# An Innovative Blood Lead Screening Program for Indian Children

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## SYNOPSIS

There is little information on the lead levels of Indian children nationally. In the late 1990s, members of the Chippewa and Cree tribes living on the Rocky Boy Reservation near Box Elder, Montana, were concerned about environmental pollution and how it might be affecting the health of their children. With financial assistance from the Environmental Protection Agency, the tribes designed and implemented an innovative lead screening program for young children. Because most children on the reservation participated in WIC and Head Start, those programs were used to indentify and screen close to 100% of young children on the reservation. The average blood lead level for children ages 1–5 on the Rocky Boy reservation was 2.4μg/dL, which is not significantly different from that of children of the same age nationally.

The project showed that Indian families will participate readily in screening programs that may improve their children's health.

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The presence of lead in children's blood can adversely affect their health, including their cognitive development.[1] A Centers for Disease Control and Prevention *Morbidity and Mortality Weekly Report* (*MMWR*) provides data from CDC's Childhood Blood Lead Surveillance program for selected counties in 19 states showing that blood lead levels for children ages 1 to 5 has declined, but remains higher than desirable in some places.[2] A level above 10 µg/dL is considered potentially harmful.[3]

The Rocky Boy Reservation was established in 1916 and is home to members of the Chippewa Cree tribe. The reservation is in a remote area at the base of the Bear Paw Mountains about 40 miles south of the Canadian border, near Box Elder, Montana.

In the late 1990s, tribal members were concerned about possible environmental pollution and how it might be affecting children living on the reservation. The buildings where reservation children spend their time are of varied ages and conditions. About half of the housing on the reservation was built before the mid-1970s, and could be contaminated by lead paint. Local elementary schools were built in the 1960s; these schools were tested and found to contain lead paint. Most young children go to two Head Start centers that were built in the 1980s. There was concern about one of the centers, which had been used as a construction warehouse before becoming a center. Finally, the tribe was concerned about potential pollution of the water supply. Testing of the headwaters of the water supply showed the presence of both lead and arsenic.

There was little information nationally or locally about blood lead levels for Indian children. Tribal members were concerned that their children were not being screened for lead regularly, and that elevated lead levels might possibly explain some children's health and developmental problems.

Under a grant from the Environmental Protection Agency as one of its Child Health Champion Pilot Projects, the tribal government sought to screen as many young children as possible and provide coordination to assure services for those with relatively high lead levels. The State of Montana Lead Education and Awareness Division provided blood lead collection materials and paid for the blood tests for children not enrolled in Medicaid. The goal was to screen at least 70% of the target group (children younger than 6 years of age). The protocol for this process involved contacting families of children receiving WIC and Head Start services and, once parental permission was granted, referring them to screening by WIC clinic nurses using capillary blood draws. Children with lead levels higher than 6 µg/dL were to have a venous blood draw to confirm results, as well as a physical exam and parental education. Children were to be referred for medical follow-up when blood lead levels were 10 µg/dL or higher. The screening program was conducted from March 1999 through September 2000.

The project was very effective at contacting families and assuring that children were screened (see Table). Over 90% of children younger than age 5 on the reservation were screened, and a substantial percentage of children in the early grades were also screened. At the time the project was launched, no one knew

**Table. Percent of children tested and their lead levels—Rocky Boy, MT, 1999–2000**

| *Age (years)* | *Number tested (March 1999–September 2000)* | *Population (April 1, 2000)* | *Ratio of number tested to population* | *Average lead level (µg/dL)* |
|---|---|---|---|---|
| <1 | 47 | 76 | 61.8 | 1.6 |
| 1 | 80 | 67 | 119.4 | 1.8 |
| 2 | 46 | 62 | 74.2 | 1.7 |
| 3 | 69 | 67 | 100.3 | 2.0 |
| 4 | 60 | 63 | 95.2 | 3.0 |
| 5 | 32 | 67 | 47.8 | 3.0 |
| 6 | 37 | 79 | 46.8 | 4.2 |
| 7 | 26 | 61 | 42.6 | 3.0 |
| 8 | 5 | 85 | 5.9 | 2.0 |
| Unknown | 51 | — | — | — |
| Total (8 and younger) | 453 | 627 | 72.2 | 2.4 |

Sources: Rocky Boy tribal program data on lead testing and U.S. Census data on population size.[4]

how many children might require medical intervention for high lead levels. The findings from the screening process were somewhat surprising to project staff: there were no children identified with lead levels high enough to require medical intervention. Lead levels were relatively low for all ages, although levels at the older ages were somewhat higher than for the youngest children. We speculate that the older children's higher average lead level is due to the age of the school buildings the tribal children attend and the possibility of increased lead exposure in those settings. Overall, the average blood lead level of 2.4 ug/dL on the Rocky Boy reservation was not significantly different from that of all U.S. children as reported from the National Health and Nutrition Examination Survey of 1996–l999, when the average was 2.0 (95% Confidence Interval 1.7, 2.3) µg/dL for children ages 1–5[2]. While national data are not available for a more recent period, levels are known to have declined in many areas, as mentioned in the CDC study above in selected sites. Consequently, it appears that the lead levels on the Rocky Boy reservation are on a par with children elsewhere in the U.S. Since the project did not collect data after the project period, it is not possible to know whether lead levels declined to an even lower level after the project's educational interventions.

The success of the Chippewa Cree Child Health Champion pilot project in identifying young children and having them screened for high lead levels was due to the close ties that the project staff established with the important places where young children living on the reservation are served regularly: the WIC program, the Head Start program, and the school. It appears that WIC and Head Start programs are particularly successful locations, as they already have health care screenings as a routine part of their activities. The close-knit community on the reservation undoubtedly facilitated those ties.

The Chippewa Cree project also aimed to educate their entire community on environmental hazards for children (including lead), and children's vulnerability to a variety of environmental threats. Newsletters highlighted a range of environmental issues on the reservation. In-school environmental health education targeted both school children and their parents, and a workshop on environmental problems was held for tribal government staff. Finally, an environmental education booth was set up twice at the annual tribal powwow. The project was not as successful in engaging residents in these broader environmental education programs, since many community residents did not perceive environmental issues to be very prominent compared to other more pressing issues such as the need for economic development. Still, the success of this lead screening program shows how tribal communities can effectively address the environmental and public health concerns that directly threaten the health of their children.

While results from the lead screening program on the Rocky Boy reservation suggest that the average blood lead levels for Indian children in remote rural locations may be generally relatively low, such findings should be confirmed elsewhere. Also, Indian children living in urban areas may face greater exposure to lead in their environments. The Rocky Boy program provides a good model for doing outreach and education in other parts of the country, in both tribal and non-tribal communities.

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