



## Inside Story: Indoor Air Quality

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### INTRODUCTION

Indoor Air Quality (IAQ) is a major concern among today's population because the quality of air that we breathe at home can be five times more polluted than outside air (Environmental Protection Agency et.al, 2003). Presently, there are sixty federal and state IAQ bills pending, which if passed will greatly improve the public's health. Unlike the state of Texas, Florida does not have any current state statutes to regulate and monitor IAQ in homes and workplaces. There is also pending legislation in the Florida Senate, regulating IAQ in the state's public schools. This article will discuss IAQ and its relation to our health. We will also discuss two recent IAQ cases that demonstrated how indoor mold exposure affected the health of the occupants.

According to the Environmental Protection Agency (EPA)'s Science Advisory Board, "indoor air pollution has consistently been ranked among the top five environmental risks to public health" (Environmental Protection Agency et.al, 2003). The majority of the population is aware of the health hazards related to outdoor pollutants,

but are not aware of the risks associated with poor indoor air quality. Levels of indoor air pollutants may cause adverse health conditions due to constant exposure and time spent indoors. Some common indoor pollutants that are triggers for asthma, allergies and other upper respiratory problems are mold, animal dander, dust mites, and volatile organic compounds (e.g. formaldehyde, benzene and acetone etc).

Volatile Organic Compounds (VOC) are a major source of indoor air pollution. Items such as personal cosmetics (e.g. make-up, perfume and hair spray), disinfectants, dry-cleaning agents, pesticides, cooking and heating fuels and adhesives are common household products containing volatile organic compounds. The use of these products should only be used in well-ventilated areas to minimize the spread of these contaminants within the home.

Mold and mildew are fungi that live on plant and animal matter (U.S. Center for Disease Control, 2003). There are over a hundred thousand different types of molds that are found virtually everywhere both indoors and outdoors (U.S. Centers for Disease Control, 2003). The growth of mold is

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encouraged in dark and moist areas. When there is excessive moisture and/or high humidity indoors, mold will begin to proliferate. Mold growth produces spores that circulate within the entire home, spreading the growth of mold as well as being ingested within one's body. It is this mold growth that needs to be prevented and remediated. Areas within the home such as the kitchen, bathroom, garage, and laundry rooms are common sites for indoor mold growth. Mold becomes hazardous when certain forms produce a toxic substance, known as Mycotoxin that disperses throughout the air and is inhaled. Some of the symptoms that may occur from exposure to molds are inflammation within the upper respiratory track, lack of concentration, headaches, dizziness, itchiness of eyes and skin, sore throat, runny nose, shortness of breath, aches and pains, disturbed sleeping patterns and forgetfulness. Signs and symptoms of long-term exposure to mold and other indoor air contaminants may get ignored as having the common cold or the flu virus.

The Miami-Dade County Health Department Indoor Air Quality program was established in 1995, under the division of Environmental Health. The program's goal is to improve the health of Miami-Dade County citizens by reducing exposure to indoor air contaminants. The Indoor Air Quality program is staffed with one Environmental Specialist inspecting an average of 250 indoor air quality cases of which approximately 90% are mold-related. These high percentages of mold-related complaints result from our semi-tropical climatic weather, humid environment, and high average temperature. In addition, due to recent media exposure in Miami-Dade County, the public's awareness of health-related issues with regards to mold has increased substantially.

## **CASE STUDIES**

### **Indoor Air Quality Investigation involving a Senior Citizen**

#### **Nature of Complaint**

The complaint was initiated by a phone call from an occupant of an apartment complex, who felt that the poor IAQ unit was making her ill. In addition, she

had been noticing mold growth in various surfaces in her home. A complaint card was initiated with the occupants name, location information as well as a summary of her problems. The Environmental Specialist made an appointment for a home visit to ascertain the problem. He brought to the occupant's home some instruments such as a moisture meter and an indoor air quality monitor, that are used to help determine the source and extent of the problem.

#### **Field Visit & Findings**

Upon entering the apartment, we immediately encountered a musty odor, which is indicative of mold growth. A detailed inspection was conducted in the home to determine the source of contamination. The occupant stated that there was visible mold on the bedroom walls, however management recently painted the room so that the mold was not visible. In addition to the mold on the walls, the occupant stated that her clothes and bedding accessories also were inundated with mold and she had to discard the items. Other viable information was obtained from the client to help substantiate the damage that occurred and possible health effects from the contaminants. The occupant stated that she was experiencing headaches, dizziness and nausea as well as muscular aches and pains during the time she spent indoors. When she was outdoors, her condition improved. She was under the care of a physician for these symptoms. The symptoms that she was experiencing were consistent with mold exposure.



#### **Recommendations**

The client was given in-service education on IAQ and how to alleviate indoor air pollutants. In addition, she was given EPA educational materials. The client requested a written report of our findings and recommendations. We felt that due to her adverse health conditions, it would be in her best interest if she relocated.



## Mold Investigation in a Low-Income Household

### Nature of Complaint

This case study involves the relation of mold-related symptoms and a low-income home. The resident, a young divorced mother of four children, occupied a home that had continuous roof leaks. The Environmental Specialist received a complaint by telephone from the client who stated that she had recently moved out of a HUD (U.S. Housing and Urban Development) house that had considerable mold on the walls and ceilings. She stated that although she was no longer living there, she was still the legal occupant of the home. A complaint card was initiated with her name, location and an appointment was made for a home inspection.

### Field Visit & Findings

The leaking roof contributed to the growth of mold throughout the house. A visual inspection revealed considerable mold on all the home's ceilings, walls, furniture and personal items. A moisture meter showed that there was considerable moisture throughout the home. The entire family had relocated due to the adverse health effects. The client was very detailed in explaining the symptoms of skin irritation, itching and redness of eyes, disturbed sleeping patterns, upper respiratory problems and other allergenic type symptoms. The client had not been to a doctor. This case was different from the first case in that there was considerable visible mold growth. All the windows and doors in this home were open so that there was no apparent musty odor, as was identified in the first case.



### Recommendations

The client was strongly advised to seek medical advice as soon as possible. In addition, the client was given in-service education along with EPA reading material. The client requested a written report so that she could present it to Section 8 HUD authority in hope that it would expedite her getting a new home. We recommended, in our written report, that experts in mold remediation remove the mold on all the walls and ceilings.

### Conclusion

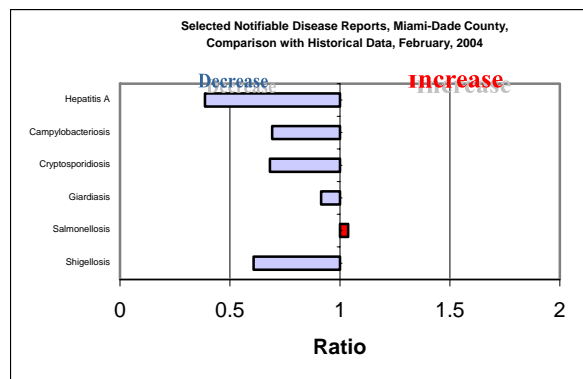
In conclusion, the need for public education on IAQ has never been greater. Simple awareness of IAQ and its numerous contributors is the first step to the improvement of the public's indoor air supply. Interventions such as allowing fresh air to enter the home, control of all water leaks and the use of cleaning cosmetics in well ventilated areas are a few simple solutions to minimize the exposure to indoor air contaminants. Due to semi-tropical climate weather and high humidity levels, the most important IAQ concern for Miami-Dade County residents is mold. Those with preexisting health conditions, pregnant women and the elderly are at greater health risk from the exposure of indoor air pollution. Evidence from the case studies indicated a strong similarity with regards to the types of complaints, health effects due to exposure of mold, and the lack of education and awareness presented by the clients. In the Miami-Dade County IAQ case studies, 90% of all cases were mold related.



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\*Ratio of current month total to mean of 15 month totals (from previous, comparable, and subsequent month periods for the past 5 years).

**To report diseases or for information:**

**Office of Epidemiology and Disease Control**  
**Childhood Lead Poisoning**  
 Prevention Program (305) 623-3565  
 Hepatitis (305) 324-2490  
 Other diseases and outbreaks  
 (305) 324-2413

HIV/AIDS Program (305) 324-2459  
 STD Program (305) 325-3242  
 Tuberculosis Program (305) 324-2470  
 Special Immunization Program  
 (786) 845-0550

**Nights, weekends, and holidays**  
**(305) 377-6751**



# Monthly Report

## Selected Reportable Diseases/Conditions in Miami-Dade County, February 2004

Diseases/Conditions	2004 this Month	2004 Year to Date	2003 Year to Date	2002 Year to Date	2001 Year to Date	2000 Year to Date
AIDS <sup>Provisional</sup>	119	250	192	198	248	267
Animal Rabies	0	0	0	0	0	0
Campylobacteriosis	9	12	17	5	16	1
<i>Chlamydia trachomatis</i>	232	492	619	767	469	462
Ciguatera Poisoning	0	0	0	0	0	0
Cryptosporidiosis	1	1	2	1	4	0
Cyclosporiasis	0	0	0	0	0	0
Diphtheria	0	0	0	0	0	0
<i>E. coli</i> , O157:H7	0	0	0	0	0	0
<i>E. coli</i> , Non-O157	0	0	0	0	0	0
<i>E. coli</i> , Other	0	0	0	0	0	0
Encephalitis (except WNV)	0	0	0	1	0	0
Encephalitis, West Nile Virus	0	0	0	0	0	0
Giardiasis, Acute	20	25	15	12	21	0
Gonorrhea	80	202	298	387	226	357
Granuloma Inguinale	0	0	0	0	0	0
Hepatitis A	4	5	2	7	20	2
Hepatitis B	4	4	2	2	1	1
HIV <sup>Provisional</sup>	114	276	283	341	278	323
Lead Poisoning	19	23	19	22	23	55
Legionnaire's Disease	0	0	0	0	0	0
Leptospirosis	0	0	0	0	0	0
Lyme disease	0	0	0	0	0	0
Lymphogranuloma Venereum	0	0	0	0	0	0
Malaria	0	0	2	1	4	0
Measles	0	0	0	0	0	0
Meningitis (except aseptic)	0	0	0	0	1	0
Meningococcal Disease	0	1	2	2	3	5
Mumps	0	0	0	0	0	0
Pertussis	0	0	0	0	0	0
Polio	0	0	0	0	0	0
Rubella	0	0	0	0	0	0
Rubella, Congenital	0	0	0	0	0	0
Salmonellosis	26	31	35	27	19	8
Shigellosis	13	21	36	21	9	0
<i>Streptococcus pneumoniae</i> , Drug Resistant	1	1	8	13	15	17
Syphilis, Infectious	16	34	32	32	23	25
Syphilis, Other	76	130	177	180	65	135
Tetanus	0	0	0	0	0	0
Toxoplasmosis	0	0	1	0	0	0
Tuberculosis <sup>Provisional</sup>	12	23	31	36	25	28
Typhoid Fever	1	1	1	0	0	0
<i>Vibrio cholera</i> Type O1	0	0	0	0	0	0
<i>Vibrio cholera</i> Non-O1	0	0	0	0	0	0
<i>Vibrio</i> , Other	0	0	0	0	0	0

\* Data on AIDS are provisional at the county level and are subject to edit checks by state and federal agencies.

\*\* Data on tuberculosis are provisional at the county level.

