Indian Health Service Division of Environmental Health Services
Position Paper on Mold

Introduction

This paper states the Indian Health Service (IHS) Division of Environmental Health Services (DEHS) position on environmental health officers' (EHO) scope of responsibilities regarding mold issues in homes and IHS facilities.

EHOs in several IHS Areas have been spending increased time and resources on mold issues within Indian homes. Although the IHS has a professional obligation to respond to these concerns, scientifically valid literature does not substantiate an increased priority on mold issues. This paper clarifies the mold issue and defines the problem in terms of actual health risks rather than perceived risks. Providing a written statement defining the scope of responsibilities regarding mold issues sets limits on time and resources committed to these activities so that they are proportionate to the level of health risk. This will benefit Native Americans and Alaska Natives by reserving resources for environmental health issues whose health risks have been confirmed by statistically significant data. This paper supports a continued yet limited EHO response to residential mold issues, which concentrates on prevention, remediation, and education rather than environmental sampling and health assessments.

Background

Fungi make up a large taxonomic kingdom called Myceteae, which includes molds, mushrooms, smuts, and rusts.[1] Fungi live in nearly all environments: indoors, outdoors, and on or within other living creatures, including humans. Because the scope of this paper deals with mold contamination within tribal homes and IHS facilities, it will concentrate only on those molds that, under proper conditions, thrive inside buildings.

Mold, the most common type of fungus, includes thousands of different species. Indoor molds alone are estimated to include 1,000 species. Mold colonies grow as long, tangled cellular masses, and are usually pigmented. Since all fungi, including molds, lack chlorophyll, they are heterotrophic, and therefore must obtain nutrients from organic material. In addition to organic nutrients, molds also must have a water source for survival.[2, 3]

Through reproduction processes, molds create tiny spores that are easily suspended in air.[1, 2] When mold spores encounter moisture, they may begin growing and digesting organic material. When excessive moisture or water accumulates indoors, mold growth will often occur, particularly if the moisture problem remains undiscovered or is not addressed. An attempt to eliminate all molds and mold spores in the indoor environment is not practical. Only by controlling moisture can one successfully control indoor mold growth.[4]

Health Risks

Mold spores, fragments, and mycotoxins have the potential to cause illness. Three categories of illness are of concern regarding mold exposure: allergic response, infection,

and toxigenic effect of mycotoxins. The current body of scientific knowledge regarding health effects of mold suggests that the presence of mold in buildings constitutes a minimal health risk to the general population.[1, 5, 6] However, mold has been shown to be a health risk to the following susceptible populations: the very young; the elderly; those with existing respiratory problems, such as asthmatics; and the immunocompromised, such as AIDS patients and those who are undergoing chemotherapy. Because of potential health risks, no matter how minimal, and because mold damages building materials, mold growth should be prevented and eliminated.[6] Furthermore, individuals who feel that their health is being affected from exposure to mold should be encouraged to seek medical attention and advice.

Allergic Responses

It is believed that all fungi produce allergenic substances; however, relatively few have been tested for allergenicity. Fungal allergies are common: 10% of the general population and 40% of asthmatic patients are allergic to fungi.[6] While serious allergic reactions to mold can occur, such as hypersensitivity pneumonitis (HP), these reactions have been shown to occur only at very high occupational concentrations of fungal spores and fragments.[5] These concentrations occur at levels several orders of magnitude higher than typical levels found in the indoor environment.[1]

The most commonly reported health effect caused from mold exposure is immediate hypersensitivity. This is a Type I, IgE –mediated sensitization reaction whose clinical manifestations can vary from urticarial skin reactions (wheals and flares) to signs of hay fever (rhinitis and conjunctivitis), and can be a precursor to asthma attacks among asthmatics.[5, 7] In its 2000 report "Clearing the Air: Asthma and Indoor Air Exposures," the Institute of Medicine (IOM) concluded that there is sufficient evidence of an association between exposure to mold and *exacerbations* of asthma, but there is not adequate evidence that molds cause people to become asthmatic.[8]

Infections

Serious infections from molds are a concern only for severely immunocompromised individuals. Precautions should be taken to eliminate amplification factors, such as excessive moisture, from their living areas. Also, molds associated with superficial fungal infections, such as athlete's foot (*tinea pedis*) and so forth, can be found as indoor mold. However, existing literature does not warrant recommendations relative to home, school, or office exposures in patients with superficial fungal infections.[5]

Toxigenic Effects

Most of the information on health effects from mycotoxins comes from human ingestion data and animal exposures. To date, however, no study in humans has conclusively linked mycotoxin inhalation exposure to any serious health effect. While there may be health risks from mycotoxins, a causal association of illness with respect to mycotoxins remains weak and unproven. In particular, while

many molds contain mycotoxins, studies have failed to establish routes of exposure.[1, 5, 6]

Mold has also been blamed for other health effects such as upper and lower respiratory illnesses, memory loss, and lethargy; however, there have been no studies confirming this. Microbial Volatile Organic Compounds (MVOC), which are the metabolites of fungi that cause the odors associated with mold growth, have been suspected as causing some of the health effects listed above. Once again, however, no association has been shown between the presence of MVOC and health effects, primarily because the MVOCs are produced in such minute levels.[6] According to the Centers for Disease Control and Prevention (CDC): "We do not know whether molds cause other adverse health effects, such as pulmonary hemorrhage, memory loss, or lethargy. We also do not know if the occurrence of mold-related illnesses is increasing."[9]

Scope of Environmental Health Officer Responsibilities

When necessary, DEHS will utilize a team approach responding to mold complaints. The EHO will be the technical leader of a team comprised of numerous individuals who either have a stake in the outcome, or have technical expertise that might contribute to a solution. Examples of potential team members are healthcare providers; mold specialists; industrial hygienists; tribal housing authority directors; community health nurses; and building inspectors. The role and involvement of the EHO will be limited to the following activities that are supported by current standards of best practices and the IHS Indoor Air Quality (IAQ) guidance document.

- Advocate for early preventive measures such as best practices for siting, design, and construction of homes and facilities.
- Provide educational materials and presentations to increase the general public's understanding and knowledge on mold and its potential health effects.
- Perform an initial assessment.
- Provide guidance and technical assistance to tribes and individuals on preventing the growth of mold and remediation.
- Consult with other healthcare providers, professionals, and authorities to alleviate potential health risks and effects.

<u>Advocacy</u>

EHOs should advocate local action requiring pre-construction mold prevention efforts. These efforts would include such considerations as proper site selection, design and construction of buildings, and preventive maintenance in HUD-owned and publicly owned buildings.

Partnerships - Partnerships should be developed that include all stakeholders regarding mold issues. Some of the partners involved should include HUD; Tribal housing authorities (THA); Designated Tribal housing entities (DTHE); IHS Sanitation and Facility Construction (internal and external divisions); and other Tribal, medical, or professional organizations.

Risk Communication

EHOs should develop or have access to educational programs based on known facts regarding health risks of mold. They should also learn the basic principles of risk communication in order to effectively address issues where the perception of risk differs significantly from the actual risk. Following is a list of resources that can aid in educational efforts:

- New York City Department of Health & Mental Hygiene Bureau of Environmental & Occupational Disease Epidemiology, "Guidelines on Assessment and Remediation of Fungi in Indoor Environments"[10]
- U.S. Environmental Protection Agency (EPA) "A Brief Guide to Mold, Moisture, and Your Home"
- Office of Native American Programs (ONAP)/Housing and Urban Development (HUD) "Mold Prevention and Detection: A Guide for Housing Authorities in Indian Country"
- American Conference of Governmental Industrial Hygienists (ACGIH) "Building Air Quality"
- American Industrial Hygiene Association (AIHA) "The Facts About Mold"

Initial assessment

The assessment described here is meant to primarily apply to homes rather than facilities because a facility investigation may use various methods and techniques that are not appropriate for homes. The home assessment should be limited to a thorough visual identification of signs of mold and excessive moisture through non-destructive means.[10] The EHO should not collect samples or perform any activity that is destructive to the structure. A written report of assessment results should be sent to the appropriate parties.

Guidance

EHOs should consult the IAQ guidance document prepared by DEHS that provides details for investigating mold concerns and complaints. It also includes information on guidance and technical assistance to tribes regarding IAQ, mold, and mold remediation.

Testing - Sampling should rarely, if ever, be performed. If mold growth is identified, the moisture source must be eliminated and the mold growth abated, regardless of the species involved. If a thorough initial assessment fails to identify the problem and there is still reason to suspect mold growth, then sampling by a qualified professional familiar with current guidelines, using a laboratory accredited through the Environmental Microbiology Laboratory Accreditation Program (EMLAP), may be warranted.

However, all testing methods for mold have limitations that can confound the interpretation of results. Depending on a number of factors, these limitations can over- or under-estimate spore concentrations. Moreover,

given the lack of established health risks, there is little benefit to identifying the species of mold.

Remediation – The EHO should be knowledgeable of remediation methods for relatively minor infestations (<10 ft^2 of mold growth) in order to instruct individuals on proper remediation techniques.[10] For mold infestations greater than 10 ft^2, the EHO should provide guidance on identifying a reputable mold assessment and remediation contractor. In all cases, excessive moisture is the cause of mold growth and should be located and corrected or mold growth will recur.[10]

Summary

The IHS has a professional obligation to respond to concerns about mold; however, current scientifically valid literature does not substantiate an increased priority on mold issues. This paper clarifies the mold issue and defines the problem in terms of actual health risks rather than perceived risks. Providing a written statement defining the scope of responsibilities regarding mold issues sets limits on time and resources spent on these activities so that they are proportionate to the level of health risk. This will benefit Native Americans and Alaska Natives by reserving resources for environmental health issues whose health risks have been confirmed by statistically significant data. This paper supports a continued yet limited EHO response to residential mold issues, which concentrates on prevention, remediation, and education rather than environmental sampling and health assessments.

The role of the EHO will be to serve as a member of a team made up of healthcare providers and other professionals with expertise in various disciplines. The scope of EHO activities regarding mold issues are:

- Advocate for early preventive measures such as best practices for siting, design, and construction of homes and facilities.
- Provide educational materials and presentations to increase the general public's understanding and knowledge on mold and its potential health effects.
- Perform an initial assessment.
- Provide guidance and technical assistance to tribes and individuals on preventing the growth of mold and remediation.
- Consult with other healthcare providers, professionals, and authorities to alleviate potential health risks and effects.

Mold, the most common member of the fungi, is found nearly everywhere, indoors and outdoors. The current body of scientific knowledge regarding health effects of mold suggests that the presence of mold in a building constitutes a minimal health risk to the general population.[1, 5, 6] The most common health effect of indoor mold is immediate hypersensitivity, usually resulting in hay fever-like symptoms. The most important step to take to eliminate mold is to eliminate excessive moisture.[1, 2, 3, 4]

Citations

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