

Evaluating a Health Education Project in Maine

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Introduction

The following paper details the evaluation of a public health education project in the state of Maine. Evaluation of education projects presents a challenge, in that the effects of the intervention are not easy to trace and outside influences difficult to impossible to control. This study approached this difficult issue at the start by focusing on one variable for which data are readily available (namely blood lead testing rates). The evaluation was further enhanced by use of a model called "RE-AIM", which measures the reach, efficacy, adoption, implementation and maintenance of educational projects (Glasgow, et.al. 1999). Measurements centered on data tracked through newly created databases and focused on elements directly attributable to the project (i.e. behavior of medical personnel trained through project activities). Finally, small focus groups and interactions with families served by the program were used to derive qualitative data that provided a broader perspective on the success of activities. As the program ultimately seeks to entirely eliminate childhood lead poisoning, this paper concludes with a discussion of areas that continue to need attention for future education projects.

Overview of the Lead Education Project

The Maine Childhood Lead Poisoning Prevention Program (MCLPPP) is part of the state Bureau of Health, Maine's state-level public health agency. Although the MCLPPP initially worked only with children officially recognized as “poisoned” (having a blood lead level of 20 micrograms per deciliter [ug/dl] or above), the program expanded its mission slowly during the project period. The new mission of the program included educational interventions and home visits as indicated for children in the “elevated” category (having a blood lead level of 10 ug/dl or above). Medical care providers were alerted to these changes through mailing campaigns and trainings.

In 1999, MCLPPP contracted with the Institute for Public Sector Innovation (IPSI) at the University of Southern Maine to implement and evaluate an education campaign encouraging parents to seek screening in areas judged to be at high risk for poisoning. The project was designed with the philosophy that prevention measures would be adopted as a result of raising the awareness of parents and various health care and day care providers to the issues of lead hazard avoidance.

In particular, the project originally focused on the blood lead testing rate. Due to a state law requiring the state lab conduct all lead testing, a complete universe of data was available for this measure. The Centers for Disease Control and Prevention (CDC), which funds the MCLPPP, had asserted that children under age six are at particular risk for lead poisoning, due to a variety of developmental factors (CDC 1997). Recommendations from CDC suggested at that time that children be tested at ages 1 and 2 if they are found to be at elevated risk for exposure to lead hazards. Children at these ages were found to be most vulnerable

to adverse developmental effects stemming from lead's disruption of neurological functions. The CDC (1997) had determined that lead-based paint was the most common source of lead hazard exposure for children and that the risk may be concentrated geographically in tracts of homes built before 1950.

In 2000, the MCLPPP commissioned the Maine Medical Assessment Foundation (MMAF) to report on blood lead testing data for the years 1994 -1999. The study, released in December 2000, found the following (MMAF, 2000):

- The overall blood lead testing rate among children under 6 was 14.9% in 1994 and 11.3% in 1999. This represents a significant downward trend. The trends varied widely by county.
- There was absolutely no pattern found to link the percent of positive screens with the proportion of older housing or poverty rates in a given geographic area.
- Maine has shown an overall 19% decline in average blood lead over the past several decades (close to the national average).
- Children under the age of six who are Medicaid clients are twice as likely as others to have elevated blood lead levels. This is the only population trait found to be a positive predictor of blood lead elevation.
- Children under age six on Medicaid were tested at much lower rates than the general population. Yet, Medicaid at the national level requires blood lead testing at ages 1 and 2 for all children on the program.

The results of this study demonstrated that Maine could not use the model suggested by CDC of geographically targeting parts of the state for intervention. The study also showed a need for issuance of testing guidelines to medical care providers and parallel education among parents, especially in the Medicaid population.

Educational Activities

The MCLPPP, with the assistance of IPSI, developed several strategies in response to the issues described above.

Educational Partnerships: The MCLPPP began its educational efforts by engaging potential community partners, such as Maine Kids Run Better Unleaded (MKRBU), the Department of Environmental Protection (DEP), the Maine State Housing Authority (MSHA), Community Action Program (CAP) agencies and the local public health departments in Portland and Lewiston/Auburn. The MCLPPP also established a Lead Advisory Board composed of citizens, agencies, parents and health care givers in order to provide input and feedback into policy decisions. Among the contributions of the advisory board were the recommendation of intervention protocols at lower blood lead levels and finalization of PSA's, brochures and the website design. Educational partners assisted program efforts by coordinating training and health promotion campaigns with MCLPPP.

Brochures: The MCLPPP developed a program brochure that provided a general overview of lead poisoning facts and figures, along with tips and contacts for readers. This brochure was developed alongside similar brochures by DEP and MSHA. All the brochures utilized these standardized social marketing messages:

- Lead is a problem
- Lead is a problem in Maine
- Lead hurts children
- You can do something about lead

The MCLPPP eventually revised its program brochure in an “easy-to-read” format. The original brochure was retained as an informational vehicle for health care givers and other professionals, who have responded positively to it. The program developed a fact sheet based on the easy-to-read brochure. This sheet was distributed to 11,000 households through the Early Periodic Screening and Diagnostic Testing program (EPSDT).

Mailing Campaigns: The project included three major mailing campaigns.

- Treatment and testing guidelines for all family, general practice, and pediatric care physicians.
- All three interagency brochures (MCLPPP, MSHA and DEP) and a cover letter (to over 1,000 professionals and agencies).
- Summaries of the MMAF report, along with the full report, for all family, general practice, and pediatric care physicians in Maine.

PSA’s: Using the social marketing messages above and a pool of funds provided by partner agencies, the MCLPPP assisted in the development of televised Public Service Announcements (PSA’s) on the dangers of lead exposure broadcast in 2001 and again in 2002.

Website: In August of 2001, the MCLPPP launched a website with general information, links to other websites, educational materials, basic contacts and national news about lead.

Trainings: MCLPPP trained public health nurses in the fundamentals of lead exposure and poisoning prevention and the new case management protocols. The program case management database was redesigned to allow for the tracking of case activities against protocols

Displays and Presentations: MCLPPP personnel participated in several public presentations and displays at conferences and events throughout the state of Maine in the project period. The program also assisted in a statewide project through MSHA to train HeadStart personnel in lead basics.

Newsletter: The program developed a one-page newsletter to go out on an “occasional” schedule to all members of the Advisory Board and to any persons ordering more than the basic three brochures of the social marketing campaign. At the end of the project period, there were approximately 400 recipients of this newsletter statewide.

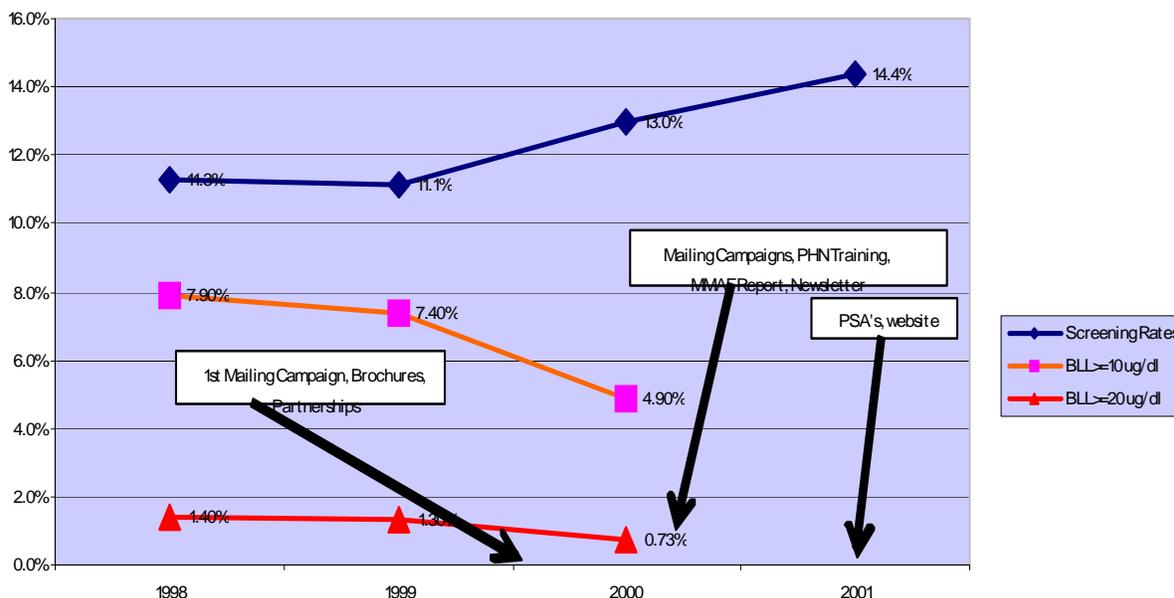
Measures of the Project’s Effectiveness

Blood Lead Testing Rates: The education project first determined that the impact on blood lead testing rates would be the main measure of project effectiveness. The MCLPPP has, with the help of its epidemiologist and the MMAF, been able to trace the testing rate through the project years. The following charts were supplied courtesy of Kathy Tippy, Maternal Child Health Epidemiologist, State of Maine. Data were analyzed through the end of calendar 2001. The chart displayed below

(see Figure 1) shows that overall testing rates among children under age 6 in Maine rose over the project period while blood lead levels detected decreased. This effect is precisely that which the MCLPPP sought in the project period. Each event in the education project is noted on the chart. It is instructional to recall that in 2000, MMAF found the blood lead testing rate was following a several year pattern of significant downward trend in 1999. In that year, the rate reached its lowest mark since 1994.

Figure 1

Blood Lead Trend Analysis for Maine Children Under Age Six

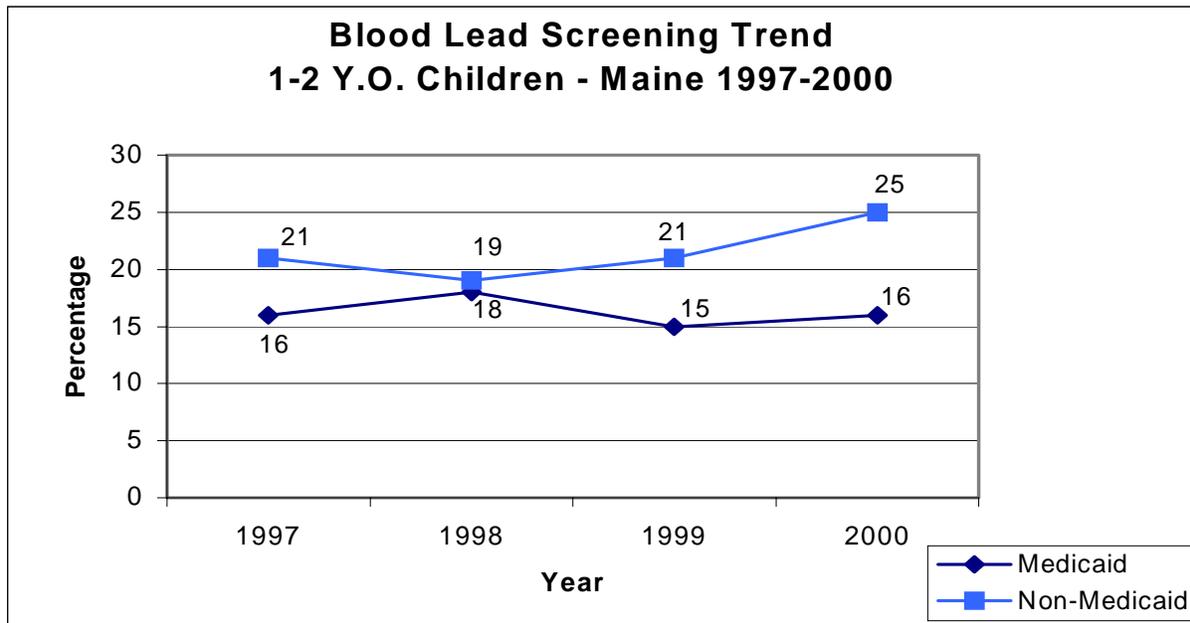


Studies conducted by Kathy Tippy in 2001 showed that there was a continuing trend throughout the project period of lower (but rising) testing rates among Medicaid participants and that testing rates were higher among 1 year olds than 2 year olds. The MMAF study of 1994-1999 data had shown a higher average blood lead in relatively older children. Both results suggest children are more likely to be

tested at one year old and then not followed up until they enter a program such as HeadStart, which requires a recent blood lead test.

Figure 2

Blood Lead Screening Trends in Maine for the Period 1997-2000



Figures for Maine children ages 1 and 2 overall (for the year 2001) are as follows in Table 1:

Table 1

Testing Rates and Percent Blood Lead Levels

Age	Testing Rate	% Blood Lead Levels \geq 10 ug/dl
1	38.4 %	5%
2	15%	6.7%

These data emphasize the point that children on Medicaid and children who are older than age one are not being tested as often as they should be. The Medicaid

testing rate should be 100%, as testing is actually required at this age by federal statute. The higher blood lead levels among two year olds in the face of lower testing rates suggests, among other things, that there is a group of poisoned children not adequately detected among the wider group. For the MCLPPP, these data also illustrate a success. The testing rate among one and two year olds is consistently higher (and rising) than for the entire population 6 and under. This result suggests that providers do understand the greater risk of damage from lead exposure to younger children.

The RE-AIM Model : In 1999, Glasgow, et.al., proposed the use of a model called RE-AIM to evaluate health promotion interventions. These letters stand for:

- Reach
- Efficacy
- Adoption
- Implementation
- Maintenance

In general, the focus is on determining the following:

- How many people received the program message,
- How many followed the message as measured by behavior changes,
- How closely the delivery of the program matches the intent of designers,
- How institutionalized behavior changes become.

The MCLPPP began its overall evaluation planning by creating a logic model describing desired outcomes for the program and activities designed to achieve these outcomes. The logic model focused on blood lead testing rates as a measure of *awareness and adoption* and on numbers trained as a measure of program *reach*. The focus is on extending program *reach* in hopes of effecting *adoption* of the behavior changes recommended to minimize lead hazard exposure.

To follow the logic model through its implications, if the public *adopts* the educational message, parents would know when to pursue blood lead testing while medical providers would know when to provide blood lead testing and how to manage cases of elevated blood lead. Furthermore, parents and providers both would be able to *implement* measures to minimize exposure to lead hazards. As a result, blood lead testing rates would rise but average blood lead levels would continue to drop. Follow-up blood lead tests would be performed in a timely fashion and cases would be managed appropriately, demonstrating strong *efficacy* of program design. Eventually, the number of poisoned children would drop, demonstrating the continued *maintenance* of the system.

Program Measures

Creating a rise in blood lead testing rates was the goal of the lead education project, but these rates are affected by many competing factors, including the efforts of other agencies, national organizations and media coverage. In order to evaluate project effects under more direct control, the MCLPPP selected several local program measures as well, using the RE-AIM model as a guide.

Number of Items Sent

The number of educational materials distributed by the MCLPPP, especially those distributed by request, reflects public interest in lead poisoning and the *reach* of the program. According to a database designed specifically for this project, these requests were evenly distributed over the state. The baseline measure of distribution is effectively zero, as the MCLPPP did not have any materials to mail before 1999. As of January 1, 2002, MCLPPP mailed 70,611 items. Those who requested print materials above what was sent in blind mail campaigns represent 380 individuals receiving 68,956 items from January 2000 to January 2002.

Trainings and Other Public Presentations

The number of trainings conducted by MCLPPP and the number of persons trained is also a measure of program *reach*. From 2000 to 2002, the MCLPPP trained all public health nurses (state employees) and community health nurses (contracted nurses), 89 individuals, in the new program protocols for lead hazard education and reduction and medical case management. MCLPPP personnel also trained office nurses, contractors, inspectors and HeadStart personnel. A rough estimate of the numbers of persons reached through training by the MCLPPP during the project period would modestly approach 400 and would encompass every part of the state. All trainings were tracked through a database.

Case Management Reports

One measure of the *efficacy* of the trainings conducted by MCLPP in assuring *implementation* and *adoption* of protocols is the adherence of trainees to the

protocols. The MCLPPP case management database (redesigned for the purposes of the project) allows users to track the difference between the date an intervention is supposed to occur (the "target date") and the date upon which it actually occurs. As of January 2002, 90% of interventions by the public health nurse system averaged response times within 3 days of the target date.

Qualitative and Anecdotal Data

Staff communicated to the IPSI consultant that the general public displayed a changing awareness that lead is a problem but continued to show a lack of understanding as to how to fix the problem or where to seek help. During public contacts at health fairs and conferences, for example, staff were approached by people with the questions such as "What is this about lead? I thought they got rid of that a long time ago?" By the end of the project, it became more common to be approached with a question that began, "I live in an old house...." There were a small number of phone calls (29) received directly in response to the PSA's as well.

The IPSI consultant surveyed participants in the public health nurse trainings by mail, after nearly a year had passed from the original trainings in order to determine how well the nurses had implemented the protocols. The 22 respondents to the survey demonstrated good grasp of the case management protocol for poisoned children, but 17 failed to mention preventative measures for homes where children are not yet poisoned. Responding to questions about how useful the trainings were, 5 specifically linked usefulness to whether or not they had lead poisoned children on their caseloads.

A follow-up phone survey of supervisors found that there was a perceived need for refresher training and a general frustration in working with housing issues (especially landlords). Supervisors all rated the trainings as effective and useful.

The IPSI consultant also surveyed all parents of children with elevated lead levels who had definitely received materials from MCLPPP in 2001 and parents with children whose capillary draws were elevated who may or may not have received materials from any source. Of 52 respondents, 23 rated program materials as "very helpful" or "helped a lot" and 10 rated the materials "somewhat" or "a little helpful." Those who did not respond to this question indicated they received no materials. Some parents responded that they were frustrated that they did not know where to get help for kids with blood lead levels under 20 ug/dl.

In 2002, MCLPPP 's new "Easy To Read" brochure was chosen as part of a focus group review of environmental risk education materials offered by the Bureau of Health to parents of young children. This brochure was chosen more often by participants as the most attractive brochure, based not on its appearance but on its content. Most participants in the four groups rated lead as an important problem and even the youngest teenaged parents displayed a basic understanding of lead hazards. Many referred to the PSA's as having influenced their opinions.

Conclusions

Outcomes: During the education project period, the blood lead testing rate in the state of Maine rose 3.1% (a 20% increase) and new case management protocols were successfully established. The project reached a statewide population through several media and reinforced many relationships with other agencies that serve the

population potentially at risk for exposure. In terms of RE-AIM measures, the project achieved what it was created to achieve in terms of extending the *reach* of the MCLPPP and encouraging the *adoption* of its message. Partnership with the University of Southern Maine proved successful in promoting this outcome.

Remaining Work: The long-term goal of the MCLPPP is to eliminate childhood lead poisoning. While progress is being made towards that end, the goal has not been met. Some of the data gathered for this project suggest further solutions.

- Reinforcing Public Health Nursing's Role In Prevention: The Public Health Nursing system has been a valuable partner in managing the cases of children who have elevated blood lead levels. However, the mail survey of training participants hints at the need to institutionalize the message that prevention of exposure to lead hazards is a part of their mission, even if no elevation has been detected.
- Supporting Medicaid's Role In Promoting Testing: Physicians paid through the Medicaid system do not adhere to the federal policy requiring them to test all clients regardless of risk factors. The new Maine state law requiring a physician task force to create a Maine-specific risk questionnaire presents a "teachable moment" for this population in that all physicians will have to be made aware of the new law and the risk questions.
- Showing The General Public How To Adopt Prevention Measures: The PSA's did much to raise awareness that lead exposure may be a problem and that it hurts children. A new round of PSA's could carry the message further by emphasizing some of the risk factors. The public further needs to know

that there are simple measures that can be adopted by homeowners to address risks that will not lead them to be bankrupted (a common fear that surfaces in talking with homeowners, according to MCLPPP staff).

- Reassessing Data: While the MMAF found no particular geographically defined risk areas and no specifically advisable testing rate, the data available at the time were consistently eroding in quantity. More data are available now to assess risk based on various factors and more data will continue to be available. Another study of the type conducted by MMAF may be warranted within a few years.
- Promoting Program Services: During the last year of the project, it was common for callers to want to know who was responsible for different portions of the case management task and what would be done at different blood lead levels. This was one by-product of the successful promotion of the case management system and the raised awareness of the public to lead poisoning as an issue. Now people knew that their children should not have lead in their bodies, but they did not know how much was acceptable and how the program responded at each level. There was no single educational piece available to answer all these questions, so the staff often used the training flowchart used to summarize the system. The program would be well served by a piece, designed in conjunction with parents, that answers basic questions about the program and how it serves children.
- Promoting Screening Of 2 Year Olds: Data available during the project period suggest that providers are acquainted with the fact that 1 year olds need to be tested for lead. However, the 2-year-old population is apparently

not being tested as suggested. The program should emphasize this gap in testing through a campaign to educate health care providers. Providers also should receive acknowledgment of their obvious dedication to assisting in the prevention of lead poisoning.

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