Clearing the Air: Asthma and Indoor Air Exposures

- Institute of Medicine report on what is known about indoor air exposures and asthma
  - Exposures and asthma onset
  - Exposures and worsening asthma
  - Effectiveness of interventions

- 12 person expert panel convened in late 1998, final report issued January 2000
- **http://books.nap.edu/books/0309064961/html/**

Exposures Addressed in IOM Report

- Biological
  - Animals
    - Cats / dogs / rodents/ cows / horses / birds
  - Cockroaches
  - House dust mites
  - Endotoxin
  - Fungi
  - Plants
  - Pollens
  - Infectious agents
- Chemical
  - NOx
  - Pesticides
  - Fragrances
  - Plasticizers
  - VOCs
  - Formaldehyde
  - Environmental tobacco smoke
  - Ozone / PM/ SOx

Classification Scheme of IOM Report

- Distinction between *development* of asthma and *exacerbation* of asthma
- Categories of evidence
  - Sufficient evidence of a causal relationship
  - Sufficient evidence of an an association
  - Limited or suggestive evidence of an association
  - Inadequate or insufficient evidence to determine
  - Limited or suggestive evidence of no association

Exposures Associated With Exacerbation of Asthma

- Sufficient evidence of a causal relationship
  - Environmental tobacco smoke (preschool aged children)
  - Cat / Cockroach / House Dust Mite
- Sufficient evidence of an association
  - Dog / Fungi – Molds / Rhinovirus
  - NOx / NO_2

Exposures Associated With Exacerbation of Asthma

- Limited or suggestive evidence
  - ETS (other than preschoolers) / formaldehyde / fragrances
  - Birds / C. pneumoniae / M. pneumoniae / RSV
- Inadequate evidence
  - Pesticides / Plasticizers / VOCs Everything else

Exposures Associated With Development of Asthma

- Sufficient evidence of a causal relationship
  - House Dust Mite
- Sufficient evidence of an association
  - Environmental tobacco smoke (preschool aged children)
- Limited or suggestive evidence
  - Cockroach (infants) / RSV
- Inadequate evidence
  - Everything else
- Limited or suggestive evidence of no association
  - Rhinovirus (adults)

Sufficient Evidence of an Association for Mitigation Strategies for House Dust Mite

- Humid climates
  - Air conditioning for humidity control
  - Reduce nests / bedding measures
- Moderately or seasonally humid
  - Open windows / upper floor apartment
  - Reduce nests / bedding measures / chemical treatment
- Dry areas
  - Daily ventilation

Limited Evidence for Effectiveness of Mitigation Strategies for Cockroach Exposure

- Combination of extermination and control of allergen reservoirs
- Extermination alone ineffective; cleaning alone ineffective

Limited Evidence for Effectiveness of Mitigation Strategies for Cat Exposure

- Remove cat
  - May also require removal of reservoirs of allergen to be effective
- Washing cat

Effectiveness of Mitigation Strategies for Reducing ETS and Chemical Exposure

- Smoking cessation
- Air cleaning
  - Technologically capable of reducing concentrations
- Increasing ventilation
  - Technologically capable of reducing concentrations

Research Recommendations, IOM Asthma Report

- Exposure
  - Prenatal exposures
  - Assessment of age at first exposure
  - Importance of gene – environment interaction
- Strategies to reduce exposure
  - Rigorous mitigation trials
  - Importance of considering target population
- Integration of health and healthy environment sciences