

# PCBs in the Indoor Environment: An Emerging Public Health Issue

---

James Viano

Boston University School of Public Health  
48<sup>th</sup> Annual Yankee Conference  
9/24/2010



# PCB Background and Concerns

---

- ❑ What are PCBs?
  - Production (1.2 million tons between 1929- 1977, WHO 1993)
  - Commercial uses (“Closed system” vs. “open system” products)
  - Banned by Federal Toxic Substance Control Act (TSCA) in 1977
  
- ❑ Health Effects:
  - Exposure routes
  - Non-cancer health effects
  - “Probable” human carcinogen
  
- ❑ In last 10-15 years, environmental and occupational health researchers have increasingly highlighted building materials as a substantial PCB reservoir and source of inhalation exposure



# PCBs in the Indoor Environment

---

- U.S. Environmental Protection Agency (EPA)
  - September 2009
  - Announced caulk and other building materials in schools and buildings constructed/renovated 1950-1978 may contain PCBs
  
- Federal Regulations
  - Toxic Substances Control Act (TSCA)
  - PCB > 50 ppm in products manufactured to contain PCBs require remediation and disposal
  - PCBs > 1 ppm in materials as a result of a spill, release, or or unauthorized release identified as remediation waste and requires management as well
  - However, testing not mandated



# Nature and Extent of PCBs in Caulking: Regional Significance

- ❑ National Center for Education Statistics (1999): Northeast region had oldest average age (46 years) of schools than any other region
- ❑ Massachusetts School Building Authority (2006): 53 % of over 1,800 school buildings surveyed in MA built between 1950-1980
- ❑ HSPH Herrick PCB study, 2004
  - Caulk in 8 out of 24 buildings sampled in Greater Boston contained PCBs >50 ppm

**Table 1.** Results of sample analysis of 24 buildings.

Building type	PCB content (ppm by mass) <sup>a</sup>
Government office, mixed use	35,600
Government office	25.2
Office building	ND <sup>b</sup>
Subsidized housing	ND
Subsidized housing	ND
Elderly housing	ND
Elderly housing	ND
University student housing	36,200
University dormitory	70.5
University dormitory	1.68
University classrooms and offices	26,400
Elementary school	7,740
Middle school	5,010
High school	5,970
High school	ND
High school	ND
Community college	19.3
Church offices	2.14
Synagogue	8,240
Hospital	ND
Hospital	ND
Museum	0.56
Hotel	ND
Police station	ND

# Discovery of PCBs in Building Materials

---

- Involves numerous stakeholders
  - Building owners and administrators (facilities)
  - Health directors and boards of health
  - School departments and administrators
  - EPA
  - State environmental and health agencies
  - Consultants and remediation contractors
  - Building occupants
  - Other community members
  - Municipal budget personnel



- May raise/trigger other environmental concerns
  - Building ventilation and maintenance
  - Asbestos
  - Simmering concerns about indoor environmental quality

# Massachusetts Environmental Health Association PCB Survey

---

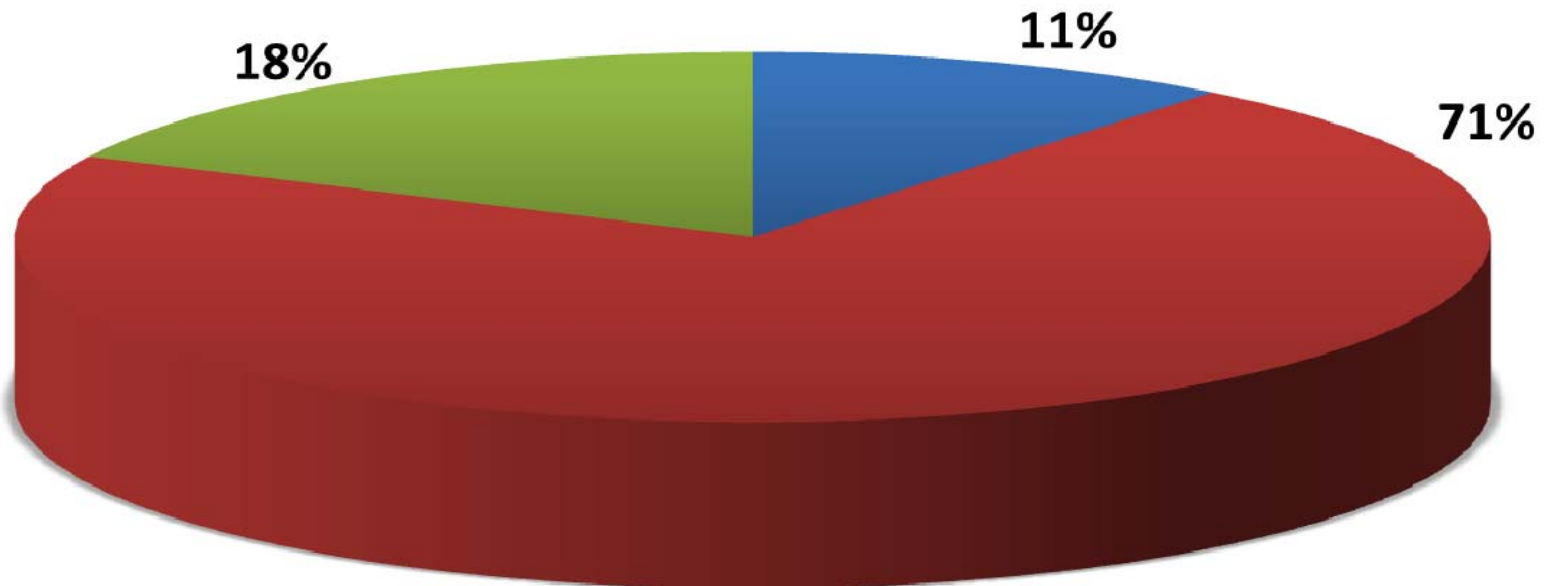
- ❑ Goal: Assess awareness, experience, and concerns among environmental health professionals regarding PCBs problem in order to identify future needs
  
- ❑ Methodology:
  - MEHA members asked via e-mail to complete online, ten question multiple choice survey in July, 2010
  
- ❑ Participants: 28 out of ~ 400 MEHA members
  
- ❑ Limitations:
  - Low response rate (~ 7%) possibly due to “survey fatigue”
  - Due to potential for limited awareness on topic, questions provided PCB issue background potentially introducing bias

# MEHA PCB Survey Results

---

## Level of Awareness and Experience Concerning Polychlorinated Biphenyls (PCBs) in Building Materials

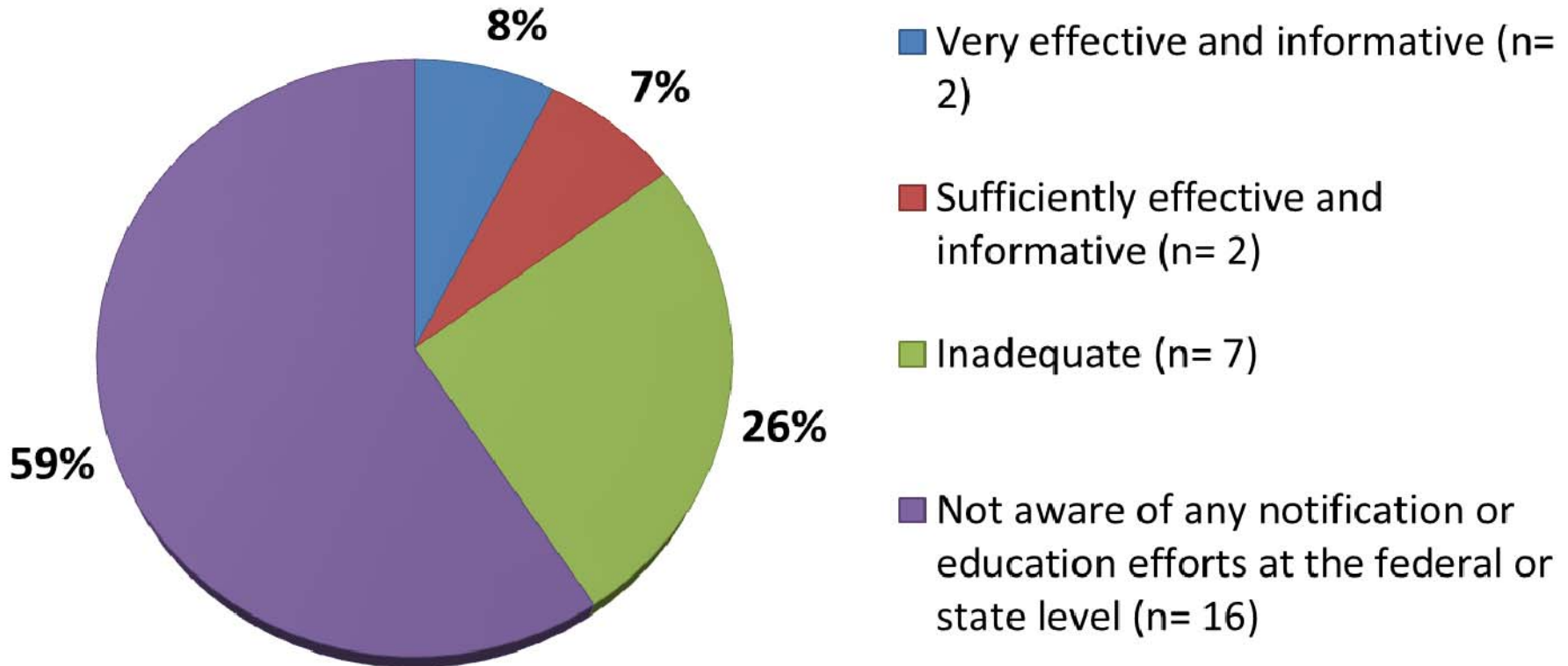
- Fully aware with specific experience dealing with the issue (n= 3)
- Limited awareness and no experience dealing with this issue (n= 20)
- Never heard of this issue and no experience dealing with this issue (n= 5)



# MEHA PCB Survey Results

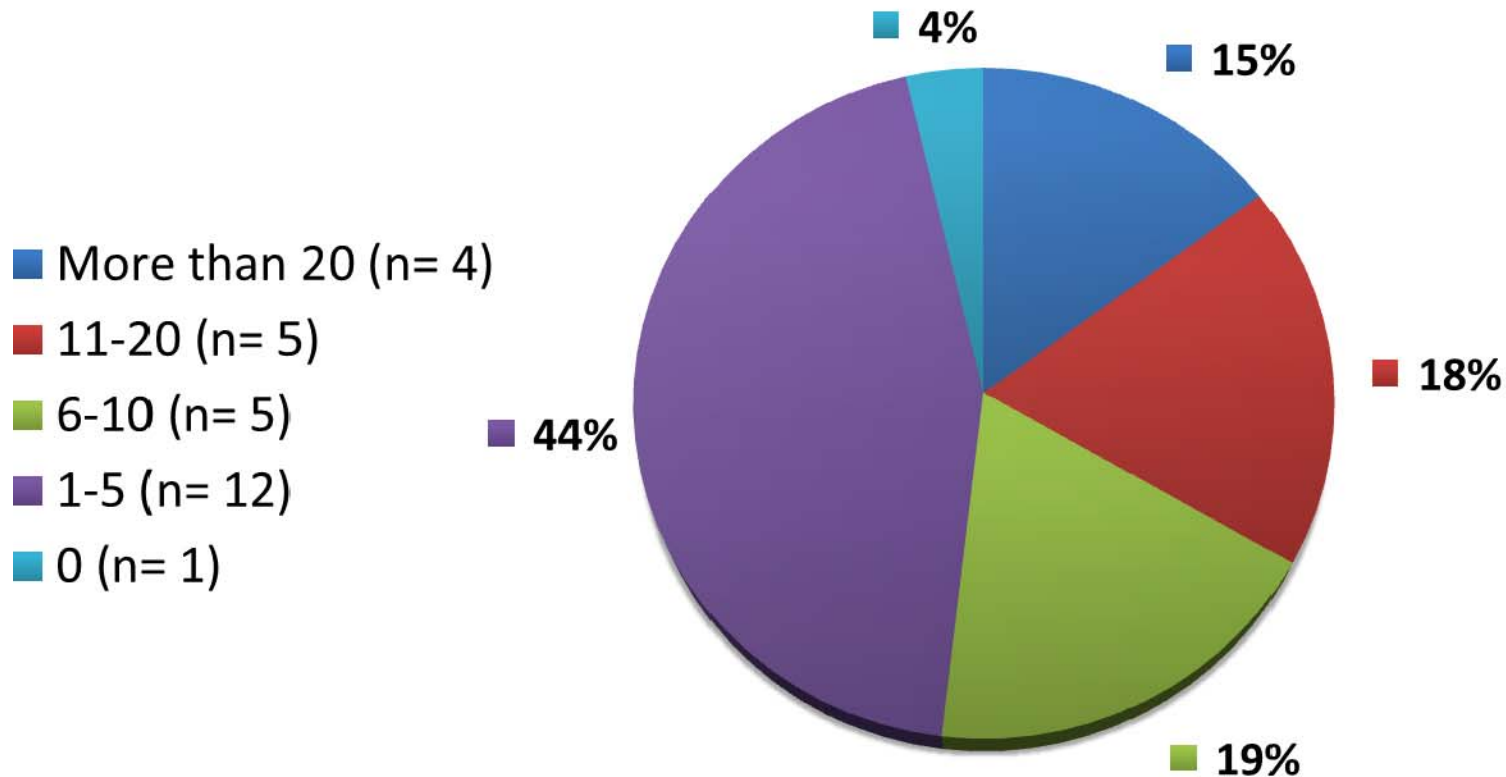
---

## Effectiveness of Federal and State Agency Efforts to Notify and Educate Local Health Departments



# MEHA PCB Survey Results

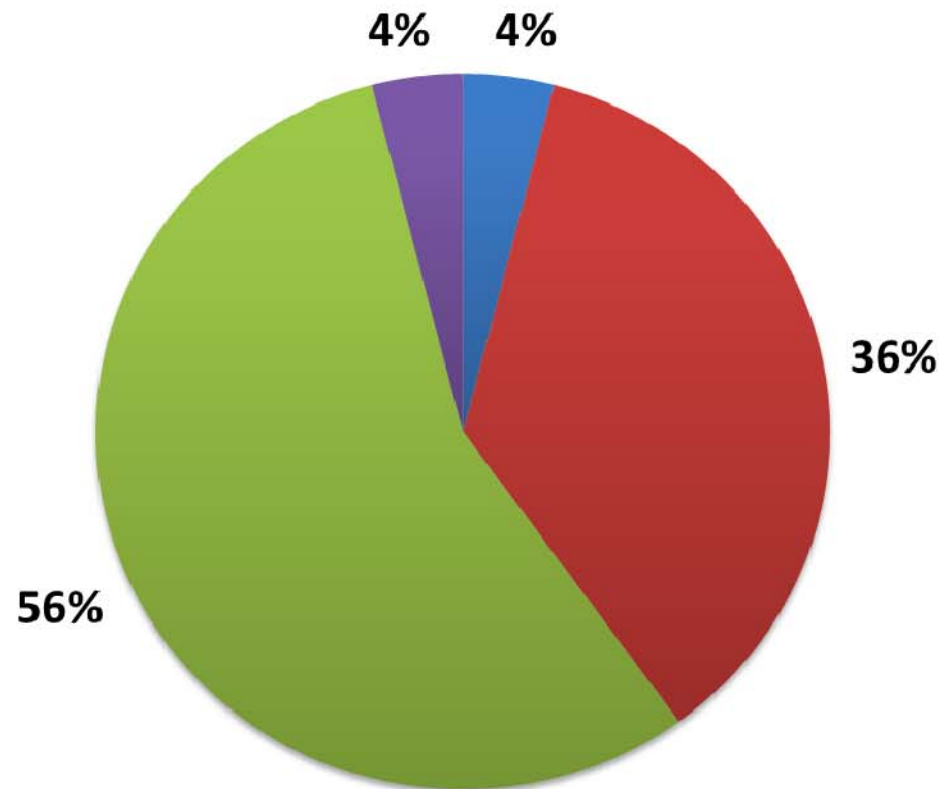
Approximate Number of Schools and Public Buildings in Town of Employment Constructed or Renovated Between 1950 -1978



# MEHA PCB Survey Results

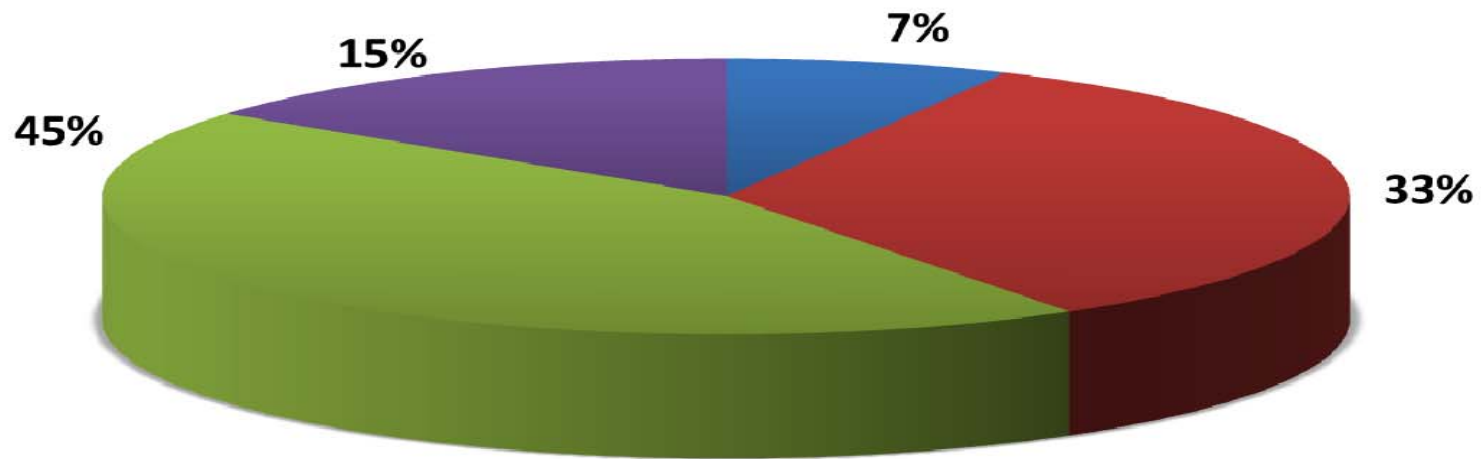
## Role of Complex Federal Regulations and Guidelines Regarding PCB Testing on Local Government Decision to Test or Not

- Have resulted in costly expenditures for testing and remediation of PCB caulk that my town was not prepared for when initial testing was ordered (n= 1)
- Will not influence whether my town government decides to test for PCBs or not (n= 9)
- Creates a situation that discourages town government from testing for PCBs, but is not necessarily the deciding factor (n= 14)
- Is the critical factor influencing the decision of my town government to NOT test for PCBs (n= 1)



# MEHA PCB Survey Results

## Capability of Local Health Department to Handle Risk Communication Regarding PCBs in Building Materials Issue



- Fully capable of handling all risk communication issues pertaining to this issue (n= 2)
- Capable of all risk communication but it would be a significant challenge for health department (n= 9)
- Training and education regarding how to communicate the risks of PCB exposure would be a valuable resource (n= 12)
- Incapable of handling risk communication efforts without input from an outside expert (n= 4)

# Role of Municipal Health Professionals

---

- ❑ Become familiar with EPA PCB caulk guidance
- ❑ Recognize the complex nature of this issue
  - Involves numerous stakeholders
  - Progresses quickly
  - Is typically very expensive
  - Will elicit strong emotions on all sides
- ❑ Participate in proactive planning and communication to help limit unanticipated costs and community concern
  - Identify at risk buildings and potential PCB sources
  - Be prepared to explain likelihood and magnitude of building-related PCB exposure and risk to other officials