When the FACILITY Becomes the Culprit

By Claire L. Barnett

Why should our schools be healthy places for all children? Find out what happens when we send our children to dilapidated facilities.

An Unaddressed Public Health Crisis: Poorly Maintained Facilities

America's single largest unaddressed public health crisis for children is that 32 million of the 54 million children in schools are at elevated risk for health and learning problems due *solely* to the conditions of their schools. *(Lessons Learned, 2006, national collaborative report: http://www.healthyschools.org/documents/Lessons_Learned_Rpt.pdf)*

Ten years ago, grassroots healthy schools advocates were often dismissed as fringe activists. Today, there is a robust and growing national healthy schools movement that has earned the attention of schools, parents, teachers, facility directors, architects, and policy makers at the city, state, and national levels. And there is no doubt among building and indoor environmental scientists, public health professionals, environmentalists, teachers' unions, or the array of federal and state agencies concerned with school facilities, that the poor environmental conditions of school buildings adversely impact children and all staff in profound ways.

Our children and grandchildren—yours and mine—are compelled to be in school today. Yet, every day, we see fresh reports of e-coli or lead in school drinking water; schools sinking into landfills or filling with vapors from nearby toxic sites; closures due to mold infestations; evacuations and ER trips prompted by chemical spills and fumes; inadequate cleaning; failed ventilation systems; pest problems and pesticide spraying indoors; out-of-control renovations during the school day; ancient chemicals in closets from the 1950s (and, worse, earlier); parents directed by physicians to keep their children home until the unhealthy school is cleaned up. No parent wants any of that for their child.

But we do allow those threats to occur and recur, despite the knowledge and the ability in the city, state, and federal agencies, and among school facility planners to help prevent problems through improved siting, design, construction, and operations of our children's workplaces—schools.

Healthy Schools Offer Several Benefits

School buildings must be designed and maintained in such a way that the school facility itself promotes the health and well being of children, and promotes and facilitates learning. A "Healthy and High Performance School" (codified in federal laws) can dramatically improve the health and learning of students while saving money for schools. The Healthy and High Performance School combines design features that hard science finds, helps promote children's health and achievement and attendance, as well as adult health and productivity. Other features promote resource conservation, energy efficiency, and reduced carbon emissions. All save money for education and for taxpayers and enhance communities. In fact, it now appears that 'healthy' schools save more money by reducing illness, absenteeism, and promoting higher test scores than 'green' buildings do which capture energy and water savings *(Greening America's Schools: Costs and Benefits; October 2006).*

What happens when we ignore the most vulnerable occupants? The two parent reports in the boxes below speak volumes. (*Source: Lessons Learned: A National Report— 32,000,000 children: victims of a public health crisis)*

Are Children In Your Meetings?

When a facility planner meets with school decision-makers, the most vulnerable and highest risk learners, and the most numerous building occupants, are not even at the meeting. If they were, they would tell you that children are uniquely vulnerable to environmental contaminants, many of which are found in schools.

Children proportionately breathe more air, drink more fluids, and eat more food than adults. Their developing systems are more vulnerable to environmental toxins than are fully developed adults. Toxic exposures and serious injuries during a child's developing years (0-18 years) can result in a lifetime of health problems (US EPA, CDC, ATSDR, NIEHS, AAP, APHA). They might also tell you that health standards for children's exposure to indoor environmental contaminants do not exist. Thus, to meet children's biological and developmental needs, the adults around them must think through all the aspects of how an educational facility is sited, designed, built, and maintained. For example, what are children's needs for fresh air and daylight? What are their needs for safe, outdoor play? What are the best ventilation and acoustical standards, and, were child health experts engaged in setting those professional standards? And not just for the average child. What are the relevant standards for the millions of children with asthma or with learning and behavior disorders, or those with underlying physical disorders or on daily medications that disrupt their tolerances to heat, light, noise, or deadly contaminants such as carbon monoxide.

To focus on the most common hazards to all schools- indoor air pollution, EPA has estimated that half of all schools have IAQ problems. EPA also has found that indoor pollution may be at least five times more polluted than outdoor air. School indoor air is a major contributor to causing and exacerbating asthma among adults. Asthma is also a leading occupational disease of teachers and custodians—that is, they get it on the job, at school. Asthma is also a leading cause of school absenteeism due to chronic illness. Other documented health effects from poor IAQ include: res-

New Jersey Parent

When my daughter entered fifth grade, the nightmare began. Construction was taking place and she became very asthmatic, but over the summer, she was fine. As soon as school re-convened, she got extremely ill- headaches, body rashes and sores. She got worse; her skin began peeling, she was losing hair and developed dark spots all over. After staying home, within two hours of re-entering the school, I was called to pick her up because she had completely relapsed! Once I moved her to another school, she never had a problem.

Missouri Parent

My daughter had been missing one day of school per week for 3 months because of her extreme bouts with chronic illness. She was sent home several times complaining of severe headaches..., *the doctor recommended that she stay home from school for 2 weeks to rebuild her strength. We have to be extremely cautious in managing her asthma* because she is allergic to a lot of the medications that help, so we followed the doctor's orders without hesitation. Shortly after her school absence, *I discovered that the school had reported me to Social Services for educational neglect! This was a shock because the school is well aware of her health problems as well as the doctor's order to stay out of school...*

National Summary of Data*

# of Public School Buildings	96,143
# of Students	48,590,635
# of Minority Students	19,778,912
# of Students in Special Education Programs	6,597,187
# of Employees in School System	5,447,541
% of Children withAsthma (under 18)	8.7%
% of Schools with at least one Inadequate Building Feature	57%
% of Schools with at least one Unsatisfactory Building Condition	68%
Estimated # of Students at High Risk	31,067,803

* *Lessons Learned* provides state by state data tables, news clips & reports for parents & teachers on school conditions.

piratory problems, poor concentration, rashes, headaches, gastrointestinal problems, nervous system disorders, and cancers. Nationally, there has been a dramatic rise in the number of children with learning disabilities, attention deficit hyperactivity disorder, and autism, as well as other children on daily medications for an array of chronic health conditions.

It's simple. Good parents plan on sending their well-rested, healthfully fed children to school ready to learn. Good parents and the rest of us are horrified when their children's—or any other child's--health and learning can be irreversibly damaged by hazards in the school such as bioaerosols, contaminated particulates, chemical spills or pesticide misuse, and renovation dusts and fumes.

The Healthy + Green School

Everyone wants to be green—this year. Conventional green buildings typically follow design protocols that require building owners and their designers to save energy and water, conserve land, recycle, avoid run off, and orient themselves to ease heating and cooling. They offer an array of optional design points for building elements that promote dry, quiet buildings with superior IAQ, like features that resist mold. IAQ management is too often simply a document about protecting occupant health during renovation, not a permanent requirement of the new or renovated facility.

Thus the missing element is a set of requirements, as opposed to electives, that make the buildings' health an imperative: healthy + green. In fact, a recent report from the National Research Council pointed out that, "future green school guidelines should place greater emphasis on: Building systems, their interrelationships, and overall performance; Operations & Maintenance practices over building lifetime; and Encourage systems that are durable, robust, easily installed, operated..." *(J. Spengler, NRC, Green Schools Expert Committee Chair, Dec. 2006)*

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Fortunately, these findings make a great deal of sense in the public health community and to parents. It is a "back to basics" approach to restore fresh air and sunshine to our nation's schools. Clean air, non-toxic building materials, daylighting and full-spectrum lighting, state of the art thermal and acoustical engineering and energy efficiency are incorporated into the holistic design and construction of a school. Demonstrated benefits include improved student performance, improved child health, attendance, teacher productivity, and substantial operational savings. Healthy and high performance schools mitigate poor indoor air quality by using materials that do not off-gas hazardous chemicals, utilize properly designed ventilation and air conditioning systems, by keeping materials and buildings dry and mold-resistant, and incorporating other features such as radon-proofing, and pest-proofing, and durable, easy to maintain floors and roofing systems.

Across the country, communities are building healthy and high performance as well as green and sustainable schools. Governors of both California and New Jersey have issued Executive Orders requiring schools to be built "green." The New York City school district, the largest school district in the US recently adopted a Green School Guide blending US GBC's LEED rating system with elements of the New York Collaborative for High Performance Schools (NY-CHPS) design guidelines. New York's new standard is linked to the City's $13.2 billion five-year capital plan for school construction. The CHPS model that began in California and is adopted by Los Angeles and 21 other large districts has now been adapted for use statewide into Washington, New York, Massachusetts, New Hampshire, and New England generally. These state and metro-based CHPS protocols are in fact impacting billions of dollars of school construction. More states and cities can and should do the same.

The National Research Council report "Green Schools: Attributes for Health and Learning" is an excellent review of the hard sciences. Among the landmark report's findings and recommendations:

- there is a robust body of evidence linking health to IAQ/Indoor Air Quality
- there is some evidence linking IAQ to productivity and learning
- there is an association between excessive moisture, dampness, molds in buildings and adverse health outcomes
- key factors in IAQ include ventilation rate and effectiveness, filter efficiency, temperature and humidity control, control of excess moisture, maintenance
- indoor pollutants and allergens are also linked to linked to respiratory and asthma symptoms
- reducing the indoor pollutant load reduces the occurrence

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of building-associated health symptoms
- work performance decreases with higher room temperatures
- lighting must focus on a work performance priority, then on energy savings
- control glare when encouraging daylighting
- speaking and listening are key to learning
- sufficient evidence for inverse association between excessive noise and student learning
- infection control in densely occupied spaces requires cleaning and ventilation

Summarized by Greg Kats in outlining the benefits/savings of Indoor Air Quality in schools in a series of studies conducted by Carnegie Mellon, it "identified 17 substantial studies that document the relationship between improved air quality and health. The health impacts include asthma, flu, sick building syndrome, respiratory problems, and headaches. These 17 separate studies all found positive health impacts (i.e. reduction in reported prevalence of symptoms) ranging from 13.5% up to 87% improvement, with average improvement of 41%."

A newer study funded by the National Institute for Occupational Safety and Health (NIOSH), *(Work related asthma in the educational services industry: California, Massachusetts, Michigan, and New Jersey, 1993-2000: Mazurek, et al, AJ Industrial Medicine 2007)* examined the occupational health sentinel event notification system for work-related pollutants. Researchers found that the most frequently reported agents were indoor air pollutants, molds, dusts, and cleaning products. The report cites challenges of interventions in schools as complex, diverse workplaces placing two populations at risk—adults and children. It calls for prevention of moisture, ventilation maintenance, control of air contaminants, methods to reduce exposure to cleaning product hazards, including use of third-party certified 'green' cleaning products mandated in New York State in 2005 and now Illinois.

Building design, construction, and operations of schools—typically very large, very densely occupied, and very heavily used indoor environments of 75,000–100,000 ft^2 plus associated 'portables' and bus garages, are complex systems.

How can you find out how to design and operate a healthy school?

One way to get usable information into local hands quickly and to accelerate the number of schools taking action is to encourage more states to become active. Thus, Healthy Schools Network and our National Coalition for Healthier Schools partners nationwide helped to shape and support the newly enacted High Performance Green Buildings Act of 2007 that creates a federal office and advisory committee for green buildings. Importantly it directs US EPA to give grants to qualified state agencies to build information and technical assistance systems that promote healthy school environments, to identify and help resolve environmental problems affecting children, and to create model federal school siting guidelines that take into account children's vulnerability to toxins, modes of transportation, and schools as community emergency shelters. A tall order! In 2002, the Healthy and High Performance Schools Act was also signed into No Child Left Behind, directing EPA, Education, and Energy departments to develop federal guidelines to meet specific benchmarks for school design and then develop a federal-state partnership grant program to build state information and outreach programs to assist local schools.

The Bottom Line

There is no downside to healthy and high performance school design and operations; and there are plenty of upside advantages, including improving school performance and attendance for all children. Such work improves children's health, workers' health, improves our environment, saves energy, and saves money for education. As schools across the country are built, rebuilt and renovated, we owe it to our children, their parents, their sponsoring communities and the taxpayers to assure that they are designed and built to specifications representing now proven state-of-the-art healthy and high performance architectural standards.

A healthy school is a back to basics step, and a new imperative. It is good for children, for the environment, for education, for health, and for all communities. ■

Claire L. Barnett, MBA, is the founding Executive Director of Healthy Schools Network, Inc, and the Coordinator of the National Coalition for Healthier Schools. Healthy Schools Network is a national award-winning not for profit research, information and education, and advocacy organization that seeks to ensure that every child will have an environmentally healthy school that is clean and in good repair.