Submission to The World Health Organization Additional Publications Regarding Molds and Mycotoxins October 7, 2009

Dear Mr. Krzyzanowski,

The 2009 WHO "Guidelines for Indoor Air Quality--Dampness and Mould" is an excellent report. The report is making a significant difference in the international understanding of the health effects of moulds and mycotoxins. It is specifically noted that the WHO did an outstanding job of highlighting the immunological effects.

As I mentioned in my previous communication, there are several additional publications that were not included in the literature review for the WHO report. There are also several items that were excluded from the IOM review when they prepared their 2004 report on "Damp Indoor Spaces and Health." I appreciate your invitation to provide a list of additional literature items for your consideration. As you are aware, there are thousands of publications on this topic. The attached lists are not intended to consist of all possible documents, but I hope you find it helpful and hope it leads you to additional sources of information.

I would like to provide a few brief comments:

- 1. There are two files attached. The first file includes literature items that were published prior to the WHO cutoff date of June 2007 and prior to the IOM cutoff date of 2003. The second file has a few select items that have been published since July 2007. I included only a few of the newer items because I am sure you will do an extensive search when you are ready to update your report.
- 2. I included the report by Etzel et al titled "Acute Pulmonary Hemorrhage in Infants Associated with Exposure to Stachybotrys atra and Other Fungi." On page 81 of the WHO 2009 Guidelines for Indoor Air Quality, it states that this 1998 report by Etzel et al had been retracted. That statement is incorrect. Per Dr. Etzel, this report has not been retracted.
- 3. There are certain stakeholders who try to confuse this issue by claiming that molds and mycotoxins are only harmful if ingested (not inhaled or touched). This is simply a marketing ploy and is not valid. Molds and mycotoxins are harmful to humans whether exposure is by "ingestion, inhalation, skin and mucosal exposure, or by a combination of two or more of these routes." The following items represent a few examples where this issue is addressed.
- a. From page 96 of the "U.S. Army Medical Management of Biological Casualties."

"Exposure causes skin pain, pruritis, redness, vesiculation, necrosis, and sloughing of the epidermis. Effects on the airway include nose and throat pain, nasal discharge, itching and sneezing, cough, dyspnea, wheezing, chest pain, and hemoptysis. Toxin also produces similar effects after ingestion or eye contact. Severe intoxication results in prostration, weakness, ataxia, collapse, shock, and death."

b. The following quote is from page 284 of the 2006 paper titled, "What the Primary Care Pediatrician Should Know about Syndromes Associated with Exposures to Mycotoxins" (by Etzel RA).

"Mycotoxins can have protean manifestations; the symptoms depend on the specific toxin or mixture of toxins, the age, sex, and diet of the child, the dose, and whether exposure is by ingestion, inhalation, skin and mucosal exposure, or a combination of two or more of these routes. The most well-characterized presentations among infants and children are summarized in Table 2 under four headings: vomiting illness, bone marrow failure, acute pulmonary hemorrhage, and recurrent episodes of apnea and/or pneumonia."

- c. Another good source is the ACGIH book (published in 1999) titled "Bioaerosols: Assessment and Control." This book has a lot of information about the health effects of mycotoxins including the chart of health effects from "ingestion, dermal, or inhalation exposure" on page 24-3.
- d. The following statements are from Dr. Harriet Amman's 2002 report titled "Is Indoor Mold Contamination a Threat to Health?"

"Because molds grow in moist or wet indoor environments, it is possible for people to become exposed to molds and their products, either by direct contact on surfaces, or through the air, if mold spores, fragments, or mold products are aerosolized."

"Health effects from exposures to molds in indoor environments can result from allergy, infection, mucous membrane and sensory irritation and toxicity alone, or in combination."

e. On page 6 of the 2008 report by the U.S. Government Accountability Office, they state:

"Mold may affect human health through a number of routes and mechanisms. While inhalation is generally the most common route of exposure for mold in indoor environments, exposure can also occur through ingestion (for example, hand-to-mouth contact) and contact with the skin. The roles of these routes of exposure in causing illness are unclear. Once exposure occurs, health effects may arise through several potential mechanisms, including allergic (or immune-mediated), infectious, and toxic. It is not always possible to determine which of these mechanisms is associated with a specific health outcome."

Thank you again for your invitation to submit additional literature items. I look forward to hearing from you after you have had an opportunity to review this information.

Sincerely

Cheryl Wisecup

This submission is dedicated to the millions of families, teachers, employees, and school children throughout the world who have been harmed by exposure to molds and mycotoxins...and to the countless advocates, doctors, scientists and others who have been working tirelessly for years to bring this very important issue to the forefront.

Health Effects of Molds and Mycotoxins

Additional Publications Submitted to the World Health Organization

Publications dated June 2007 and Earlier

Date	Author	Title
2002	Ammann HM	Is Indoor Mold Contamination a Threat to Health? J Environ Health: 64 (2002) 43-44
2003	Ammann HM	Is Indoor Mold Contamination a Threat to Health? Part Two J Environ Health: 66 (2003) 47-49
Apr 1998	Etzel R et al	Toxic Effects of Indoor Molds American Academy of Pediatrics, Committee on Environmental Health, Vol 101, No. 4, April 1998
1999	Flappan SM et al	Infant Pulmonary Hemorrhage in a Suburban Home with Water Damage and Mold (Stachybotrys atra) Environ Health Perspectives, 107 (1999) 927-930
Apr 2004	Anyanwu EC, Ehiri J, Akpan, Al	Application, Effectiveness, and Limitations of the Electrophysiological Diagnosis of Neurotoxic Effects of Chronic Environmental Toxins in Humans Int J Adolesc Med Health, 2004 Apr-Jun; 16(2):107-18
Aug 1998	Etzel R et al	Acute Pulmonary Hemorrhage in Infants Associated with Exposure to Stachybotrys atra and Other Fungi Arch Pediatr Adolesc Med, Vol 152, Aug 1998, 757-762
1993	Smoragiewicz W et al	Trichothecene Mycotoxins in the Dust of Ventilation Systems in Office Buildings Int Arch Occup Environ Health, 65 (1993) 113-117
2001	Engvall K et al	Sick Building Syndrome in Relation to Building Dampness in Multi-Family Residential Buildings in Stockholm Int Arch Occup Environ Health, 74 (2001) 270-278
1992	Harrison J et al	An Investigation of the Relationship Between Microbial and Particulate Indoor Air Pollution and the Sick Building Syndrome Respir Med, 86 (1992) 225-235
2001	Apostolakos MJ et al	Hypersensitivity Pneumonitis from Ordinary Residential Exposures Environ Health Perspectives, 109 (2001) 979-981
2003	Chao HJ et al	The Work Environment and Workers' Health in Four Large Buildings Environ Health Perspectives, 111 (2003) 1242-1248
2001	Trout D et al	Bioaerosol Lung Damage in a Worker with Repeated Exposure to Fungi in a Water-Damaged Building Environ Health Perspectives, 109 (2001) 641-644
1999	Dillon HK et al	Review of Methods Applicable to the Assessment of Mold Exposure to Children Environ Health Perspectives, 107 (1999) 473-480
1992	Brunekreef B	Associations Between Questionnaire Reports of Home Dampness and Childhood Respiratory Symptoms Sci Total Environ, 127 (1992) 79-89
2003	Santilli J et al	Fungal Contamination of Elementary Schools: A New Environmental Hazard Ann Allergy Asthma Immunol, 90 (2002) 203-208
2005	Cox-Ganser JM et al	Respiratory Morbidity in Office Workers in a Water-Damaged Building Environmental Health Perspectives, 2005
Jun 1999	Etzel R et al	Indoor Mold and Children's Health Environmental Health Perspectives, Volume 107, Supplement 3:463, June 1999
1999	Peraica M et al	Toxic Effects of Mycotoxins in Humans Bulletin of the World Health Organization , 1999; 77(9):754-66
Feb 1998	Linz DH, Pinney SM, Keller JD, White M, Buncher CR	Cluster Analysis Applied to Building-Related Illness JOEM, Volume 40, February 1998

3/8/2004	Shendell DG, Barnett C, Boese S	Science-Based Recommendations to Prevent or Reduce Potential Exposures to Biological, Chemical, and Physical Agents in Schools Healthy Schools Network, Inc. (HSN), Albany, NY
		Supported by grants from The Rockefeller Foundation, the National Institutes of Environmental Health Sciences, & the National Clearinghouse for Educational Facilities of the U.S. Dept of Educ
2004	Wilson SC et al	Culturability and Toxicity of Sick Building Syndrome-Related Fungi Over Time J. Occup. Environ. Hyg. 1(8): 500-504, 2004
Jan 1998	Fung F, Clark R, Williams S	Stachybotrys: A Toxin-Producing Fungus of Increasing Toxicological Importance Journal of Toxicology: Clinical Toxicology, Jan-Mar 1998
2004	Marinkovich VA	Fungal Hypersensitivity: Pathophysiology, Diagnosis, Therapy *Adv Appl Microbiol*, 2004; 55:289-307
2003	Fung F et al	Health Effects of Indoor Fungal Bioaerosols Exposure Applied Occupational and Environmental Hygiene, 2003: 18; 535-544
Apr 2000	Mahmoudi M et al	Sick Building Syndrome III. Stachybotrys chartarum. Journal of Asthma, April, 2000; 37 (2000) 191-208
1972	Forgacs J	Stachybotryotoxicosis Microbial Toxins Vol. III (book), published by Academic Press, Inc., pp. 95-128
2005	Hastings C et al	Comparison of Immunomodulator mRNA Expression and Concentration in Lungs of Stachybotrys Chartarum Spore Exposed Mice J Toxicol Environ Health, A68; 2005:1321-1335
1995	Johanning E et al	Fungi and Bacteria in Indoor Air Environments: Health Effects, Detection and Remediation (book) Eastern New York Occupational and Environmental Health Center, Albany, NY (1995)
6/15/2005	Rand TG et al	Inflammatory and Cytotoxic Responses in Mouse Lungs Exposed to Purified Toxins from Building Isolated Penicillium brevicompactum Dierckx and P. chrysogenum Thom. <i>Toxiciological Sciences</i> , 2005; 87:213-222
Sep 1998	Cooley JD, Wong WC, Jumper C, Straus DC	Correlation Between the Prevalance of Certain Fungi and Sick Building Syndrome Occup. Environ. Med., 1998 Sep; 55(9)579-84
5/20/1998	Rylander R	The Link Between Exposure to Mould and Respiratory Problems is Incontrovertible Lakartidningen. 1998 May 20;95(21):2445-6. Swedish
1974	Newberne PM	Mycotoxins: Toxicity, Carcinogenicity, and the Influence of Various Nutritional Conditions Environmental Health Perspectives, Vol. 9, pp. 1-32, 1974
2007	Buzina W	Health Effects of Indoor Molds Wien Med Wochenschr. 2007;157(19-20):462-5.
7/21/1998	Jarvis BB et al	Study of Toxin Production by Isolates of Stachybotrys Chartarum and Memnoniella Echinata Isolated During a Study of Pulmonary Hemosiderosis in Infants Applied and Environmental Microbiology, Oct. 1998, p. 3620-3625 American Society for Microbiology, Received 26 March 1998; Accepted 21 July 1998
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	and Mygatovine Banara from an Intern	ational Company !!

Book: "Molds and Mycotoxins--Papers from an International Symposium"

Molds and Mycotoxins--Papers from an International Symposium (book) 2004 Kilburn KH et al

Published by Heldref Publications

Papers originally published in the Journal of Archives of Environ Health, Vol. 58, Nos. 7 and 8

Papers included in "Molds and Mycotoxins"

2004

Kilburn KH Indoor Mold Exposure Associated with Neurobehavioral and Pulmonary

Impairment: A Preliminary Report

Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication

Book titled "Molds and Mycotoxins" published by Heldref Publications

2004 Rea WJ, Didriksen N, Simon TR, Effects of Toxic Exposure to Molds and Mycotoxins in Building-Related Illnesses Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication Pain Y, Fenyves EJ, Griffiths B, Kilburn KH (ed.)

Book titled "Molds and Mycotoxins" published by Heldref Publications

2004	Simon TR, Rea, WJ	Use of Functional Brain Imaging in the Evaluation of Exposure to Mycotoxins and Toxins Encountered in Desert Storm/Desert Shield Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication Book titled "Molds and Mycotoxins" published by Heldref Publications
2004	Gray MR, Thrasher JD, Crago R, Madison RA, Arnold L, Campbell AW, Vojdani A, Kilburn KH (ed.)	Mixed Mold Mycotoxicosis: Immunological Changes in Humans Following Exposure in Water-Damaged Buildings Journal of Archives of Environmental Health, Volume 58(8):464-74 Book titled "Molds and Mycotoxins" published by Heldref Publications
2004	Gray MR, Thrasher JD, Crago BR, Madison RA, Arnold L, Campbell AW, Vojdani A, Kilburn KH (ed.)	Psychological, Neuropsychological, and Electrocortical Effects of Mixed Mold Exposure Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication Book titled "Molds and Mycotoxins" published by Heldref Publications
2004	Campbell AW, Thrasher JD, Madison RA, Vojdani A, Gray MR, Arnold L, Kilburn KH (ed.)	Neural Autoantibodies and Neurophysiologic Abnormalities in Patients Exposed to Molds in Water-Damaged Buildings Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication Book titled "Molds and Mycotoxins" published by Heldref Publications
2004	Vojdani A, Thrasher JD, Madison RA, Gray MR, Hauser G, Campbell AW, Kilburn KH (ed.)	Antibodies to Molds and Satratoxin in Individuals Exposed in Water-Damaged Buildings Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication Book titled "Molds and Mycotoxins" published by Heldref Publications
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2004	Shinn EA, Griffin DW, Seba DB, Kilburn KH (ed.)	Atmospheric Transport of Mold Spores in Clouds of Desert Dust Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication Book titled "Molds and Mycotoxins" published by Heldref Publications
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2004	Warsco K, Lindsey PF	Proactive Approaches for Mold-Free Interior Environments Journal of Archives of Environmental Health, Volume 58, Nos. 7 and 8, for bound publication Book titled "Molds and Mycotoxins" published by Heldref Publications
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Chapter 4: Trichothecene Mycotoxins

Published by the Office of the Surgeon General, Department of the Army, U.S.

3/26/2002	Croft WA, Jastromski BM, Peters HA	Clinical Confirmation of Trichothecence Mycotoxicosis in Patient Urine Journal of Environmental Biology, 23(3), 301-320 (2002) Received 19 April 2001; Accepted 26 March 2002
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1999	Macher J, Ammann HA, Burge HA, Milton DK, Morey PR (editors)	Bioaerosols: Assessment and Control (book) Published by ACGIH (American Conference of Governmental Industrial Hygienists)
2002	Andersen B et al	Characterization of Stachybotrys from Water-Damaged Buildings Based on Morphology, Growth, and Metabolite Production Mycologia, 94; 2002: 392-403
2002	Ebbehoj NE et al	Building-Related Symptoms and Molds: A Two-Step Intervention Study Indoor Air 12 (2002) 273-277
2003	Miller JD et al	Stachybotrys chartarum: Cause of Human Disease or Media Darling? Medical Mycology, 2003; 41:271-291
9/24/2004	Straus DC (editor)	Sick Building Syndrome (book) Advances in Applied Microbiology, Volume 55
Sept 2006	Marinkovich VA	Position Paper on Molds is Seriously Flawed J Allergy Clin Immunol, 2006 Sept; 118(3):761-2
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Apr 2005	Shoemaker R C	Mold Warriors: Fighting America's Hidden Health Threat (book) Published by Gateway Press, April 2005
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2004	Curtis L et al	Adverse Health Effects of Indoor Moulds Journal of Nutr Environ Med , 2004, 14(3): 261-274
1986	Croft WA et al	Airborne Outbreak of Trichothecene Toxicosis Atmos Environ . 1986; 20: 49–552
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5/9/2006	Pestka J, Zhou HR	Toll-Like Receptor Priming Sensitizes Macrophages to Proinflammatory Cytokine Gene Induction by Deoxynivalenol and Other Toxicants Toxicol Sci. 2006 Aug;92(2):445- 55. Epub 2006 May 9
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