

**DRAFT**

**CHILDREN'S RESPIRATORY DISEASE, SCHOOLS AND DAY-CARE  
CENTERS**

**OPERATIVE ASSUMPTION:** Reports suggest that asthma (characterized by wheezing, chest tightness, cough) and respiratory disease is on the increase, both in children and adults.

**OVERALL TRENDS:** Many observers report that the following are demonstrable, if not clearly established trends:

1. Asthma is on the increase
2. More mothers are in the workplace
3. Children spend less time with mothers in home
4. Children spend more time indoors in daycare centers and schools (including after school hours)
5. Many schools and daycare centers have reported serious IAQ problems.
6. Major reasons for IAQ problems:
  - a. old HVAC systems
  - b. inadequate ventilation
  - c. more carpets are in use in schools and daycare centers to reduce maintenance costs; these carpets harbor bioaerosols and other toxins.
7. The New York State United Teachers Union recently estimated that one out of every two schools are "sick".
8. A recent study in Georgia reported that a lack of humidity control in schools correlated with respiratory illness in children
9. Children of low socioeconomic status receive less health-care, live in environmentally "risky" homes and generally have a higher prevalence of respiratory illness.

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**SOURCES OF RESPIRATORY ILLNESS IN HOMES, SCHOOLS, AND DAYCARE CENTERS:**

bacteria	cockroaches
fungi	molds
bioaerosols	dust mites
rats, mice	cats, dogs

The EPA's recently published brochure on secondhand smoke claims that "between 200,000 and 1,000,000 asthmatic children have their condition made worse by exposure to secondhand smoke." However, trends indicate that the prevalence of smoking in the U.S. has been on the decrease for a number of years. Children spend less time in the home as the number of children attending day-care facilities has been on the increase and the majority have policies that prohibit or severely restrict smoking. The above trends do not support the contention that ETS is the cause of an increase in respiratory illness in children. In fact, several studies have shown an increased risk of respiratory illness associated with attending day care centers, especially for children 6 weeks through 17 months of age. (1,2)

Scientific studies have also correlated dampness in the homes, fungi, cockroaches and dust mites with children's respiratory illness. (3,4,5) The EPA's "School Evaluation Program" (SEP), initiated in 1989, has begun to generate some interesting findings indicating the ventilation in many of the schools is inadequate. (6) Researchers recently published a report on IAQ investigations in several schools in Georgia and stated:

"each of the school buildings had HVAC systems that provided insufficient humidity control. In each of the schools, a majority of the occupants complained of respiratory illnesses." (7)

"Why is the prevalence of asthma in children on the increase?" One possible answer, which is not receiving adequate public attention, is

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life-style changes which may have a major, yet undefined, impact on respiratory illness in children.

A recent study found that inner city children in Atlanta exposed to high levels of mite and cockroach allergens have a high incidence of asthma. (8) In addition, the authors, in response to a letter to the editor criticizing the researchers' omission of ETS as a risk factor, state:

“Our data do not support a major role of ETS in causing asthma in children more than 5 years of age, and we are not convinced by published data from other groups that active or passive smoking is an important risk factor for acute exacerbations of asthma in this group.” (9)

Another theory, which currently has little scientific substantiation, is stress-induced respiratory illness. NIH has recently initiated scientific research on the impact of stress as a factor in compromised immune-systems and its impact on illness; the theory being that stress-induced illness is real.

In addition, it is known that pre-pubescent children react differently to some medications than do adults; partly due to the different metabolism in the liver. Some believe this is partially accounted for by the lack of certain hormones. Indeed, many studies on children's respiratory disease find a greater prevalence at the younger ages. It is also possible that children's immune system lack the development to respond to certain stress; i.e. the relative by-products of the metabolism of norepinephrine, which is a critical mechanism to the body's reaction to stress, or other important chemicals may differ.

Today's children clearly face many more sociological and environmental stress than those of ten years ago (child abuse, dysfunctional families, violence, crime, etc.). Is it possible the stressed child's immune system is so compromised that respiratory illness results?

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**RECOMMENDATIONS FOR ADDRESSING THIS PUBLIC POLICY  
ISSUE:**

1. The public interest will be served if reputable scientists are urged to address this issue. In this regard, a group of scientists could convene a workshop to address the impact of substandard IAQ in schools and day-care centers on children's respiratory illness.
2. Teachers unions should be alerted to and should be actively addressing the IAQ problems in their schools.
3. Research should be pursued to identify the magnitude of the problems in the schools and day-care centers which may be causing or exacerbating children's respiratory illness. EPA's techniques could be utilized for estimating the actual numbers of children who may be impacted.
4. The overall issues are appropriate for media consideration.

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### REFERENCES

1. Hurwitz, E., et al., "Risk of Respiratory Illness Associated with Day-care Attendance: A Nationwide Study." Pediatrics, 87 (1), 62-69, 1991
2. Fleming, D., et al., "Childhood Upper Respiratory Tract Infections: To What Degree is Incidence Affected by Day-Care Attendance?" Pediatrics, 79 (1), 55-60, 1987
3. Burge, Harriet, "Indoor Air Quality: Evaluation, Measurement, and Control". Course given at Harvard School of Public Health, Dec. 10-12, 1991
4. Strachan D., "Damp Housing and Childhood Asthma: Validation of Reporting Symptoms." British Medical Journal 297 (12), 1223-1226, 1988
5. Platt, S., et al., "Damp Housing, Mould Growth, and Symptomatic Health State". British Medical Journal 298 (24), 1673-1678, 1989
6. Turner, P.E., "Diagnostics and Remediation for Healthy "Schools." IAQ 91: Healthy Buildings. ASHRAE, 225-227, 1991
7. Bayer, C. and Downing, C., "Indoor Conditions in Schools with Insufficient Humidity Control". IAQ 92: Environments for People. ASHRAE, 197-200, 1992
8. Call, R., et al., "Risk Factors for Asthma in Inner City Children." The Journal of Pediatrics 121, (6), 862-866, 1992
9. Call, R., et al., "Environmental Tobacco Smoke as a Risk Factor for Asthma in Inner City Children", a reply to the Editor, The Journal of Pediatrics 123, (1), 171, 1993

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