



# Lead Awareness: North Philly Style

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Lead poisoning in children has been associated with reduced intelligence, shortened memory, slowed reaction times, poor hand-eye coordination, and antisocial behavior. The cost to society includes not only medical treatment and special education but also higher high-school drop-out rates, which are associated with crime and low earning potential.

## THE MOST COMMON PATHWAY

for childhood lead exposure is the chronic ingestion of household dust and soil from deteriorating low-value housing contaminated by lead-based paint. Housing at risk was built prior to 1950, when the industry voluntarily stopped producing lead-based paint. Children under 6 years of age retain a higher percentage of lead in their blood and soft tissue, where the lead exerts toxic effects. In addition, they are more likely to place lead dust-covered fingers and objects in their mouth and to have iron and calcium nutritional deficiencies, all of which enhance the absorption of lead.

How to lower children's exposure to lead is known, but how to get the caregivers to take action is still a subject of investigation. This demonstration project tested the impact of community-developed, community-based prevention-intervention strategies on citizens' knowledge and on hazard, exposure, and outcome surveillance of lead poisoning.<sup>1</sup>

## THE PROGRAM

Community-developed strategies were created for this project with resident leaders from the community and grassroots agencies serving the community. The grassroots agencies included the Philadelphia Housing Authority Tenant Councils for Norris Homes and Apartments and Fairhill Apartments; the Village of the Arts and Humanities, an organization devoted to introducing the arts and humanities to all socioeconomic groups; the Philadelphia Parent Child Center; the Neighborhood Action Bureau, an economic development corporation; and the Salvation Army. All agencies that were initially approached actively participated in the 4-year project. These community leaders participated in the writing of the proposal and served as grant staff throughout the project.

Four experimental and control census tracts were selected and matched on the basis of percentage of housing built before 1950, percentage of the population living below the poverty level, and percentage of African Americans. The prevention-intervention strategies were developed by and for this economically disadvantaged urban African American

target population, living primarily in public housing developments or scattered sites. The 4 census tracts targeted for the intervention cover approximately 200 city blocks. In the targeted census tracts, the mean percentage of the population living below the poverty level is 51%, with a mean income of \$11 000. The percentage of African Americans is 89% and the mean housing value is \$14 999 to \$35 700. The targeted area within North Philadelphia is one of the poorest in Pennsylvania. Lead poisoning and all other health problems are generally 2 to 2.5 times more prevalent than in the City of Philadelphia as a whole.

Creative interactive educational sessions, including puppet shows, crafts, and chants, were presented to children in after-school and camp programs. Thirty interactive after-school and camp programs were held each year. Each program included 3 sessions, with an average attendance of 40 children. In addition to educating the children, these interventions aimed to create interest in the adult block parties through the knowledge and crafts that the children brought home. Those programs that showed the potential to create such interest were often held each year. The

grant team arranged for the North Philadelphia block captains to invite adults to informational block parties, 30 of which were held each year, with an average attendance of 30 adults. The adults received a standardized curriculum addressing the risk of lead as an environmental agent. In the invitation, the adults were promised as incentives the materials needed to limit lead exposure within their homes as well as T-shirts, tote bags, and lanyards to hold keys. On the fronts of the T-shirts and tote bags were the title of the grant—Lead Awareness: North Philly Style—and one of the chants used in the after-school and camp programs with the children (e.g., “Wash those hands, wipe those feet, don’t bring that lead from off the street.”); on the backs were the names of the community partners involved in the grant and the basic tenets to reduce lead exposure in children. Pictorial pretests, given to the adults before the curriculum was presented, made all participants aware of their need for knowledge.

To test the impact of the prevention–intervention strategies on knowledge related to the risk of lead as an environment agent, random telephone surveys were completed before the intervention strategies began and after the first and second years of the intervention. During the first year of the study only, adults in the experimental census tracts tested and reported on lead exposure in their homes, using the lead-sensitive brushes distributed at the informational block parties. We learned of their results via random telephone calls to party attendees (100 homes). To test for exposure and outcome surveillance, the percentage change in the blood lead levels of children

(aged 6 years and younger) living in the experimental and control census tracts was followed.

## DISCUSSION AND EVALUATION

Approximately 1200 children and 900 adults participated in the educational sessions in each of the 3 years of the intervention.

Before the implementation of all proposed strategies, the responses of adults in the experimental and control census tracts to questions from a random telephone survey were compared; no significant differences in knowledge regarding lead poisoning were found. Overall lead poisoning awareness was low. After the first and second year of the intervention, the only significant difference found was in the greater number of respondents in the experimental census tracts that ranked lead as the number 1 children’s health problem in their neighborhood.

Hazard surveillance (reported via follow-up telephone calls to attendees of the informational block parties during the first year of the intervention) found that in the experimental census tracts, 90% of the homes tested with the lead-sensitive brushes were positive for lead. This finding was shared with adults and children participating in the project and was used to motivate them to listen, learn, and act. After the first year of the intervention, there was a 27% increase in the number of children tested in the experimental census tracts and a 10% increase in the control census tracts. Regarding exposure surveillance, after 1 year of the intervention, there was a 3% reduction in the percentage of children with venous blood lead levels greater than or equal to 10

µg/dL in the control census tracts compared with an 11% reduction in the experimental census tracts. At the end of 3 years of intervention, there was a 24% reduction in venous blood lead levels greater than 14 µg/dL in the control tracts vs a 27% reduction in the experimental census tracts. Regarding outcome surveillance, there was a larger percentage reduction in venous blood levels greater than 19 µg/dL, 24 µg/dL, and 29 µg/dL in the experimental census tracts than in the control census tracts. Over the 3 years of the intervention, the largest difference or percent change in venous blood level between the experimental and control census tracts was a 5% greater reduction in the number of children with levels greater than 29 µg/dL. At the end of the 3-year intervention, unlike in the control census tracts, there were no children in the experimental census tracts with levels over 29 µg/dL.

The methodology of using experimental and control census tracts was advantageous because

## KEY FINDINGS

- Community-developed, community-based prevention–intervention strategies increased the number of children in experimental census tracts tested for lead and decreased their blood lead levels compared with children in control census tracts.
- Using control and experimental census tracts proved useful in measuring community-based outcomes.
- Community-developed, community-based prevention–intervention strategies can provide answers about how to narrow the disparity in health in this country.

### Project incentives and T-shirt logos.



it allowed for limited cross-contamination in the 2 populations and provided an acceptable control group with which outcomes could be compared. The impact of community-developed, community-based prevention-intervention strategies on exposure and outcome surveillance of lead poisoning proved effective in reducing blood lead levels in the experimental census tracts to a greater extent than in the control census tracts. It is important to relate that over the 4 years of this project, both the experimental and control census tracts received all of the services normally provided by the Childhood Lead Prevention Program of the Philadelphia Public Health Department, which has an excellent reputation throughout the country.

Just as the second year of the intervention in this project began, a major change took place in health care delivery in Philadelphia. It became one of the first 5 counties in the state to require Medicaid recipients to choose 1 of 4 managed care organizations. Whereas previously the Lead Poisoning Prevention Program of the Philadelphia Health Department received all reports on blood lead levels, the managed care organizations only reported, as required, levels greater than 14  $\mu\text{g}/\text{dL}$ . Therefore, the city data bank no longer includes all blood lead levels of 14  $\mu\text{g}/\text{dL}$  or less. The grant team had to reformulate its data collection methods. The city health department continues to seek full reporting and may have better numbers retrospectively.

## NEXT STEPS

As the result of a long-term commitment made to the experimental census tracts through a community-based academic nurs-

ing center, Temple Health Connection, children and adults in the experimental census tracts will continue to be educated about lead as a toxic environmental agent. After-school and camp programs for the children and informational block parties for the adults will remain the venue to meet this and other health education needs in this community. The results of the testing of blood lead levels in the experimental and control census tracts will be followed into the future.

Developing community-based strategies for this population-based research and demonstration project by and for the targeted population ensured the active participation of the children and adults. All members of the partnership have identified the trust developed and nurtured throughout the 4 years of this project between the targeted community and the faculty of an academic department of nursing as setting the stage to address future research questions.

Lead Awareness: North Philly Style has resulted in Environmental Protection Agency

(EPA)-supported service projects at Temple Health Connection and other academic nursing centers in North Philadelphia, including Lead Safe Babies, Asthma Safe Kids, and the RADICAL project inaugurated at Temple Health Connection on September 27, 2001, by Christine Todd Whitman, the administrator of the EPA. RADICAL (Real Actions Directed to Improving Children's Health and Lifestyle) calls for developing a replication model for training community youth about 3 environmental issues: lead poisoning, environmental tobacco smoke, and asthma. This model is built on the community-developed, community-based prevention-intervention strategies tested in Lead Awareness: North Philly Style. ■

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*This report was accepted December 13, 2001.*

## Contributors

N. Rothman was principal investigator on the project. R. Lourie and J. Gaughan were coinvestigators. All authors participated in the writing of this article.

## Acknowledgments

Funding for this study was provided by the National Institute of Nursing Research (NINR) following a joint call for proposals with the National Institute of Environmental Health Sciences (NIEHS). NIEHS included Lead Awareness: North Philly Style in all activities of its Community Based Prevention and Intervention Program during the funded period and in their program Web site.

Participants in Lead Awareness: North Philly Style include Neva White and Sally Hammerman, Thomas Jefferson University; Lester Levin and Edward Thomas, University City Science Center; Richard Tobin and Peter Palermo, Philadelphia Department of Public Health; Diane Gass and Annette Dyer, Philadelphia Housing Authority Tenant Council Presidents; and the following community agency partners: Village of the Arts and Humanities, Philadelphia Parent Child Center, Neighborhood Action Bureau, and the Salvation Army.

## References

1. Rothman NL, Lourie R, Gaughan J, White N. A community-developed lead poisoning prevention program: Lead Awareness North Philly Style. *Holist Nurs Pract*. 1999;14:47-58.

## Resources

The educational pamphlet *Lead Awareness: North Philly Style Presents WIPE OUT LEAD Funbook* is available from the Philadelphia Department of Public Health by calling 215-685-5263.

**RADICAL inauguration on September 27, 2001, at Norris Homes and Apartments. The project will train youths to take action against lead poisoning, environmental tobacco smoke, and asthma.**