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WHO'S IN CHARGE

OF PROTECTING CHILDREN'S HEALTH

AT SCHOOL?

A REPORT ON
"AMERICA'S LARGEST UNADDRESSED CHILDREN'S HEALTH CRISIS"

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Healthy Schools Network, Inc.

Healthy Schools Network, Inc. (HSN) is a 501c3 national environmental health research, information, education, and advocacy organization that seeks to assure every child and school employee an environmentally safe and healthy school that is clean and in good repair, through collaborative research, information, assistance, and advocacy.

In 1996 it established its ***Healthy Schools/Healthy Kids Clearinghouse***$_{SM}$ with initial packets of informational materials culled by experienced New York State parents of health-affected children teamed with occupational safety and health experts, representatives of teachers' unions, and environmentalists. The goal then, as it is today, was to provide consistent, widely supported, expert advice, information, referral, and support to parents whose children are compelled to attend environmentally unhealthy schools, precisely because they had nowhere else to turn. Schools are children's unregulated workplaces.

In the decade since, the ***Clearinghouse*** has developed its own copyrighted guides and fact sheets, worked with parents, personnel and schools in every state, inspired and advised the development of coalitions in many states, and in every year from 2002 and 2005, half or more of all schools honored by US EPA for improved Indoor Air Quality have come from communities that sought out and used the ***Clearinghouse***. In 2005 we were honored to receive a **US EPA Children's Health Protection Recognition Award.**

> **Said US EPA: "The continued success in raising awareness about children's environmental health is dependent upon the ongoing support of programs like the Healthy Schools/Healthy Kids Clearinghouse."**

In addition, with the growth of the grassroots driven national healthy schools movement and the emergence of NGO leaders and networks in the states, there are parent-oriented fact sheets and reports being developed for specific states, testament to the need for expanding need for non-clinical support services for parents whose children are harmed by environmental exposures at school.

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ACKNOWLEDGEMENTS

That millions of children attend polluted schools is "America's single largest unaddressed children's health crisis", observed Lloyd Kolbe, the founding director of the federal Centers for Disease Control and Prevention's Division of Adolescent and School Health (CDC/DASH). Kolbe is now professor of Applied Health Sciences at Indiana University in Bloomington. I would like to thank Lloyd for permission to use his comment that so perfectly captures the urgent need to establish public health prevention and intervention services for children.

I had learned it the hard way years ago. I acknowledge here a nameless New York State public employee who insisted on a bleak winter day in 1991, "We really aren't allowed to talk to parents, so why don't you stop calling us?" As a former Reporter for TIME magazine in New York City, a Governor's appointee on a state environmental commission, and parent of a middle-schooler injured in a 1990 school pesticide misapplication, I was chasing down sources of information about education, health, and environmental laws on school buildings. The quest for preventive activities that protect human health is precisely what drives parents and other ***Clearinghouse*** users every day.

I would also like to thank our expert contributors without whom none of this work would be possible, and especially our friends and colleagues in unions and in the occupational safety and health field who have worked for decades to win workplace protections for adults on the job. We share their frustration that indoor environmental quality is not regulated.

Finally, Healthy Schools Network, Inc. is deeply grateful to the New York Community Trust Henry Philip Kraft Fund for its generous support for this report and activities to promote children's environmental health nationally among environment and public health groups and the federal agencies.

Claire L. Barnett, Founder and Executive Director, Healthy Schools Network, Inc.

November 2005

Embargoed: for release Monday, April 24, 2006, 12:01 PM EDT

Contributors

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- Jenny Young, Senior Project Coordinator, IAQ in Schools Program, NEA Health Information Network, Washington, DC
- Participants in the American Public Health Association panel presentation on November 9, 2004 *Session #4034.0, "School Environments - Not Just Little Offices"*, in Washington, DC: Jane Browning, Executive Director, Learning Disabilities Association of America, Moderator; Derek Shendell, D. Env., MPH, Director of Environmental Health Sciences and Education, Community Action to Fight Asthma (California); Robert Axelrad, Acting Deputy Director, Indoor Environments Division, US EPA; Jean Cox-Ganser, Ph.D., Research Team Supervisor, Division of Respiratory Disease Studies, National Institute on Occupational Safety and Health; and, Dana Carr, MPH, Program Specialist at the Department of Education Office of Safe and Drug Free Schools.

Note: Contributors have seen drafts of this paper. Every effort has been made to incorporate all comments. The final content and recommendations are the responsibility of Healthy Schools Network, Inc.

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WHO'S IN CHARGE OF PROTECTING CHILDREN'S HEALTH AT SCHOOL?

Executive Summary

The report clearly makes the case that NO ONE IS IN CHARGE of protecting children from harmful environmental exposures at school and recommends steps at the federal and in New York State to begin to address this hidden world. With information gleaned from adult occupational health experts, from new national studies and reports, and from the reports of parents of health-affected school children, it outlines the scope of the public health response needed to resolve the nations' largest unaddressed children's health problem: **millions of children attend polluted schools that daily erode health and learning.**

The report also points out that the federal agencies are stumbling. They are aware of the problems but have no direction on how to deal with them, and that neither the new National Children's Study nor the federally designated pediatric environmental health services have proposed protocols to research or to uncover and resolve school environmental problems. **The lack of services further harms children, overwhelms parents, and disadvantages both public and private schools by denying independent expertise and oversight**.

Primary recommendations:

- Children should have access to a range of environmental public health services similar to but independent of the array of research, training, information, support, and clinical services available to protect adults in their workplaces. One health or environment agency at the federal level, advised by child environmental health advocates and experienced parents, must be authorized and funded to establish regional pilot programs.

- New York State should pilot a pediatric environmental public health program, advised by experienced parents and child health advocates.

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WHO'S IN CHARGE OF PROTECTING CHILDREN'S HEALTH AT SCHOOL?

A Report on "America's Largest Unaddressed Children's Health Crisis"

by Claire L. Barnett

- An **Oklahoma parent**, ignored by school and the state health department, sought out the ***Clearinghouse*** for advice on stopping the toxic effects of uncontrolled renovations in her daughter's high school. Thick particulates and fumes filled the halls for weeks outside classes for **medically fragile special education students**. Although her daughter's already precarious health was affected and she missed more school days, needed more doctor's appointments, and took more medications, not one person at school told the parent about the renovations which were also affecting the health of staff. *No one---not the teacher, not the support staff, and not the principal. The parent learned the full extent of the school contamination when a support staff person called her to pick up her daughter after a gasoline-powered engine had been operating indoors, just days before the end of the school year. The school district was also working with a designated US EPA* IAQ Tools for Schools *consultant at the time.*

- The **New York State Association of School Nurses** surveyed its own membership in spring 2000 about the conditions of schools and the impacts on students. It found that many of its members could identify and knew of children whose health was affected by pollutants at school; and that they also knew of parents who had tried to get their children protected through changes in school practices. *Because of the fear of job retaliation, the nurses were not asked to give their names or the names of their schools, or the school zip codes.*

- A **California** lawyer and parent of a new Kindergartner was stunned to find her district superintendent had decided to move the diesel bus parking lot to within six feet of her child's portable classroom, the district's 'choice' school. *When her urgent and finally public appeals went unheeded, she went online with her fellow law school graduates only to learn that there are no laws to protect children from bad decisions by local administrators.*

- In **western New York** State where unconscious children were evacuated by ambulance from a local public school, only one parent's persistent questions finally made public problems in the design and construction of the facility, found and made public the lack of compliance with federal and state environmental laws. This parent has spent the last two years addressing issues at her children's school, after her daughter's medical condition was exacerbated by unregulated demolition and renovation. Among her findings were an *inability and sometimes unwillingness of the state education, health, and environment agencies to stop harm to children.*

- **National Institutes of Occupational Safety and Health** accepted the request for a workplace evaluation of Stuyvesant High School facility in **New York City** following the

collapse of the World Trade Center's Twin Towers and contamination of the Ground Zero impact zone with toxic fumes and particulates. The school facility had some 300 employees and enrolled over 3,000 students, including 27 handicapped, wheel-chair bound children. *NIOSH found preliminary evidence of new onset diseases among staff. Not one public agency or publicly funded environmental health service was available for children or their parents of any of the seven public schools of Ground Zero; NIOSH does not consider student health.*

- When the **US Government Accountability Office** issued its first reports of the conditions of America's schools in 1996 with the stunning finding that more than 13 million children were in buildings that daily threatened their health, the national headlines were not about the children getting sick, but how much money schools needed to rebuild infrastructure. Asthma, an environmentally triggered illness, is the nation's leading cause of absenteeism due to chronic illness and teachers lead many other workers in rates of occupational asthma. Today, the US Environmental Protection Agency estimates that half of America's 120,000 schools that enroll 54 million children have polluted indoor air which the agency considers one of the top-five human health hazards.

Why this paper now? The romantic view of a warm, welcoming local school that would never do harm is deeply embedded in the nation's conscience, a view that is surely necessary to the process of educating children away from their parents. But this view, nurtured by school districts and education leaders, is also a conceptual barrier to understanding that children may in fact need protection from harm at school and also a major political barrier to actually creating effective oversight of and interventions for school environmental problems.

Healthy Schools Network has spent a decade fielding daily incoming requests for information and assistance from parents and school personnel. It has also spent years coordinating peer-reviewed presentations on school environmental hazards and health effects for American Public Health Association that have engaged union occupational health representatives and other professional members of the Environment, Occupational Safety & Health, and Maternal and Child Health Sections of APHA.

Following extensive work with several lower Manhattan Parent Associations in 2001-2002, Healthy Schools Network commissioned and co-published with APHA ***Schools of Ground Zero: Early Lessons Learned in Children's Environmental Health.*** Later in the year, the volume was part of invited public hearing testimony that Healthy Schools Network coordinated for the US Senate in 2002 ("*A is for Asthma, B is for Bugs, C is for Chemicals, and …N is for No System for Children"*).

At the Board of Directors 2003 Strategic Planning Retreat, the Board challenged staff to develop a 'scoping paper' that would define what "No System for Children" means. This is the paper.

Several recent publications in the field spurred this report this year. Documentation is now available in the peer-reviewed literature that children's learning and health are undermined by adverse facility conditions. One report was a Congressionally mandated National Priority Study by the US Department of Education (USD Ed) pursuant to the Healthy and High

Performance Schools provisions of the federal No Child Left Behind law (NCLB, 2001); another was Mark Mendell's article in *Indoor Air (Jan 0*5), and the final was a concise report on the peer-reviewed literature authored by Derek Shendell, DEnv, MPH, for Healthy Schools Network that also appeared in the Journal of School Health *(Dec 2004)*. In addition, an extensive chapter on school environments in the ***Pediatric Environmental Health*** (*2nd ed., 2003*, aka, *Green Book*, American Academy of Pediatrics/Committee on Environmental Health) gave us the perfect opening to begin.

Importantly, we regard this report as only a first step. The major recommendations and our consultant's independent recommendations we hope will launch a wider substantive discussion among experts in pediatric environmental health, adult occupational health, and among children's advocates in several fields, in and out of government.

WHO'S IN CHARGE began with a stellar presentation of the peer-reviewed scientific literature on school environments at an American Public Health Association 2004 Panel Session, moderated by Jane Browning, Executive Director, Learning Disabilities Association of America. The panel called on several expert presenters: Robert Axelrad, US EPA/Indoor Environments Division; Jean Cox-Gasner, Research Team Supervisor, Division of Respiratory Disease Studies, National Institutes of Occupational Safety and Health; and Dana Carr, MPH, for William Modzeleski, Associate Assistant Deputy Secretary, USD Education Office of Safe and Drug-Free Schools. Derek Shendell, MPH, DEnv, presented his survey of the peer-reviewed literature.

It should be noted that the three federal agencies (EPA, CDC, USD Ed) had interacted before, as co-chairs of a federal Inter Agency Task Group on schools (2001-2002), reporting to the larger federal Inter Agency Task Force on Risks to Children's Health (pursuant to federal Executive Order #13045, renewed by President Bush). The Schools Task Group created an inventory of federal school environment-related programs, advised USD Education on the National Priority Study it completed pursuant to Section 5414 of No Child Left Behind, created a shared web portal, and prompted EPA to create a new tool for assessing school facilities (TBA, "HealthySEAT", *aka*, School Environmental Assessment Tool). It should also be noted that these and several other agencies are currently being convened to discuss school environments by The White House Council on Environmental Quality (March 2005- ongoing). As of this writing, however, EPA, CDC, and USD Education have not added any new staff or resources to address school environmental health.

APHA Session Summary It was clear from the well-attended early morning APHA session and the presentations that schools can adopt relatively simple, prevention-oriented steps to achieve healthier environments, and that healthier indoor environments are conducive to attendance and test scores—the education bottom line. It was also clear that the nation's 120,000 public and private schools were a long, long way from doing so.

The three federal agencies have different authorizations and programs to address school environments, but none is charged with intervening to protect children's health at school. Similarly in the states, EPA has found many state agencies have various roles—which may or may not conflict in guidance and regulation among themselves or with federal regulations

and guidelines. USD Education has very limited resources for school facility work and Congress has curtailed resources to promote programs to help schools deal with safety emergencies and violence. CDC/NIOSH conducts research, training, surveillance and makes recommendations for the prevention of work-related injury for adult workplaces, while OSHA sets and enforces specific standards. A long-standing and unresolved issue for workers and for NIOSH is how to address indoor air problems, a major problem for all schools. In short, no agency is authorized to prevent harm to the nation's 54 million school children, while the six million adults working in public schools may have some workplace protections.

Indeed, this was one lesson of the federal Centers for Disease Control and Prevention's investigation of the outbreak of non-contagious rashes among school children in 2001-02 affecting 1,000 children, and more than 100 schools in twenty-seven states: there is no baseline data on child environmental health at school. From that investigation, we also learned that schools could turn away a federal environmental health investigation affecting children.

Following the APHA session, Healthy Schools Network asked Jerome Paulson, MD, Co-Director of the Children's Environmental Health Specialty Unit at George Washington University and former Soros Fellow at the Children's Environmental Health Network in Washington, DC, to conduct key informant interviews in several federal programs, to review the APHA Session, and to review publications in the field. HSN also conducted its own limited set of key informant interviews with school occupational safety and health experts in New York and nationally. Paulson then prepared a draft paper.

New York is a key state for this report and its major recommendations. New York has a rich history of adult occupational safety and health and for more than ten years has spent state dollars to operate regional occupational health clinics. New York also is home to a federally-designated and supported Pediatric Environmental Health Specialty Unit (PEHSU, at Mount Sinai Medical Center) that is interested in expanding pediatric environmental health clinical services to three or more of the regional occupational health clinics supported by the state. And Healthy Schools Network ground-breaking work that launched a national call to action around schools as "children's compulsory workplaces" is based here. **For these reasons, New York is a key state for addressing the issues of children's environmental health at school and for beginning to derive lessons on how to promote children's environmental health and prevent harm to all occupants from the historic efforts used to reduce risks to adults in their workplaces.**

We can now observe *post-Katrina* that while EPA and CDC immediately issued bulletins on assessing homes for hazards and flood damage, no agency leapt to provide tips on schools or day care centers. Four years after 9/11, no agency has yet issued uniform guidelines for assessing and remediating day care centers or schools for safe re-occupancy by children. We also note that the National Environmental Education & Training Foundation has recently published a first-ever *Pediatric Environmental Health History Form and Primer*. This is a very welcome step. However, the NEETF format focuses on homes; it does not provide routine prompts on school exposures, nor does the *Primer* reference federal data or resources on school environmental hazards.

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In brief, **NO ONE'S IN CHARGE** of protecting children from harm at school and clearly too few organizations and people are prepared to grapple with "America's largest unaddressed children's health crisis".

The Recommendations that follow are proposed by Healthy Schools Network. In the coming year, we will widely circulate this report to our state and national partners for suggestions and comments.

RECOMMENDATIONS

- Children (and their parents/guardians) who are enrolled in public and private schools PreK-12 and in out of home licensed day care centers should have provided at public expense a range of preventive environmental public health services, perhaps similar to but independent of, the array of research, training, information, support, and clinical services available to protect adults in their workplaces. One health or environment agency at the federal level must be authorized and funded to establish regional pilot programs.

- Experienced child environmental health advocates, experienced parents, parents of health-affected children, and skilled occupational health experts must advise the development and operations of these pilot programs and participate in their evaluation.

- New York State should support a children's environmental public health pilot program that will: provide information and support services for parents of children with exposures at school; provide school on-site investigations and interventions; and create a parent and child health advocate-advised clinical service, co-located with state supported occupational health clinics.

- The authors and contributors to this paper, and others as expertise and interest warrants, should be funded to convene in a facilitated two-day retreat and discussion of the issues raised in this paper, including issues in school employee occupational health and safety, issues in the research community, issues for parents, and the clear need for independent systems of intervention and protection and ancillary support services for children and their parents. The gathering should develop a common consensus on questions to be addressed by a longer-term university-based task force.

- Federal agencies and/or private foundations should fund a multi-year task force at a leading school of public health to address the complex issues of protecting children from harm in day care centers and in schools, including an in-depth review of the adult health protections for school and day care workers and an assessment of their effectiveness; basic preventive steps should be primary goals; the development of ready-to-publish cases of the children's exposures; and a framework for federal action that includes state demonstration programs.

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End Notes for Narrative

- Oklahoma, California, and New York **parents**: on file with Healthy Schools Network.
- New York State Association of **School Nurses Survey**: *What School Nurses Know*, © NYSASN and HSN, May 2000.
- **NIOSH Health Hazard Evaluation of Stuyvesant High School**, Interim Letter, June 5, 2002; enrollment and child health information from *Schools of Ground Zero: Early Lessons Learned in Children's Environmental Health*, Bartlett and Petrarca, © 2002 APHA and HSN.
- **US GAO,** GAO/HEHS-95-61, School Facilities: Condition of America's Schools, February 1995 and related reports; **absenteeism**, US EPA, *America's Children and the Environment*, Second Edition, 2003, p 69, citing data from the Centers for Disease Control and Prevention, www.cdc.gov/nchs/products/pubs/pubd/hestats/asthma/asthma.htm; and, IAQ in schools, www.epa.gov/schools.
- **Interagency group on school environments** convened by the White House Council on Environmental Quality, March 2005-ongoing, personal communication from Khary Cauthen, White House Council on Environmental Quality, and Ed Pinero, Office of the Federal Environmental Executive, with Claire Barnett, Healthy Schools Network and Tina Dove, National PTA.
- **Enrollment and employees**: 53 million total public and private; public only enrollment projected at 48.2 million for 2004, 6m public school employees. National Center for Education Statistics, "State Nonfiscal Survey of Public Elementary/Secondary Education: School Year 2001-02", 2003.
- **American Public Health Association Session** November 9, 2004 #4034.0, "School Environments - Not Just Little Offices, Washington, DC: Jane Browning, Executive Director, Learning Disabilities Association of America, Moderator; Derek Shendell, D. Env., MPH, Director of Environmental Health Sciences and Education, Community Action to Fight Asthma (California) presents "Science Based Recommendations to Prevent or Reduce Potential Exposures to Biological, Chemical, and Physical Agents in Schools"; Robert Axelrad, Acting Deputy Director, Indoor Environments Division, US EPA, reviews the work of the Schools Committee of the Task Force on Risks to Children's Health and present tools for schools to use in assessing conditions based on a web-based model from Los Angeles; Jean Cox-Ganser, Ph.D., Research Team Supervisor, Division of Respiratory Disease Studies, National Institute on Occupational Safety and Health, introduces the National Occupational Research Agenda for office buildings and schools and discusses future plans for developing practical integrated building assessment and health survey tools to improve indoor environment; and, Dana Carr, MPH, Program Specialist at the US Department of Education Office of Safe and Drug Free Schools, will give an overview of the Department of Education's approach to school environment and will offer issues experienced in the field and brought to her program's attention.
- **CDC rash investigation**: see Paulson text and footnotes; school turning away investigation, personal communication with Harriet Amman, PhD, Washington State Dept. of Health, July 2002, with Claire Barnett.
- ***Katrina* advisories**. Collected from CDC and US EPA, culled and posted as *Katrina-Tips for Protecting Children* by HSN October 18, 2005, updated November 4, 2005. Note lack of day care center or school-specific assessment and remediation information.
- **NEETF Pediatric Environmental Health History**, www.neetf.org/health/PEHI.htm

Embargoed: for release Monday, April 24, 2006, 12:01 PM EDT

Report on the Needs of Children Related to School Environmental Health & Recommendations for Changes in the System

prepared by
Jerome A. Paulson, MD
for
Healthy Schools Network, Inc.

INTRODUCTION

The environments where children spend time influence their health. Children spend many hours per week in and around school buildings and their short-term and long-term health outcomes are affected by numerous environmental factors related to the school buildings, the school grounds, the school transportation system and the use of various materials in and around the school.

The Healthy Schools Network has the following concerns:

1. There are numerous environmental health hazards present in schools in the United States.
2. The protection of adults and children from these environmental health hazards is:
    a. inadequate for both children and adults, although adult employees of schools will have a patchwork of various regulatory and other protections, and
    b. not designed to take the needs of children, or often, pregnant women, into account.
3. The present system for gathering data about school-related environmental health problems is inadequate or nonexistent.
4. There is no baseline data on children's exposures in schools.

The Healthy Schools Network believes the nation must build a better system for collecting and analyzing data relevant to children's environmental health and build a system that will protect and intervene for children at risk of harm. Improvements to adult environmental health are also required, although that is not the focus of this paper.

Review of Current Status

There are about 120,000 public and private schools in the US, operated by over 15,000 school districts and serving over 53 million students. Around 70 % of schools enroll elementary students; 24 % secondary students; and the remainder enrolls both.[1] Schools are also the work site for about 6 million adults serving as teachers, administrators and ancillary staff. Although those adults are in the same environment (indeed, even the same classroom) as the children, the impacts on the health of the children may be greater than the impacts on

the health of the adults, yet the legislative, regulatory and systematic protection of children are much less than that of adults.

As NYCOSH's David Newman observed, on the one hand, science, shop, and art teachers, and custodial workers, for example, would be expected to be more frequently exposed to higher concentrations of toxic substances than would students and thus would be potentially much more severely impacted. On the other hand, children, particularly young children, constitute a sensitive population whose health and development may be more critically impacted by on-going low level exposures to toxic materials that they handle differently than adults do, for example, chewing paste, paints, markers, pens, or handling toxics and inhaling fumes in art or vocational education shops.[2]

There are many poorly maintained schools in the US. In the late 1990s, the average age of school buildings in the US was 42 years; some of the buildings were over 100 years old.[3] All buildings can have a myriad of problems ranging from poor indoor air quality, to poor lighting, to extensive use of highly toxic pesticides, to poor noise control, to the presence of radon, asbestos or lead, and inadequate heating, lighting, plumbing systems, as well as poor drinking water quality, unsafe playgrounds, or poor sitting.[4]

During the early 1990's the Government Accounting Office undertook a study on "The Condition of American Schools". They reported that "[a]bout 50 percent of the schools reported at least one unsatisfactory environmental condition; while 33 percent reported multiple unsatisfactory conditions. Of those, half reported four to six unsatisfactory conditions. Those conditions most frequently reported to be unsatisfactory were acoustics for noise control, ventilation, and physical security. Additionally, three-quarters of schools responding had … spent funds during the [early 1990s] on requirements to remove or correct hazardous substances such as asbestos (57 percent), lead in water or paint (25 percent), materials in [underground storage tanks] such as fuel oil (17 percent), radon (18 percent), or other requirements (9 percent)." The GAO found that an additional "…two-thirds [of schools] must spend funds [between 1994 and 1997] to comply with these same requirements—asbestos (45 percent), lead (18 percent), [underground storage tanks] (12 percent), radon (12 percent), or other requirements (8 percent)." [5] This amounted to about $2.3 billon to correct or remove hazardous substances, primarily asbestos and a need to expend about $5 billion more to bring all schools up to the then-existing federal requirements.[6]

In the same study, the GAO found that "…28 million [students] attend schools nationwide that need one or more building feature extensively repaired, overhauled, or replaced or that contain an environmentally unsatisfactory condition…" (Environmental factors include lighting, heating, ventilation, indoor air quality, acoustics for noise control, energy efficiency and physical security of buildings.).[7]

Millions of Students Attend Schools with Unsatisfactory Environmental Conditions[7]

Environmental condition	Number of Schools	Estimated Number of students affected
Lighting	12,200	6,682,000
Heating	15,000	7,888,000
Ventilation	21,100	11,559,000
Indoor air quality	15,000	8,353,000
Acoustics for noise control	21,900	10,044,000
Physical security	18,900	10,638,000

Schools have a myriad of environmental issues that have rarely been addressed.

° Bus emissions and infiltration of fumes and carbon monoxide into classrooms;
° Toxic construction demolition debris and toxic fumes from paints and glues and carpets;
° Schools located in former factories or on or near Superfund sites or other hazardous facilities;
° Use of toxic and explosive products in classrooms or stored in schools
° Chemical spills or misapplications that have closed schools and sent students to local emergency rooms
° Outbreaks of infectious diseases.

While many schools have dealt with asbestos, lead in water or paint, materials in underground storage tanks and radon because these are environmental hazards that the schools have been directed to deal with by the federal or a state government, there are a myriad of other problems that need to be addressed: indoor air quality (IAQ), water damage (with resultant problems of mold and bacterial growth, and deterioration of building materials), carbon monoxide, persistent organic pollutants, lighting and noise. Shendell, et al. reviewed the available science and potential exposures these factors present.[8] It should be noted that there is no federal mandate to remove asbestos or radon or lead from schools, and no mandate on testing and remediating school drinking water.

Indoor Air Quality (IAQ)

The issue that has been most thoroughly explored for schools is indoor air quality. IAQ can be affected by external and internal sources of air pollutants.
Because school buildings are quite old, they may have windows that are broken or that do not fit well. This can lead to the movement of outdoor air pollutants and allergens – oxides of sulfur, oxides of nitrogen, particulate matter (PM_{10} and $PM_{2.5}$) and tree pollens and grass pollens – into the school building. The problem with air pollutants can be exacerbated when diesel trucks or buses are parked next to the air intake for the buildings heating, ventilation, and air conditioning (HVAC) systems and exhaust materials are sucked into the school building.

School buildings, both old an new, can have problems with dampness. This can occur as a result of building materials that have been water-damaged during construction, rain incursion through ill-fitting or damaged windows, leaks from the roof and through the floors, leaks from pipes and HVAC systems, or seepage from groundwater. The presence of excess moisture can lead to the excess growth of mold and bacteria and the degradation of building materials. Some of the chemicals released from the molds, bacteria and building materials are allergens, irritants and toxins. The presence of these pollutants in the air can lead to multiple complaints from the students and the adults in the building. This may be diagnosed as Sick Building Syndrome or Building Related Illness, two separate but related conditions. There have been numerous reports of Sick Building Syndrome in schools.[9,10]

Off-gassing of volatile organic compounds (VOCs) from building materials can contribute to indoor air pollution in schools. This can include formaldehyde from plywood, and other volatiles from markers, from glue used on carpets and from cleaning materials, as well as instructional products and personal care products. These VOCs can be irritants and toxins.

Allergens are present in the indoor air of schools. Many come in from outside the building. Tree, grass and other pollens come into the schools. In addition, animal danders can be brought into schools on the clothing of children and adults and can be present when certain animals are kept in classrooms as pets or for educational purposes. The allergens can exacerbate allergic symptoms in sensitized children and adults, including asthma.

Although there are no standards for IAQ in schools, it is one of the few areas where the Federal government has been active in promoting voluntarily programs. The US Environmental Protection Agency (EPA) created the IAQ Tools for Schools program[11] in the mid-1990's and has funded extensive nationwide outreach since. This program provides guidance for do-it-yourself assessment of indoor air quality issues in schools and suggestions for management of deficiencies identified. Thousands of schools have used the IAQ Tools for Schools Program. US EPA has not, however, required schools using the IAQ protocol to track or report child health or learning improvements following IAQ interventions.[12]

EPA is developing the Healthy School Environments Assessment Tool (HealthySEAT). This new tool is designed to help school districts assess and rate individual buildings, and offers EPA and Occupational Safety and Health Administration (OSHA) guidance and regulations on multiple environmental factors: Hazardous Waste, Hazardous Materials, Non-hazardous Waste, Chemical Management, Water, Pest Control, Energy, Mold / Moisture, UV Radiation, Outdoor Air Pollution, and Renovation / Construction.[13] The tool: 1) includes a database file that will help school districts to manage all aspects of a self-assessment program; 2) includes a comprehensive and customizable sample checklist for environmental hazards; 3) fully integrates all of EPA's programs for schools; and 4) includes information on health, safety and injury prevention programs of all other pertinent federal agencies.

Lighting

Adequate light is essential for children to be able to perform well in school. However, many schools do not have good lighting and many more do not take advantage of daylight to

provide good lighting for their students. When children work in daylight or under full spectrum artificial light (light that mimics daylight), early findings suggest they have higher test scores, better behavior, and are healthier.[14]

Pesticides

School buildings have the potential to have pest problems. Moisture, food, and places to nest are inside schools. Schools serve meals and snacks; children and adults may bring food to school. The books and other educational materials may also provide nutrients and habitat for pests. To prevent pests or when pests are present, schools often undertake routine application of pesticides as the primary means of attempting to ameliorate the situation. Herbicides are also used on school grounds to control weeds. Because pesticides are designed to kill or repel animals (rodenticides), insects (insecticides) and certain plants (herbicides and fungicides), they also have the potential to be toxic to children and adults. They can cause both acute and chronic symptoms.[15] Exposure to some pesticides on a chronic basis is associated with abnormal brain development.[16] More than three dozen states have enacted laws to restrict pesticide use in schools (see, www.beyondpesticides.org).

Noise

Noise is any unwanted, extraneous sound. In order to learn well, children require better acoustic quality than adults in classrooms. Good speech recognition is necessary for optimal comprehension and learning during language and reading acquisition.[17] Noise levels greater than 60 dBA can interfere with cognitive activities. Sources contributing to noise in the classroom include outside sounds from traffic, from construction and from the playground and inside sounds from other classrooms, from audio, video and computer equipment, from lighting ballasts and dimmers.

Problems of Unknown Etiology that May Be Related to the School Environment

Children may develop illnesses in schools that are of unknown etiology, but may be related to their environment. For example, the Centers for Disease Control and Prevention report on school children in 27 states who developed noncontagious rashes at school. These children were in approximately 110 elementary, middle, and high schools. The rash was generally transient and not associated with many other symptoms. Gathering data about the extent of the problem; i.e., whether children in other schools in the nation were involved, was impossible and led Healthy Schools Network, in cooperation with the American Public Health Association, the Natural Resources Defense Council, Children's Environmental Health Network, and Beyond Pesticides to request that CDC report to Congress on its findings and on how to develop a system to establish a baseline for children's health at school.[18]

Overwhelming Contamination of School Buildings in Disasters

During disasters (earthquakes, terrorism, floods), school buildings can become overwhelmingly contaminated with environmental hazards. This can occur, for example, when flood waters bring not only moisture leading to mold growth, but hydrocarbons from

fuel tanks, and pesticides and fertilizers from farm fields. Inundated local Superfund sites, human and animal wastes from overwhelmed sewer systems and breeched containment ponds, and other materials from up-stream industrial sites can also spread contamination. Another example of overwhelming contamination was the inundation of seven schools close to the World Trade Center with dust after the building collapses on September 11, 2001. documented in ***Schools of Ground Zero***. This dust contained asbestos, lead and other respirable particles.[19] During the recovery period, concerns were also raised about elevated CO_2 levels, volatile organic compounds, and polychlorinated biphenyls.[20] Because of lack of information about actual contaminants, information about risks associated with exposures specifically of this nature, lack of federal guidelines on 'building clearances' for children, and lack of monitoring of children's health complaints, it was difficult to determine when it was safe for children to return to specific buildings.

NIOSH has prepared a preliminary report on adults at school showing the onset of new diseases, but no agency prepared a report on school children. ***Schools of Ground Zero*** is the only peer-reviewed contemporaneous account of the evacuations and contamination ever done; a take-home survey conducted with parents also indicated new illnesses among children.

Differences Between Protection of Children and Protection of Adults in Schools

Private sector workers are afforded some protection from work-place hazards by the Occupational Safety and Health Act of 1970.[21] Public sector workers, such as school employees, are either covered by their state Occupational Safety and Health programs or are not covered at all. OSHA was developed, however, to fit the proverbial 160 pound white male industrial worker, not Kindergartners or their teachers, especially not women of child-bearing age.

As American Federation of Teachers' Director of Occupational Safety and Health Darryl Alexander explained, "It should be noted that public school employees only have OSHA coverage if they work in an OSHA state-plan state, currently 27 states. Three are federally certified public employee-only state-plan states (New York, Connecticut and New Jersey). The other 24 states enforce the OSHA standards and regulations in both the private and public sector. In non-OSHA state-plan states, federal OSHA has no jurisdiction in the public sector and will not respond to a complaint or make any type of investigation <u>except</u> in the case of asbestos. The Toxic Substances Control Act (TSCA) regulations state that all workers who are potentially exposed to asbestos (including public sector employees across the board) in the course of performing their job tasks are covered by the OSHA asbestos standard. Any other public school employee who may not be involved in removal or encapsulation of asbestos but who may be exposed is covered by OSHA 11c.

Alexander added, "Some states adopt OSHA standards for their public sector-- most notably, Illinois, Wisconsin, Ohio-- but have no real enforcement effort. Other states have virtually nothing. Texas and Pennsylvania have a "right to know" state law that deals with labeling and Material Safety Data Sheets for hazardous material in 55 gallon containers. The south has less: Florida recently did away with the occupational health and safety office for

public employees. Alabama, Louisiana, Mississippi, Georgia have only the asbestos rule through TSCA."

But, importantly from a parent and a child health protection standpoint, there are also member supports available for union members and hard-won community support services available to employees that aid and abet the effective implementation of specific OSHA laws and regulations or worksite negotiations to protect employees. These related regulations or ancillary or support services are not available to children, including:

- local union bargaining units;
- union health & safety expertise centrally and sometimes regionally;
- training about environmental, health and safety issues (supported by health or labor department grants or union dues);
- (in some states) department of health-funded occupational health clinics (although private occupational health clinics may be available elsewhere);
- (in some states) free-standing regional nonprofit committees for occupational safety and health;
- State Departments of Labor;
- OSHA-NIOSH
- Worker's Compensation for illness or injury on the job;
- state right to know laws for employees or the right to form health & safety committees
- the ability to accumulate and use sick leave or to call in a "substitute" for a day or an extended absence;
- the ability to switch job locations;
- and (for some school jobs) the ability to work part-time or to carry out part of the job from home.[22, 23]

Yet, even in situations where adult employees may recognize and ask about a health problem related to an exposure at work or in school, much of the effort to try to demonstrate that link and to get the situation resolved falls on the individual employee. OSHA also does not necessarily protect workers from commonly encountered indoor environmental hazards-- such as indoor air or molds or the intrusion of outdoor pollutants-- that are not specifically linked to the employee's job of handling hazardous materials or engaging in hazardous work activities, such as operating heavy equipment, construction, or assembly line work.

Schools are also extremely reluctant to recognize that children could be affected by the same health hazards that are affecting an adult in the building. In New York State there is a network of state-funded occupational health clinics that workers can access. However, these are not set up to respond to queries regarding children. Such clinics have the capability to do on-site evaluations, but must obtain permission from the schools to do so.[24,25] As one industrial hygienist pointed out, the reluctance to admit that children are affected also impedes a school facility onsite investigation, since an onsite hygienist might typically ask 'who else is affected?" This reluctance and sometimes outright refusal is thus a major barrier to epidemiological studies or to making effective recommendations on how to address the adult occupant health issues.[26] There are no programs in the country specifically designed to evaluate children who have health problems that may be school related.

It is said that the major advantage that parents have in dealing with school environmental issues is that their jobs are not on the line and they can readily communicate with

community and with media. It is also said that children may have actionable rights under federal law for an 'accessible' facility and program, for example under Section 504 of the Rehabilitation Act, Americans with Disabilities Act, or Individual with Disabilities Education Act. In turn, parents have responded, especially those with children with disabilities and other special needs, that they are utterly dependent on negotiating with the local public school district to fulfill its obligations under federal law for the education of children with disabilities, including health impairments.

The lack of formal systems to protect children means that parents fall back on their own resources if they suspect their children are having environmentally-related health problems due to the school environment. Skilled resources appropriate to meet the demand are simply not available. Most primary health care offices and/or pediatricians do not have the knowledge necessary to evaluate the situations.[27,28,29] Moreover, the evaluation of school-related environmental health problems requires a multidisciplinary approach. A physician should evaluate the individuals involved; and industrial hygienists with knowledge about how children interact with their environment are needed to evaluate the building. Other specialists with knowledge of building sciences or about HVAC systems or other systems may also be needed. Parents need back up and ongoing advice. And, of course, as presently organized, the school must be willing to have an onsite investigation take place.

Additional Concerns about Children's Health and the Environment in Schools

We have summarized a few of the environmental health issues in schools. The example above about the rash illnesses indicates some of the issues around data collection. There is no systematic method for collecting health data on children in schools; moreover, parents might also need to give permission for data collected about health-effects on their children.

The Healthy Schools Network undertook research to explore this issue further and to determine how the problem of collecting school-related environmental health data may impact on current and future federal programs attempting to gather such data.

~ ~ Supplementary Data Collection ~ ~

The Healthy Schools Network commissioned Paulson to conduct a series of key-informant interviews to determine how three programs-- the proposed National Children's Study (NCS), the Environmental Public Health Tracking Program (EPHT) of the CDC and the Pediatric Environmental Health Specialty Units (PEHSUs) -- are considering the needs of schools and school children in the environmental health work that they do. The results are reported below.

In depth interviews were conducted with Dr. Marion Balsam, the director of the Research Partnerships Program Office for the NCS; with Judith Qualters, PhD Chief, Environmental Health Tracking Branch (EPHT), Division of Environmental Hazards and Health Effects, National Center for Environmental Health at the CDC; with individuals at each of the EHPT Centers of Excellence; and with individuals at the PEHSUs in EPA Regions 1, 6 and 10.

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Federal Programs Impacted by Lack of School-Related Environmental Health Data

National Children's Study

On the basis of our interviews we have determined that:

1. The National Children's Study is currently unprepared to deal with data collection regarding children in school or data collection regarding school buildings. The only effort currently underway to explore this issue is a paper, about which there is no public information, which is being prepared by a contractor to lay out some of the issues for the NCS staff.
2. Some of the same issues that have created problems in the EPHT programs; i.e., the Family Educational Rights and Privacy Act (FERPA) and liability issues related to school environmental data will create problems for the NCS.[30]

School-Related Environmental Public Health Tracking

On the basis of our interviews we have determined that:

1. Schools and school-related environmental health problems were not specifically targeted by the EPHT program.
2. Except for the program in Massachusetts where there was preexisting legislation facilitating school-health department cooperation, the EPHT pilots trying to collect data from schools have floundered.
3. The primary stumbling block for the school-related EPHT projects has been FERPA.
4. There is a need for a legal review of FERPA in the context of children's health and the environment.

Another major issue for school-related EPHT projects has been the lack of school nurses and a lack of any standardized system into which school nurses can report data. One small survey that should be replicated raised serious concerns about whether school nurses can or would participate, given their lack of independence and stated job retaliation fears.[31]

Pediatric Environmental Health Specialty Units

On the basis of our interviews we have determined that:

1. There is no uniform approach to school-based problems among the federally-funded PEHSUs.
2. By design, the PEHSUs are reactive rather than proactive. However, some of the PEHSUs have taken a proactive approach to glaring problems in their home communities.
3. There is an urgent need for NGO's interested in Children's Environmental Health and the PEHSUs to have an ongoing dialog, support and advice in this relatively new area of expertise. Experts in occupational health can help pediatric and other environmental health advocates and clinicians understand how school exposures—children's exposures in their workplaces—will differ from assessing home and community exposures, differ in types of interventions and types of resolutions available, as well demonstrate the need for parent support and assistance.
4. There is a need for school environmental quality standards.

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Consultant's Recommendations

In the current world, as schools exist today, there are numerous environmental health hazards that can affect the health of students and staff. Although the laws, regulations, policies and programs that protect adults are not as comprehensive or as effective as they could be, such laws, regulations and policies are nonexistent for children. The publicly supported environmental public health programs to serve children are woefully inadequate.

Based on these findings, the Consultant recommends:

1. That a data collection system be created for school environmental health problems. Such a model school health tracking data collection system should describe what parameters should be tracked, what type of database should be used, who should do the data entry, where the data should go.
2. Than environmental public health tracking be implemented in at least sentinel school systems throughout the country. *(See below for the recommendations about overcoming barriers to implementing EPHT in schools.)*
3. That the federal agencies develop a shared outreach plan for schools to help improve facility design, construction, and maintenance.
4. That adequate research be funded, conducted and published so that standards for indoor environmental quality can be promulgated that are appropriate to children's higher respiration rates and enhanced vulnerability to toxins.
5. That, where adequate information currently exists, states develop regulations regarding indoor environmental quality for schools; and that, as new information is developed, those regulations should be updated.
6. That the federal agencies and the states supplement the funding of the Pediatric Environmental Health Specialty Unit Network so that branches can be developed in every state and can assist in evaluating school related health complaints of children. The PEHSUs need appropriate staffing and authorization to facilitate on-site inspections of schools when necessary.
7. That the National Children's Study be directed, by legislative language or executive decision, to examine the issue of data collection in schools and about school children.
8. That the NCS office hires a staff member specifically to oversee school issues related to the NCS.
9. That a meeting be convened between representatives of the Department of Health and Human Services (NIH, CDC) and the Department of Education, the Department of Justice and outside legal experts and child health advocates to discuss the issue of research and data collection in and about schools and about school children. This meeting should review FERPA in the context of EPHT and the NCS.

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ENDNOTES TO CONSULTANTS' REPORT

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> Parents have the right to review their child's "education record," defined as "those records, files, document, and other materials which contain information directly related to a student, and are maintained by an educational agency or institution or by a person acting for such agency or institution." When a student becomes 18 or is attending college, the right to view the record transfers to the student. Parents may request corrections of the records, with opportunity for a hearing if necessary. FERPA applies to any public or private entity that receives federal funds.

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