

**DETERMINANTS OF DECISION MAKING
UNDER A DECENTRALIZED REGULATORY
ENVIRONMENT: A CASE STUDY OF THE
ASBESTOS HAZARDS EMERGENCY
RESPONSE ACT (AHERA)**

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ABSTRACT

The Asbestos Hazards Emergency Response Act (AHERA), unlike previous environmental regulations such as the Clean Air and Clean Water Acts, does not specify a standardized ambient concentration of contaminant against which compliance could be measured. The law only requires that each local education agency inspect for asbestos and, depending on the condition of the material found (undamaged, potential for damage, damaged, significantly damaged), develop and implement a management plan in a timely fashion. The broad latitude given to local authorities regarding the specific level of environmental control adopted raises a new set of regulatory design issues that differ from those involved in regulations with specific compliance standards. This study employs a logit model to assess how local factors may affect the responses that school districts make regarding the level of compliance with the federal asbestos regulations. The results show that press coverage, the effects of more organized interest groups such as unions, and the role of the courts, contribute significantly to the school district's compliance with the regulations. According to the model, the probability of initiating inspections and developing management plans will be decreased by over 60 percent if the school district has a poorer population. The survey underscores the need for regulatory planners to assess the ways in which a variety of interest groups receive and process environmental regulations.

The Asbestos Hazards Emergency Response Act (AHERA) was signed into law by President Reagan, on October 22, 1986 [1]. Unlike previous environmental regulations such as the Clean Air and Clean Water acts, AHERA does not specify a standardized ambient concentration of contaminant against which compliance could be measured. It only requires that each local education agency inspect for asbestos and, depending on the condition of the material found (undamaged, potential for damage, damaged, significantly damaged), develop and implement a management plan in a timely fashion.

Given that the law requires local authorities (e.g., the school principal) to carry out abatement activities while taking into account local economic circumstances, one is likely to observe different levels of activity in dealing with the asbestos problem among school districts. The school principal may take several local factors into consideration. The budget constraint and the source of funding for asbestos control will play an important role in responding to asbestos problems. If parents, teachers, or school maintenance unions organize to raise the issue of asbestos abatement, school officials will tend to respond earlier and more strongly to develop asbestos programs. (By mandating asbestos school inspections and the documentation of inspection results, AHERA aided in the process of local groups organizing and bringing pressure to bear on school officials.) Those in the community without children must be convinced to support often expensive asbestos programs. In this regard the role of the press is important in creating a favorable atmosphere for the school principal to initiate action.

The objective of the study described here was to assess how local factors such as parent participation in school board meetings, teacher/union interest or activity, area income, or the size of the school may affect the local response that schools make to federal asbestos requirements. The strength of the response, for the purpose of this study, was measured by the level of inspection and management plan preparation activity the school had undertaken at the time of the survey conducted as part of this investigation. If a school had completed an asbestos inspection and developed a management plan it was considered to have adopted an active response to the AHERA regulations.

DATA SOURCES

A survey of asbestos management and abatement activities was conducted in the summer of 1988 in the Midwest. Questionnaires were mailed to 6,000 school district officials designated to be responsible for abatement programs in Ohio, Minnesota, Indiana, Illinois, Michigan, and Wisconsin. The major issues addressed in the survey were:

1. The demographics of the school districts;
2. The history of the asbestos abatement activities;

3. The stage of development of abatement plans; and
4. Press, community, and union involvement in school board asbestos related discussions.

A total of 1,563 questionnaires were returned.

ASBESTOS SCHOOL RESPONSE MODEL SPECIFICATION

A model of the effect of local factors on school response was hypothesized in which a binary dependent variable was defined to represent the potential school response. Let Y be a binary variable which takes on the value of one if the school district has completed an inspection and developed a management plan; let Y equal zero otherwise. The limited nature of the dependent variable Y implies that conventional econometric methods cannot be used in the analysis without violating certain assumptions. The expected value of the error term, if an ordinary least squares model specification is employed, will not equal zero when we have a limited dependent variable. The residual is correlated with the explanatory variables in such cases resulting in inconsistent estimates of the regression coefficients [2].

One of the techniques used in estimating equations with limited dependent variables is the logit model. It is based on the cumulative logistic function [3]. For a choice between two alternatives, for example, adopting an aggressive asbestos program or not, the logit model specifies the probability of choosing one of them as:

$$P = F(Z_i) = \frac{1}{1 + e^{-Z_i}} ,$$

where $Z_i = a_i + b_i X_i$, and Z_i is an "underlying response" variable that is linearly related to the explanatory variables X_i which influence the school district's probability of initiating an asbestos program. The logit coefficients a_i and b_i are to be determined.

The variables X_i in the model specified here include:

1. PUBLIC = 1 if the school in question is a public school; PUBLIC = 0, otherwise.
2. PARENT = 1 if board meetings in which asbestos was discussed were attended by the community; PARENT = 0, otherwise. The variable PARENT is a proxy for community involvement.
3. PRESS = 1 if either asbestos was actively discussed at two or more board meetings with press attention or if asbestos was a major topic of discussion and subject of press editorials; PRESS = 0, otherwise.

4. LITIGATION = 1 if there were threats of litigation from either the public, teachers or unions or if the school district was ever fined or penalized for violation of asbestos regulations; LITIGATION = 0, otherwise.
5. POVERTY = 1 if the percentage of students at the school receiving aid to families with dependent children exceeds the average percentage in the midwest region (11%); POVERTY = 0, otherwise. This variable was employed as a proxy for the poverty level of the school district.
6. TEACHER = 1 if discussions took place with teachers' organizations on asbestos issues; TEACHER = 0, otherwise.
7. STUDENT indicates the student population of the school.

RESULTS OF THE LOGIT ANALYSIS

Table 1 presents the results of the analysis. Except for the variables representing community participation and size of the student population, all variables were significant at the 5 percent level of significance. The chi-squared statistic for overall significance of the logit model is also significant at the 5 percent level. Public schools have a higher probability of initiating actions to comply with asbestos regulations than private schools, based upon survey results. The larger budgets available to public schools or the higher levels of public accountability of public schools may account for this finding. Involvement of the press in asbestos issues improves the probability of initiating an asbestos program as does an active role by teachers and unions in school deliberations regarding asbestos. The threat of litigation also has the effect of increasing the probability of active asbestos program development at the school. School districts in poor neighborhoods, as expected, have a lower probability of initiating an asbestos abatement program than schools with a more affluent population. Apart from PARENT, all of the signs of the estimated coefficients conform to a priori expectations of the direction that each of the local factors should have on the probability that the school would initiate an asbestos abatement program.

The last column of Table 1 shows the partial effects of changes in the explanatory variables on the probability of initiating an asbestos program. The figures in this column are estimated by taking the derivative of P, the probability of initiating an asbestos program, with respect to X_i :

$$\frac{dP}{dX_i} = b_i P(1 - P).$$

Examination of this column shows that if teachers and worker organizations are active in local asbestos abatement discussions, the probability that the school district will have initiated an asbestos program increases by 8 percent above that for schools in which such organizations were not active. The role of the press has the most effect on the probability that the school will be active in the asbestos

Table 1. Maximum Likelihood Estimates of the Logit Model

<i>Explanatory Variable</i>	<i>Odds of Completing Inspection and Scheduling Management Plan</i>			<i>Change in Probability Due to Change in Explanatory Variable (Percent)</i>
	<i>Mean</i>	<i>Logit Coefficient</i>	<i>Asymptotic t-Values</i>	
Constant		-1.856	-12.17	
PUBLIC	.66	1.429	8.30**	33
PRESS	.32	4.496	11.76**	105
TEACHER	.37	.356	2.77**	8
LITIGATION	.34	.410	3.24**	10
PARENT	.36	-.172	-1.26	-4
STUDENT	1800	.0000026	.35	.00006
POVERTY	-11	-2.691	-12.18**	-63

$X^2 (7 \text{ df}) = 400.397$

$N = 1471$

** p significant at 5 percent level.

abatement arena. The existence of press involvement almost doubles the probability of initiating a program. The model also shows that the probability of initiating inspections and planning will be decreased by over 60 percent if the school district has a poorer population.

DISCUSSION

Environmental regulations such as AHERA depend for their effectiveness upon the responsiveness of local authorities to reactions of the groups within the community. AHERA-type regulations have their impact by setting up a process by which environmental information is developed and disseminated to local authorities and interested parties. The broad latitude given to local authorities regarding the specific level of environmental control adopted raises a new set of regulatory design issues that are distinctly different from those posed by regulations with specific compliance standards. How information such as asbestos inspection plans should be developed, packaged, and used in local decision making becomes an integral part of the regulatory design.

One of the basic assumptions underlying the AHERA efforts was that once parents received information regarding the condition of asbestos in their schools they would demand a strong response from the local school official. The survey

seems to indicate that while parent concerns do affect the probability of initiating an asbestos inspection and planning effort, their impacts are by no means the most significant. The large impact of press coverage and the effects of more organized interest groups such as unions were reflected in the survey data.

For future environmental regulatory design efforts, the survey results seem to emphasize the distinction between those *affected* by a regulation and those *effective* in promoting regulatory compliance. They are not necessarily the same groups.

The survey seems to underscore the need for regulatory planner to assess the ways in which a variety of interest groups receive and handle information. The format of a governmental consulting report, while useful in developing environmental standards, may be less appropriate in reporting to teacher's unions or local interest groups. If the EPA continues to promote decentralized decision making by mandating a process of environmental information dissemination, the approach to designing appropriate information channels will need increasing attention.

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