

***Who's sick at school:***  
**Linking poor school conditions**  
**and**  
**health disparities for**  
**Boston's children**



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## Acknowledgements

This report was written and produced by the Massachusetts Coalition for Occupational Safety and Health (MassCOSH) and the Boston Urban Asthma Coalition's (BUAC) Healthy Schools Committee. BUAC representatives are members of the joint City-wide Healthy Schools Taskforce which was established in 2003 with the school department and Health Commission to monitor the implementation of the annual environmental audits and address other environmental health and safety issues as they affect health and learning in Boston schools. This paper was written in response to a request by the school department to help raise awareness in Boston about the importance of building, renovating and maintaining safe, healthy learning spaces. BUAC believes that children with asthma are like the "canaries in the mines". When we improve our school buildings and rid them of the significant asthma triggers (mold, pests, chemicals and fumes) we will achieve a school environment that is health for everyone.

**MassCOSH** is a non-profit organization that advocates for safe, secure jobs and healthy communities. MassCOSH coordinates the Mass Healthy Schools Network, a statewide coalition which works with parents, students, school staff, public health and environmental advocates to promote environmentally healthy and safe schools through advocacy, education, organizing and technical assistance.

**BUAC** is comprised of 200 Boston residents and parents, community-based organizations, government agencies, medical professionals, and other individuals who share the common interest of improving the Boston community in order to halt the growing asthma crisis in low income neighborhoods. The Coalition serves as a clearinghouse and network for those in the city who are committed to improving the problem of asthma in Boston. Strengthening Voices, a program of BUAC, supports parent leadership on asthma through community organizing and education. Community-led committees on Housing, Healthy Schools and Access to Quality Healthcare develop the advocacy work and activities of the coalition.

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“We know what the problem is and we have the findings, so why does it take so long to get repairs done? It should be about the health of our children, yet why does it take so long? The money should be in the budget to fix our schools.”

*- Mary White, BUAC Parent Leader, parent of two BPS students, on fixing our school buildings*

## **Introduction**

A recent review of student asthma rates and environmental audits of school buildings suggests that schools with poor indoor air quality have higher than average rates of asthma. Many Boston Public School children and staff are learning and working in poor indoor environmental conditions that not only can exacerbate asthma, but also lead to other problems ranging from allergies and sinus infections to adverse academic performance.<sup>1</sup> The Boston Urban Asthma Coalition conducted a preliminary analysis of 2004-5 childhood asthma rates for BPS students and compared them to the 2004-5 environmental audits of the top 10 schools with environmental problems. This analysis suggests that schools with the highest rates of leaks, mold and pest infestations also have higher than average asthma rates for children.

## **Problem**

Asthma is a condition in which the airways in the lung constrict and become inflamed. It can result in loss of breath and loss of life. An asthma attack can be precipitated by exposure to allergens such as mold or pests, irritants, or cold temperature. Asthma is the leading cause of school absenteeism due to chronic illness, accounting for over 12 million missed school days per year.<sup>2</sup> Nationally, inequities in health conditions, such as asthma, together may account for as much as a quarter of the racial gap in school readiness.<sup>3</sup> The cause or causes of asthma are still unclear although research has found

that exposure to pests, molds, diesel exhaust, and environmental tobacco smoke play key roles in asthma's development and exacerbation.

Childhood asthma is a major public health concern for the City of Boston and one that disproportionately impacts children of color. Asthma is the number one chronic condition treated in Boston Public Schools. Between 7% - 12% of the Boston Public School student body in grades K – 8 have asthma<sup>4</sup> and this number may be an underestimate of the extent of the problem for Boston's children as other local studies have found much higher childhood asthma rates for Boston's children.<sup>5</sup> Boston has higher childhood asthma hospitalization rates than the rest of the state, with children of color having much higher rates.<sup>6</sup> Latino and Black children suffer from asthma more than Boston's White children do.<sup>7</sup>

As Boston sets forth to tackle health disparities, addressing environmental factors that make asthma worse should be a top priority. Boston Public School students are primarily children of color, with 74% qualifying for free or reduced-rate meals.<sup>8</sup> Many Boston Public School families have no choice to send their children to a healthier school because of their economic situation. For many Boston Public School students and their families, advocating for improved environmental conditions is their only recourse.

Poor school environmental conditions are one of many components that affect a child's asthma. Housing conditions, outdoor air quality and environmental tobacco smoke are among other factors that also affect a child's health. Sixty-three percent of the housing in Boston was built before 1950 and 75% was built before the lead paint laws passed (1978). Twenty-five percent of the homes receive federal or state subsidies to charge below fair market rate. Many Boston families rent their apartments

(approximately 63% of Boston residents) and lack affordable housing options (Boston ranks 48<sup>th</sup> in affordable housing), and so often have little control over housing conditions and little influence over the actions of their landlord. In Boston, air toxics exceed by 128 times the Environmental Protection Agency’s safe level of carcinogen in the air.<sup>9</sup> School

“I know from my own experience in our old apartment that certain asthma triggers such as carpeting sent me to the emergency room many times with my daughter. As a BUAC Parent Leader in the Strengthening Voices project, I learned a lot about the asthma triggers in our schools. Now I tell other parents and teachers how important it is to speak up about the poor conditions in our schools so we can get them fixed.”

*-Bridget Hickson, BUAC Parent Leader, BPS Parent*

conditions are only part of picture, but with children spending increasingly long hours in school buildings, school conditions play an important role in creating health disparities in asthma. It’s a role that should not be ignored.

### **Boston Public Schools**

Boston Public Schools are mandated by city ordinance to conduct bi-annual environmental inspections for all elementary, middle, and high schools. These inspections serve as a method of tracking the environmental status of all Boston Public Schools.<sup>10</sup> As part of the inspections, data regarding leaks and visible water stains, visible mold growth, overt pest signs, improper chemical storage, and repairs needed are tracked. While there are other environmental issues that were inspected, we will address these issues specifically because of their direct relationship to triggering asthma episodes. Leaks are of concern because moisture can promote mold growth as well as encourage insect or rodent infestations. Visible mold growth is important because mold and mildew are often asthma triggers. Pests are of concern for sanitation reasons as well as being sources of animal dander that can be an asthma or allergy trigger. Improper chemical storage can be an issue because toxic fumes

and chemicals can aggravate asthma as well. The use of chemicals through pesticides and cleaning products has also been linked to other health problems including behavioral disabilities and damage to the nervous and immune systems.<sup>11</sup> Building repairs are important because they can stop a small problem from getting bigger - such as immediately fixing a leak in the ceiling could stop mold from growing later.

## Results

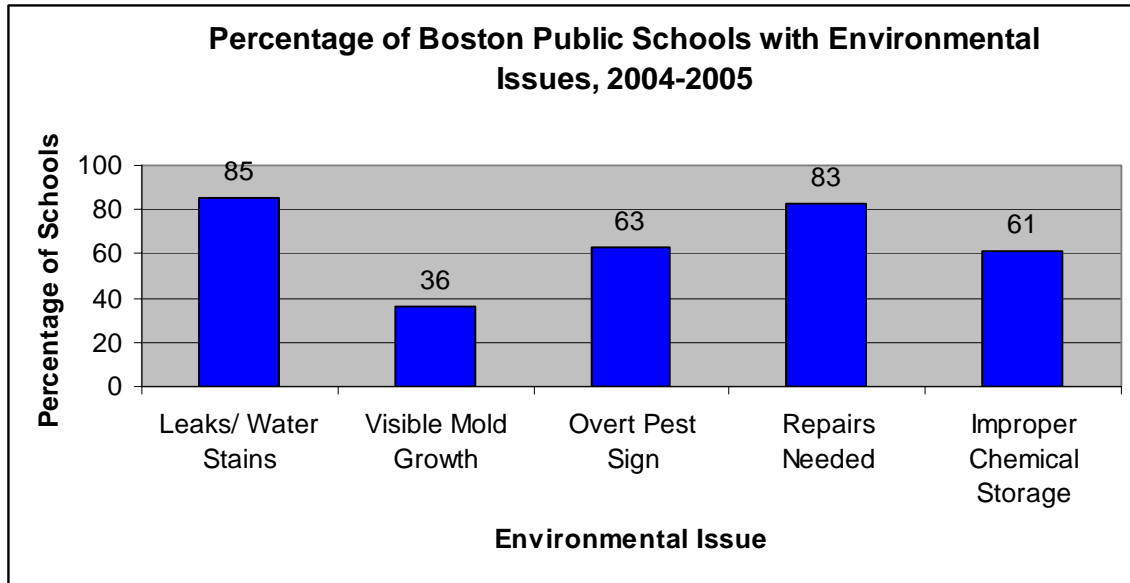
The overall estimated asthma rate for Boston Public Schools during the spring 2005 is 7.0%.<sup>12</sup> The rates across Boston Public Schools

“One of the major concerns at the Curley is that the building needs to be pointed. We have been on a list for 4 years and the project always gets postponed. We have water that makes its way into the building causing leaks, paint to flake and fall on students and teachers, and dust to cover the radiators. As a result many of our students with asthma are affected--so many have poor attendance because they are out a lot and as a result their grades suffer.”

*-Geraldo Martinez, Principal  
Mary E. Curley Middle School*

range from 0-27%; these asthma rates, however, do not include high schools.<sup>13</sup> Many schools had asthma rates well above the state average; in addition, inspections of the schools noted an overwhelming presence of environmental issues which contribute to the incidence of asthmatic children in schools.

The following graph represents the percentage of schools within the Boston Public School system during the 2004-05 school year that reported the presence of environmental issues such as leaks, mold, or overt pest infestation.



Looking at the graph above, approximately 85 percent of Boston Public Schools reported leaks or water stains, 36 percent reported visible mold growth, 63 percent reported overt pest signs, 83 percent reported repairs needed, and 61 percent reported improper chemical storage.<sup>14</sup>

“I got adult onset of asthma, I believe, from working in a sick school building with a roof that was leaking and mold all over. I went on daily medication to deal with my breathing problems. Now, three years away from that building and working in another school, I no longer need my asthma meds. School buildings that are not maintained are a health problem for students and staff.”

*-Sue Trotz, Boston School Guidance Councilor*

For the 2004-05 school year, The Harvard Kent Elementary School in Charlestown reported the highest percentage of water intrusion issues with 62.5 percent of rooms inspected having leaks or visible water stains.<sup>15</sup> The James Curley Elementary School in Jamaica Plain had the highest percentage of overt pest signs, approximately 60.7 percent of all rooms inspected.<sup>16</sup> These schools both have significant higher rates of asthma than the city average of 7% percent (12.25 and 10.69 percent respectively). While

environmental problems in the school may not be responsible for the higher asthma prevalences, the presence of triggers such as mold and pests do aggravate children who have already been diagnosed with asthma, increasing the incidence of asthma attacks at schools. The presence of these triggers also contributes to increased absenteeism among asthmatics and more frequent trips to the school nurse.<sup>17</sup>

Below are the top 10 ranked schools for the categories of leaks/ water stains, mold, and pests for the 2004-05 school year. The percentages listed indicate the percentage of rooms with the presence of the environmental issue.<sup>18</sup> Boston Urban Asthma Coalition calculated the asthma rates using raw data collected by the Boston Public School Department.<sup>19</sup>

**Chart: Top ten schools  
Ranked by percentage of rooms with environmental problems**

<b>Leaks</b>			<b>Pests</b>			<b>Mold</b>		
<b>Top 10 Schools with Problem</b>	<b>Percentage of Rooms with Problem</b>	<b>Asthma %</b>	<b>Top 10 Schools with Problem</b>	<b>Percentage of Rooms with Problem</b>	<b>Asthma %</b>	<b>Top 10 Schools with Problem</b>	<b>Percentage of Rooms with Problem</b>	<b>Asthma %</b>
1. Harvard/ Kent*	62.5	12.25	1. James Curley	60.7	10.69	1. Quincy Upper 3*	38.5	n/a
2. Mary Curley *	58.0	11.66	2. Health Careers Academy	56.3	5.31	2. West Roxbury High	28.3	n/a
3. Lewis	54.2	n/a	3. Hennigan	50.0	9.51	3. Quincy Upper 2	17.6	n/a
4. Ohrenberger	53.3	n/a	4. Harbor Elementary	48.6	12.45	4. Excel High	8.2	n/a
5. Condon	46.0	15.54	5. Dearborn	41.1	16.29	5. Clap Elementary	7.7	7.35
6. Cleveland	41.3	14.34	6. Mary Curley	40.6	11.66	6. Fenway High	7.1	n/a
7. Mattahunt	39.2	3.71	7. Taylor	40.0	5.31	7. Beethoven	6.8	3.18
8. Agassiz*	39.0	11.29	8. Quincy Upper 3	38.5	n/a	8. Harvard/ Kent	6.3	12.25
9. McKay	38.2	6.00	9. Carter Development Center	35.0	n/a	9. Agassiz	5.2	11.29
10. Tynan	37.2	10.70	10. Hale	33.3	10.61	10. Grew	5.1	7.84

\* Schools appear on multiple “top ten” lists.

N/A These schools either failed to report their asthma rates or are high schools which currently are not part of the asthma surveillance system.

Further analysis of data will be required to fully assess the connection between asthma rates and environmental conditions. The Department of Public Health will soon release a report on their statewide findings on asthma rates and their link to environmental factors in school which will help further this area of research. Regardless of the link, pests and leaks are known asthma triggers that make children with asthma more sick once exposed. A child with asthma who attends a school with a 60% pest infestation rate will have difficulty learning if the pest droppings trigger his asthma.

### **Community Efforts**

To address concerns about poor school conditions and health, the Boston Urban Asthma Coalition (BUAC) and MassCOSH won compliance with a 1996 ordinance stating that Boston Public Schools must conduct bi-annual environmental inspections for all elementary, middle, and high schools in the year 2002. Another outcome of the compliance was the creation of the Healthy Schools Taskforce. The joint Taskforce brings together parents, community and health organizations, and city councilors, Boston Public Schools, the Boston Public Health Commission to jointly resolve air quality problems such as pests, and cleaning chemicals. This taskforce will continue to address the issues raised by this report. However, many changes require leadership from the top. The following recommendations can only be accomplished by Mayor Menino.

### **Recommendations**

The Boston Urban Asthma Coalition and MassCOSH call upon the City of Boston and Mayor Menino to take immediate steps to promote a safe and healthy school environment for children and school employees by:

- Funding an independent report on the condition of the Boston Public Schools to determine what it will cost to repair and upgrade our buildings (including roofs, pointing, HVAC systems, mold remediation) and create a safe and healthy learning environment. The report should include an evaluation of the annual environmental audits and their effectiveness in improving school building maintenance and best practices for environmental safety and health.
- Validating current asthma surveillance system and making all efforts to include all Boston Public School children in the report, such as high school students and those students from schools with incomplete or missing reports.
- Adopting Boston’s Green Building Taskforce recommendations for building and renovating healthy high performance buildings as a model for the Boston Public Schools.
- Advocating that the Massachusetts School Building Authority adopt the MA-CHPS (healthy high performance school design criteria) into its new regulations by July 2006.
- Committing to appropriating \$200 million dollars in capital expenditures estimated to upgrade and repair schools as necessary to create a safe, healthy environment. Building repairs and upgrades should prioritize items that result in unsafe or unhealthy conditions (for example leaks that result in mold). The City

“It’s imperative that we get funding to fix our schools immediately. We need to do something about the leaks and the mice. Students and teachers are getting sick.”

*-Nia Burke  
Physical Education Teacher  
Boston Teachers Union*

should investigate other methods of financing these repairs by surveying other cities and states.

- Finishing the retrofit of the Boston School bus fleet to reduce diesel pollution in our neighborhoods, initiated by the school department with EPA funding in 2003.
- Pass a resolution at the next U.S. Conference of Mayors on *Children's Environmental Health and School Building Conditions* to promote a national dialogue and actions needed to address our aging school buildings.

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<sup>1</sup> Mendell MJ, Heath GA. Do indoor pollutants and thermal conditions in schools influence student performance? A critical review of the literature. *Indoor Air* 2005 Feb;15(1):27-52.

<sup>2</sup> National Center for Health Statistics. Raw Data from the National Health Interview Survey, U.S., 2003. (Analysis by the American Lung Association, Using SPSS and SUDAAN software).

<sup>3</sup> Currie J. Health disparities and gaps in school readiness. *Future Child*. 2005 Spring;15(1):117-38.

<sup>4</sup> Over the last four years, the asthma rate in Boston Public Schools has ranged from 12% - 7%.

<sup>5</sup> One study found that 56% of the children in the Franklin Hill Housing Development had doctor diagnosed asthma. D. Brugge, et. al., "An Asthma Intervention Pilot Study in Public Housing: Lessons and Baseline Data," Engineering Solutions to Indoor Air Quality Programs Symposium, U.S. EPA 2000. In addition, the Massachusetts asthma rate for children is 12.3%, the same as the New England regional rate. It is difficult to believe that Boston has a childhood asthma rate lower than the rest of the state when our adult asthma rates exceeds the state average and childhood asthma rates are traditionally higher than adult rates. *Child Asthma in New England: A Report by the New England Asthma Regional Council*. January 2004. [www.asthmaregionalcouncil.org](http://www.asthmaregionalcouncil.org). Health of Boston, 2005, Boston Public Health Commission, Research and Technical Services, Boston, MA. 02118.

<sup>6</sup> Health of Boston, 2005. Boston's children under the age of 5 experience the highest hospitalization rates at 8.9 per 1,000 – four times the Massachusetts rate.

<sup>7</sup> *Ibid*. In 2004, Black children under the age of 5 had the highest asthma hospitalization rate of 10.7 per 1,000 and Latino children under the age of 5 had 8.6 per 1,000 while White children of the same age had a rate of 2 per 1,000.

<sup>8</sup> Boston Public Schools website: [www. http://boston.k12.ma.us/](http://boston.k12.ma.us/).

<sup>9</sup> National Resource Defense Council. <http://www.nrdc.org/air/pollution/cep/cbos.asp>.

<sup>10</sup> The inspections began in 2002 of a city council hearing initiated by City Councilor Charles Turner and the Boston Urban Asthma Coalition. City Ordinance mandates that each school receive bi-annual inspections for air quality problems. As of 2003, four inspections per school have been conducted. The most recent results can be found on the BPS website: [www. www.](http://www.bps.edu)

<sup>11</sup> Boston Urban Asthma Coalition, MassCOSH, Boston Public Health Commission, and Boston Public Schools. *Integrated Pest Management Promoting Healthier and Pest Free Schools*

<sup>12</sup> Boston Public Schools. Raw Data collected from Pediatric Asthma Surveillance (K-8) Spring 2005

<sup>13</sup> *Ibid*

<sup>14</sup> Boston Public Schools. *School Environmental Inspection Report*. 2005

<sup>15</sup> *Ibid*

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<sup>16</sup> Ibid

<sup>17</sup> Moonie SA, Sterling DA, Figgs L, Castro M. Asthma status and severity affects missed school days. *Journal of School Health*. 2006 Jan;76(1):18-24.

<sup>18</sup> Boston Public Schools. School Environmental Inspection Report. 2005. Reports can be found at the BPS website.

<sup>19</sup> For the raw data, contact the Boston Public School Department.