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Asbestos in Vermont Schools: Findings of a Statewide On-Site Investigation

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Abstract: Materials containing asbestos were found in 75 per cent of 336 Vermont Schools constructed or renovated between 1946 and 1974, with two-fifths of the materials in student exposure areas. Findings from visits to all schools contrasted with an earlier investigation relying on self-reporting. Of 105 schools with student exposure disclosed by the current survey, only eight had been identified in the earlier effort. Ceiling tiles, previously not believed to contain substantial asbestos material, constituted a source of student exposure in 36 schools. (*Am J Public Health* 1981;71:744–746.)

A survey for asbestos-containing materials was performed by room-to-room inspection of all 336 Vermont schools constructed or structurally renovated between 1946 and 1974. Findings were compared with the results of a previous study performed in 1977 that employed self-reporting to potential asbestos problems by Vermont school officials. In 1979, the Vermont Department of Health embarked on this repeat survey because the earlier 1977 self-reporting effort resulted in an incomplete response and suspected under-reporting. The design of the 1979 repeat survey differs significantly from that recommended by the Environmental Protection Agency (EPA) and others which rely on self-reporting by schools.[1–3] Surveys that employ self-reporting have inherent deficiencies of both under-reporting and lack of uniformity of information, as suggested in a recent study from Rhode Island: "Can we be certain, however, that schools do not report having spray-on asbestos actually have none?"[3]

From the Vermont State Department of Health. Address reprint requests to Lloyd F. Novick, MD, MPH, Commissioner, Vermont State Department of Health, 60 Main Street, Burlington, VT 05401. Ms. Freedman is Director, and Dr. Jillson is Biostatistician, both with the Division of Public Health Statistics, VSHD; Dr. Rice, formerly with Division of Occupational Health of VSDH, is now with the University of North Carolina. This paper, submitted to the Journal September 17, 1980, was revised and accepted for publication February 19, 1981.

Design of the Survey

The 1979 survey utilized a trained inspector to assess the use and conditions of the wide range of materials possibly containing asbestos in the school setting. The survey protocol required the systematic visual inspection of each room in the school. Inspection and sample collection included areas above suspended ceilings, bathrooms, specialized rooms, storage and maintenance areas. For each room, the inspector recorded location, condition, accessibility, friability, and proximity to air moving system of any suspect material. Collection of samples from classrooms was done after school hours to minimize student exposure and concern among students or parents. A petrographic light microscope was chosen as the analytical method due to its high reliability for identification of asbestos in bulk samples. For quality assurance, the inspector split samples according to a regimen similar to that adopted by EPA.[1]

Results

The 1979 survey disclosed that 251 schools or three-fourths of the institutions visited had asbestos containing materials. The most frequent use of asbestos was for pipe and boiler insulation (Table 1). In 105 schools, asbestos-

TABLE 1—Location of Asbestos-Containing Material Identified in 336 Vermont Schools

Type of Sample	Location of Asbestos Materials		Location of Asbestos Materials in Student Exposure Areas	
	# Schools	% Schools	# Schools	% Schools
Pipe Lagging	183	54.4	43	12.8
Boiler Cover	104	31.0	36	10.7
Suspended Ceiling	34	10.1	17	5.1
Spray-on	21	6.3	2	0.6
Non-suspended Ceiling	2	0.6	25	7.4
Other*	114	33.9		
One or more of above	251	74.8	105	31.3

*Hot water tank covers, chimney cover, kiln wire insulation, welding dividers, welder curtain, etc.

TABLE 2—Type of Asbestos by Type of Sample Found in Student Exposure Areas

Type of Sample	Total Number of Samples Taken	Type of Asbestos Present in Student Exposure Areas				
		Amosite	Chrysotile	Crocidolite	Hardboard	Total
Pipe Lagging	312	10	47	2	12	71
Boiler Cover	124	0	0	0	0	—
Suspended Ceiling	292	24	21	0	8	53
Spray-on	115	0	45	0	4	49
Non-suspended Ceiling	153	1	0	0	1	2
Other*	212	1	29	1	4	35
TOTAL	1208	36	142	3	29	210

*Hot water tank cover, chimney cover, kiln wire insulation, welding dividers, welding curtain, etc.

containing materials were found in student exposure areas. Overall, 1,208 samples were collected at all facilities and 542 (45 per cent) were positive for asbestos.

Comparison of these findings to the earlier 1977 self-report survey showed a marked divergence. Of 105 schools with student exposure disclosed by the current survey, only eight had been identified in the earlier effort. In the 1979 survey, 21 schools had spray-on coatings containing asbestos. Of these, 13 schools were never identified in the 1977 survey because the school officials did not recognize the suspect material.

Type of asbestos, location of the positive samples in student exposure areas, and the friability of these materials are shown in Tables 2 and 3.

Some asbestos content was found in 34 schools in suspended ceiling tiles. Two schools used perforated asbestos (chrysotile) cement hardboard as tiles. All other tiles were the more porous commercially available variety, approximately ½ inch thick.

Ceiling tiles containing asbestos were installed in schools built between 1952 and 1974. The name of the supplier of the installed asbestos tiles cannot be determined, but a review of available building specifications and architectural designs indicates that these were most likely obtained from national firms.

The total cost of the survey was $26,330, or $78 per facility. Of these costs, 51 per cent were for sample collection, 20 per cent for sample analysis, and 29 per cent for design and administration (see Table 4).

Discussion

Identification of asbestos-containing materials was followed by issuance of recommendations for the control of significant sources of potential exposure to students and staff. The health department can provide valuable assistance to schools faced with the problem of asbestos-containing materials where there is concern about both the hazard to health and the cost of remediation, which can be substantial. Meetings with the local school board and other contact between health department and school staff defused potentially troublesome situations and established plans for resolution of potential asbestos hazards.

In one school in a small Vermont community, however, a bond issue including $100,000 to replace an asbestos-containing ceiling is being opposed by some residents who regard the risk as too speculative or remote to justify the large expenditure.

The detection of asbestos content in ceiling tiles that was first disclosed by this survey was an important finding with respect to student exposure. The EPA has verified the Vermont Department of Health results by performing repeat analyses of these ceiling tile samples.

For schools with asbestos-containing ceiling tiles, educational officials were advised that vandalism, strong air currents, and movement of the tiles can contribute to airborne concentrations. Unnecessary movement of the tiles was discouraged and monitoring of vandalism or water damage was advised.

TABLE 3—Friability by Type of Sample for Schools Having Positive Asbestos Samples with Student Exposure

Type of Sample	Number of Schools Sampled	Friability of Samples in Student Exposure Areas				
		Non-friable	Slightly	Moderately	Very	Total
Pipe Lagging	209	27	13	0	3	43
Boiler Cover	110	0	0	0	0	—
Suspended Ceiling	198	34	0	0	0	34
Spray-on	40	9	7	1	0	17
Non-suspended Ceiling	120	2	0	0	0	2
Other*	138	21	4	0	0	25
One or more of above	336	93	24	1	3	123

*Hot water tank cover, chimney cover, kiln wire insulation, welding dividers, welding curtain, etc.

TABLE 4—Cost Details Associated with Project

Sample Collection	
Inspector salary	$10,865
Travel, meals, lodging	2,255
Other operating expenses	308
Subtotal	$13,428
Sample Analysis	
Technician salary	$4,016
Operating expenses	1,250
Subtotal	$5,266
Other Administrative Costs	
Supervisory salaries	$6,400
Operating expense	1,236
Subtotal	$7,636
TOTAL	$26,330

Removal, encapsulation, and enclosure were considered as control approaches in schools with spray-on materials containing asbestos. Removal was generally preferred, even if control had to be delayed until the next fiscal year, as it offers the only permanent solution.

A characteristic of the 1979 survey is the uniformity of the techniques employed. A simple trained inspector gathered samples from all schools. Laboratory analysis was by Vermont Health Department staff who had received special training. This approach is different from that described in the Federal Asbestos School Hazard Detection and Control Act of 1979 which would provide detection funds for individual schools.[4] The latter approach has serious pitfalls because it does not provide a mechanism to assure that identification of asbestos containing materials in various schools will be performed with accuracy and uniformity.

This problem is documented in the differences noted between an earlier Vermont study relying on self-reporting and the latter survey utilizing actual inspections. The self-report approach did not detect the problem in the majority of schools where potential student exposure existed to asbestos-containing materials.

REFERENCES

1. U.S. Environmental Protection Agency: Asbestos-Containing Materials in School Buildings: A Guidance Document, Parts I and II. Washington, DC:EPA 1979.
2. Irving KF, Alexander RG, Bauley H: Asbestos exposure in Massachusetts public schools. Am Indus Hyg Assoc 1980; 41:270-276.
3. Faich G: Asbestos hazard evaluation in Rhode Island schools. Am J Public Health 1980; 70:162-164.
4. U.S. House of Representatives: H.R. 3282, Asbestos School Hazard Detection and Control Act of 1979.

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Modifying Dog Litter in Urban Communities

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Abstract: Dog litter not only damages the esthetic quality of a community but also poses a serious health problem. The present paper summarizes a series of projects which were designed to ameliorate this litter problem. Two studies indicated that surrounding specific target areas with posts connected by string effectively eliminated dog droppings. Two other studies, which focused on prompting dog owners to pick up their dogs' droppings, also brought about considerable reductions in dog litter. (*Am J Public Health* 1981;71:746–747.)

Besides damaging the esthetic quality of a community, dog litter is part of a number of pernicious, well-documented health hazards. Some of the infections and parasites which can be transmitted from uncollected dog feces to humans include: round worms, fish tapeworm, leptospirosis, and echinococcosis.[1] There is a need to devise behavioral strategies to ameliorate this ubiquitous urban litter problem. The present paper reviews a three-year, anti-litter research effort conducted by a team of investigators at DePaul University.

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Fence Interventions

The first two studies occurred in low-income and high-income areas in Chicago. In both studies, one block was selected as the target intervention site. In the target area, throughout each study, dog feces were collected each morning starting at 7:00 am. All dog litter which had color and texture, and was located within a 0.2m area, was counted as only one dropping.

In both studies, during a four-day baseline phase, there were four to seven droppings collected daily in one site and six to 13 droppings in the other. In both studies, the