Can Mold Contamination of Homes Be Regulated? Lessons Learned from Radon and Lead Policies

FELICIA WU,* TOM BIKSEY, AND MERYL H. KAROL

Environmental and Occupational Health, University of Pittsburgh, Bridgeside Point, Room 560, 100 Technology Drive, Pittsburgh, Pennsylvania 15219

Increasingly, airborne mold in home environments has been linked with asthma exacerbation and other respiratory diseases in both children and adults. This problem is particularly relevant today, as Hurricane Katrina has resulted in water damage and mold proliferation in numerous homes on the U.S. Gulf Coast. Policies to control indoor moisture and mold can help solve problems of mold contamination and associated adverse health effects, yet very little attention has been given to developing such policies. We address the question of how to develop effective policies by deriving lessons from successful control of other home environmental contaminants; namely, radon and lead. These two agents are being controlled by a variety of policy approaches, including federal regulations and guidelines, public education, and economic incentives among home buyers and sellers. We analyze the mold problem and identify both similarities and differences with the radon and lead situations in the United States. We recommend policy approaches for controlling mold in homes that rely on home marketing incentives, building and housing codes, and maintenance and rehabilitation regulations, as well as public education initiatives.

Introduction

For millennia, doctors and public health workers have understood the role of indoor environments in causing or exacerbating human diseases (*1, 2*). For example, Hippocrates was aware of the adverse effects of polluted indoor air in crowded cities and mines (*2*), and Biblical Israelites understood the dangers of living in damp housing (Leviticus 14: 34−57).

Indoor hazards include biological, chemical, and physical contaminants that cause or exacerbate a variety of adverse health effects in humans. In modern societies, people spend about 90% of their time indoors, and most of that time is spent in private homes (people in the United States, Canada, and Germany spend on average 15.6−15.8 h per day in their homes (*3*)). Hence, indoor environmental quality (IEQ) may significantly affect public health and well-being.

Mold and moisture in indoor environments have been recognized as important public health concerns. Extensive water damage to buildings increases the likelihood of severe mold contamination. Mold can cause human illness through several mechanisms, including allergy, infection, and toxicity. Longitudinal studies have shown that children exposed to high levels of indoor mold in their early years (*4, 5*) and adults who have lived in damp homes for a number of years (*6, 7*) have an increased probability of developing asthma. Infants with or without asthmatic mothers experience increased wheezing and coughing associated with mold exposure (*8*). There is sufficient evidence of association between indoor mold exposure and asthma symptoms in sensitized asthmatic persons, upper respiratory tract symptoms, hypersensitivity pneumonitis in susceptible persons, wheeze, and cough (*9*). In the wake of Hurricane Katrina in 2005, mold was listed as one of the top nine health hazards in the Gulf Coast region (*10*).

Molds have been associated with superficial infections in humans (*11*), and with aggressive infections in immunocompromised or immunodeficient individuals (*7*). In addition, some molds can produce specific mycotoxins (secondary metabolites) under defined circumstances. These low-molecular-weight chemicals may cause toxic effects (mycotoxicosis) in humans. Toxicity of ingested mycotoxins has been reported in occupational settings (*11*). In non-occupational settings, considerable controversy exists regarding both the dose and route of exposure required for mycotoxicosis (*11−20*). Extensive research is underway to understand the risk to human health from particular mycotoxins in indoor air. Importantly, recent findings may prove useful in developing a biomarker for exposure to the fungus *Stachybotrys chartarum*, which produces trichothecene mycotoxins (*21*).

Major barriers exist to developing policies to improve IEQ in general, and particularly in home environments in situations such as mold remediation. Due to privacy concerns, governments are reluctant to make regulations that affect individual homes. Second, indoor environmental quality (including moisture and mold prevalence), with its many contributing factors and complex interactions, is difficult to regulate. Third, little attention has been given to the health costs of living in mold-damaged homes and the health benefits of remediating such homes (*2*).

Nonetheless, there exist examples of successful policies that have resulted in reduced burdens of two indoor contaminants, radon and lead. (Although asbestos is another important case, it is more relevant to workplaces than to homes, and thus is not included in this analysis.) For lead, federal regulations have led to reduced lead exposure in U.S. homes, and to significant health benefits for children and adults (*22, 23*). For radon, economic incentives are used; in many states, sellers are required to disclose home radon levels, although they are not required to reduce the levels. Rather, the incentive to remediate comes both from marketing the home to potential buyers, and from health concerns on the part of the home owners. Policy-driven campaigns to reduce home-based exposures to both radon and lead have included a significant public education component.

We suggest that these two cases provide valuable guidance for controlling mold in home environments. By identifying similarities and differences between the situation regarding indoor moisture and mold (e.g., health effects, socioeconomic considerations, interventions and their costs, and public concern) and those of radon and lead, we suggest policy approaches for control of moisture and mold in homes.

Why Mold? Current Health Concerns

Although medical researchers drew a link between indoor mold and adverse health effects in the late 1800s (*24*), only

* Corresponding author. E-mail: few8@pitt.edu.

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TABLE 1. Comparison of Radon, Lead and Mold Characteristics for Policy Development

	radon	lead	mold
nature of the agent	chemical element; radioactive progeny of radium	chemical element	biologic agent; comprised of numerous diverse fungal species
main health effects	lung cancer	neurological and developmental disorders	asthma exacerbation, allergies, infections, (toxicological effects less well-established)
high-risk subpopulations	smokers; dwellers of high-radon homes	children; low-socioeconomic (SES) households; those living in older housing being rehabilitated or repainted.	children; allergic individuals; immunocompromised individuals; low-socioeconomic (SES) households
exposure in U.S. homes	ubiquitous; some areas higher risk (not dependent on SES)	higher exposures in homes built before 1978 more common in; damp areas where paint deterioration can increase exposure	ubiquitous
interventions	ventilation; sealing; sub-slab depressurization	professional lead paint hazard control; house cleaning; moisture reduction; dust testing	moisture reduction; ventilation; cleaning
decade of first policy actions to control risk	1980s (federal, state, local)	1970s (federal)	1990s (local)
agency responsible for policy oversight	EPA, HUD, state and local agencies	EPA, CDC, HUD, state and local agencies	no federal agency has Congressional authority to develop indoor mold policy
type of policy developed (local vs federal, regulatory vs guidelines)	34 states: mandatory information disclosure at time of home transfer; EPA guideline for safe level in home; public education	federal regulations to limit lead exposure in consumer products; federal dust, paint & soil health-based standards; federal standards for inspection,risk assessment and abatement; blood lead screening; mandatory information disclosure at time of home transfer; public education	few policies developed: some local-level initiatives (e.g., Cuyahoga County, OH); public education; research initiatives

recently have the health risks of mold in indoor environments received significant public health attention. The Institute of Medicine (IOM), the Surgeon General, and the World Health Organization have all recognized the importance of reducing moisture in homes to prevent proliferation of mold and other agents that thrive in moist environments (*9, 25–27*). Indoor moisture can be generated by the inhabitants , or through structural features of the dwelling. While mold is not always present where there is moisture, moisture is a necessary condition for mold proliferation. Mold will inevitably develop on surfaces that stay moist for 48 h or longer (*28*). Of the more than 119 million housing units and 4.7 million commercial buildings in the United States, almost all have experienced leaks or flooding at some time (*9*). The problem in U.S. homes spans the range from minor water damage to public health disasters such as the extensive household water damage caused by Hurricane Katrina. Global climate change may increase both the incidence of hurricanes and total rainfall in parts of the country, potentially increasing indoor mold problems (*29*).

Aside from its unattractive appearance, indoor mold is a contributor to many adverse health effects including allergies, infection, and toxicity as described previously. There is a disproportionate effect of indoor mold on the poor (those who live below poverty level). They are more than three times as likely (22% vs 7%) to have substandard housing, and blacks and low-income people are more likely than the general population to be in housing with extreme physical problems, including moisture- and mold-control problems (*30*).

Policies regarding mold—whether in the form of federal regulations or in guidelines and public education efforts—are necessary for several reasons. In a *laissez-faire* scenario, stakeholders often have little motivation to solve the problems associated with indoor mold. Those who design and build houses are usually not the ones who live in them; thus, in the absence of national regulations, there is little incentive to erect moisture-proof buildings when building could otherwise be done more cheaply and quickly. Unless motivated by regulations, guidelines, or economic incentives, landlords may not make moisture and mold prevention a priority in their rental spaces unless the mold problem is so overwhelming as to turn away potential tenants. Further, the people living in damp houses often lack knowledge of the link between dampness, mold, and respiratory effects. As a result, absent relevant policies, those who can address and are affected by problems of indoor mold often do not make mold/moisture prevention a priority, in spite of the growing medical evidence of adverse health effects from mold exposure.

Development of Policies to Address Indoor Mold: Comparison with Radon and Lead Contaminants

Radon and lead provide examples of indoor contaminants that have been addressed by development of policies. In Table 1, we compare radon, lead, and mold with regard to the following: the nature of the agent and its health effects and exposures, as well as socioeconomic factors, feasibility and cost-effectiveness of interventions, and types of policies developed.

Nature of the Agent and Health Effects. Radon is a naturally occurring radioactive gas that is a product of the radioactive decay of uranium to radium (*31*). The released radon gas partitions into small air- or water-containing pores in the subsurface environment. If the release is near the surface, radon will be emitted to the ambient air. Radon released in the subsurface beneath a structure such as a residence or commercial building will enter the indoor environment through pressure differentials and inadequate sealing.

Radon gas breaks down to produce progeny that can enter the lungs in fine inhaled particles, and those progeny can release alpha radiation that can damage the lungs. These emissions raise the risk of lung cancer; indeed, radon is the second-leading cause of lung cancer in the United States after tobacco smoke. Race and gender have no significant effect on severity of health outcomes from radon exposure. However, smoking increases the risk of lung cancer due to radon exposure; smokers exposed to radon have a 10–20 times increased risk of developing lung cancer than non-smokers (*31*). Extrapolation from studies of highly exposed miners projects approximately 18 600 lung cancer deaths per year (range 3000–41 000) in the United States are a result of exposure to radon progeny at concentrations found in indoor residences (*31*).

Lead is a naturally occurring heavy metal found in soil. It is usually present as ore deposits combined with two or more other elements. Anthropogenic sources of lead released to the environment include mining and smelting of lead ore, manufacture of lead-containing products, coal and oil combustion, and incineration of waste. Lead is found in leaded gasoline, lead-based paint, lead solder, pipes, batteries, lead-arsenate pesticides, and lead shot and fishing sinkers. Although many of these uses of lead have been eliminated or strictly controlled, lead persists in the environment due to its resistance to degradation. In particular, lead remains widely dispersed, but highly concentrated in 24 million homes with lead-based paint hazards (*32*).

Lead affects several organ systems including the central nervous system, kidney, and blood cells. As early as the 1890s, medical reports linked lead paint exposure and pediatric toxicity (*33*). Research in the 1960s and 1970s demonstrated that the effects of lead on the fetus and young children may include delays in physical and mental development, lower intelligence quotient (IQ) levels, decreased school performance, shortened attention spans, seizures, and increased behavioral problems (e.g., *34–36*). Because lead is more easily absorbed in growing bodies, children and fetuses are more susceptible than adults to the effects of lead. Moreover, children are at increased risk because of neurological and behavioral system development in the early years. The Centers for Disease Control (CDC) determined that a blood lead level of 10 micrograms per deciliter (μg/dL) in children is elevated, and if the elevated level is chronic, the child may be at increased risk of cognitive deficits (*36*). CDC has stated that no threshold level of lead exposure has been identified below which adverse health effects are not found (*37*).

Indoor mold differs from both radon and lead in that it is an aggregated biological contaminant that can include multiple different of fungal species. In the natural environment, mold breaks down and digests dead organic matter, and is an important part of the overall recycling process of environmental nutrients. In homes, however, mold can cause structural damage, gradually destroying the substrate on which it grows. In addition, mold can cause a variety of adverse health effects to humans occupying the indoor space.

Exposure. Radon concentrations in soil vary dramatically county by county in each of the 50 states (http://www.epa.gov/radon/zonemap.html). Lead exposure in homes depends primarily on when the home was built. By law, homes built after 1978 are free of lead-based paint. The principal source of exposure is from deteriorated paint (due to moisture and other problems) and paint disturbed during rehabilitation, repainting, and other repairs (*38, 39*). Mold is found in homes in all climates across the United States. However, low-income households are more frequently affected with severe mold contamination.

Interventions. Radon control relies primarily on radon disclosure at times of home transfer (mandatory in 34 states), and public educational measures. Homes that are found to have dangerously high levels of radon. Those that are, however, require interventions such as ventilation, sealing, and subslab depressurization of the home (particularly the basement).

Lead has historically entered homes through several pathways including paint, plumbing systems, indoor condensations, and gasoline engine exhaust. Homeowners typically have had little knowledge or ability to remove lead in safe and cost-effective ways. Lead paint removal requires professional lead paint hazard controllers, and lead exposure overall can be reduced by dust testing, house cleaning, and moisture reduction.

The key to mold control in homes is preventing or reducing indoor moisture. In some cases, simple interventions, such as increasing ventilation through opening windows, cooking with pot lids, and using mechanical ventilation systems where they exist (e.g., in kitchens or bathrooms) can help reduce moisture (*40*). Although absent from housing codes, mechanical exhaust ventilation is needed to remove excessive moisture because often home dwellers do not wish to open windows due to weather conditions. Appropriate building design that keeps rainwater and groundwater from the building interior is crucial, as well as properly functioning heating, ventilation, and air conditioning systems and indoor water sources (*41*). Mold growth that has developed in the home may be very difficult for the homeowner to address without help from a professional remediation contractor.

Current Regulatory Oversight, Types of Policies Developed, and Benefits. To develop a public health policy for an indoor contaminant, an agency must have regulatory oversight of managing the contaminant. In the United States, the relevant federal agencies were not established until the 1960s and 1970s. The Department of Housing and Urban Development (HUD) was created in 1965, and the Environmental Protection Agency (EPA) was created in 1970. The CDC and Consumer Product Safety Commission (CPSC) have also played important roles in development of indoor environmental policies.

The EPA has pursued a program to reduce indoor radon exposure since the mid-1980s. The federal program is based on a strategy of voluntary action, public education, and partnerships with other government agencies (federal, state, and local), nonprofit organizations, educators, real estate organizations, and the radon service industry (*42*).

The EPA guideline for radon in air inside homes is 0.15 becquerel (Bq) of radon-222 per liter (L) of air. The recommended “action level” is based on the availability of economical reduction technologies, with current remediation methods capable of reducing radon levels to 0.15 Bq/L of air for a “reasonable cost” of $2150 (in 2006 dollars) (*43*). The real estate transaction process provides an opportunity to test for radon. Today, 34 states have a mandatory property condition disclosure, and 12 states require licenses for radon testing services. The EPA has relied also on a public education program, because Congress has not authorized mandatory radon testing in the United States (*42*).

A progress report by EPA (*44*) focused on four major categories: radon awareness, testing, mitigation, and radon-resistant new construction. In 1999, approximately 63% of respondents indicated that they were aware of radon, and an estimated 1.5 million homes were tested for radon, with the number rising since the mid-1990s. The trend tends to follow the increase in real estate transactions, with a strong rise in transactions during 1999. Approximately 800 000 homes have been mitigated since the mid-1980s, with radon mitigations increasing steadily since 1994. The majority of the mitigation is by subslab depressuration. By the end of 2003, an estimated 1.7 million homes had radon-reducing features (515 000 active mitigations and 1.2 million homes with radon-resistant new construction), preventing an estimated 470 future premature cancer deaths annually. In 2004, the number of annual mitigations increased to over 575 000, and the total number of future lives saved increased to an estimated 520 annually (*23*).

Leaded paint is the primary source of lead in the indoor environment. However, the first lead reduction regulations concerned leaded gasoline. In 1973, the EPA issued regulations to gradually reduce the lead content of the total gasoline pool. In 1996, the Clean Air Act banned all remaining leaded fuel still available in the United States for on-road vehicles (*45*). The CPSC (CFR 1978) banned lead-containing paints in 1978; however, approximately 40% of all homes built before 1978 have lead-based paint hazards. Under EPA's national standards, lead is considered a hazard if there are greater than the following: 40 μg of lead in dust per square foot on floors, 250 μg of lead in dust per square foot on interior window sills, or 400 parts per million (ppm) of lead in bare soil in children's play areas or 1200 ppm average for bare soil in the rest of the yard (*46*).

The U.S. Congress passed the Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X of the 1992 Housing and Community Development Act), which authorized EPA, HUD, CPSC, OSHA, and other agencies to protect residents from exposure to lead from paint, household dust, and bare contaminated soil. To implement the Act, HUD issued a regulation governing lead paint in federally assisted housing, and HUD and EPA jointly required disclosure of lead-based paint hazards in most other housing. The responsibility is on the sellers, landlords, and their agents to provide the information to the buyer or renter before sale or lease.

Importantly, Congress required that state-of-the-art procedures be published and broadly implemented in subsidized housing and local law (*47*). The creation of standardized procedures helped to create a viable, professional inspectorate and remediation work force, promoted private sector competition on a level playing field, and thus drove down the average cost of lead paint hazard control. These standardized procedures also prohibited dangerous forms of lead paint removal, such as use of torches to burn lead paint, abrasive blasting, and power sanding (*23*).

It is worthwhile to note that environmental lead regulation was recommended by the Surgeon General as early as the 1920s, with a temporary ban on leaded gasoline in 1925. This was due to a large number of workers' deaths and illnesses associated with handling the gasoline additive tetraethyl lead. However, the gasoline and lead industries dominated the Surgeon General's investigatory committee, which concluded in 1926 that the time constraints under which it was forced to investigate lead's adverse health effects made a ban unreasonable: "there were no good grounds for prohibiting the use of ethyl gasoline" (*48, 49*). Moreover, the following decades marked by the Depression, World War II, and postwar boom were not conducive to leaded gasoline regulation. It was not until the 1970s that lead regulation could first be achieved.

The data show that the benefits of lead hazard control far outweigh the costs. For all high-risk U.S. housing, the incremental cost of eliminating lead-based paint hazards during 2000−2010 is $US 2.3 billion, but the benefits are estimated at $US 11.2 billion (*50*). A retrospective study quantified economic benefits from improved worker productivity due to childhood blood lead declines from 1976 to 1999. With discounted lifetime earnings of $US 723,300 for each 2-year old expressed in 2000 dollars, the estimated economic benefit for each year's cohort of 3.8 million 2-year old children ranged from $US 110 billion to $US 319 billion (*51*). Indeed, lead poisoning prevention in the United States is considered a major public health success story. However, it took nearly a century since the discovery of lead's neurotoxic effects in children to develop the necessary infrastructure to begin to solve the problem (*23*).

Several policy developments have recently taken place to reduce indoor exposures to mold. Through the Consolidated Appropriations Act of 2005, HUD and EPA engaged in mold- and moisture-related activities that include mold measurement and detection technologies, intervention and health issues, moisture management and control practices, moisture modeling research, assessment and remediation, and outreach (*52*). Regulations can affect the structural causes of moisture and mold. Education and economic incentives will affect the behavioral causes. However, as of yet, no federal agency has Congressional authority to develop indoor mold regulations.

Discussion

Analysis of each characteristic of the three contaminants described above offers useful insights into the challenges and possible solutions for developing policies to reduce indoor mold.

First, the nature of the contaminant poses interesting problems. Since mold is a biologically aggregated term encompassing many different species, it would be difficult to establish a "safe mold level" (as done for radon and lead) either for health assessment purposes or for indoor air guidelines. There is a lack of consensus on whether total mold count represents a meaningful measure of exposure, or if assessment of exposure to a specific mold species is more relevant. The IOM (*9*) suggests that, given the present state of knowledge, both specific and total mold measures be implemented. However, this may make exposure assessments cost-prohibitive, especially as a large number of homes must be assessed to establish a robust data set for statistical analyses. More research is needed to understand how to set thresholds for acceptable levels of mold, given the difficulties associated with multiple different fungal species and measuring exposure to bioaerosols. Useful measures may include examination of dust in various parts of the home for mold components (*53*), and long-duration air samples of mold components glucan and ergosterol, which have been shown to be highly correlated with visible mold damage (*54*). Regardless of specific methods of measurement and standard-setting for mold, at the present, it may make more sense for policies to focus on preventing the moisture problems that lead to mold in homes. Some countries have already made attempts to develop guidelines for assessing the extent of mold contamination in homes, as reviewed by the World Health Organization (*55*).

Second, health effects, exposure conditions, and effective interventions regarding mold all indicate the importance of taking into account socioeconomic conditions of the home dwellers. In this regard, the situation regarding indoor mold is more similar to that of lead than of radon. In the cases of both lead and mold, low-income households are disproportionately at high risk of adverse health effects due to higher exposure levels. Also, when exposure is extremely high, simple interventions are not effective, and professional help is required for remediation. Therefore, mold prevention policies should consider the financial situations of affected individuals and families, and should include resources for community organizations that can provide remediation assistance to low-income households.

Third, public education and home transfer incentives can be useful tools to better engage homeowners in care of their indoor environments. Experience from radon and lead policies suggest that real-estate transactions would likely encourage homeowners to remediate mold- and moisture-related problems. Visible mold and signs of water damage and intrusion, for example, can be assessed and disclosed at the time of home transfer; providing incentives for both home buyers and sellers to focus attention on reducing these indoor environmental risks. Also, public education can be undertaken to assist homeowners in understanding what the health risks of mold are, and how moisture and mold can be controlled in home environments.

Fourth, regulations may be useful to alter building and housing codes to reduce mold and moisture risks in buildings. Building construction can be adapted to reduce the likelihood of moisture accumulation in the home. As mentioned earlier, codes that regulate the types of building materials used, the integrity of the roof, and appropriate building design that keeps rainwater and groundwater from the building interior are crucial; as well as properly functioning heating, ventilation, and air conditioning systems and indoor water sources. This is especially important at the local level, in areas where moisture is a prevalent problem in home environments (e.g., the Gulf Coast).

Conclusions and Recommendations

Policies to control indoor environmental contaminants should be based on multiple considerations. Risk assessment with consideration of exposure levels, severity of health effects, and vulnerable subpopulations plays a central role. Beyond risk assessment, the type of policy developed depends on factors such as the nature of the contaminant, available technologies and interventions (whether they are cost-effective, safe, feasible, and manageable by individual homeowners), and the expected benefits and costs associated with controlling the home environmental contaminant.

It is in the interest of public health to remediate homes with excessive moisture and mold, and to improve building standards such that moisture is prevented from entering in the first place. To continue policy development in this area, valuable lessons can be drawn from the experiences with radon and lead control in U.S. homes. Our analysis shows that although the nature of mold is different from that of radon and lead, the similarities in terms of health and exposure, as well as feasibility and cost-effectiveness of interventions, allow recommendations for development of policies to control mold. We arrive at the following policy recommendations to address control of indoor mold contamination.

While it is not yet feasible to develop standards and regulations for acceptable mold levels in the home, guidelines and policies can be developed at the federal, state, and local levels to disclose information regarding moisture and mold in homes for real-estate transactions. As in the case of radon, mold and moisture levels vary substantially across the United States, and can in many cases be controlled by homeowners. Real-estate transactions have provided powerful market incentives for home buyers and sellers to focus on reducing home environmental contaminant levels. With respect to mold, certain measures such as visible mold, moisture damage, and signs of water intrusion can be required for disclosure at the time of home transfer. Meanwhile, research should continue on how to set thresholds for acceptable levels of mold, given the complexities associated with multiple different fungal species and measuring exposure to bioaerosols.

Policymaking needs to occur at two levels: the level of improving building design and structure, and the level of communicating with the public. Even the most optimally designed buildings could acquire moisture and mold if the inhabitants do not properly maintain their indoor environments. Likewise, public education alone cannot solve the problem if homes are too damaged to begin with, or if buildings are designed improperly. A combination of measures is key: (1) to ensure proper building design and construction, and (2) to communicate with the public both the risks associated with damp home environments and means of remediation. A way to achieve both goals is to devise seamless responsibility at all levels of government. At the national level, regulations can be put in place regarding basic building and housing codes and maintenance, and construction and housing rehabilitations to reduce moisture and mold damage in buildings. At the local and community government levels, public education and information dissemination can be more effectively carried out.

Information dissemination among all relevant stakeholders, including professional and public education, is necessary to develop strategies for achieving healthy indoor environments. As is the case with both radon and lead, hazard identification and hazard control strategies are essential. The public must become aware that a problem exists, and they must have the information necessary to improve their indoor environments. That adverse health effects due to moisture and indoor mold are still widespread indicates that broad efforts are needed to provide information to the public. In the short term, enhanced public health education is important because those at risk will be given the ability to adopt those practices that can improve their health and quality of life. In the long term, the key to healthier indoor environments is collaboration among the different stakeholders in the situation.

Relevant policies should include specific precautions to protect low-income households that are the most vulnerable to indoor mold problems. The very poor are the most likely to be living in housing with severe physical problems, including moisture- and mold-related problems, and the least likely to have the means (money and education) by which to remediate such problems. Oftentimes they also lack access to information regarding the health problems associated with indoor moisture and appropriate remediation responses. Hence, in addition to the educational efforts described above, contact information for local organizations that can assist both technically and financially in home remediation should be provided.

Although control of a home environmental problem is dependent to a large extent on socioeconomic status, access to information that explains how to safely and effectively remediate the problem, and information on public resources that can, if needed, provide assistance, are critical to a successful policy.

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