



D.C. Mounts Unfunded Program of Screening for Lead Poisoning

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A nonfunded screening program for lead poisoning was launched in 1970 by the Health Services Administration of the District of Columbia's Department of Human Resources. The program is unique in that it did not require any special allocation of staff or funds to achieve a measure of success.

In 1965 for the first time, the staff of the District of Columbia's Department of Public Health (now Community Health Services Administration) unsuccessfully requested funds from the Federal Government for a screening and research program to detect lead poisoning in children. Health officials were concerned because numerous studies had indicated that 10 to 25 per-

cent of the nation's inner city children between the ages of 1 and 5 years had absorbed significant and potentially dangerous quantities of lead (1). These children lived in housing built before World War II, when paint containing lead was used on interior walls.

Dr. Jesse L. Steinfeld, Surgeon General of the Public Health Service, estimated that some 400,000 children in the United States have dangerously elevated blood lead levels. Dr. Steinfeld said, "A growing body of data from studies in many cities has established beyond doubt that lead intake by children from paint, particularly in the slums of the cities, is an important and widespread problem" (2).

Because the District of Columbia has approximately 50,000 children living in deteriorated housing, we believed that between 5,000 and 12,500 children had elevated blood lead levels. Approximately 500 of these children were estimated to have ingested sufficient amounts of lead to cause lead intoxication.

Many children, particularly

those with pica (an unnatural craving for nonfood items), eat flakes of old leaded paint and plaster that peel off crumbling walls and ceilings, or they chew on accessible windowsills and other surfaces. If these children are not discovered promptly and treated, permanent central nervous system damage may result and, in some cases, death.

Those who have eaten leaded paint chips for long periods are likely to be seriously affected. Lead may interfere with the body's synthesis of hemoglobin, thus causing anemia, or it may cause brain damage resulting in coma or convulsions or affect the nerves of the arms or legs, causing paralysis. In cases where irreversible damage to the central nervous system has occurred, a patient may require treatment throughout his lifetime. No one knows how many of today's brain damaged children had lead poisoning.

Screening Planned

Despite the acknowledged dangers of lead poisoning the fact remained that neither Federal nor District funds were available.

By the fall of 1968, Dr. John Mills, a representative of the D.C. Medical Committee for Human Rights, decided that, money or no money, the community could wait no longer to take action on lead poisoning. He, together with members of the D.C. health department and the housing division of the Department of Economic Development, worked out a plan for community cooperation.

Children's Hospital and Freedmen's Hospital agreed to report diagnosed cases of lead poisoning to the housing division. It was decided that the division's investigators would then visit the child's home, take paint samples, and make recommendations to repaint dangerous areas.

The D.C. Health Services Administration's accident prevention division conducted six training seminars for city housing inspectors and for about 300 physicians and nurses who wanted to bring themselves up to date on lead poisoning.

During 1969, as a result of a new awareness among those deal-

ing with ill children, 33 cases of lead poisoning were reported by Children's Hospital and 12 by D.C. General and Freedmen's. In March 1970, the District of Columbia amended housing regulations to require removal of interior lead-based paint that contained more than 1 percent lead by weight of its nonvolatile materials. At the same time, new health regulations were established requiring any physician who diagnoses or treats a case of lead poisoning to report it to the health services administration within 72 hours.

The next step was a screening program aimed at locating children in the District of Columbia who had elevated blood lead levels and getting them to places where they could be treated.

Dudley Anderson, chief of the health services administration's accident prevention division, who undertook this project, had no funds for staffing, supplies, publicity flyers, parental consent forms, or for renting facilities in the inner city where the screening might be done.

Many Persons Help

The staff of the United Planning Organization, a local organization funded by the Office of Economic Opportunity, agreed to make neighborhood and community centers available for use as screening stations to supplement those centers available from the health services administration. Each center director offered to publicize the program and to assist during the actual screening. The health services administration provided manpower, supplies, blood analysis, publicity, and coordination for each station. The Medical Committee for Human Rights provided 70 physicians who volunteered to draw blood samples.

Health educators and the staff of the accident prevention division met with the director and volunteer workers at each neighborhood center to acquaint them with lead poisoning and to explain the screening program.

Orientation sessions were conducted for 50 workers who were selected by neighborhood center directors. The problems and hazards of lead poisoning were discussed. Also presented were ways of encouraging community participation. Printed materials were distributed. The workers were given assignments to contact residents with children under 8 years of age who lived near the screening stations.

The health education and information division of the District of Columbia Health Services Administration sent information to newspapers and radio and television stations. Flyers announcing the program had a tear-off form for parental consent for the testing of their children. These flyers were distributed in the centers and carried house-to-house in

A physician is preparing to take a blood sample to test for lead poisoning



Table 1. Distribution of children screened by age and blood lead level, Washington, D.C., June 1970

Blood level ($\mu\text{g. percent}$)	Years								
	1	2	3	4	5	6	7	8 years and over	Total
55.0-59.9		1	3	...	...	...	1	...	5
50.0-54.9	2	1	...	2	...	2	...	...	E
45.0-49.9	5	3	2	2	...	2	...	...	14
40.0-44.9	2	10	4	4	3	...	...	...	23
35.0-39.9	7	11	11	1	3	1	2	5	41
30.0-34.9	15	19	24	15	11	10	4	10	108
25.0-29.9	20	25	28	28	19	14	9	19	162
20.0-24.9	13	27	30	34	40	13	10	38	205
15.0-19.9	20	14	30	34	27	20	10	37	192
10.0-14.9	3	8	6	10	7	5	4	8	51
5.0-9.9	1	...	1	...	...	...	...	...	2
Total	88	119	139	130	110	65	40	117	808

nearby neighborhoods.

Arrangements were made for personnel from the accident prevention division to discuss the lead screening plans on local radio and television stations.

Screening

The screening took place from June 2 to June 8, 1970, with each station open between 6:30 p.m. and 9:30 p.m. on weekdays and from 12:30 p.m. to 4:30 p.m. on Saturday. Blood samples were taken from 808 children ranging in age from 1 to 8 years and over.

A coordinator from the health services administration's staff at each center opened the screening station, checked on supplies, and telephoned the command post when the staff had arrived and everything was in readiness. The command post was staffed by Mills, Anderson, and Miss Arlene Fregulia, a health educator. The command post was located in the accident prevention division's office.

Two rooms were used in each center for the screening. In the first, each child's name and registration number was recorded, and the parent was questioned about the youngster's eating habits and as to whether the child

had any history of lead poisoning. In the second room a physician, assisted by the public health nurse, drew 3 to 5 cc. of blood, using lead-free disposable syringes and needles. Each sample of blood was labeled with the child's registration number.

At the close of each day the samples were delivered to the command post where they were picked up the following morning by a messenger and taken to a contract laboratory. An atomic absorption method was used to determine blood lead levels. Results of the tests, estimated at precision accuracy of 93-95 percent, were reported within 72 hours to the health department.

The blood level mean was calculated at 25.5 $\mu\text{g. per 100 ml.}$ of blood with a standard deviation of 11.1 for all children tested.

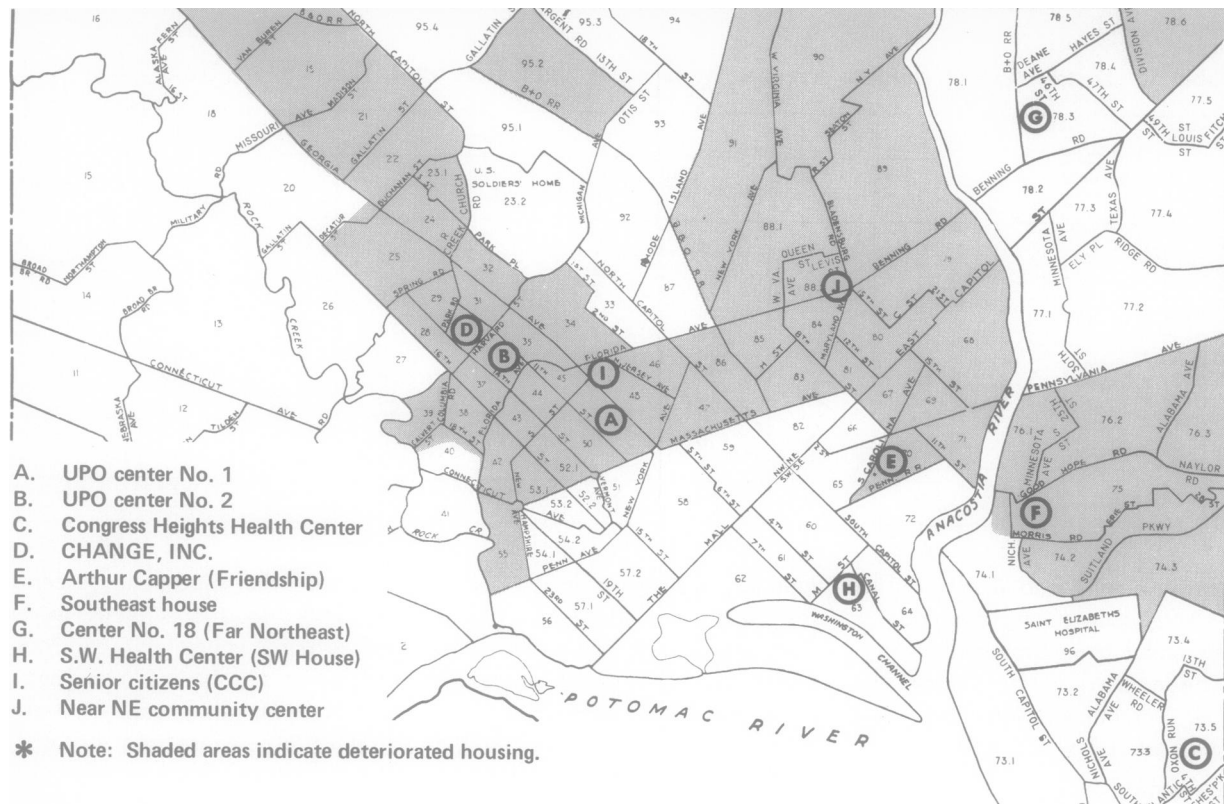
Discussion

During the first days of testing, attendance was light, and no one came to some centers. The neighborhood volunteer workers went door to door and brought children to the centers. Obviously, our publicity either had not reached the city's low-income families, or if it had, did not motivate them to bring their children to the testing centers.

During the week-long screening, 808 blood specimens were drawn from center-city children ranging in age from 1 to 8 years and over. Of this group, 47 children (5.8 percent) had elevated blood lead levels of at least 40 $\mu\text{g. of lead per 100 ml. of blood}$ (table 1).

For the 476 children under age 5 (58.9 percent of the total who were tested), the mean blood lead level was 26.4 $\mu\text{g.}$ as compared with a mean blood lead level of 25.0 for all children tested (table 2). It is well known that children in this age group are more likely to have a higher level because of the tendency to pica.

As expected, children living in pre-World War II housing showed higher blood lead levels than children living in the newer housing projects. For example, the children with the highest mean blood lead levels were discovered at the near NE community center and at UPO center No. 1 (see chart). These centers are in areas with large concentrations of old deteriorated houses. The lowest mean blood lead levels, however, were noted in children living in Congress Heights, the far Northeast, and Friendship



Location of screening centers and deteriorated housing in D. C.

where similar public housing projects have been built more recently (table 2).

No child living in more recently built projects had a blood lead level above 39.9 μg . In fact, all but one of these children had levels below 34.9 μg . Investigators from D.C.'s Health Services Administration agreed that future screening programs for lead poisoning need not include families living in public housing built after 1942 because the evidence clearly indicated there was little or no danger of lead poisoning for the children living there.

Of the 808 children tested, 165 (20.4 percent), had pica. Among the 47 children, however, who had blood lead levels of 40 μg or greater, pica was reported in 21 children or 44.7 percent (table 3). Without a doubt this figure is too low because many children were brought in by neighborhood workers who did not have information on whether

or not the child had pica.

In the areas of deteriorating houses in the District of Columbia, 11.2 percent of the children under 5 years had elevated blood lead levels. Referrals to Children's Hospital for additional diagnosis and treatment were made for 47 children with levels of 40 μg . or higher. Of these, five children (10.6 percent) were admitted to the hospital for treatment.

Conclusions

The District of Columbia's lead poisoning detection program was accomplished without special funding by concerned people in the community who gathered together the manpower and facilities to do the job. Many of those who took part in the program, both professionals and nonprofessionals, contributed their services gratis. Others, salaried by service agencies, assumed duties beyond their normal workload.

As a direct result of this program, routine screening for lead

poisoning has been instituted at all child health clinics and at children and youth centers of the District of Columbia Community Health Services Administration. In addition, the D.C. City Council on November 17, 1970, passed a regulation providing free medical treatment for lead poisoned children, regardless of the families' income level.

REFERENCES

- (1) U.S. House of Representatives, Committee on Banking and Currency: Hearing before the Subcommittee on Housing. Statement of the American Academy of Pediatrics, 91st Cong., 2d sess. U.S. Government Printing Office, Washington, D.C., July 22-23, 1970, p. 257.
- (2) U.S. Senate Committee on Labor and Public Welfare: Hearings before the Subcommittee on Health on lead based paint poisoning. S. 3216 and H.R. 19172, 91st Cong., 2d sess. U.S. Government Printing Office, Washington, D.C., Nov. 23, 1970, pp. 45-46.

Table 2. Children screened by screening center, blood lead level, and age, Washington, D.C., June 1970

Screening center and age group	Number of children with blood level ($\mu\text{g. per } 100 \text{ ml.}$) of											Total	Mean blood level ($\mu\text{g. per } 100 \text{ ml.}$)	
	5.0-9.9	10.0-14.9	15.0-19.9	20.0-24.9	25.0-29.9	30.0-34.9	35.0-39.9	40.0-44.9	45.0-49.9	50.0-54.9	55.0-59.9			
A. UPO center No. 1:														
Under 5 years	0	0	10	14	14	16	9	3	4	3	1	74	} 29.2	
Total screened	0	0	14	23	19	21	10	3	4	3	1	98		
B. UPO center No. 2:														
Under 5 years	0	2	7	7	11	7	2	2	0	0	0	38	} 24.2	
Total screened	0	4	13	16	15	11	3	2	0	0	0	64		
C. Congress Heights Health Center:														
Under 5 years	1	12	33	28	6	9	1	1	1	0	0	92	} 20.3	
Total screened	1	18	64	46	11	10	1	1	1	0	0	153		
D. CHANGE, INC.:														
Under 5 years	0	2	10	11	17	13	2	4	1	1	0	61	} 25.4	
Total screened	0	5	19	21	22	15	2	4	1	1	0	90		
E. Arthur Capper (Friendship):														
Under 5 years	0	1	1	2	0	0	0	0	0	0	0	4	} 15.4	
Total screened	0	3	4	4	1	0	0	0	0	0	0	12		
F. Southeast House:														
Under 5 years	0	6	18	14	6	7	4	1	1	0	1	58	} 23.3	
Total screened	0	7	20	16	7	8	4	1	1	0	1	65		
G. Center No. 18 (Far Northeast):														
Under 5 years	1	2	2	2	1	0	1	0	0	0	0	9	} 18.8	
Total screened	1	3	2	2	1	0	1	0	0	0	0	10		
H. S. W. Health Center:														
Under 5 years	0	1	6	4	5	0	0	2	1	0	0	19	} 26.8	
Total screened	0	1	10	6	12	1	0	4	3	0	1	38		
I. Senior citizens (CCC):														
Under 5 years	0	1	8	15	26	13	6	4	0	0	0	73	} 24.8	
Total screened	0	9	43	64	59	29	14	5	0	0	0	223		
J. Near NE community center:														
Under 5 years	0	0	3	7	15	8	5	3	4	1	2	48	} 32.1	
Total screened	0	1	3	7	15	13	6	3	4	1	2	55		
Total:														
Under 5 years	2	27	98	104	101	73	30	20	12	5	4	476	} 26.4	
Total screened	2	51	192	205	162	108	41	23	14	5	5	808		

Table 3. Children screened by blood lead level, age, pica, and by public housing residence

Blood lead level ($\mu\text{g. percent}$)	Number under 5 years	Percent total of children under 5 years	Number with pica under 5 years	Total screened	Total with pica	Number living in public housing
55.0-59.9	4	0.8	2	5	2	0
50.0-54.9	5	1.1	3	5	3	0
45.0-49.9	12	2.5	8	14	8	0
40.0-44.9	20	4.2	7	23	8	0
35.0-39.9	30	6.3	12	41	13	1
30.0-34.9	73	15.3	22	108	25	7
25.0-29.9	101	21.2	29	162	36	8
20.0-24.9	104	21.8	27	205	35	32
15.0-19.9	98	20.6	23	192	30	55
10.0-14.9	27	5.7	3	51	4	14
5.0-9.9	2	.4	1	2	1	...
Total	476	100.0	137	808	165	117