors for their child and about 57% had at least one risk factor. As is evident in the pie chart almost one-third reported one risk factor. About one-fourth of the respondents (26.4%) reported their child had two or more risk factors. Number of risk factors was dichotomized into no risk factors and one or more risk factors. Chi-square analysis did not reveal any significant differences by subgroups.

Figure 6. Number of lead exposure risk factors per child.



Receiving information about lead poisoning. Parents were asked if they had ever received any information about lead poisoning, who they have spoken to about lead poisoning, and if they had ever received a card, letter, or call about having their child tested for lead. Fifty-nine percent (n=319) noted they had received information about lead poisoning, 6% (n=33) did not know if they had ever received such information. About 18% reported they had not spoken to anyone about lead poisoning. For those who did speak to someone about lead poisoning, the most common contacts were at health departments/WIC (59%) or their child's physician/nurse (56%) (Table 4.4). Respondents generally did not receive information from daycares, local Medicaid offices, or pharmacies. Other sources of

information written in by parent responders included landlord (n=13), school (n=8), Section 8 housing (n=7), real estate agent (n=3), house inspector (n=2), and news/TV (n=2). Most respondents reported receiving information from 1-2 sources (76%) (M=1.8, SD=1.0)

Table 4.4. Reported discussions about lead poisoning.

Who have you talked to about lead poisoning? (check all that apply)	N(%)
No one	97 (17.9%)
Someone at health department or WIC	315 (59.3)
Child's doctor or nurse	297 (55.8)
Family member or friend	104 (19.4)
Someone at child's daycare or Head Start	44 (8.3)
Someone at county Medicaid office	23 (4.3)
Someone at the pharmacy	6 (1.1)

Table 4.5. Number of sources spoken to about lead poisoning.

No. persons	N(%)
0	12 (2.8)
1	175 (40.2)
2	157 (36.1)
3	68 (15.6)
4	20 (4.6)
5	3 (0.7)

Blood Lead Testing. Respondents were asked if they had ever received a card, letter or phone call about having their child tested for lead. Slightly more than one-fourth (28.2%, n=150) had received such a reminder. About two-thirds (64.4%, n=343) had not, and 39 respondents (7.3%) did not know. There were no significant differences by subgroups.

When asked if their child had ever had a blood lead test, about half (56%, n=296) self-reported their child had had a BLL. Sixteen percent (n=85) did not know if their child had had a BLL (Figure 7). There were no differences by subgroup with regard to reporting if their child had a BLL completed.

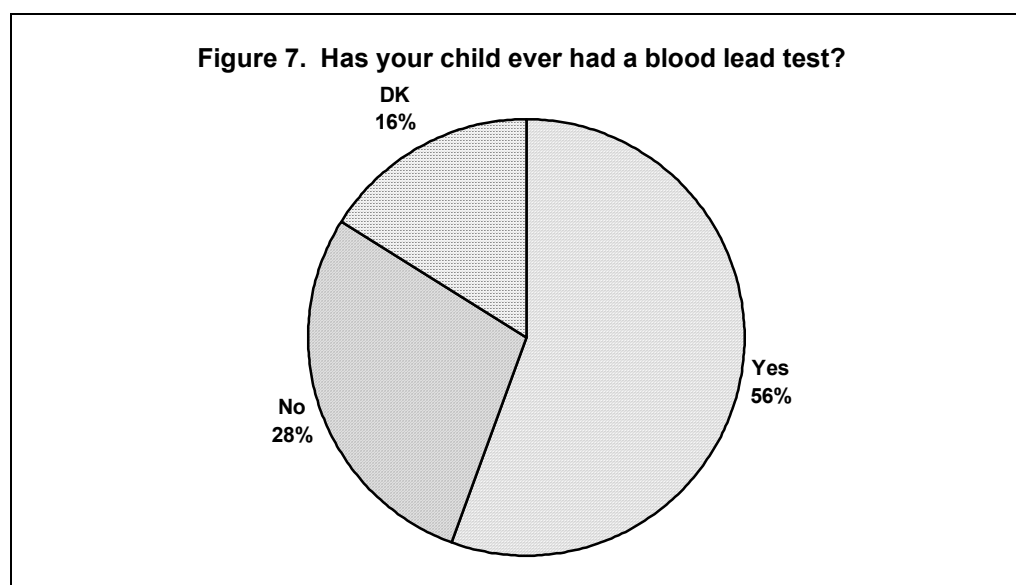


Table 4.6. Where was your child's blood lead level drawn? (n=296)

Location	N (%)
Physician office	166 (56.1)
WIC Clinic	146 (49.3)
Hospital clinic or lab	74 (25.0)
Health Department	28 (9.5)

Blood lead testings of the respondents were also assessed using Medicaid claims data and STELLAR data (Table 4.7). In calendar year 1999 only 6% children had a blood lead test (most likely due to young age of children); in 2000 about 11% had a blood lead test, yet only 7.6% had both a STELLAR record and a Medicaid claims record of the test. In 2001 about one-fourth of the respondents had a blood lead test and about 19% had a record in both STELLAR and claims data. Based on Medicaid claims data, 3 children had two blood lead levels drawn in 2000, in 2001, 5 children had 2 lead levels drawn and 1 child had 3 lead levels.

Between 1999-2001, for 31% of the sample, there was evidence via the Medicaid claims data/CPT codes that a BLL had been completed; for 34% there was an indication via STELLAR data. BLL were identified either in STELLAR/Medicaid claims data for 41% of the sample. On univariate analysis, a record of a BLL via STELLAR or Medicaid claims data was more likely to have occurred if the child lived in an urban area (49%) compared to rural (32.5%) or suburban (39%) ($p=0.002$). A record of a BLL via STELLAR or Medicaid claims data was also more likely to have occurred if the respondent was black or Hispanic (52%) compared to white (38%) ($p=0.007$). Non-white respondents (40%) were significantly more likely than white respondents (28%) to have had a BLL Medicaid claim between 1999-2001 ($p=0.012$). No significant differences by subgroup were identified for the STELLAR data.

Comparisons of parent reported BLL with data from STELLAR/ Medicaid claims data revealed that for 35% of the sample there was no indication (either per parent or per database) that a BLL was drawn. For another 34.5% of the sample, a BLL was reported either by the parent or there was evidence in STELLAR or the Medicaid claims data that a BLL was completed. For the final 31% of the sample, parents reported a BLL had been completed and there was confirmation in the STELLAR/Medicaid data that a BLL had been drawn.

For parents that stated in the survey that BLL had been drawn, there was confirmation for 56% that this procedure had been completed. However, for 44% of parents who stated their child had had a BLL, there was no indication in the STELLAR /Medicaid claims data that a BLL had been done. There were no significant differences identified by subgroup analysis. Given that almost half of the parents inaccurately reported that a BLL had been done, relying on parental self-report is a questionable practice.

For 77% of parents who stated their child had not had a BLL, this was confirmed by STELLAR and Medicaid claims data. However, for 23% of those for whom parents noted their child had not had a BLL completed, there was either a STELLAR or Medicaid claims record that a BLL had been completed. Parents in urban areas were significantly more likely ($p=0.003$) to have had a BLL drawn yet report no BLL (urban = 35%, rural = 16%, suburban = 15%). Similarly, a BLL was documented via STELLAR or Medicaid claims data, but not reported by parents significantly more often for black/Hispanic parents (38%) compared to white parents (18%) ($p=0.008$). Although more parents were accurately able to report that their child had not had a BLL drawn, almost one fourth were unaware their child had had a BLL. Again, the reliability of parental self-report for BLL is lacking.

Table 4.7. Blood lead testing validation from claims data and STELLAR data (n=542)

Blood lead testing	N (%)
Calendar Year 1999	
Blood lead test per STELLAR	0 (0)
Blood lead test per CPT codes	6 (1.1)
Both STELLAR & CPT codes	0 (0)
Calendar Year 2000	
Blood lead test per STELLAR	63 (11.6)
Blood lead test per CPT codes	54 (11.1)

Blood lead testing	N (%)
Both STELLAR & CPT codes	41 (7.6)
Calendar Year 2001	
Blood lead test per STELLAR	147 (27.1)
Blood lead test per CPT codes	131(24.2)
Both STELLAR & CPT codes	102 (18.8)
Totals for 1999-2001	
CPT lead test	169 (31.2)
STELLAR lead test	184 (33.9)
CPT or STELLAR lead test	223 (41.1)
BLL per parent, STELLAR/CPT, 1999-2001	
No BLL per parent or per database	189 (34.9)
BLL per parent or per database	187 (34.5)
BLL both per parent and per database	166 (30.6)
BLL per parent survey, 1999-2001	
No confirmation in STELLAR/CPT	130 (43.9)
Confirmation in STELLAR/CPT	166 (56.1)
No BLL per parent survey, 1999-2001	
No BLL in STELLAR/CPT	182 (77.1)
BLL in STELLAR/CPT	54 (22.9)

Two logistic regression analyses were completed using a Wald Backward elimination procedure. Dependent variables for the first regression was parental report that their child had had a BLL drawn (no/don't know:yes); the dependent variable for the second regression was documentation that a BLL was drawn in Medicaid claims data/STELLAR data (no:yes). Independent variables for both regressions included: married (no:yes), eligibility for Medicaid (6-11 months:12 months), rural/suburban: urban, received a reminder card for a BLL (no:yes), receive information on lead poisoning (no:yes), child's age (≤ 2 yrs, > 2 yrs.), education (greater than HS: HS or less).

Results of the first logistic regression (Table 4.8) indicated the odds of a child having a BLL completed between 1999-2001 were 1.9 times greater if parents had received a reminder card, 1.7 times greater for those living in urban areas, 1.6 times greater if the parent had ever received any information on lead poisoning, and 1.6 times greater if the child was over 2 years old. Results of the second logistic regression (Table 4.9) indicated the odds of a parent reporting a child had a BLL via the survey were 5.6 times greater if the parent had received a reminder card, 4.4 times greater if the parent had ever received information on lead poisoning, 1.8 times greater if they resided in an urban area, and 1.5 times greater if the mother had a high school education or less. (See Appendix E for initial regressions iteration that includes all variables entered).

Table 4.8. Logistic Regression: Blood lead test in STELLAR/Medicaid data, 1999-2001

Variable	β	SE	Wald	OR (95% CI)
Received reminder to have blood lead tested (yes)	0.646	0.213	9.207	1.9 (1.3, 2.9)
Type of geographic area (urban)	0.558	0.187	8.858	1.7 (1.2, 2.5)
Received information on lead (yes)	0.503	0.201	6.295	1.6 (1.1, 2.5)
Age of child (> 2 yrs.)	0.496	0.187	7.025	1.6 (1.1, 2.4)
Constant	-2.325	0.440	27.91	

Table 4.9. Logistic Regression: Parental report of child having BLL

Variable	β	SE	Wald	OR (95% CI)
Received reminder to have blood lead tested (yes)	1.714	0.275	38.83	5.5 (3.2, 9.5)
Received information on lead (yes)	1.397	0.212	43.58	4.0 (2.7, 6.1)
Type of geographic area (urban)	0.588	0.208	8.00	1.8 (1.2, 2.7)
Education (\leq HS)	0.408	0.212	3.709	1.5 (1.0, 2.3)
Constant	-2.845	0.404	49.66	

Location of Blood Lead Testing. When asked where their child's blood lead levels were drawn, respondents primarily noted a physicians' office (56%), followed by WIC clinic (49%) and a hospital clinic/lab (25%). It is interesting to note that at the time of this study, no WIC clinics were drawing blood lead levels. Respondents from rural areas significantly less often had their child's BLL drawn at a physicians' office (rural: 43.6%, suburban: 56.3%, urban: 64.6%, $p=0.005$).

Elevated Blood Lead Levels. For the 296 children whose parents reported having had a blood lead test, only 10 (3.4%) reportedly had an elevated blood lead level; 61 (20.7%) parents/caregivers responded they didn't know if their child's blood lead level was elevated. Further assessment of the 10 children with a reported EBL revealed 8 had 1 or more risk factors for lead poisoning, 5 were from urban areas, 4 from rural and 1 from a suburban area. 5 were white, non-Hispanic, 3 were black, non-Hispanic, and 2 were Hispanic. Based on the STELLAR data and Medicaid claims data, 4 of the children did not have a BLL completed between 1999-2001 (Cases 6,7,8, & 10). Three of the children had BLL per STELLAR data in both 2000 & 2001 (Cases 1, 2, & 3). Three children had STELLAR confirmation of BLL in 2001 (Cases 7, 8 & 9) (Table 4.10).

Table 4.10. Cases of EBL per parent and BLL draw per STELLAR/Medicaid claims data. (n=10)

EBL CASE	STELLAR 2000	Medicaid 2000	Both, 2000	STELLAR, 2001	Medicaid, 2001	Both, 2001
1	X	X	X	X	X	X
2	X	X	X	X	X	X
3	X			X	X	X
4						
5						
6						
7				X		
8				X	X	X
9				X	X	X
10						

Respondents who noted their child had an EBL were then asked if they had been instructed to do any activities to assist in lowering their child's EBL. Although only 10 parents noted their child had an EBL, 28 respondents answered these questions (Table 4.11). The most common responses included eating healthy foods (71%), washing hands before eating (57%), providing the child with multi-vitamins (46%), regularly cleaning the house (43%), keeping paint chips from spreading (39%), running tap water in the morning (36%), and removing the lead from the home (36%).

Table 4.11. Activities to lower EBL per parents/caregivers (n=28).

Activity to lower EBL	N (%)
Eat healthy foods	20 (71.4)
Wash my child's hands before eating	16 (57.1)
Give my child multi-vitamins	13 (46.4)
Clean the house often	12 (42.9)
Keep the paint chips from spreading from one place to another	11 (39.3)
Run tap water in the morning to clear lead from pipes	10 (35.7)
Remove lead from my home	10 (35.7)
Contact the landlord about the lead problem	9 (33.3)
Move to another home	7 (25.9)
Use a special electric vacuum	7 (25.0)
Have a professional remove the lead	6 (21.4)
Go to a doctor for special medicine to remove lead from child's body	6 (22.2)
I was not told anything	2 (7.70)

Barriers to blood lead testing (parent perspective). Parents were asked to identify reasons why their child had not had a BLL drawn. Barriers to lead blood lead testing related to the child, to parents, and other reasons were listed. Parents could check all that apply. The major barriers to blood lead testing were: not being told about needing a blood lead test (61%) and not living in an older home (51%). Additional barriers identified by at least one-fourth of the respondents included: not knowing the test was important (30%) and not being told were to go for the test (25%) (Table 4.12). No differences by subgroup were identified. Additional reasons written in by respondents included:

“Apartment landlord said all paint used in the buildings was lead free”,
 “Didn’t think it had to be done before 3”, “having our kids tested never crossed my mind as something that needed to be done”,
 “He has no need to do this test”,
 “I didn’t think she could catch it if she didn’t come into contact with it. I didn’t know it was in pottery”?
 “I didn’t think that lead poisoning was so high of a risk”,
 “She is on WIC and I thought they tested for lead”
 “I had no idea about lead poisoning, let alone the need to get blood test for that”
 “I know they took blood, but I don’t know if they were just checking her iron level”
 “If it is a regular test I know she got it. I just don’t remember, she always gets her shots regularly”
 “My daughter has not shown any symptoms of high blood lead levels. I know what to look for”
 “Never told about it!”
 “No one has ever offered to test my child”
 “They do it at Head Start”
 “They stuck him 10 times and did not get it”
 “We do not agree with unnecessary blood testing”
 “We were never told to do it and it wasn’t something I would ask for on my own”

Table 4.12. Barriers to blood lead testing per parents (n=542)

Barriers	N(%)
Barriers related to the child:	
Child does not live in an old house or old building	137 (50.7)
It’s upsetting to see a child get stuck with a needle for a blood test	45 (16.7)
My child is too young to get lead poisoning	9 (3.3)
Our family might have to move out of our home if my child has EBL	7 (1.3)
Barriers related to Parents	
Parents not told their child needed a blood lead test	165 (61.1)
Parents not told the test was important	80 (29.6)
Parents were not told were to go to get the test done	67 (24.8)
Parents did not think their child could get lead poisoning	49 (18.1)
Parents do not have money to fix a lead problem	26 (9.6)
Parents forgot about the test	24 (8.9)
Parents do not feel anything will be done about lead anyway	10 (3.7)
Parents might get into trouble if child has EBL	5 (1.9)
Parents do not want lead inspector in their home	4 (1.5)
Other reasons	
People who draw blood do not do a good job	11 (4.1)
Test costs too much	9 (3.3)
Wait in the clinic, lab, doctor’s office was too long	9 (3.3)
Blood test was a different location and there was no way to get there	6 (2.2)

Preferences for educational information. Respondents were asked to identify how they would like to receive information about lead poisoning prevention from a list of 8 options. Most respondents indicated they would prefer to have brochures/pamphlets (71%), followed by information from their child's doctor or nurse (51%), the health department/WIC (32%), TV (31%), and Videos (25%) (Table 4.13). The number of options chosen by respondents was summed. Most respondents (88%) identified two or three means by which they would like information (M=2.5, SD=1.9) (Table 4.14). Subgroup analysis using One-Way ANOVA revealed white respondents identified fewer informational options (M=2.4, SD=1.8) compared to non-white respondents (M=2.9, SD=2.1) (F=6.97, p=0.009). Non-white respondents and those with less than a high school education significantly more often preferred information via videos (p=0.008 & p=0.003, respectively). Non-white respondents also preferred information via billboards/signs and via home visits significantly more often than white respondents (p=0.014, p=<0.000, respectively) (Table 4.15).

Table 4.13. Preference for educational informational delivery (n=542).

Information preference	N (%)
Brochures/pamphlets	365 (70.9)
Doctor/nurse	258 (50.1)
Health department/WIC	165 (32.0)
Television	157 (30.5)
Videos	131 (25.4)
Radio	94 (18.3)
Billboards/Signs	79 (15.3)
Home visit	55 (10.7)

Table 4.14. Number of educational informational delivery options chosen (n=542)

Number of options chosen	N(%)
0	40 (7.8)
1	157 (30.4)
2	103 (58.1)
3	89 (16.4)
4	48 (9.3)
5+	79 (15.2)

Table 4.15. Significant subgroup findings for type of method of information dissemination

Information delivery option	N (%)
Videos	
White	86 (22.2)
Other	44 (36.4)
Less than high school	39 (36.4)
High school	35 (18.6)
More than high school	54 (25.2)
Billboards/signs	
White	51 (13.1)
Other	27 (22.3)
Home visit	
White	29 (7.5)
Other	26 (21.5)

Exploration related to the types of educational information respondents would prefer revealed 34% preferred both brochures and discussion with their child's physician/nurse, 24% preferred discussion with someone at the health department and their child's MD/RN, 23% indicated both brochures and a video, and 23% noted both a brochure and discussion with someone at the health department/WIC.

Other comments. Parents were asked to provide other comments or suggestions regarding blood lead testing. Verbatim written comments are provided in Appendix G. The majority of parental comments focused on their lack of awareness that lead poisoning was a major pediatric health issue, questions on where to get tested, when to get tested, or a request for more information on the topic (a brochure was mailed to all requesting additional information). Suggestions for improving the process included increasing PSA on blood lead testing, providing information in Spanish, testing for BLL along with immunizations, and developing a noninvasive testing mechanism.

III. Recommendations

Based on the findings from this study, the following policy recommendations are made. The recommendations are categorized based: providers, parents/guardians, and system-level. The recommendations include a short discussion of feasibility. Priority recommendations are identified.

A. Recommendations focused on OHP Providers

- Recommendations regarding OHP office practices:
 - Implement a consistent well-child (EPSDT) checklist form for all OHP providers that includes blood lead testing at 12 and 24 months. One of several existing forms could be adapted and available on-line for OHP providers. This recommendation could be quickly implemented.
 - Implement a quality improvement system to determine if a BLL was obtained on children enrolled in Medicaid. OHP providers need to assure that blood lead levels are obtained and results are in the child's chart and explicitly communicated to the parents. This can be accomplished via a 'tickler' system. These systems are in place for immunizations and other well-child assessments. A similar system could be implemented for BLL.
- Recommendations regarding informing and educating parents:
 - A priority recommendation is that all OHP providers need to explicitly inform all parents when a BLL is drawn and the results of the testing. The results should be written and appropriately interpreted to parents. This information should be provided on a consistent form used by all OHP providers. The form should include other routine well-child procedures such as immunizations and results of other blood work. Parents are routinely given information on immunizations on standardized forms/booklets. These forms/booklets could be updated to include BLL.
 - All parents of children enrolled in Medicaid (and all pregnant women) receive education regarding blood lead testing and lead poisoning. Education should include direct discussions as well as take home materials. The use of videos in waiting rooms as well as taped messages for on-hold phone calls should be encouraged. Additional efforts should be made to assure males, non-pediatricians, those not practicing in high-risk zip codes, and those with lower numbers of children enrolled in Medicaid are providing education regarding lead poisoning. ODJFS can provide the support needed by providers for this activity: educational materials can be mass distributed to providers, available for download on ODJFS/ODH web sites, and available at Lead Resource Centers and local health departments. Further study will be needed to see how well providing this support and encouragement translates into increased education by OHP providers of parents/caretakers of Medicaid-enrolled children. The current survey indicates providers already experience several barriers to providing more education, including perceived poor reimbursement of this activity.
- Recommendations regarding educating OHP providers:
 - A priority recommendation is to provide CME programs to OHP providers. The education provided should be focused on blood lead testing requirements, anticipatory guidance, and treatment of blood lead poisoning. The education should occur via directly mailed/mailed free CME programs and by hospital grand rounds. Directly mailing free CME programs to OHP providers is easily implemented; existing national materials (ATSDR Case Study for example) could be adapted with minimal cost. Hospital grand rounds could be delivered by a contingent of physicians knowledgeable about current ODH standards; ODH's PLANet program provides a sound basis for a grand rounds

session and is already available. Training physicians to provide grand round would require recruiting a group of dedicated, knowledgeable physicians willing to provide this service. Reimbursing these physicians for their time might increase the number of willing physicians.

- Providers need to be aware of parents desire to have an increased understanding of blood lead testing and lead poisoning. Data from this study indicate that parents want information on blood lead testing and lead poisoning and parents want their children tested. Provider education regarding blood lead testing should include information on provider bias (IOM, 2002).

B. Recommendations focused on parents/caregivers

- A priority recommendation is assuring parental education occurs in multiple forms. While most parents noted they wanted a brochure, they also requested information from more than one source. Education should include direct conversations with parents. Brochures/pamphlets provided need to be at a low literacy level. Videos, public service announcements, and TV are also educational options. Providing repeated and diverse parental education can be easily implemented.
- Develop a low-literacy, high-impact, interesting educational media campaign to empower parents/caregivers that they can request a blood lead test and should be told the results. The major message should be: “My child needs a lead test and I deserve to know what that means and what the result was”. This type of education should be provided in multiple formats such as television PSAs, print media ads, brochures, posters, and flyers. The campaign should occur annually to educate new parents/caregivers. This recommendation requires a great deal of planning, development, evaluation, and resources. However, the impact could far exceed the resources required.

C. Recommendations focused at the system-level

- Priority Recommendations:
 - Further exploration, piloting, and development of a ‘one-stop’ approach that involves WIC clinics, or blood leads being drawn in clinics and provider offices. Parents and children should not be subjected to having to go to multiple sites on different days to obtain needed services. This system-wide barrier recognized by both providers and parents must be removed. Efforts should be made to assure blood lead testing occurs either in WIC clinics along with hemoglobin levels, or in provider’s offices during routine EPSDT/well-child visits. Initial efforts in this direction are underway by ODH. These efforts require close evaluation, modification, and continued development.
 - ODJFS creating/sponsoring a tracking system for identifying 12 and 24-month old children requiring blood lead testing. This system could be aimed at providers, focused on parents, or both. If aimed at providers, it should be free to them, compatible with paper charts and/or computer records. Providers could be sent a notice in the form a 3-part carbonless form that includes the Heavy-Metal Reporting form, child demographic information, including Medicaid number. The form should be similar to a prescription requiring only a signature. A system aimed at parents could entail sending all parents with children enrolled in Medicaid a reminder card to obtain a blood lead level for their child at 12 and 24 months. The card should be clear, simple, and written at a maximum of a 5th grade reading level. A matching card should be sent to providers to serve as a

reminder to them as well. Alternately, if parents have changed providers, the parental reminder card could be a two-part document, with parents receiving one part aimed at them, and one part they can tear off and hand to the child's physician. This second part could even be a pre-populated heavy metals reporting form on one side, and a non-transferable "Coupon for a free blood lead test" on the other side. This priority recommendation will require significant planning, development, and pilot testing. The potential impact on improving BLL testing rates is dramatic.

- Begin parental education regarding BLL testing during the prenatal period. Parents need to be informed regarding the importance of blood lead testing at the same time as immunizations and other well-child procedures. ODJFS should begin working with obstetricians and midwives in testing and providing information on the importance of lead poisoning as a health problem. These educational efforts need to continue into the early post-natal period and at least until the child is 36 months of age. Education must include the physical, social, and psychological ramifications of lead poisoning as well as primary prevention methods of minimizing exposure to lead. This recommendation is feasible with direct education of providers, supplying providers with needed parental educational materials, and close monitoring of efforts and results.
- Healthchek coordinators can be essential tools in blood lead testing and follow-up. Healthchek coordinators are a critical link to assuring blood lead testing occurs and assuring children live in lead-free homes. To date, Healthchek coordinators have not been used to their full capacity. Efforts to increase the role of Healthchek coordinators are underway and should be closely evaluated for impact.
- Recommendations regarding laboratories:
 - Increase the involvement of the labs in the blood lead testing process. Increased involvement can assist in decreasing problems with the ODH Heavy Metal Reporting form and in having results submitted to ODH. Laboratories must be considered a partner in the process of eliminating blood lead poisoning. Efforts to involve laboratories are underway.
 - Increase coordination between OHP providers and laboratories. All blood lead lab results must be forwarded to both ODH STELLAR and the OHP provider. Systemic barriers to assuring lab results reach end points must be eliminated. This recommendation would involve a quality improvement efforts to identify and correct systematic problems.
- Recommendations regarding the ODH Heavy Metal
 - Review the Heavy Metal Form to determine if it can be streamlined to facilitate completion and submission. The form appears daunting to providers and reportedly has multiple missing items. The most problematic item is 'race'. The inclusion of race should be re-evaluated. If it is determined that race is a critical item, other means of obtaining this information should be explored. This recommendation would involve close scrutiny of all fields on the form to determine usefulness and need.
 - Work with CDC to develop a nationally consistent lead reporting form. A consistent form used across the U.S. would facilitate reporting for laboratories that do testing for many states. National efforts are underway and ODH staff should continue to be closely involved.

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V. Appendix A

HEALTHCHEK Coordinators
Phone Survey Questions

1. In thinking about helping children enrolled in Medicaid obtain a blood lead screening test, what problems have you encountered from the perspective of the:
 - a. Parent
 - b. Child
 - c. OHP provider?

2. In thinking about the larger system, that is beyond the parent-provider-child interaction, what problems have you encountered regarding blood lead screening of Medicaid eligibles? Such as in the areas of:
 - a. Laboratories
 - b. Completion of forms
 - c. State and local health departments
 - d. State and county Job and Family Service Departments
 - e. Landlords/property owners
 - f. Other?

3. If you could make one change in the blood lead screening process – what would that change be?

VI. Appendix B

Laboratory Directors: Barriers to the Lead Screening Process Questionnaire

The following questions pertain to your lab's experiences processing blood lead levels for young children.

1. Describe the steps that are used by your lab in processing a blood lead level.
2. Are you aware of the Ohio Department of Health "Heavy Metal Reporting Form"?
 - a. Yes
 - b. No
3. Have you ever received information about how to complete the "Heavy Metal Reporting Form"?
 - a. Yes
 - b. No
4. Are you currently using the "Heavy Metal Reporting Form"?
 - a. Yes
 - b. No
5. If yes, which version are you using? (date form developed) _____
6. What problems have you had completing the Heavy Metal Reporting form (circle all that apply)?
 - a. Determining child's race
 - b. Including the Medicaid number
 - c. Determining if child is Medicaid eligible/enrolled?
 - d. Including parent contact inform
 - e. Getting a completed form from the provider
 - f. Other: _____
7. How much time does it take to process one Heavy Metal Reporting Form? _____
8. How do you submit this information?
 - a. Electronically
 - b. Hard copy
9. What problems have you encountered when submitting the form to ODH?
10. What blood lead level processing method do you use? _____
11. How many blood lead tests do you do annually? _____
12. At what blood lead level do you notify the provider? _____
13. At what blood lead level do you notify the Ohio Department of Health? _____
14. Annually, how many blood lead levels did your lab process, but did not reported to the state? _____
15. Have you ever received any follow-up information on a child with an elevated blood lead level?
 - a. Yes
 - b. No
16. How much reimbursement do you receive per blood lead specimen? _____
17. Do you feel a part of the blood lead surveillance team?
 - a. Always
 - b. Sometimes

- c. Never
- 18. Has anyone ever showed appreciation you for your services in processing blood lead levels?
 - a. Yes
 - b. No
- 19. Are you aware of the following different types of Ohio Health Plans for children:
 - a. Healthy Start
 - b. CHIP
 - c. Medicaid
- 20. What suggestions do you have to improve the processing of blood lead levels for children?

Demographics:

- 1. Is your laboratory CLIA certified:
 - a. Yes
 - b. No
- 2. What is your position?
 - a. Director
 - b. Lab technician
 - c. Other
- 3. How long have you been in this position? _____

Thank you very much for taking the time to answer these questions.

VII. Appendix C

Survey of Laboratories

Suggestions by respondents to improve the processing of samples for blood lead levels in children.

- Vaccinations and lead prevention. Lead screening should be included on checklist. Lead pamphlets need to be sent home with newborn.
- Better education of physicians in terms of completing forms. Need to strictly enforce this.
- Communication with ODH. We don't hear about problems until they are out of hand. We would like more guidance and assistance along the way; not only bad news.
- Physicians need to supply form, completed. Need one form for all states.
- Form is too time consuming; better communication with the state. State needs to send out information that discusses the problems and offers solutions.
- Health departments that receive grants should help labs of the local health departments who don't have much funding.
- Improve quality of samples received. CLIA should implement random quality control inspections to weed out dishonest analyzers.
- Increase screening and make easier for parents. Establish screening clinic that doesn't require patient see a physician before blood test. Physician visits too time consuming.
- Paperwork too time consuming. Electronic access would be helpful.
- Receive complete information from physicians. State needs to hold providers more accountable for incomplete forms.
- Requisition doesn't include Medicaid number;
- Don't know if child is Medicaid eligible or not; screen more kids
- Should be a threshold under which you don't have to report to ODH.
- Simplify demographic information on form. Need national database created by someone other than own lab.
- Standardization of program (ie data entry, submission to ODH). Should be one standard form.
- System is seamless, but sometimes do not get complete information from provider
- Test too many kids because most leads are not elevated and it seems like a waste.
- The only way to get complete information from providers is to implement financial gain at the source; pay providers to complete forms.
- Too much paperwork. Do not get complete information from providers.
- Want completed information. Spend too much time trying to decipher patients demographics by calling around.
- We want to know how our lab compares with others. Send ODH data, but never get feedback. There is no good way to capture racial information.

VIII. Appendix D

Full logistic regression model for 'always' getting a BLL at 12 months (n=280)

Variable	β	SE	Wald	OR (95% CI)
Geographic area (urban)	0.604	0.300	4.054	1.8 (1.02, 3.3)
> 25% of patients on Medicaid	0.724	0.309	5.502	2.1 (1.1, 3.8)
Provide lead education to $\geq 50\%$ of patients	1.394	0.290	23.07	4.0 (2.3, 7.1)
16 or more years in practice	0.444	0.279	2.55	1.6 (0.9, 2.7)
Pediatric specialty	0.362	0.289	1.57	1.4 (0.8, 2.5)
Female	-0.054	0.295	0.033	0.9 (0.5, 1.7)
Draw BLL in office	0.332	0.286	1.341	1.4 (0.8, 2.4)
Practicing in high risk area	0.421	0.295	2.026	1.5 (0.8, 2.7)
Constant	-2.995	0.517	33.50	

Full logistic regression model for 'always' getting a BLL at 24 months (n=277)

Variable	β	SE	Wald	OR (95% CI)
Geographic area (urban)	0.944	0.319	8.75	2.6 (1.4, 4.8)
> 25% of patients on Medicaid	1.435	0.369	15.11	4.2 (2.0, 8.7)
Pediatric specialty	0.783	0.325	5.82	2.2 (1.6, 4.1)
Draw blood in office	0.959	0.321	8.91	2.6 (1.4, 4.9)
Provide lead education to $\geq 50\%$ of patients	0.565	0.318	3.16	1.8 (1.0, 3.3)
16 or more years in practice	0.534	0.318	2.818	1.7 (0.9, 3.2)
Female	-0.101	0.339	0.089	0.9 (0.5, 1.8)
Practicing in high risk area	0.430	0.352	1.489	1.5 (0.8, 3.1)
Constant	-5.179	0.811	40.81	

Full logistic regression model for blood lead test in STELLAR/Medicaid data, 1999-2001

Variable	β	SE	Wald	OR (95% CI)
Type of geographic area (urban)	0.459	0.208	4.849	1.9 (1.3, 2.9)
Received reminder to have blood lead tested (yes)	0.646	0.215	9.062	1.4 (0.9, 2.3)
Age of child (> 2 yrs.)	0.382	0.199	3.68	1.5 (1.0, 2.1)
Not married	0.534	0.189	7.985	1.7 (1.2, 2.5)
Race (non-white)	0.113	0.122	0.864	1.1 (0.9, 1.4)
Medicaid enrollment (12 mo)	0.104	0.296	0.575	1.3 (0.7, 2.2)
Received lead information (yes)	0.478	0.204	5.460	1.6 (1.1, 2.4)
Education (\leq HS)	0.073	0.193	0.143	1.1 (0.7, 1.5)
Constant	-3.121	0.717	18.960	

Full logistic regression model for parental report of child having BLL

Variable	β	SE	Wald	OR (95% CI)
Not married	0.212	0.210	1.010	1.2 (0.8, 1.9)
Received reminder to have blood lead tested (yes)	1.756	0.278	39.83	5.8 (3.4, 10.0)
Type of geographic area (urban)	0.454	0.229	3.927	1.6 (1.0, 2.5)
Education (\leq HS)	0.388	0.215	3.253	1.5 (1.0, 2.2)
Race (non-white)	0.174	0.138	1.688	1.5 (0.8, 2.6)
Medicaid enrollment (12 mo)	0.378	0.291	0.208	1.1 (0.6, 2.1)
Received lead information (yes)	1.353	0.213	40.42	3.9 (2.6, 5.8)
Age of child (> 2 yrs.)	0.294	0.207	2.017	1.3 (0.8, 2.0)
Constant	-4.422	0.777	32.385	

IX. Appendix E

Suggestions from Ohio Health Plan Providers to improve the Blood Lead Testing Process

- “Better educate providers on goals/testing available, reimburse testing in office, provide free patient/parent info in waiting rooms (videos, etc)”*
- “In-service education; audio visuals, hospital seminars, timely literature”*
- “Reduce paperwork; increase reimbursement (this will provide incentive to the lead screening process)”*
- “WIC should share their results with providers. It’s abusive to draw blood on a baby who had blood drawn 2 days earlier just to have a paper trail to prove we did the testing. In 20 years I’ve seen 3 positives, it is not my highest priority”*
- “Add lead screening info to our pediatric flow sheets”*
- “Clarify the specific way to manage elevated lead levels, especially who to contact at health dept. The best current recommendation to medically manage patients with elevated levels. Identify a physician as a person who has agreed to remain informed as a lead expert to accept questions & share experiences.”*
- “Clear-1pg guidelines we can hang up. Simple fingerstick screen methods rather than venous draws. Make it reimbursable (not just break even) for provider and make it quick and easy (preferably be able to do the Hgb and lead with same stick and same instrument.”*
- “Decrease the lead testing requirements for only those kids with identified risk factors”*
- “Didn’t receive any information about recommendations for obtaining blood lead levels. Found out through my own research when preparing for grand rounds.”*
- “Do not delineate recommendations and requirements between children on Medicaid vs. no insurance vs. having health insurance. All children should have the opportunity for testing regardless of parental income and established risk factors.”*
- “Feel that screening process is adequate”*
- “Finger stick test instead of venous. Parents don’t like having blood drawn when risk factors not present.”*
- “Fliers to educate with few words and more pictures (1 or 2 pages given at each visit from 4 months of age). Information geared specifically to each providers’ zip code, not all of Ohio, updates on screening recommendations.”*
- “Have health dept do screening and testing on all kids.”*
- “I can be more conscientious in setting more lead-related issues during my opportunities at anticipatory guidance.”*
- “In office testing has recently been initiated. This is most helpful, but would be better if reimbursement were upgraded.”*
- “Labs should automatically report high lead levels to agencies, as they do for infectious disease. All Medicaid patients do not need lead testing if live in new home/apt.”*
- “Largest barrier is getting kids in for well child checks. Education initiatives about the importance of well checks would be helpful.”*
- “Make lead risk assessment questionnaires available in office. Have health department check up with parents to get lead levels.”*
- “Mandatory screening will be necessary to detect kids at risk. What are the statistics of screening?”*
- “Medicaid should provide more flexibility in the need for assessment & the timing. Use of a risk questionnaire is appropriate, not just mandatory testing. I check lead @ 9mon with anemia. The state doesn’t recognize test since not at 12/24 months.”*
- “Money to provide for un/under insured.”*
- “Need an easy way to test capillary blood.”*
- “No new recommendations.”*
- “Our physicians do a verbal lead screening.”*

“Provide environmental lead testing in a timely manner, in the homes of kids with EBLs. Our health department has not been successful in getting someone from state.”

“Screening questionnaire.”

“Send out lead assessment questionnaire.”

“Start drawing blood lead levels in office on all kids ages 1&2 years, then all others if elevated or if new patients with unknown status up to age 5 years.”

“State initiative to contact all Medicaid eligible kids and do test at state sponsored activity and not require physician visit to get it.”

“Target areas of higher risk with information regarding: referrals for inspection; localize home inspections (we have to call other county); provide screening question. In office for placements in charts (where I trained, screening = draw venous sample).”

“Testing every Medicaid patient regardless of risk assessment is a waste of resources in a non-endemic area.”

The original literature about toxic lead levels is not good science & I am not convinced we are not jousting windmills.”

“Well child visit routine-lead screening very important and educate parents.”

When newborn leaves hospital after birth, continuing education during well child visits.”

X. Appendix F

Comments and suggestions from Parents regarding the Blood Lead Testing Process

- “Be careful and always get your child tested early. Only let child visit homes built after 1990.”*
- “Blood test came back average, not high at all.”*
- “How old does the child need to be? Is it free for Medicaid users?”*
- “How would I know how old the buildings are? Is there a way this can be general information? Also call me negligent, but no one has ever told me my child's lead level. Thanks for the calling card.”*
- “I'm aware of the dangerous effects of lead in a child's system. I live in a house that is lead-free and am very certain that my child and his twin exist in a virtually lead-free environment.”*
- “I'm happy my children have never had a high lead level.”*
- “I'm not sure how often lead testing should be done. When my children have been tested, I was not given much information except that they were testing for lead and the results were OK.”*
- “I am on top of where my children are concerned. Both my children were tested regularly and never had a high level.”*
- “I do know a little about it from the WIC office, but I'm not sure whether the test they do there test for lead poisoning.”*
- “I know how dangerous lead poisoning can be. My God-daughters had lead poisoning.”*
- “I know it could cause death, brain or neurological damage. Please send me more info please and what clinics test locally – preferably.”*
- “I think blood testing or lead poisoning is very good. It makes me feel secure about the health of my children. Two of my children have been tested and I have a one year old that soon to be tested because many homes this day are not safe.”*
- “I think it is a great thing to have test available to anybody, if this can harm our children this kind of test must be advertised and close to everyone. Would be a good idea to have it in Spanish too so Spanish-speaking community would know more about it.”*
- “I think that it is very important to have children checked and that people SHOULD be more educated about lead poisoning and testing.”*
- “I think the test should be given regularly with the child's shots.”*
- “I will be setting up an appt. to get his blood tested.”*
- “I wish it was a more publicly talked about thing.”*
- “I wish there was a less invasive and traumatic way to test for lead. Blood tests are extremely difficult and agonizing for both children and parents and the likelihood of lead poisoning w/o symptoms or known causes is too insignificant to warrant a test.”*
- “I would like to know how a child/person can get it. What are the symptoms? Does it lead to death? I think the WIC office is very friendly and helpful. I don't think that I thought lead poisoning was dangerous enough to elicit more info from the clinic.”*
- “I would like to know if you can get a good reading for the lead test with just a finger prick. My child's doctor draws blood from my daughter's vein. It is very painful and traumatic for her and I hate making her have the test at such a young age.”*
- “If there is an issue, who would notify the parents?”*
- “In the town where I live, you're lucky if you can get a family physician, let alone info about lead poisoning. Doctors come and go so fast in this town. All the good ones are run out by this town's "higher-uppers" working for our community". No OB dept.”*
- “It's very important that young children be tested early for lead poisoning to prevent the disabilities associated with this condition that predominately affect black children.”*
- “It feels good to know that you are trying to improve America's knowledge of lead poisoning. I don't know very much about it, however, I'm noticing a lot more people talking about it. I also see more visuals. Good job, keep up the good work!!!”*
- “My baby's blood test came back kind of high, but they took it again and it was fine.”*
- “My child has never been test lead poisoning, I would like to get him tested.”*

“My doctor's office has a chart on the wall stating that if you live in certain areas (like mine built before 1900s) that your child will be tested for lead. He had the test done with my child's 2nd set of shots at 6 months.”

“Not at present time, but doctors have not spoke with me about it, or even brought the topic to my attention.”

“Now that I see that this test is important, I am gonna set up an appt for my child to go get one very soon. The doctors just haven't brought this to my attention about the lead poisoning.”

“Pediatrician did not do the lead testing, the specialist did. Lead testing should be done automatically for every child with their immunization shots.”

“Please send me information about lead poisoning in the mail. Facts about how the test outcome could be and the results of and what actually IS a high level and what to do about it.”

“The area WIC office is on top of testing, shots, etc.”

“The WIC program did not remind me to get this test done. However, I don't know very much about lead poisoning other than that my daughter had the test done.”

“We don't live in an old house so we were never tested. But I've heard about it and am aware of it.”

“We have custody of 3 grand daughters ages 3, 5 & 6 all who have been tested through the Hospital.”

“Why can they provide free services for these kind of test?”

“Yes, it can be deadly.”

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