Topical Area	Definition	Standards	Data Sources	Current Status	Ol
1. General Indoor Environment (including indoor air) **Note:** These Urgent areas were identified by Bob Glandon and Bob Godbold in response to a draft list of indicators from a variety of sources. **Note also:** The indicator areas identified here apply to all indoor environments, including work environments. However, please see the Occupational Health and safety area below for more specific occupational indicators.	**A. Biological:** 1. Infection outbreaks in child care facilities, hospitals, and nursing homes. The home and the workplace can harbor a variety of airborne allergens and pathogens. About 50% to 60% of all community acquired illness is due to respiratory infections and most of these are caused by viruses; but bacterial diseases and allergic reactions caused by biological sources can pose significant problems in homes and public facilities such as day care centers, nursing homes, schools, and office buildings (Introduction to Indoor Air Quality, EPA, 1991, p. 102)	**Biological:** 1. Childcare: The Office for Young Children (Ingham County Health Department) provides training and consultation to centers and their staff. They provide information on hand washing, immunization requirements etc. They can provide data on the number of licensed centers, number of children who are immunized (reporting is required) and how many people are trained in primary prevention practices each year.) Hospitals abide by standards established by the Center for Disease Control (we are informed that these standards are accessible via the CDC/s web page). Nursing Homes: There is a regional workgroup that works on "Infection control in Long-Term Care facilities." We are attempting to locate this group.	**Biological:** 1. Childcare: Sharon Walker, Disease Control Nurse, and Judy Williams, Disease Control Supervisor, Ingham County Health Department; Hospitals: Carl Zayatz, Infection Control Coordinator, Ingham Regional; Teri Dyke, Infection Control Coordinator, Sparrow, Dr. Dyke, Infection Control, Sparrow. Nursing Homes: Pursuing data.	**Biological:** 1. Childcare outbreaks are very under-reported. Much communicable disease, such as the common cold and chicken pox do not come to the attention of the Health Department. There were only 5 infection outbreaks (2 in 1992, 2 in 1993 and 1 in 1994) for diseases such as Giardiasis and Diarrhea. Hospitals: Formal data requests have been made to Sparrow and Ingham Regional Medical Center. Informants from both hospitals told me that infection-related data was complex, and that the data was generally non-comparable with other hospitals. Sparrow will not release nosocomial rates (that would require a FOIA request), however both hospitals are sending some data. For example, we'll get information on who's at risk, types of monitoring programs and information about how they assess indoor air.	**B** 1. Childca Acquire th Children C (objectives include 10 rate; 100% trained in preventior year and s Hospitals: Guidelines uncover th area hosp conducts a evaluation workers al Note #1:] Facilities:

1. Indoor Environment (continued)	**2. Molds** A fungous growth often producing disintegration of organic matter. “Molds are often associated with standing water in heat-ventilation-air-conditioning units (HVACs) and in water damage to rugs and furnishings (MPHI, p. 8-8).”	2. There are scores of fungi in the indoor environment. No standards yet identified (except for those related to creating a sound indoor air environment.)	2. See **Introduction to Indoor Air Quality, A Reference Manual, (EPA/400/3-1/003, July 1991, pages 110, 111)** for a listing of 42 molds identified in 68 homes in Southern California. Calls into DEQ’s Marsha Boyle (MIOSHA) and Mary Lee Hultin (DEQ, 373-9845) According to one source, Terri Dyke (infection control at Sparrow), there are indicator molds such as Aspergillus, that can be used as an indicator for overall mold prevalence.	2. Pursuing Data... Calls into NIOSH and MIOSHA	2. None id
	3. Legionaries’ disease (caused by the Legionella Bacteria)	3. See the National Institute for Building Sciences which has established building standards related to indoor air.	3. Judy Williams, Disease Control, ICHD	3. The County averaged. 2.2 cases over the last 5 years: 1993:2, 1994:3, 1995:0, 1996:3, 1997:3	3. No obje

	4.Pet bites	4. There are no standards or objectives for this area. All bites that present to the ER re required to be reported (to either ICHD or Animal Control) within a certain amount of time (I believe 24 hours). Hummel said that there is currently a lawsuit concerning the reporting requirement involving one of the local hospitals.	4. Steve Hummel, Animal Control 676-8375 The bites in the next column are mostly dog to human, but also include cats and wild animals. About 5% of bites are dog to dog!	1998:719, 1997:697, 1996:741, 1995:642	4. Humme gives pres with a 15 schools ar how to pre there are goals or o
Topical Area	***Definition***	***Standards***	***Data Sources***	***Current Status***	***O***

1. Indoor Environment (continued)	**B. Chemical:** **5. Environmental Tobacco Smoke (please see Section 5)**	**B. Chemical:** 5. See Section 5 below.	**Chemical:** 5. See Section 5 below.	**B. Chemical:** 5. See Section 5 below.	**B. Chemi** 5. See Se
	6. Carbon Monoxide	6. 50 ppm (55)., 8-hr. Time weighted average (TWA)	6. Mike Allen, toxicologist, ICHD, Gary Biddinger, Chief Mechanical Inspector, City of Lansing Building Safety Division, Karen Kingsbury, Consumer's Energy, four Heating contractors, five fire departments. For health-related data: Michael Beebe, MDCH. Thu Lee, MDCH. Request in-hospital data base for CO incidence. Marsha Boyle and Bill DeLiefde, MIOSHA (332-5239)	6. In 1998 there were an estimated 1048-1253 consumer complaint calls made to contractors and utilities. Of these reports, an estimated 470-613 had a positive CO (Note: no one tracks the actual positives, they are informed estimates; Note also: we need to incorporate ICHD, MIOSHA and fire chief's responses into these figures). Complaints are the result of the sounding of a CO alarm or are the result of a person experiencing symptoms that they attribute to CO gas. The verification of an actual positive detection of CO is made from field visits and routine inspections. Consumer's Energy is the only organization that tracks complaints. We have death data for the years 1970-1997 There were 155 deaths, (41 unintentional). Unintentional deaths have been dropping , there were 31 in the '70's but only 3 between 90 and 97). Awaiting morbidity data.	6. Healthy Decrease number of carbon mo in the U.S estimated CO poisor People 20 25 percen deaths du carbon mo poisonings (Baseline 1994) Hea Increase t States and monitor di be caused environme Only 7 sta poisoning target is 5

1. Indoor Environment (continued)	**7. Nitrogen Dioxide (NO_2)**	7. 25ppm (30 Mg/m^3), 8-hr. Time weighted average (TWA)	7. Calls into the DEQ's Environmental Response Division: Jeff Crum: 335-3092 (I was informed that he is the reigning expert); also Chris Flaga (373-0161) and Linda Larsen 335-3161.	7. Pursuing Data... Calls into NIOSH and MIOSHA	7
Topical Area	***Definition***	***Standards***	***Data Sources***	***Current Status***	***Ol***
	8. Organic Solvents and aerosols	8. Standards vary for individual compounds	8. Linda Larsen, Environmental Response Division, DEQ. Barb Cowles, Shiawassee District Office,	8. Pursuing Data	8
	9. Pesticides (Please refer to Section 6 below)	9. Standards vary for individual compounds	9. Pesticides (Please refer to Section 6 below)	9. Pesticides (Please refer to Section 6 below)	9. Pesticic to Section

	10. Volatile Organic Compounds. (Any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.)	10. Standards vary for individual compounds. See **Introduction to Indoor Air Quality, A Reference Manual, (EPA/400/3-1/003, July 1991)** for a complete discussion of various standards and health effects of VOCs. Compounds. They include formaldehyde, benzene, toluene etc.	10. Calls into Marsha Boyle, microbiologist, MIOSHA (322-6595), Mary Lee Hultin (DEQ, 373-9845)	10	10. Health (Developn methods t exposure environme hazards: a compounc aromatic h (There are methods c VOCs hov to the EPA 266) there of data tha exposures and the m complicate
Topical Area	***Definition***	***Standards***	***Data Sources***	***Current Status***	***Ol***
1. Indoor Environment (continued)	**11. Mercury**. Joy Taylor, with the DEQ, said that mercury is most dangerous when it is breathed, and when it is in the form of methyl mercury. There are numerous hazards associated with mercury in the indoor aor environment: mercury thermometers, thermostats (there is a take-back program), occupational exposures, children playing with old jars of mercury etc. The health effects of mercury include....	11. 1 milligram per 10 cubic meter (1 mg/10 m^3), established by OSHA, July 1, 1994	11. Joy Taylor, Environmental Quality Specialist DEQ (335-6974); Bob Dayring MIOSHA, (322-1057)	We can file a Freedom of Information Act request with MIOSHA to get information on their indoor air complaints/investigations (including mercury). I spoke with Bob Dayring (322-1057),an industrial hygienist, who said that a FOIA was required.	There are groups tha P2 progra without Ha this is a na and the M Pollution F Preventior

			Taylor said that the MI Health and Hospital Assn. has a workgroup that is attempting to rid Michigan hospitals of mercury products. She said that she was not aware if Ingham County hospitals were involved in the effort.	Taylor said that the DEQ has no existing database that captures indicators of mercury contamination (as in spills etc.). She suggested two possible measures: 1) measure the amount of mercury that is collected/removed from the waste stream; 2) measure the amount of mercury that is collected on hazardous waste day (estimate the amount of mercury in button batteries, thermometers etc.)	Taylor sai more educ required a with medic household businesse there is a automotiv remove m (or capsul million veh recycled e approxima contain m Each of th light or tru typically c grams of r sealed cap
Topical Area	***Definition***	***Standards***	***Data Sources***	***Current Status***	***Ot***
			Taylor said that the M2P2 coalition has worked with different utilities to reduce emissions as well as industrial equipment that contains mercury and that they have had success with Consumer's Energy and Detroit Edison, However the Board of Water and Light has not been as responsive. She said that Dave Dempsey and the MEC has attempted to work with them to	In regards to outdoor. air emission totals, Ingham County ranked 7th of all Michigan counties in 1993. During that year there were 145.3 pounds of mercury that were released into the air. (Taylor, DEQ)	Healthy P Increase t States tha caused by poisoning. were 14; t 15.

			improve.		

1. Indoor Environment (continued)	**12. Carbon Dioxide**	12. Waiting for the standards from Bob Dayring (MIOSHA)	Linda Larsen, Environmental Response Division, DEQ. Larsen an said that her office only investigates indoor air complaints when there is evidence that the contaminant domes from "impacted groundwater or soil....if the source is under the building and are volatilizing inside the building." They do not investigate naturally occurring substances like carbon dioxide and nitrogen dioxide if there is no evidence that they are coming from outside of the building.		Healthy P not specifi carbon dic
Topical Area	***Definition***	***Standards***	***Data Sources***	***Current Status***	***O***
1. Indoor Environment (continued)	**Physical :**	**Physical :**	**Physical :**	**Physical :**	
	13. Asbestos "Asbestos is the name for a group of natural minerals that separate into strong, very fine fibers. Because of asbestos' acid-resistance, tensile strength, light weight, imperviousness to chemicals and heat, and inability to conduct electricity it has been used in nearly 3000 products. Asbestos is friable which means	13. 100,000 fibers/m^3, 8-hr. TWA, Occupational Safety and Health Administration (OSHA)	Mike Mealy and Chris Robinson, MIOSHA.	We are awaiting data on regulatory action -- inspections done in Ingham County and number of violations resulting from these inspections. We can also get complaints forwarded to MIOSHA from other sources.	**Current S (continue**

	it crumbles easily. If bonded to finished products it poses no health risk." (Levenstein, *Everyday Cancer Risks* 1992 pp. 83-87)				

	There are an estimated 5,500 lung cancer deaths due to asbestosis per year in the U.S. (MMWR, CDC). The most frequently recorded occupations on death certificates for asbestosis are: 1. plumbers, pipefitters, and steam fitters *8%), 2. electricians (5.4%), insulation workers (5%), carpenters (4.3%) and laborers, except construction (4.2%).		Kevin Townsend, Asbestos Abatement Company, Phil Peterson of FiberTech (a testing agency), Ken Rosenman, M.D. Professor of Medicine, Department of Medicine, Occupational and Environmental Medicine, MSU.	We have also contacted the Asbestos Abatement Company. Kevin Townsend described the types of asbestos seen and where it was found. They receive about 15-20 calls per week, approximately 80% are industrial.	MI had 13 deaths be 1992. (Na Health Sta about 5 de year.
				FiberTech (a testing agency). Phil Peterson is sending data on the number of tests done for both residential and industrial sites and their results.	Regarding occupatio asbestosis According Rosenma of asbesto reported b physicians interpret c for pneum readers us the emplo of residen we do not for over 9 asbestosis
				We have the number of OSHA inspector samples in MI 1979-1994	Hospital D MI at large

				(approx avg. of 30 per year. Between 1985 and 1994 3.36% exceeded the permissible exposure limit (PEL).	are about year disch asbestosis seeking In level data)
Topical Area	***Definition***	***Standards***	***Data Sources***	***Current Status***	***Ot***

1. Indoor Environment (continued)	**14. Radon**. "Radon is a chemically inactive, colorless radioactive gas that occurs naturally. Radon results from the natural breakdown of uranium-238 in soil or rack, especially granite, shale, and phosphate. It can pass through solid materials, including buildings and the human body. The National Cancer Institute estimates that radon causes 20,000 to 30,000 deaths a year. Radon acts synergistically with tobacco smoke, multiplying exponentially the cancer risk for smokers when radon is present. (Levenstein, p 187)"	14. 4 pCi/L, U.S. Environmental Protection Agency. According to the EPA, this amount is equivalent to smoking about a half pack of cigarettes each day. The average Radon levels outdoors is around .2pCi/L or less.	14. Mike Allen, Ingham County Health Department. Susan Hendershot, Indoor Air Program DEQ. She referred us back to Mike Allen, saying that our program predated theirs and that they report to us anyway.	Approximately 10-12% of returned radon results show radon levels equal to or exceeding the action level of 4 pCi/L. The rate of high radon rest reports is about 5% in central/northwest Lansing. The rate of high radon test reports is about 9% overall in the city of Lansing. ICHD has data going back to 1991, approximately 733 report results. Report data are computerized. Mike Allen can produce a spot map of the current data. He has about 100 results which have yet to be input.	Healthy P Increase t percent of homes in homeown have teste concentra have beer minimal ri modified t to health, reduce the cancer (Ba percent in
	15. Respirable Particles	15. For particulates <10 microns in diameter (PM -10): (150 Mg/m^3) , 24 hour average; (50 Mg/m^3), annual average, Clean Air Act	15. Marsha Boyle, microbiologist, MIOSHA (322-6595), Mary Lee Hultin (DEQ, 373-9845)	15. Place a FOIA request for indoor air data from MIOSHA. Follow up with DEQ. According Boyle, MIOSHA does monitor RPs for industrial environments, however "there is no	Current St With indus said that t have to be couldn't se three feet

				indoor air (standard) for non-industrial environs (like office settings) other than "general duty" There would have to be an identified source for them to investigate offices (continued in "objectives column).	substance then the le one would could be c underscor biologicals amount of that a pers without ge
1. Indoor Environment (continued)	**16. Ventilation** **17. Lead-Based Paint (See section 3 below)**	16. 20 ft^3/min/person, American Society of Heating, Refrigerating and Air-Conditioning Engineers 17. (See Section 3 below)	16. Marsha Boyle, microbiologist, MIOSHA (322-6595), Mary Lee Hultin (DEQ, 373-9845). Consult the American Society of Heating, Refrigerating and Air-Conditioning Engineers. See NIOSH's excellent "Factors Affecting Indoor Air Quality (pp. 5-12).	16. File a FOIA request with MIOSHA. Follow-up with DEQ.	
	18. Faulty heat-ventilation-air-conditioning units (HVAC) Contaminants can originate in a number of ways in the HVAC system: 1) dust or dirt in ductwork or other	18. Waiting for the standards from Bob Dayring (MIOSHA)	18. Dave Vigos, MI Bureau of Construction Codes (241-9347). He has data on electrical, plumbing and mechanical complaints for Ingham		

	22. Sick Building Syndrome According to NIOSH, “the term sick building syndrome is sometimes used to describe cases in which building occupants experience acute health and comfort effects that are apparently linked to the time they spend in the building, but in which so specific illness can be identified. The complaints may be localized in a particular room or zone or may be widespread throughout the building. Many different symptoms have been associated with SBS, including respiratory complaints, irritation,, and fatigue. Analysis of air samples often fails to detect high concentrations of specific contaminants (see: http://www.cdc.gov/niosh/pdfs/appenf.pdf)	According to NIOSH, “the problem may be caused by any or all of the following:	Bob Dayring, industrial Hygienist, MIOSHA,	MIOSHA has records of numerous sick building syndrome complaints. We would have to file a FOIA request to get this information. According to Dayring, “years ago we did a lot of [SBS] responses.” MIOSHA’s studies showed that, “this is not a serious hazard. Other than getting into cases of Legionnaires’ Disease and Carbon Monoxide, we have not found exposure [to be a serious problem.].” He called this a short-term “comfort related issue” and said that while it may be true that an employee does feel better when they get home, the employee is not at health risk while at work. He said that after investigating a complaint, if MIOSHA has not discovered a serious hazard, they send the employer a “D letter” which instructs them what actions (if any) to take.	

		1. The combined effects of multiple pollutants at low concentrations. 2. Other environmental stressors (e.g. , overheating, poor lighting, noise). 3. Ergonomic stressors. 4. Job-related psychosocial stressors (e.g. overcrowding, labor management problems). 5. Unknown factors. According to Donald Waite, DO, MPH, author of *Environmental Health Hazards, Recognition and Avoidance (1994, p 353)*, providing adequate ventilation is the logical solution to most cases of SBS. For buildings where smoking takes place, he recommends that at least 20 feet of outside air per occupant be introduced rather than the customary 5 ft. Required by most building codes. This has been resisted because of the added heating and cooling costs, he said.	We are pursuing data/information from other sources including NIOSH, the EPA and advocacy groups. It is important to point out that the central office of the EPA was itself the object of a SBS action by some of its employees, resulting in ventilation changes, new workplace assignments and the increase in home-based work (source 60 minutes).		