

STATE OF DELAWARE

**Strategic Plan to Eliminate
Childhood Lead Poisoning
By 2010**

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**Department of Health and Social Services
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Executive Summary

Childhood lead poisoning remains a serious health problem for the Nation and for the State of Delaware. However, substantial progress has been made in the past decade, both nationally and in Delaware, to reduce the incidence of lead poisoning in children under the age of six.

In 1994, a Task Force on Lead Poisoning Prevention presented its report, entitled *Eliminating Childhood Lead Poisoning: A Lead-Free Future for Delaware's Children*. The report initiated a number of legislative and administrative actions that have had a profound effect on reducing childhood lead poisoning in Delaware, including the following:

- Approved the Childhood Lead Poisoning Prevention Act which requires blood lead screening of children at or around 12 months of age and proof of screening prior to child care or school enrollment;
- Created the Office of Lead Poisoning Prevention in the Division of Public Health;
- Developed a comprehensive educational and community outreach program; and
- Developed a case management system to coordinate delivery of appropriate services.

An analysis of reports on screening for lead poisoning since 1994 is informative. First, the number of children tested has increased from 8,176 in 1994 to a high of 14,302 in 2003. The number tested started to increase significantly in 2000 and accelerated rapidly in 2001. This increase is probably attributable primarily to the impact of the requirement that children must have proof of screening before school enrollment.

Second, the percentage of all children with blood lead levels at or above 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$), the level of concern established by the US Centers for Disease Control and Prevention (CDC), decreased from 17.3% in 1994 to a low of 1.5% in 2001. The percent of children with a blood lead level $\geq 20 \mu\text{g}/\text{dL}$ decreased from 1.6% of children tested in 1994 to 0.1% or less in 2001, 2002, and 2003.

Third, the absolute number of lead poisoned children also decreased dramatically. In 1994, 1411 children had blood lead levels $\geq 10 \mu\text{g}/\text{dL}$. By 2001 that number was down to 208. The number of children with blood lead levels $\geq 20 \mu\text{g}/\text{dL}$ changed from 128 in 1994 to 9 in 2002.

The overarching goal of this Strategic Plan is to reduce the incidence of lead poisoning to less than one percent of all children under the age of six. The Plan establishes a series of activities to be carried out between 2004 and 2009, which collectively will result in achieving that goal.

Goals for education and outreach include creating a marketing theme to educate the public on preventing childhood lead poisoning, and an enhanced outreach program to new mothers, childcare centers, physicians, and key health personnel. A plan will be

developed for training contractors, property owners, property managers, and maintenance personnel on using lead safe work practices in rehabilitation, renovation and remodeling.

Medical surveillance and screening will continue to give priority to children participating in Medicaid, the Women, Children and Infants (WIC) program, and Delaware's Healthy Child Program. Children in these programs have a much higher rate of lead poisoning than other children.

Case management is central to the battle against lead poisoning. Existing case management standards and protocols have been in place since 1/1/02; they will be reviewed and updated as necessary.

Of particular note is the need to find mechanisms to require property owners to stabilize deteriorated paint that creates lead hazards. Such hazards in properties occupied by children with elevated blood lead levels are typically not remediated. These substandard, deteriorated conditions remain with the possibility that additional children may become lead poisoned. The child and his/her family may receive appropriate medical treatment, education and counseling, but the underlying housing condition that created the problem goes uncorrected. This is perhaps the biggest gap in Delaware's efforts to eliminate childhood lead poisoning.

Delaware also needs to continually search for additional revenue sources to help property owners with the cost of mitigating lead-based paint hazards. DPH will aggressively seek out potential federal funding sources, especially CDC, the US Department of Housing and Urban Development (HUD), and the US Environmental Protection Agency (EPA), for grants for lead hazard control and abatement.

The Strategic Plan also discusses two additional subjects directly relevant to childhood lead poisoning: primary prevention and healthy homes. Primary prevention consists of those actions taken to prevent a child from becoming lead poisoned. It must work in conjunction with secondary interventions which are steps taken once a child has become poisoned.

The concept of healthy homes is relatively new and takes a holistic approach to creating and maintaining home environments that are free of hazards harmful to health and safety. The healthy homes approach looks at the house as a system and addresses multiple housing-related health and safety issues at one time. The Department of Health and Social Services is considering implementing a Healthy Homes Program in Delaware. The review is still in its nascent stages.

Mission Statement

Division of Public Health Mission

The mission of the Delaware Division of Public Health is to protect and enhance the health of the people by: working together with others; addressing issues that affect the health of Delawareans; keeping track of the State's health; promoting positive lifestyles; responding to critical health issues and disasters; and promoting the availability of health services.

Health Systems Protection Mission

The mission of Health Systems Protection is to assess health risks, develop standards to minimize those risks, license and permit health systems that meet those standards and assure ongoing compliance by permitted systems.

Statement of Purpose

In December 1994, the Governor's Task Force on Lead Poisoning Prevention published its report, entitled *Eliminating Childhood Lead Poisoning: A Lead-Free Future for Delaware's Children*. The Report outlined a series of legislative and administration steps that needed to be taken to confront what had been called "the number one environmental disease of children."

Now, ten years later, it is time to reassess what has been accomplished and what remains to be done. This new Strategic Plan to Eliminate Childhood Lead Poisoning by 2010 is prepared in accordance with directions and guidance from the US Centers for Disease and Prevention. It is, however, written by Delaware's Division of Public Health, Office of Lead Poisoning Prevention, with the advice and assistance of public advisors and consultants, specifically for the citizens of Delaware.

The overarching goal of this Strategic Plan is to reduce the incidence of lead poisoning to less than one percent of all children under the age of six. There are two primary lines of attack on this serious health hazard. The first is called primary prevention, which is to take actions to prevent children from becoming poisoned. The second is to aggressively treat those who have become poisoned and to eliminate the source of the lead poisoning.

The Strategic Plan outlines steps to be taken principally by the Office of Lead Poisoning Prevention. Nevertheless, preventing childhood lead poisoning is the responsibility of all health and housing agencies at the State and local level, and of all citizens who are responsible for maintaining the housing in which they live or rent to others.

Childhood Lead Poisoning in Delaware

Childhood lead poisoning remains a serious health problem for the Nation and for the State of Delaware. However, substantial progress has been made in the past decade, both nationally and in Delaware, to reduce the incidence of lead poisoning in children under the age of six.

The US Centers for Disease Control and Prevention (CDC) reported that 4.4% of all children under the age of six had blood lead levels (BLLs) at or above 10 $\mu\text{g}/\text{dL}$ ¹ in 1994. In Delaware, of the 8,176 children tested in 1994, 1,411 (17.3%) had BLLs ≥ 10 $\mu\text{g}/\text{dL}$. By 2003 when Delaware had fully instituted universal testing as a prerequisite to enter kindergarten, only 296 (2.1%) out of 14,302 children tested had BLLs ≥ 10 $\mu\text{g}/\text{dL}$. This significant reduction in the incidence of lead poisoning is attributable primarily to a series of aggressive steps initiated in 1994 to address this problem.

The Lead Problem

Lead is a highly toxic substance. It is especially harmful to young children. It can harm a child's brain, kidneys, bone marrow, and other body systems. It can cause a reduction in IQ, impaired learning ability, reading and learning disabilities, and behavior problems.

Substantial progress has been made in removing lead from the environment. Most notable was the elimination of lead in gasoline. Lead was also banned from paint in 1978, from use as solder in food and soft drink cans, and as solder in household plumbing. The principal sources of lead exposure for children today, according to the CDC, are house dust contaminated by leaded paint and soil contaminated by both leaded paint and decades of industrial and motor vehicle emissions.

The reduction in childhood lead poisoning has been dramatic because of the above reforms. CDC has conducted National Health and Nutrition Examination Surveys (NHANES) since 1976. The 1976-1980 NHANES survey estimated that the percentage of all children aged 1-5 with BLLs ≥ 10 $\mu\text{g}/\text{dL}$ was 88.2%; the estimate in the 1999-2000 survey was 2.2%.

Elevated BLLs do not occur equally across all population groups. Children from low-income families are four times as likely to have BLLs ≥ 10 $\mu\text{g}/\text{dL}$ as are children from middle-income families. Of all children tested in 2001, Black children were more than 4 times as likely to have elevated BLLs as White children; and Hispanic children were more than 2.5 times as likely to have elevated BLLs as White children.

¹ The symbol $\mu\text{g}/\text{dL}$ represents micrograms per deciliter. Ten $\mu\text{g}/\text{dL}$ is the level of concern established by CDC. BLLs ≥ 10 $\mu\text{g}/\text{dL}$ are also referred to as elevated blood lead levels (EBLLs).

Recent studies indicate that there are harmful effects from lead poisoning at levels less than 10 µg/dL. For instance, Canfield² et al reported in a study of 172 children in Cincinnati that an increase in blood lead concentrations from 1 to 10 µg/dL was associated with an IQ decline of 7.4 points. The impact of this and other recent studies has not yet been measured. While all the reports of reduced instances and levels of lead poisoning are positive, it is still too early to declare victory over this problem.

Housing Conditions in Delaware

Lead in dust from deteriorated lead-based paint in old housing is now considered the primary cause of childhood lead poisoning. Old housing contains large concentrations of lead in paint. Paint manufacturers began phasing out lead in residential paints in the 1950s and the Consumer Products Safety Commission banned it in 1978. The highest risk of lead poisoning from paint occurs in housing built prior to 1960. Both deteriorated housing conditions and renovation of pre-1960 housing without regard to lead safe work practices present a high risk of poisoning.

The 2000 census reports the following about the age of housing in Delaware:

Table 1: Age of Housing

	Delaware		New Castle County		Kent County		Sussex County	
	Units	Percent	Units	Percent	Units	Percent	Units	Percent
1990 to 2000	72,662	21.2	32,860	16.5	12,906	25.6	26,896	28.9
1980 to 1989	60,729	17.7	29,879	15.0	8,761	17.4	22,089	23.7
1970 to 1979	56,475	16.5	29,949	15.0	9,494	18.8	17,032	18.3
1960 to 1969	49,446	14.4	33,605	16.8	6,733	13.3	9,108	9.8
1940 to 1959	66,951	19.5	49,035	24.6	7,633	15.1	10,283	11.1
1939 or earlier	36,809	10.7	24,193	12.1	4,954	9.8	7,662	8.2
Total	343,072	100.0	199,521	100.0	50,481	100.0	93,070	100.0

Over 100,000 units (30.2% of all housing) were built before 1960. 36,809 units (10.7%) were built before 1940. Over 70% of this older housing is in New Castle County. There are no data on the condition of pre-1960 housing. It remains a challenge to rehabilitate all pre-1960 housing and to abate or control all potential lead hazards. A modest number of old housing units are removed from the housing inventory each year through abandonment or demolition.

New US Department of Housing and Urban Development (HUD) regulations regarding lead-based paint are now in effect that govern all federally assisted housing. Housing rehabilitation, homebuyer assistance, and rental assistance programs are all affected by the Federal Lead Safe Housing Rule 24 CFR 35 (LSHR). For instance, the Section 8 Housing Choice Voucher program provides assistance to low-income families to lease affordable rental units in the private rental market. All Section 8 units receive a housing quality standards (HQS) inspection at initial occupancy and annually thereafter. The

² Canfield RL et al. Intellectual impairment in children with blood lead concentrations below 10 µg per deciliter. N Engl J Med 2003 Apr 17; 348: 1517-26.

LSHR applies to all units occupied or to be occupied by a family with a child under the age of 6. A person trained in lead safe work practices must stabilize all deteriorated paint. The Delaware State Housing Authority (DSHA), and the Dover, Newark, Wilmington, and New Castle County Housing Authorities administer section 8 Housing Choice Voucher programs.

DSHA, all three counties, the City of Wilmington, and other smaller communities administer HUD-funded Community Development Block Grant (CDBG) and HOME Investor Partnerships (HOME) programs each year. Most CDBG and HOME programs include homeowner or rental rehabilitation programs. All pre-1978 rehabilitation projects involving more than \$5,000 per unit in federal assistance must have a risk assessment to identify lead hazards, all lead hazards must be addressed either by abatement or interim controls, and all units must pass clearance at the end of the work. If lead-based paint is disturbed, the work must be done by either State-certified abatement personnel or persons trained in lead safe work practices.

The full impact of the LSHR is not yet known. Hundreds of units are rehabilitated each year throughout the State. Annual HQS inspections assure that Section 8 housing is safe and in good condition. Other federally assisted housing programs also include provisions for visual assessments, lead inspections, risk assessments, lead hazard control, and clearance.

Nevertheless, only a small portion of the housing in Delaware receives any federal assistance. Most remodeling and renovation is done privately without any guidelines or controls on testing for or controlling lead-based paint or lead-based paint hazards. This represents the real challenge to both health and housing agencies.

1994 Report on Childhood Lead Poisoning

In December 1994 the Governor's Task Force on Lead Poisoning Prevention presented its report to Governor Thomas R. Carper. The report, entitled *Eliminating Childhood Lead Poisoning: A Lead-Free Future for Delaware's Children*, recommended a number of legislative and administrative actions that needed to be taken. Most administrative actions were promptly initiated. Efforts to create new and stronger legislative authority to remove lead hazards were unsuccessful.

Among the accomplishments following publication of the Report are the following:

- Approved the Childhood Lead Poisoning Prevention Act which mandates lead screening at or around 12 months of age;
- Required proof of screening for lead poisoning prior to admission to child care facilities, public and private nursery schools, preschools, and kindergartens;
- Created the Office of Lead Poisoning Prevention in the Division of Public Health;
- Developed a comprehensive educational and community outreach program;
- Formed an inter-agency task force to address childhood lead poisoning prevention in a coordinated manner;

- Identified priority areas in which the risk to children is known to be exceptionally high to target initial lead hazard reduction activities;
- Developed a case management system to coordinate delivery of appropriate services;
- Developed an accreditation process for all training programs for persons engaged in lead hazard inspection or reduction activities;
- Required all persons who conduct lead inspections, risk assessments or lead-based paint hazard control activities to attend accredited training programs and become licensed;
- Mandated use of accredited laboratories for testing of environmental samples;
- Developed regulations for conducting lead inspections and risk assessments;
- Developed regulations specifying lead hazard control responsibilities for owners of child care facilities;
- Developed regulations establishing health-based standards for lead hazard control through interim controls and abatement;
- Developed regulations for management of waste from lead hazard control activities; and
- Established procedures for DSHA to consult with DPH when preparing the lead-based paint hazard portion of the Consolidated Plan.

Among the recommendations not implemented are the following:

- Establish effective liability and enforcement mechanisms and require consistency in standards at all levels of government; and
- Develop financial assistance programs to assist and encourage owners of target housing to conduct lead hazard reduction activities.

New approaches to achieving the above recommendations are included in this Strategic Plan.

Office of Lead Poisoning Prevention

The Office of Lead Poisoning Prevention (OLPP) was established in 1995. It is located in the Division of Public Health (DPH) in the Department of Health and Social Services. OLPP manages the Childhood Lead Poisoning Prevention Program (CLPPP) funded by CDC. The objectives of the CLPPP are to:

- Screen infants and children for elevated BLLs;
- Ensure that lead-poisoned infants and children are referred for medical and environmental intervention;
- Educate the public and health-care providers regarding childhood lead poisoning; and
- Implement prevention measures to reduce children's exposure to lead.

OLPP is headquartered in the Central Office in Dover. Outreach, education and all case management activities are carried out by full- or part-time staff located in the Northern

Health Services Office which serves New Castle County and the Southern Health Services Office which serves Kent and Sussex Counties.

Universal Screening³

The State of Delaware enacted legislation in 1995 that required mandatory lead poisoning screening of children at or around 12 months of age. Federal regulations in 1998 mandated testing at 12 months and 24 months for all Medicaid-eligible children and children receiving the Supplemental Food Program for Women, Infants and Children (WIC) or other federal assistance programs. The new State law and the federal regulations led to the following guidelines.

- All Medicaid-eligible children and children receiving WIC assistance must be blood-lead tested at 12 months and 24 months of age. A blood-lead test must also be performed for any Medicaid-eligible child or child receiving WIC assistance 36 months to 72 months of age who has not previously been tested.
- Children between the ages of 9 months and 6 years determined to be at risk as determined by a *Risk Exposure Questionnaire* must be tested. The questionnaire asks such questions as whether the child lives in a pre-1978 house with peeling, chipping, or flaking paint; lives in a pre-1978 house with recent, ongoing or planned renovations; or lives with an adult whose job or hobbies involve working with lead.
- All children must show proof of lead screening prior to enrolling in a childcare facility, a public or private nursery school, a preschool, or a kindergarten.
- All laboratories involved in lead level analysis must submit all blood-lead test results to the DPH.
- Lead poisoning screening, screening-related services and diagnostic evaluations are reimbursable under health insurance contracts, and group and blanket health insurance.

There was a phase-in of the screening requirements. Enrollment in kindergarten is the latest possible date for screening if a child is not eligible for Medicaid or WIC, missed previous deadlines or requirements, or is new to the State. The 2001–2002 school year was the first year when children could not enter kindergarten without documentation of a blood lead screen. When it became obvious that many children had not been tested or did not have documentation of testing, the applicability date was delayed until the 2003–2004 school year.

Universal screening is now in place in Delaware. An analysis of screening by age group in 2003 showed the following:

³ For purposes of this Plan, the words “screening” and “testing” are used interchangeably and have the same meaning.

Table 2: Children Screened by Age--2003

Age	Number Screened	%
0 – 11 months	895	7.12
12 – 36 months	7,379	58.70
37 – 72 months	3,948	31.41
> 72 months	348	2.77
Totals	12,570	100.00

Nearly 60% of all children screened were in that critical age of 12 to 36 months. Since nearly one-third of all children screened were over 36 months, it is likely that they were first screened before being admitted to a preschool or kindergarten.

Trends in Childhood Lead Poisoning

Centralized records on the results of screening for lead poisoning have been kept since at least 1994. An analysis of this data reveals significant trends in the extent of childhood lead poisoning in Delaware. The following summarizes the results of blood lead testing in Delaware over the past decade:

Table 3: Statewide Screening of Children < 6 Years of Age

BLL	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
< 10	6,765	8,902	8,851	8,110	8,141	9,014	10,374	13,585	13,682	14,006
10 - 14	1,186	976	645	588	488	417	323	165	237	271
15 - 19	97	92	64	65	38	20	22	29	14	13
≥ 20	128	125	56	61	34	29	21	14	9	12
Total	8,176	10,095	9,616	8,824	8,701	9,480	10,740	13,793	13,942	14,302
# ≥ 10	1,411	1,193	765	714	560	466	366	208	260	296
% ≥ 10	17.3	11.8	8.0	8.1	6.4	4.9	3.4	1.5	1.9	2.1
# ≥ 20	128	125	56	61	34	29	21	14	9	12
% ≥ 20	1.6	1.2	0.6	0.7	0.4	0.3	0.2	0.1	0.1	0.1

The above table shows how childhood lead poisoning has changed in Delaware since 1994. The following observations highlight these differences.

First, the number of children tested has increased from a low of 8,176 in 1994 to a high of 14,302 in 2003. The number tested started to increase significantly in 2000 and accelerated rapidly in 2001. This increase is probably attributable primarily to the impact of the requirement to show proof of screening before school enrollment and the first cohort of children impacted by the lead screening requirement in 1995 approached kindergarten age in 2000.

There are approximately 60,000 children under age 6 in Delaware at any given time. A total of 60,524 children were initially tested from 1999 through 2004. There are approximately 11,000 births each year. Once Delaware physicians, health care centers,

and families have accepted the fact that all children must be tested before enrolling in kindergarten, and that children on Medicaid must be tested at 12 months and 24 months, it is anticipated that the number of initial tests will stabilize between 11,000 and 12,000 each year.

Second, the percentage of all children with blood lead levels at or above 10 µg/dL decreased dramatically over the past 10 years. A part of this reduction is due again to the advent of universal testing; i.e., low risk children such as those living in new or relatively new housing were tested for the first time. However, that alone does not fully explain the reduction in the percent of children who had a blood lead level ≥10 µg/dL from 17.3% in 1994 to a low of 1.5% in 2001. The percent of children with a blood lead level ≥20 µg/dL decreased from 1.6% of children tested in 1994 to 0.1% or less in 2001, 2002, and 2003.

Third, the absolute number of lead poisoned children also decreased dramatically. In 1994, 1411 children had blood lead levels ≥10 µg/dL. By 2001 that number was down to 208. The number of children with blood lead levels ≥20 µg/dL changed from 128 in 1994 to 9 in 2002.

Priority Target Groups and Areas

Delaware has long recognized the importance of placing emphasis on certain groups and geographic areas. For instance, children on Medicaid are more than three times as likely to have high levels of lead in their blood as are children not receiving care under Medicaid. OLPP works hard to assure that all Medicaid-eligible and WIC children are tested as required, but has encountered some objections from private physicians who are not in agreement with the requirements. OLPP works closely with ten duPont Pediatric clinics and public health clinics throughout the State, many of which are in priority target areas.

The following table shows the progress that has been made in screening children on Medicaid:

Table 4: Statewide Screening of Children < 6 Years of Age on Medicaid

FY	Total	# Tested	% Tested	# ≥10 µg/dL	% ≥10 µg/dL
2003	23,685	13,425	57	313	2.3
2002	26,854	14,220	53	784	5.5
2001	24,515	12,138	50	NA	NA
2000	26,032	12,796	49	1115	8.7

The total column represents the total number of children on Medicaid at a given date in that fiscal year. The number tested is the number of such children that have had a least one lead screening. That screening may have occurred at any age for a child less than six years old. For instance, of the 23,685 children on Medicaid in FY 2003, 13,425 were tested. Some may have been tested in 2003, others in 2002, 2001, 2000 or 1999. Only

initial lead screens are counted. Therefore, some Medicaid children may have been tested multiple times, but only the initial screen is reported in this table.

The trend is clearly in the right direction. The percentage of Medicaid children tested has increased each of the last four years. The practical maximum percentage of children tested is approximately 70%. That is because approximately 20% of all children less than 6 years old are less than one year old and not subject to lead screening. Furthermore, it is not reasonable to expect that all children will receive their initial lead screens precisely on their first birthday. Continued priority to Medicaid children will result in a higher percentage of children tested.

The other measurable indicator of progress is that the percentage of Medicaid children screened that have elevated blood lead levels of ≥ 10 $\mu\text{g}/\text{dL}$ or greater has steadily declined from 8.7% in 2000 to 2.3% in 2003.

A new priority for Delaware is the Delaware Healthy Children Program (HCP). The HCP is a low-cost health insurance program for children who are low income and are uninsured. It provides benefits comparable to most private health insurance plan for children in households with incomes up to 200% of the federal poverty level. Upon payment of a \$10 to \$25 monthly premium, children are eligible for a wide range of health services, including well-baby and well-child checkups, immunizations, hospital care, physician services, and lab work. Services include the cost of a lead screening.

Delaware's Division of Social Services (DSS), the same agency that administers the State's Medicaid program, administers the Delaware Healthy Children Program. DSS will share information on enrollment, much as it does now with Medicaid enrollment data. OLPP will include HCP children in its priority education and outreach activities and will include a HCP match in its data collection and reporting.

One of the recommendations in the 1994 report, *Eliminating Childhood Lead Poisoning*, was to identify geographic priority areas in which the risk to children is known to be exceptionally high and to target initial lead hazard reduction activities to those areas. Twenty zip codes have been identified as priority target areas. They were selected based on high levels of poverty and areas where there is a concentration of older housing. Six of the zip codes are in Wilmington or surrounding communities; the rest are in the central and southern part of the state.

Designation as a priority target area means that such areas are given priority in various education and outreach activities. A close working relationship is established with health clinics and other medical personnel located in such areas.

A significant proportion of lead poisoning cases are from the City of Wilmington. Wilmington has both a large number of families in poverty and pre-1950 housing that is known to have deteriorated paint and lead hazards. OLPP meets frequently with Wilmington's Department of License and Inspections, and with the Department of Real

Estate and Housing to coordinate efforts to control lead hazards in high priority target areas.

In 1999, HUD awarded a \$2.7 million Lead Hazard Control Grant to OLPP. A total of 324 units were successfully treated and the grant has been completed. OLPP teamed with the Latin American Community Center Development Corporation, a community-based organization in the City of Wilmington, to run the DeLead Delaware program. The grant was targeted entirely to one census tract in zip code 19805, one of the zip codes with the highest incidence of lead poisoning in the City of Wilmington.

Table 1: Delaware Lead Poisoning Prevention Surveillance Data 1995-2000

Average Number of Children Screened and with Confirmed BLL
10_≥mcg/dL by Age Group and Risk Area

Risk Areas	Population under 72 months	Average # Screened Annually	%	Children 0-36 months old at 10 _≥ mcg/dL	Children 37-72 months old at 10 _≥ mcg/dL	Total
19801:Wilmington	1663	347	21%	14	13	27
19802:Wilmington	2266	500	22%	29	10	39
19804:Wilmington	1414	161	11%	1	1	2
19805:Wilmington	3417	820	24%	24	21	45
19806:Wilmington	411	44	11%	2	1	3
19809:Wilmington	1356	159	12%	3	1	4
19901:Dover	4307	542	13%	3	2	5
19933:Bridgeville	349	174	50%	2	1	3
19934:Camden-Wy	871	118	14%	1	1	2
19941:Ellendale	271	44	16%	-	-	-
19945:Frankford	449	59	13%	-	-	-
19946:Bowers Beach	313	46	15%	-	-	-
19947:Georgetown	989	297	30%	3	3	6
19950:Greenwood	467	79	17%	1	0	1
19952:Harrington	800	132	16%	2	1	3
19960:Lincoln	437	75	17%	-	-	-
19963:Milford	1028	238	23%	4	5	9
19966:Millsboro	905	194	21%	1	1	2
19968:Milton	356	84	24%	1	0	1
19973:Seaford	1713	368	21%	4	2	6
Totals	23782	4449	19%	95	63	158

Strategic Work Plan

Great progress has already been made to achieve the goal of reducing lead poisoning in the State of Delaware to less than one percent of all children under the age of six. As noted in the previous section, the incidence of children with elevated blood lead levels has steadily decreased over the last decade. OLPP is now at the stage of fine-tuning a highly successful strategy that was put into place starting in 1994.

Priority in outreach, education and medical surveillance has been and continues to be given to zip codes that have the greatest amount of old housing and have historically had the highest incidence of childhood lead poisoning. Priority has also been given to children receiving Medicaid and WIC assistance. These priorities will continue. However, the introduction of universal testing has significantly changed the landscape.

OLPP believes that reaching the goal of less than one EBLL child out of 100 is the lowest feasible level that can be reached. There are several impediments to reaching a goal of total elimination of childhood lead poisoning. First, it is not realistic to expect that all substandard pre-1978 housing will be repaired. Second, there will always be new residents arriving from other countries or states that do not have effective lead poisoning prevention programs. Third, a portion of all lead-poisoned children become poisoned by imported pottery, toys, home remedies, candy, and other sources that are difficult to control or prevent.

This section describes the six components and associated activities for the Strategic Plan to End Childhood Lead Poisoning by 2010:

- Education and Outreach;
- Medical Surveillance and Screening;
- Case Management;
- Partnerships;
- Compliance and Enforcement; and
- Resources and Funding.

1. Education and Outreach

Objective: To increase public awareness about childhood lead poisoning.

Discussion

Early in the history of Delaware's efforts to prevent childhood lead poisoning, many children were identified with blood lead levels above 20 µg/dL. Because of the urgency to alert the public that lead-based paint was the most likely source for such poisoning, the education and outreach efforts included very elementary lead presentations to people gathered at various events within impoverished communities and distribution of printed materials through clinical settings. Occasional door-to-door campaigns conducted in Wilmington included blood lead testing on site, yielding a better identification of the areas of greatest concern.

Over the past decade, outreach and education efforts have been modified to a large extent, tending to put the message into the hands of younger children as well as their parents. A very extensive statewide poster contest has been held eight consecutive years and involves poster submissions from many children who gain basic lead information in the process. Such efforts require extensive coordination of children's clubs (e.g., Boys and Girls Clubs) throughout the State to produce the posters for competitive judging and then to select some drawings for printing and distribution. Whereas earlier versions of this contest resulted in the production and distribution of 400 poster calendars, the most recent contest resulted in poster calendars reaching 1600 sites across the State, including clinics, pediatric offices and schools.

Today's outreach efforts by the Health Educator include approximately 12 presentations per year to groups of homeowners and others gathered for health-related matters. In an effort to reach broader audiences, a "train the trainers" model is used to prepare others to actually conduct lead informational sessions with members of the community.

One of the larger concerns regarding the educational and outreach process involves the need to have concise surveillance information at hand. As data show an ongoing decline in blood lead levels, there must be a refined look at the target areas where the incidence of children having elevated blood lead levels greater than 10 µg/dL is still high, and to then customize outreach efforts to those populations at risk.

Some of the more successful outreach opportunities for the Health Educator include training workshops for contractors, homeowners, and owners of rental properties and their maintenance workers. Since these targeted audiences are in fact responsible for the condition of housing, they are key to providing lead-safe units.

Related to the above cited audience presentations/training is the need to provide information regarding the EPA Pre-Renovation Education rule, the HUD/EPA Real Estate Notification and Disclosure requirements, and hands-on workshops for lead-safe work practices. When the local boards of realtors hold meetings at which members of the

target audiences are invited, this would present an excellent opportunity to include lead-safety information as part of the agenda.

Another important element of outreach and education is the need to train contractors, homeowners, rental property owners, their property managers, and maintenance personnel in the use of lead safe work practices in the rehabilitation, renovation, remodeling and maintenance of pre-1978 housing. Safe work practices are required for many HUD-funded housing rehabilitation programs that do not require the use of certified abatement contractors. EPA and HUD have sponsored one-day training courses on safe work practices. However, their sponsorship of such courses has ended. It is now up to state and local agencies that receive federal funds for housing to identify resources for ongoing training in safe work practices.

A statewide training program will work best if there is a collaborative effort by OLPP, the Delaware State Housing Authority, and various city and county agencies that run housing programs. They all have a stake in having an ongoing, on-demand course that is available to anyone who needs or can benefit from such training. The State currently certifies Central Delaware Training Academy and Delaware Technical and Community College as training providers for lead work disciplines.

Training in lead safe work practices is a one-day course that does not meet the requirements for State certification, but is sufficient to meet the training requirements for most HUD programs. It is logical that OLPP take the lead or at least be an active participant in planning and supporting an ongoing training program in safe work practices.

Activities

1. Create a marketing theme to educate the public on preventing childhood lead poisoning. The *Don't Be Mislead* theme that was used in the past has some public familiarity and may prove to be worthy of retention. The theme will be used on OLPP documents and in public presentations. The purpose is to raise public awareness of childhood lead poisoning.
2. Contract with a marketing consultant to develop a strategy for promoting the marketing theme. DPH currently has contracts with five marketing consultants. OLPP will prepare a proposal for review by the consultants.
3. Develop an education and outreach plan for OLPP staff each year. The plan will identify education and outreach priorities and audiences, and include specific goals and objectives for meeting those priorities.
4. Inventory, review and update outreach and education materials. Public information documents have not been modified for several years. The purpose of this task is to first identify what materials are available. Then OLPP will review them for accuracy,

completeness, and relevance. The best publications will be updated as needed. New publications may be added to reflect new priorities.

5. Distribute information about preventing childhood lead poisoning to new mothers at hospital birthing centers throughout the State. New mothers are keenly interested in knowing what to do to protect the health of their new child. Appropriate educational materials will be handed out, along with a home test kit to test for the presence of lead paint on walls, furniture and toys.
6. Distribute information about preventing childhood lead poisoning at childcare facilities throughout the State. Young children in childcare centers are especially vulnerable to lead poisoning. Since childcare facilities must already be inspected for lead hazards, the objective is to encourage parents to check their own homes for hazards.
7. Conduct outreach to physicians and other key health personnel on State and federal childhood lead poisoning prevention laws, regulations, and policies. Not all physicians are fully familiar with what is required or expected of them. Others are not in agreement with certain requirements such as universal testing. Nevertheless, they all need to be fully conversant with State policies and fully support their implementation.
8. Develop a plan and program for training contractors, property owners, property managers, and maintenance personnel on using lead safe work practices in rehabilitation, renovation and remodeling. This will be done in collaboration with other State and local agencies that have a need for persons who have received this training.

Evaluation Plan

There is a continuous need for education and outreach activities to inform people about the dangers of lead hazards, especially lead-based paint hazards. OLPP will take several steps to evaluate the effectiveness of education and outreach activities. First, it will monitor the implementation of the eight steps described above. Assignments will be made for each of the steps, deadlines will be established, and progress will be tracked. Second, OLPP will constantly look for opportunities to educate people about childhood lead poisoning, including new opportunities that are not included in the annual education and outreach plan.

There are several types of audiences that are especially challenging for health department staff to reach. They include contractors, landlords, and building maintenance personnel. These are the very people who are primarily responsible for creating and managing a lead safe environment in residential housing. Presentations, workshops, and training to these audiences will be carefully tracked. Monitoring will be ongoing to assure that these critical groups are increasing their knowledge of lead safe work practices when painting,

remodeling, rehabilitating, and maintaining residential properties, especially rental housing.

2. Medical Surveillance and Screening

Objective: To provide lead screening of children at high risk of lead poisoning in a timely manner.

Discussion

The Childhood Lead Poisoning Prevention Act adopted in 1995 had important implications for surveillance and screening. It is best known for requiring universal testing of children. Also significant was the new requirement for reporting all blood lead test results to the Division of Public Health.

OLPP periodically analyzes data on the results of blood lead testing. Among the data reviewed are the overall numbers and percentages of children with blood lead levels in excess of 10 µg/dL and 20 µg/dL, the number and percentage of children on Medicaid who are tested and who have elevated blood lead levels, and the percentage of children tested in priority zip codes who have elevated blood lead levels.

Now that universal testing is fully implemented, the question is not whether children will be tested but whether children at high risk for lead poisoning are tested at appropriate ages. As a general rule, testing at age five, when a child typically enters kindergarten, is of limited value. Children are most vulnerable to lead exposure as toddlers (ages 1 and 2) when hand to mouth activity is most pronounced. Therefore, children on Medicaid and WIC are required to be tested at 12 and 24 months. OLPP's lead screening protocol also gives priority to children at high risk of lead poisoning due to such factors as poverty, age and condition of housing, and location in a priority zip code. The only way to confirm that State lead screening policy is being followed is to analyze the test result data reported to the State.

Analysis of the data by the age of the child, by zip code, and by age of housing will inform OLPP as it prepares its annual outreach and education plan. Other factors to review include the incidence of lead poisoning among the immigrant population as opposed to resident population, and the extent to which repeat lead poisoning cases occur at the same address.

Lead poisoning screening protocols were last revised in 1997. It is time to review whether the protocols need revision or expansion. OLPP will convene a committee of representatives from OLPP, DPH clinics, and DuPont Pediatric sites to evaluate the effectiveness of the protocols and recommend any changes that may be needed. Following the evaluation, and any changes if necessary, OLPP will conduct workshops for both the public health and duPont site staffs. This will be repeated biennially due to staffing changes and to provide quality control reviews.

OLPP will also provide outreach to physicians, starting in 2005, to review screening protocols and the new marketing theme discussed above.

Activities

1. Perform a quality control review of lead screening data. The purpose is to confirm whether data have been properly entered over the past year and are complete. Additional quality control reviews will be performed as needed.
2. Conduct analysis of lead screening data by:
 - Age of child initially tested;
 - Medicaid, WIC, and HCP eligibility;
 - Zip code;
 - Age of housing;
 - Address (to identify repeat offenders); and
 - In-state vs. immigrant status.

The analysis will be repeated regularly to guide OLPP in developing its annual outreach and education plans and to confirm the adequacy of its lead screening protocols.

3. Review and update the lead screening protocols. Use a committee of OLPP, public health, and duPont clinic staffs to conduct a review and to develop recommendations.
4. Conduct workshops for both OLPP public health clinic staffs and the duPont pediatric site staffs on lead screening protocols.
5. Conduct outreach and training to labs that report lead levels to DPH. Training will focus on accurate completion of the reporting forms and will be repeated at regular intervals.
6. Continue giving priority to Medicaid, WIC, and HCP in lead screening.
7. Update the priority zip codes. This will flow from the analysis of lead screening data in item 2 above. Priority zip codes will be reviewed every three years.
8. Evaluate the feasibility of electronic reporting of screening data by laboratories. The CDC is promoting the use of electronic reporting. DPH is in support of electronic reporting. The question is how a shift to electronic reporting will be planned, paid for and implemented.

Evaluation Plan

Medical surveillance and screening activities are essential components of a comprehensive childhood lead poisoning program. An effective surveillance and screening program relies on continuing analysis of lead screening data and tailoring targeted efforts to changing needs and opportunities. The OLPP Director will assure that a quality control review of lead screening data is performed each year. In addition, there will be an analysis annually to determine whether priorities need to be shifted or whether new approaches are needed.

Even though all children must be tested prior to entering kindergarten, the essential need is to identify and test those children who are at high risk of lead poisoning at an earlier age, generally around 12 months as prescribed by Medicaid rules. This objective is currently being met by giving priority to Medicaid and WIC enrollees, and to targeted zip codes. However, a new analysis may identify other priority areas and suggest new techniques to reach children at risk of becoming lead poisoned.

Quality control reviews of lead screening data will also indicate whether additional training or workshops are needed with pediatric clinics or labs to assure that lead screening protocols are being followed and that data is being accurately and completely reported.

3. Case Management

Objective: To provide high quality service and assistance to families of children with elevated blood lead levels, including evaluations, education, and medical referrals.

Discussion

OLPP has established standards for case management that include the following:

- Educational materials are provided to parents of children testing at or above 10 µg/dL.
- Children with a confirmed initial venous blood lead level of 15-19 µg/dL are encouraged to obtain a second venous blood lead level within 3 months.
- Children with a confirmed venous blood lead level of ≥ 20 µg/dL or two consecutive venous blood lead levels of 15-19 µg/dL are referred to a Public Health Nurse/Case Manager for an initial home visit.
- The Public Health Nurse/Case Manager assesses the health of the child, completes a nutritional assessment, discusses hygiene practices, demonstrates cleaning techniques, and develops a plan of care with the parent to address the needs of the child.
- An Environmental Health Specialist performs a risk assessment and sends a report to the owner and resident that identifies lead hazards in the house.
- Follow-up visits are initiated as appropriate and in accordance with the plan.

Personnel located in the Northern and Southern Health Services Offices provide case management. They work closely with the Environmental Health Specialist in the Central Office. The focus is on improving the health of the child and preventing additional lead poisoning of either that child or siblings.

Activities

1. Update case management standards. The existing standards have been in effect since January 2002. They have provided consistent direction to Public Health Nurses and Case Managers. Nevertheless, it is time to review the standards and make any changes that may be appropriate.
2. Explore the possibility of hiring a contractor to perform intensive cleaning of houses occupied by children with elevated blood lead levels. The Latin American Community Center has cleaned houses in the City of Wilmington. Cleaning is not a long-term solution, but it does serve to quickly reduce serious lead dust hazards. Resources to pay for cleaning need to be identified.
3. Develop a monitoring form and plan for appropriate case management services. This will give OLPP timeframes and baseline standards for such things as initiating and completing case management services, developing written plans, reducing blood lead levels, and closing cases.

Evaluation Plan

The best indicator for determining whether case management is successful is a reduction in a child's blood lead levels following intervention by the public health nurse/case manager. The objective of case management is to get the child's BLL down to less than 10 µg/dL. This is accomplished by educating the parent on nutrition, hygiene practices, and proper cleaning techniques. The parent is instructed about lead poisoning and prevention activities. A risk assessment by the Environmental Health Specialist identifies hazards in the home. Medical referrals are made as needed. The parent is encouraged to get follow-up testing to confirm whether the child's BLL is declining, holding steady, or actually increasing.

The new monitoring form and plan for case management services will track for the first time on a systematic basis the changes in individual BLLs over time following intervention by the public health nurse/case manager. The Health Program Coordinator will review tracking reports on a regular basis to determine whether case management objectives are being met. The OLPP Director will conduct an annual review with the Health Program Coordinator of the results of case management activities.

4. Partnerships

Objective: To establish and maintain partnerships with public and private organizations to obtain insight into childhood lead poisoning issues and assistance in combating it.

Discussion

Eliminating childhood lead poisoning is not the responsibility of DPH and OLPP alone. The active participation of many other stakeholders is essential.

Partnerships are important at two different stages: first, to inform and advise OLPP about appropriate steps to be taken; and, second, to implement whatever course of action is chosen.

OLPP did not establish an Advisory Committee specifically for the purpose of drafting this Strategic Plan. It has, however, used advisors outside the agency since the development of the original plan in 1994. In that instance, a 25-member task force broadly representative of the medical, housing, real estate, labor, and political communities was instrumental in developing recommendations and obtaining legislative action on certain recommendations.

In 2001, the legislature established a Childhood Lead Poisoning Advisory Committee co-chaired by the Deputy Secretary of the Department of Education and the Director of the Division of Public Health. The bill extended the effective date of the mandatory requirement that all kindergarten enrollees have a documented screening for lead poisoning for admission or continued enrollment to the 2003 – 2004 school year. It also directed the Committee to develop recommendations for full compliance with the Act.

What evolved was a coordinated effort by DPH and OLPP, the Department of Education, and the Office of Child Care Licensing. Several steps were taken including:

- Reminded primary health care providers that blood lead screening is required prior to enrollment in kindergarten.
- Reminded childcare providers of the lead screening enrollment requirement for childcare facilities.
- Developed a plan to track compliance with the screening law as it pertains to school enrollment.
- Revised the Delaware Physical Examination Forms to include blood lead screening.
- Provided training on screening requirements for school nurses on lead screening guidelines.
- Began conducting lead paint inspections on pre-1978 buildings used for childcare.
- Conducted an outreach and education campaign to inform parents and others of the importance of and requirements for testing children's blood lead levels.

In addition to the Childhood Lead Poisoning Advisory Committee, which is still in place, OLPP has sought and obtained the advice of numerous parties on an on-going basis. Such organizations and entities include the following:

- Delaware State Housing Authority;
- Other local housing and community development agencies;
- Nonprofit organizations;
- Landlord/tenant associations;
- Politicians/lawyers;
- Hospitals and physicians;
- Child care centers;
- Parent groups;
- Department of Education; and
- Business groups/private sector.

DPH/OLPP will establish a new Advisory Committee in 2006 (when the current Advisory Committee sunsets) that will include the various stakeholders in eliminating childhood lead poisoning. Such a group must cut across traditional lines of communicating and doing business. For instance, it needs to include the State Department of Health and Social Services, the Department of Education, and the Delaware State Housing Authority. In addition to the above State agencies, it must include representatives of county and city governments. It must include both health organizations and entities responsible for housing, codes, and community development. Finally, it must include nonprofit organizations and members of the private sector.

An important long time supporter of efforts to control childhood lead poisoning has been the A.I. duPont Institute, in which many Medicaid-eligible children in medically underserved areas are enrolled.

A key partnership is in place between OLPP and the Latin American Community Center (LACC) in Wilmington. LACC is a community-based organization serving primarily the Hispanic community. OLPP teamed with LACC to administer DeLead Delaware, a lead hazard control project in Wilmington. LACC provided community outreach, application intake and review, and conducted lead hazard control activities where abatement was not required. LACC was effective in getting community support, interpreting and translating materials and information to the public, and assuaging fears of governmental intrusion into their lives. Employees recruited by LACC also carried out lower level lead hazard control measures, especially cleaning.

Partnerships are especially essential to control or eliminate lead hazards in housing, the root cause of most cases of lead poisoning of children. The Department of Health and Social Services, DPH, and OLPP do not manage housing programs. At the State level the State Housing Authority is responsible for administering housing and community development programs. At the local level it is housing and community development agencies in the City of Wilmington, New Castle, Kent, and Sussex Counties, and other local governmental entities.

OLPP meets periodically with such agencies and shares information whenever practical. For instance, information is often shared with a local agency when a risk assessment by OLPP's Environmental Health Specialist identifies serious housing problems that have contributed to the poisoning of a child. Local agencies can apply their code enforcement powers to such properties to achieve improvements and repairs.

Activities

1. Continue and expand partnerships with community-based organizations. The partnership with the Latin American Community Center in Wilmington has been active and effective. OLPP will partner with other community-based organizations as the opportunity and need arises.
2. Continue and expand partnerships with other State and local agencies. DPH and OLPP have worked closely with other agencies from time to time although no formal partnerships exist. OLPP will give special attention to coordinating with the City of Wilmington where a high proportion of the State's lead poisoned children reside.
3. Establish a new Advisory Committee in 2006 to assist with implementation of the childhood lead poisoning elimination plan. The committee will include representatives of the many parties who have a stake in eliminating childhood lead poisoning and the conditions that contribute to it

Evaluation Plan

OLPP and the Advisory Committee will evaluate the value and contribution of partnerships at the State and local level. The primary question will be whether the partnerships made a difference. A partnership for the purpose of managing a program or conducting certain agreed upon activities must be supported by a Memorandum of Agreement (MOA). Such agreements will have specific timeframes for performance. They will be renewed at regular intervals. OLPP will evaluate performance under each MOA at the time it is up for renewal.

Partnerships that essentially call for coordination and cooperation will be subject to a Memorandum of Understanding (MOU). They also will have timeframes and expected outcomes. MOUs will also be evaluated by OLPP when they come up for renewal.

5. Compliance and Enforcement

Objective: To assure that corrective actions are taken by owners of properties to eliminate lead hazards.

Discussion

The 1994 report, *Eliminating Childhood Lead Poisoning*, recommended “the passage of the Childhood Lead Poisoning Prevention Act, a comprehensive legislative package that forges a strategy to remove lead in housing.” Draft legislation was included in the report. The draft legislation established a standard that owners of target housing⁴ ensure that all surfaces containing lead-based paint are kept intact and free of deteriorated paint. The draft legislation authorized DPH to conduct inspections and issue abatement orders. The legislation authorized fines and criminal penalties for failure to comply with the Act.

Unfortunately, the Childhood Lead Poisoning Prevention Act passed in 1995 did not include any of the enforcement mechanisms. Consequently, OLPP does not have the capacity to direct property owners to abate lead hazards or to enforce recommendations contained in a lead inspection or risk assessment report. Lead hazards in properties occupied by children with elevated blood lead levels are typically not remediated. The substandard, deteriorated conditions remain with the possibility that additional children may become lead poisoned. The child and his/her family may receive appropriate medical treatment, education and counseling, but the underlying housing condition that created the problem goes uncorrected. This is perhaps the biggest gap in Delaware’s efforts to eliminate childhood lead poisoning.

Absent a state law that is designed specifically to address lead hazards, OLPP will reevaluate its current regulations as well as look to other state and local laws that govern minimal housing conditions.

The Delaware State Housing Code was enacted to establish minimum maintenance standards for residential housing. The Housing Code applies statewide except where a community has enacted its own code, which contains minimum standards, which are equal to or exceed the State Code’s standards. Nearly all communities⁵ have now adopted their own housing codes. The housing codes are comprehensive, but do not specifically incorporate deteriorated paint or lead in paint. There are, however, several other related sections:

- Interior surfaces shall be maintained structurally sound and in a sanitary condition;
- Floors, walls, windows, doors, ceilings and other interior surfaces shall be maintained in good, clean and sanitary condition;

⁴ “Target housing” means residential dwellings constructed prior to 1978, except housing legally restricted for the elderly or persons with disabilities.

⁵ Only five small towns have not adopted a housing code. The Delaware State Housing Authority is responsible for enforcing the Code in those jurisdictions.

- Bathroom and kitchen floors shall be maintained so as to be easily kept in a clean and sanitary condition;
- Exterior foundations, walls, roofs and other exterior surfaces shall be maintained in a workmanlike state of maintenance and repair;
- Exterior surface materials shall be maintained weatherproof so as to prevent deterioration;
- Roofs shall be structurally sound;
- Windows and exterior doors shall be weathertight; and
- Every window, other than a fixed window, shall be capable of being opened.

Correcting the building and maintenance deficiencies cited by local housing codes would go a long way toward eliminating the conditions that cause paint to deteriorate and children to become lead poisoned. Granted, there is no assurance that the work will be done using lead safe work practices. Nevertheless, the ongoing maintenance required by the housing codes will prevent the deterioration and decay that causes paint to flake, chip and peel.

Greater coordination and collaboration between OLPP and State and local housing agencies and departments can lead to enhanced enforcement of code standards that will remove lead hazards. City and county inspectors do not test for lead in paint, but the presentation of a lead paint inspection by OLPP's Environmental Health Specialist could prompt a city or county to take enforcement actions.

Coordination with codes agencies is especially important for addressing cases involving repeat offenders (i.e., properties with a history of poisoning multiple children). The lack of enforcement authority has generally tied OLPP's hands when dealing with owners of deteriorated property with lead hazards. This is especially problematic, however, when there are properties that have a history of poisoning multiple children. Application of all relevant codes is needed to bring pressure on owners of such properties to either eliminate the hazards or shut down the properties.

At the present time there is not an accurate record or tracking system for the disposition of properties that are subject to a risk assessment. It is generally assumed that property owners do not make the corrections cited in the risk assessment report. That is not documented, however, and there is no process for conducting a clearance test when work is completed. OLPP will initiate a tracking system for each case so that there is a record of each case.

An effective program of compliance and enforcement is dependent on an adequate pool of certified abatement contractors, supervisors and workers. Ongoing maintenance of properties does not require the use of certified contractors or personnel. However, once abatement orders are issued, certified personnel must do the work.

Delaware has a lead certification and training program that is administered by OLPP. As of June 2004, OLPP had certified 58 abatement companies, 143 supervisors, 157 workers, 140 inspectors, and 119 risk assessors. This number is constantly changing as

existing companies and personnel do not renew their licenses, and as new companies and personnel are certified. Ongoing financial support is needed to assure a continuing supply of contractors and personnel. OLPP will conduct annual seminars with certified personnel to update them on new State policies, procedures, and requirements.

Activities

1. Reevaluate current State lead poisoning prevention regulations to determine whether mechanisms can be established to help property owners abate lead hazards
2. Target repeat offenders by coordinating with local codes agencies on enforcement of housing codes in cases where there is a lead-poisoned child. Priority will be given to properties where multiple children have been poisoned.
3. Refer cases to EPA or HUD for enforcement of the lead disclosure rule. Priority will be given to egregious cases where landlords rent properties known to contain serious code deficiencies to low income households.
4. Develop and maintain a tracking system for all properties that receive a risk assessment report. The system will track the date of the inspection report, follow up calls or visits, communications from the owner, site visits to assess progress, and the date of the clearance report or other disposition of the case.
5. Expand the pool of certified abatement contractors by continuing to offer free training.
6. Conduct annual seminars with certified personnel to update them on new State policies, procedures, and requirements.

Evaluation Plan

OLPP will continue its search for mechanisms to assist property owners with the cost of abating lead hazards. In the meantime, however, OLPP will develop and maintain a tracking system for all properties that receive a risk assessment report. The OLPP Director will review the report monthly with the Environmental Health Specialist to assess accomplishments in eliminating lead hazards in housing. OLPP will give special attention to repeat offenders, in conjunction with local codes agencies, to achieve at least interim controls or removal of the properties from the housing stock. The OLPP Director, as part of his monthly review, will assure that egregious rental cases are referred to EPA or HUD for enforcement of the lead disclosure rule.

6. Resources and Funding

Objective: To seek out and make maximum use of multiple funding sources.

Discussion

Delaware's CLPPP and other lead poisoning prevention activities are funded by several sources. The primary federal funding sources are the EPA and CDC, both of which pay for several OLPP staff positions. Several positions are supported by State appropriations. The OLPP Director has been funded by a HUD Lead Hazard Control grant.

In 1999, the State received a \$2.7 million grant from HUD to eliminate lead hazards in 224 units in a single census tract in Wilmington. A total of 324 units were actually completed. The State will apply again for an additional grant in 2004 when HUD publishes its Notice of Funding Availability. This important resource will again be targeted to a high priority target area yet to be determined.

OLPP will routinely review funding opportunities from CDC, EPA and HUD, and apply for grants that will support its core mission of eliminating childhood lead poisoning.

All of the above funding sources have to deal with identifying lead poisoning cases and building the infrastructure to help the children and their families. None of them pay for the cost of repairing the housing that caused the problem.

Federal and State housing programs (CDBG, HOME, and others) are primarily for the purpose of rehabilitating substandard housing up to State or local code standards. In many cases priority is given to basic health and safety conditions such as replacing the furnace, repairing the roof, etc. The clients are often elderly low-income persons. The work write-ups for rehabilitation must include eliminating lead hazards identified in a risk assessment report. However, none of the programs are dedicated to rehabilitating properties occupied by a child with an elevated BLL.

Activities

1. Research options for revenue sources to assist property owners with the cost of lead hazard control.
2. Seek out all possible funding sources and make applications to EPA, CDC, HUD and other federal agencies.

Evaluation Plan

OLPP will routinely seek out and apply for federal assistance whenever possible to augment State funds and current federal grants. Success will be measured by the amount of funds received.

Primary Prevention

Primary prevention is a term used to describe actions taken to prevent children from becoming lead poisoned. Secondary intervention, on the other hand, describes actions taken to alleviate the problem after a child has become poisoned.

Both primary prevention and secondary interventions are essential components of a comprehensive lead poisoning prevention program. This Strategic Plan includes both components. The following table illustrates how primary prevention and secondary interventions work together.

Table 5: Primary and Secondary Prevention

	Primary	Secondary
Health	Education Outreach	Case management
Housing	Code enforcement Rehabilitation programs	Abatement of hazards

OLPP has an education and outreach program. It will be continued and expanded. An education and outreach plan will be developed each year that identifies specific priorities and audiences. There is currently a set of case management standards that will be reviewed and updated if needed.

Housing is not a responsibility of OLPP. However, it is important to be able to work with property owners to either abate hazards so other children will not become poisoned, or cause the property to be boarded up or demolished.

Code enforcement and rehabilitation programs are administered by numerous State, county and city agencies. Those programs that are federally funded are subject to new HUD regulations that generally require the correction of lead hazards and/or compliance with local codes and ordinances. HUD rules also require the use of lead safe work practices during the course of rehabilitation and repairs. OLPP will continue to offer its experience and expertise to State and local code enforcement and rehabilitation programs.

Delaware will continue to seek a balance between primary prevention and secondary interventions. The State's approach to primary prevention, in particular, will be emphasized and expanded in the future. The best indicator that a child will become lead poisoned is that he/she lives in a house that previously poisoned a child. Thus, secondary interventions also serve as a vehicle for primary prevention.

Healthy Homes

There has always been a strong relationship between housing conditions and the health of its occupants. Efforts to study the impact of housing quality on health have generally been categorical in nature focusing on single agents such as lead, allergens, radon, and various toxins. The concept of healthy homes is relatively new and takes a holistic approach to creating and maintaining home environments without elements harmful to health. This approach looks at the house as a system.

The Department of Health and Social Services is considering implementing a Healthy Homes Program in Delaware. The review is still in its nascent stages. The broad purposes, scope of programs, and organizational elements are still under consideration. Delaware's CLPPP will remain a separate program at this time, although it may well be incorporated in a larger Healthy Homes program in the future.

There is general agreement that the idea behind healthy homes is to address multiple housing-related health and safety issues at one time. The following discussion is designed to reflect current thinking on the subject of healthy homes. By including this discussion in this Strategic Plan to Eliminate Childhood Lead Poisoning, the Department is inviting comments and suggestions on this important subject.

What conditions should be combined? Is it the housing condition we should be concerned about? A leaking roof causes the ceiling, walls, and paint to deteriorate, which in turn can cause lead poisoning. Or are we looking at the health conditions? After all, there are multiple triggers for asthma in a house. To complicate matters, certain subjects that are not structural in nature are often lumped with structural housing conditions. Examples include cockroaches, rodents, and pest infestations. Following are some of the more common examples of the nexus between health and housing.

- Excess moisture is a risk factor for respiratory illnesses and symptoms, especially children. It is also associated with paint deterioration, mold formation, higher concentrations of dust mites, cockroach infestation, asthma and allergen sensitization, and structural hazards associated with rot and rust.
- The connection between dust and childhood lead poisoning is well documented. Dust is also an exposure route for mold, allergens, dust mites, asthma, and some pesticides. Carpets and rough or porous floors trap dust and can be easily and cost-effectively addressed.
- Proper ventilation supplies adequate oxygen and removes carbon dioxide and other pollutants, such as allergens. There are no national or State standards for ventilation. Most air intake is through normal building "leakage." Too much ventilation can create moisture problems. Inadequate ventilation can contribute to dispersal of mold, radon, excess carbon monoxide, and toxics from building materials, cleaning products, and appliances.

- Delaware's public water supplies are generally deemed to be safe to its customers. Private water supplies are another matter. Lead pipes or lead solder can contaminate healthy water.
- Hazardous household products and pesticides need to be stored safely out of the reach of children. Consumer behavior is usually the concern, not the dwelling per se.
- Unintentional injuries are among the leading causes of death. The National Safety Council estimates that in 1998, home-related injuries caused approximately 28,800 deaths. This includes deaths due to falls, poisoning (solids, liquids, and gases), burns, choking, suffocation (mechanical), and firearms.
- Education is an important part of any program to promote healthy homes. Many interventions are not expensive (e.g., vacuum carpets and floors, install and run a bathroom exhaust fan, install and change filters on a furnace, and remove food and water sources from rodents and cockroaches at night).

These questions and issues are but a few of the many that must be considered in designing a Healthy Homes Program. Consideration of a Healthy Homes Program is a reflection of the progress that has been made in understanding and combating lead poisoning and other housing-related health issues in Delaware.

Evaluation Plan

Previous sections of this Strategic Plan identified questions to be raised to evaluate specific subject or activity areas, such as education and outreach, case management, and so on. That is an important part of an evaluation process. Were the activities carried out as proposed and were those activities effective? The broader responsibility is to evaluate the State's effectiveness in eliminating childhood lead poisoning.

The overarching goal of this Strategic Plan, as stated in the Statement of Purpose, is to reduce the incidence of lead poisoning to less than one percent of all children under the age of six.

That is a feasible goal that is attainable by the year 2010. It is measurable and verifiable.

There are subsets of that overall goal, however, that also need to be reviewed and evaluated. They get to the heart of the entire effort and can be measured by looking at the following:

1. The number and percentage of children initially tested that have elevated blood lead levels (EBLLs). Are the numbers and percentages going up or down, or holding steady?
2. The number of children with elevated blood levels at initial testing whose blood lead levels are reduced to acceptable levels as a result of OLPP's intervention. Is intervention successful?
3. The number of properties occupied by children with EBLLs where lead hazards are controlled by the owners. Are the hazards cited in a risk assessment eliminated so that future exposures will not occur?

With regard to the first measure, both the number and percentage of children initially tested with BLLs ≥ 10 $\mu\text{g}/\text{dL}$ has declined from 17.3% in 1994 to 2.1% in 2003. That is a major achievement. However, it is still approximately double the goal of 1% by the year 2010. A careful and continuing analysis of the data is called for. What patterns are there, if any? Where are the children with EBLLs living? Are they mostly in the City of Wilmington? Are some in rural areas? Are there repeat addresses where children are being poisoned over and over again? Has there been an influx of very low-income people from outside the State of Delaware living in housing in poor condition? Conducting this analysis is necessary to establishing annual goals for education and outreach.

The second measure of effectiveness is whether children with EBLLs are able to reduce their BLLs. This is definitely and appropriately the priority of the public health nurses. Data on this subject have not been reported, so it is not known how successful intervention is. The Public Health Nurses are very confident that their case management

is having a positive impact on these children. It is not known whether that confidence is borne out by the data.

The third measure of effectiveness is whether the lead hazards are being remediated in the housing where the children with EBLLs live. OLPP does not keep data on this important subject. The consensus of OLPP staff is that very little is done by property owners in response to a risk assessment report that identifies lead hazards. Deteriorated paint is not stabilized. The general argument is that there is insufficient legal or regulatory authority to require abatement or interim control of lead hazards, even when they are linked to lead poisoning, and no financial assistance is available for the owners. These important subjects are addressed in the section on Compliance and Enforcement.

Delaware's evaluation plan will focus on these three key subjects.

Work Plan Activities

1. Outreach and Education

Objective: To identify and correct housing and environmental hazards before children become lead poisoned.

	Activity Description	Lead Agency	2004	2005	2006	2007	2008	2009	Cost/ Budget (\$000)	Expected Outcomes
1	Create a marketing theme to educate the public on preventing childhood lead poisoning.	OLPP, contractor	X						\$5,000	Theme
2	Contract with a marketing consultant to develop a strategy for promoting the marketing theme.	OLPP, contractor		X					\$10,000	Strategy
3	Develop an outreach and education plan for OLPP staff each year.	OLPP	X	X	X	X	X	X	\$0 (in-house)	Plan
4	Inventory, review and update outreach and education materials.	OLPP	X		X		X		\$10,000	Materials with OLPP telephone #
5	Distribute information about preventing childhood lead poisoning to new mothers at hospital birthing centers throughout the State.	OLPP, Christina Hospital	X	X	X	X	X	X	\$90,000	60,000 lead testing kits @ \$3/kit

Work Plan Activities

1. Outreach and Education

6	Distribute information about preventing childhood lead poisoning at childcare facilities throughout the State.	OLPP, DCCL	X	X	X	X	X	X	\$3,000	Mailing cost for 3,000 units
7	Conduct outreach to physicians and other key health personnel on State and federal childhood lead poisoning prevention laws, regulations, and policies.	OLPP		X		X		X	\$3,000	Mailing cost for 3,000 units
8	Develop a plan and program for training contractors, property owners, property managers, and maintenance personnel on using lead safe work practices in rehabilitation, renovation and remodeling.	OLPP, contractor		X					\$10,000	Plan

Work Plan Activities

2. Medical Surveillance and Screening

Objective: To provide lead screening of children at high risk of lead poisoning in a timely manner.

	Activity Description	Lead Activity	2004	2005	2006	2007	2008	2009	Cost/ Budget (\$000)	Expected Outcomes
1	Perform a quality control review of lead screening data	OLPP	X	X	X	X	X	X	\$0 (in-house)	QC review
2	Conduct analysis of lead screening data.	OLPP	X	X	X	X	X	X	\$0 (in-house)	Annual review
3	Review and update the lead screening protocols.	OLPP, health clinic staffs	X		X		X		\$0 (in-house)	Updated protocols
4	Conduct workshops for OLPP public health clinic staffs and duPont pediatric site staffs on lead screening protocols.	OLPP		X		X		X	\$0 (in-house)	Trained professionals
5	Conduct outreach and training to labs that report lead levels to DPH.	OLPP	X		X		X		\$0 (in-house)	Trained professionals

Work Plan Activities

2. Medical Surveillance and Screening

6	Continue giving priority to Medicaid, WIC, and HCP in lead screening.	OLPP, clinics	X	X	X	X	X	X	\$0 (in-house)	Increased testing
7	Update the priority zip codes.	OLPP		X			X		\$0 (in-house)	Updated priority zip codes
8	Evaluate the feasibility of electronic reporting of screening data by laboratories.	DPH		X		X		X	\$0 (in-house)	Electronic reporting

Work Plan Activities

3. Case Management

Objective: To provide high quality service and assistance to families of children with elevated blood lead levels, including evaluations, education, and medical referrals.

	Activity Description	Lead Agency	2004	2005	2006	2007	2008	2009	Cost/ Budget (\$000)	Expected Outcomes
1	Review and update case management standards.	OLPP	X		X		X		\$1,000 printing costs	Revised case management standards
2	Explore possibility of hiring a contractor to perform intensive cleaning of a house occupied by a child with EBLL.	OLPP	X	X	X	X	X	X	\$6,000 (\$1,000 annually)	Contract with cleaning company
3	Develop a monitoring form and plan for appropriate case management services.	OLPP	X						\$0 (in-house)	Monitoring form

Work Plan Activities

4. Partnerships

Objective: To establish and maintain partnerships with public and private organizations to obtain insight into childhood lead poisoning issues and assistance in combating it.

	Activity Description	Lead Agency	2004	2005	2006	2007	2008	2009	Cost/ Budget (\$000)	Expected Outcomes
1	Continue and expand partnerships with community-based organizations.	OLPP, LACC, etc.	X	X	X	X	X	X	\$0 (in-house)	Activities with partners
2	Continue and expand partnerships with other State and local agencies.	OLPP, DSHA, counties, cities	X	X	X	X	X	X	\$0 (in-house)	Activities with partners
3	Establish an advisory committee to assist with implementation of the childhood lead poisoning elimination plan.	DPH, OLPP			X	X	X	X	\$2,000 (\$500 annually)	Committee formed

Work Plan Activities

5. Compliance and Enforcement

Objective: To assure that corrective actions are taken by owners of properties to eliminate lead hazards.

	Activity Description	Lead Agency	2004	2005	2006	2007	2008	2009	Cost/ Budget (\$000)	Expected Outcomes
1	Reevaluate current State lead poisoning prevention regulations to determine whether mechanisms can be established to encourage property owners to abate lead hazards.	OLPP	X	X					\$0 (in-house)	Increased opportunities for abating lead
2	Target repeat offenders by coordinating with local codes agencies on enforcement of housing codes in cases where there is a lead-poisoned child.	OLPP, DSHA, Wilmington, 3 counties	X	X	X	X	X	X	\$0 (in-house)	Compliance
3	Refer cases to EPA or HUD for enforcement of the lead disclosure rule.	OLPP, AG, EPA, HUD	X	X	X	X	X	X	\$0 (in-house)	Compliance
4	Develop and maintain a tracking system for all properties that receive a risk assessment report.	OLPP	X	X	X	X	X	X	\$0 (in-house)	Compliance

Work Plan Activities

5. Compliance and Enforcement

5	Expand the pool of certified abatement contractors by continuing to offer free training.	OLPP, EPA, CDTA	X	X	X	X	X	X	\$60,000 (\$10,000 annually)	Trained professionals
6	Conduct annual seminars with certified personnel to update them on State policies, procedures, and requirements.	OLPP	X	X	X	X	X	X	\$3,000 (\$500 annually)	Trained professionals

Work Plan Activities

6. Resources and Funding

Objective: To seek out and make maximum use of multiple funding sources.

	Activity Description	Lead Agency	2004	2005	2006	2007	2008	2009	Cost/ Budget (\$000)	Expected Outcomes
1	Research options for revenue sources to assist property owners with the cost of lead hazard control.	DPH, OLPP, Advisory Committee, contractor		X					\$5,000	List of revenue sources
2	Seek out all possible funding sources and make applications to EPA, CDC, HUD and other federal agencies.	DPH, OLPP	X	X	X	X	X	X	\$0 (in-house)	Grant funding