

National Ambient Air Quality Standard for Lead (Pb)

April 29, 2008

Current Lead NAAQS

- Issued by EPA in 1978
- 1.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), not to be exceeded by the maximum arithmetic mean concentration averaged over a calendar quarter
- Under review, new standard to be released May 1

Health and Environmental Impacts

- Lead accumulates in the blood, bones, muscles, and fat.
- Infants and young children are especially sensitive to even low levels of lead.
- Exposure to lead can:
 - Damage organs
 - including the kidneys and the liver
 - Affect the brain and nerves
 - Excessive exposure causes seizures, mental retardation, behavioral disorders, memory problems, and mood changes.
 - Low levels of lead damage and lower IQ.
 - Affect the heart and blood
 - Causes high blood pressure and increases heart disease, especially in men.
 - Affect animals, fish and plants
 - Can damage organs, reproduction system, and growth.

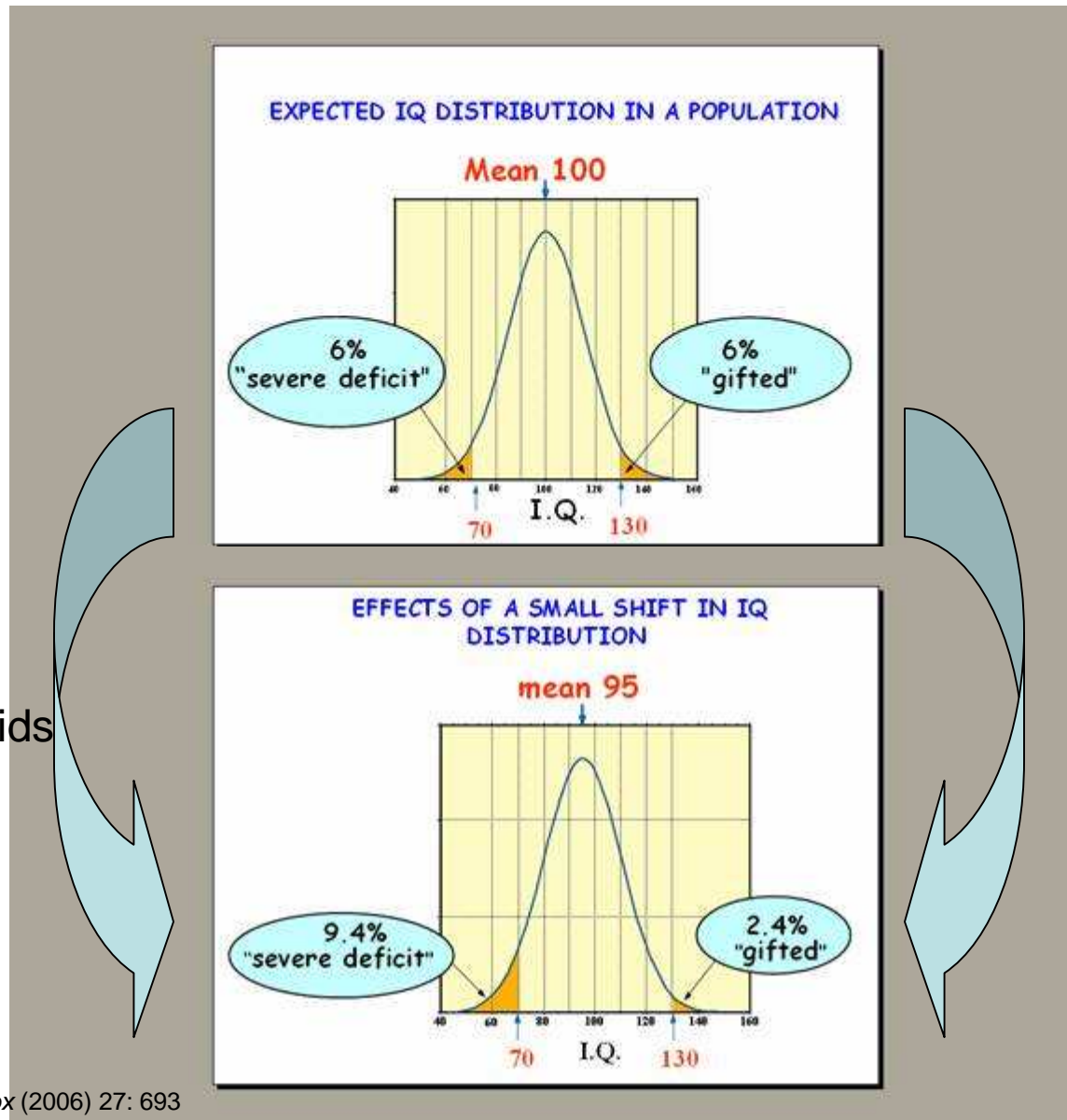
Lead: A Success Story?

- Current ambient air lead levels have greatly decreased
 - 99% reduction in lead emissions from tailpipes
- Blood lead concentrations for children aged one to five have dropped significantly:
 - Average has decreased from 15 to 2 $\mu\text{g}/\text{dL}$
- No threshold for “safe” blood lead levels
 - At lower blood lead levels, smaller changes have larger impacts on IQ
 - Example: 4x increase in risk for ADHD from blood lead levels of 0.8 $\mu\text{g}/\text{dL}$ to 2 $\mu\text{g}/\text{dL}$

Lead Levels and IQ

- Current average bone lead levels are STILL 50x evolutionary levels (1000x in 1970s)
- CASAC and EPA staff paper focus on impact of lead on IQ to recommend lead NAAQS ranges
- Every 1 microgram/deciliter (ug/dL) increase in blood lead levels results in an approximately 3 point decrease in population IQ levels

Are a Few IQ Points Significant?



Lead NAAQS Review Schedule

May 1	New proposed standard released
Approx. May 15	Publication in federal register
60 days later	Deadline for comments
Sep. 1	Final Rule

States' Review

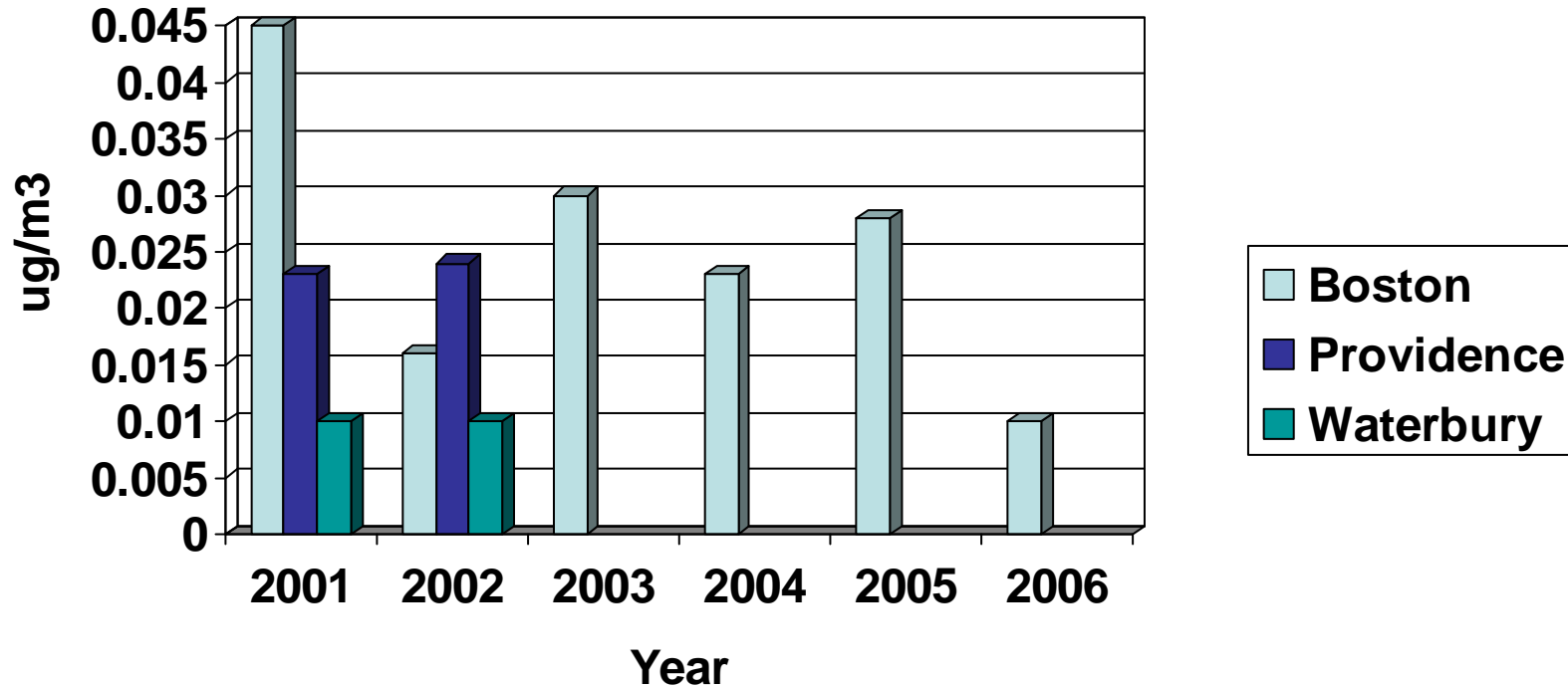
- NESCAUM states (New England + NY, NJ) will comment on proposed new lead standard
- Factors for consideration:
 - Standard level and associated health impacts
 - Averaging time (quarterly, monthly) and methodology (not to be exceeded, rolling, nth highest, percentile)
 - Monitoring indicator (TSP vs PM10) & methodology (XRF vs ICPMS)
 - Monitor locations/network (ambient, near sources, roadways)

CASAC Recommendation

- Standard to ensure that 95% or more of U.S. children do not experience decreased IQ from exposure to ambient concentrations of recent airborne lead
- Not more than $0.2 \mu\text{g}/\text{m}^3$
- Monthly averaging
- Not to exceed standard
- PM10 low volume sampling using FRM (method) and ICPMS (analysis)

Ambient Lead Levels in New England

Maximum Monthly Pb Concentrations*



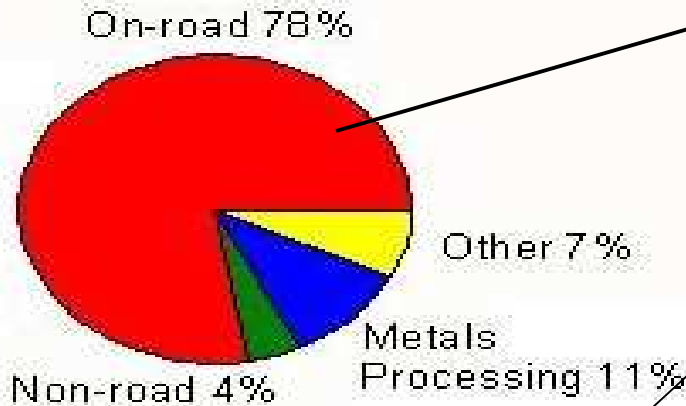
Slide Credit:
Bob Judge
EPA Region 1

* Incomplete data set

Lead: Where does it come from?

1970 Lead Emissions Sources

221,000 tons

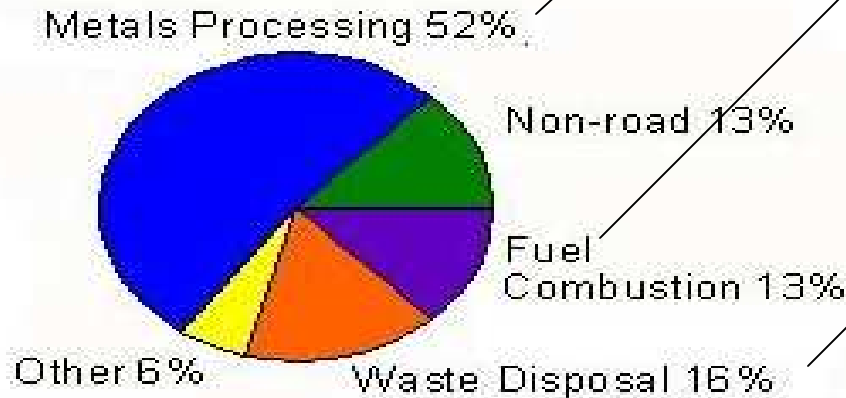


Dust with lead from the era of leaded gasoline is still a significant contributor to air lead exposure

Nearest source is in NY state, secondary smelter for recycling car battery lead & is highly controlled

1997 Lead Emissions Sources

3,915 tons



Non-commercial aviation & some racecar fuels

Municipal Waste Combustion

For More Information

http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_index.html