

Economic Burden of the Environment on Childhood Lead Poisoning in Minnesota

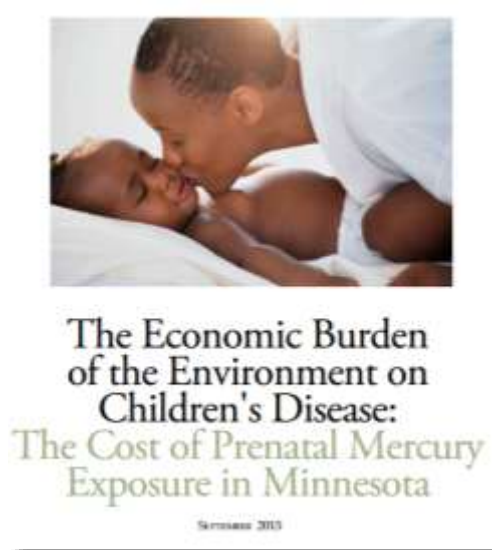
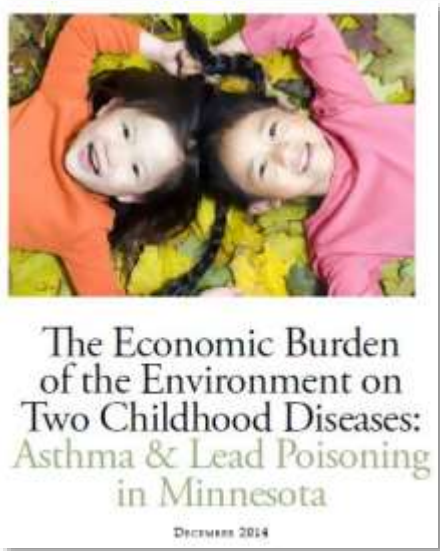
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MN Tracking

Minnesota's economic burden reports

- Childhood asthma
- Childhood lead poisoning
- Prenatal mercury exposure



Childhood lead poisoning

Elevated Blood Lead Levels (EBLLs)

- No safe level of exposure to lead
- 5 $\mu\text{g}/\text{dL}$ of lead in blood currently used as reference value
- Children under 6 years and pregnant women most vulnerable

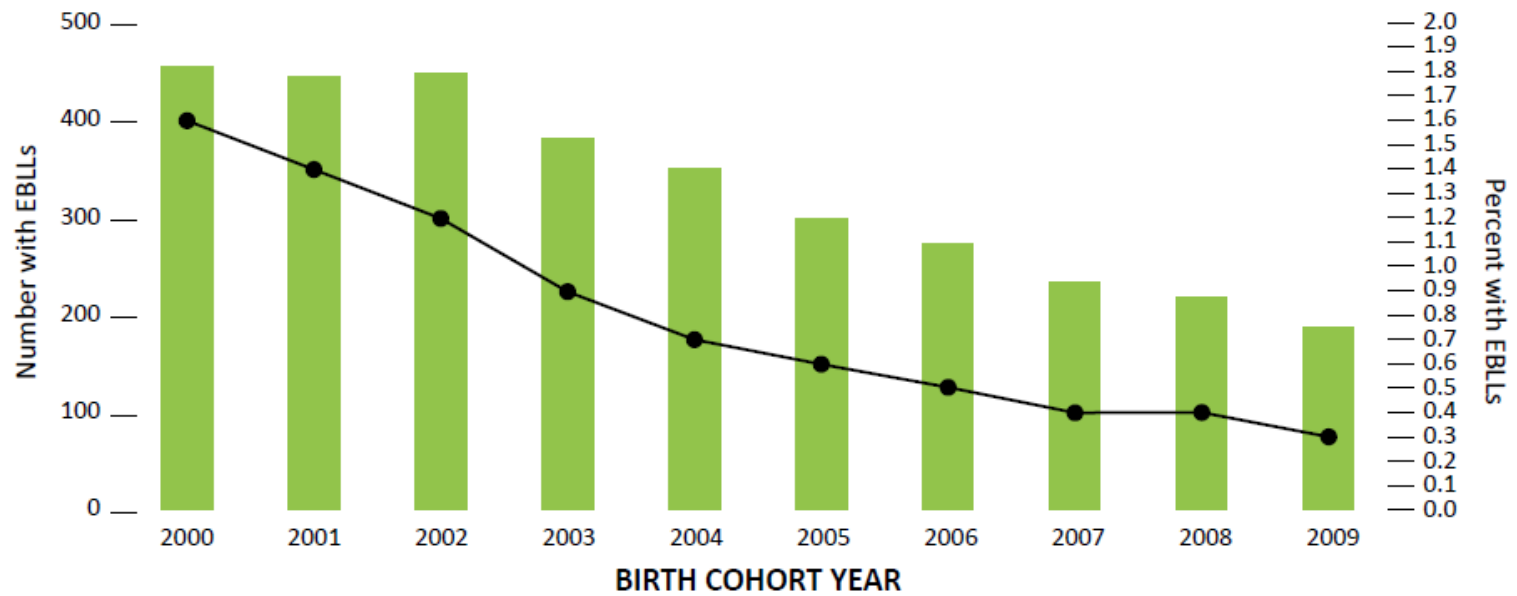
Common sources of exposure

Residential lead paint dust remains the #1 source of childhood lead exposure in Minnesota



Burden of lead in MN

CHILDREN WITH CONFIRMED ELEVATED BLOOD LEAD LEVELS (EBLLs) IN MN



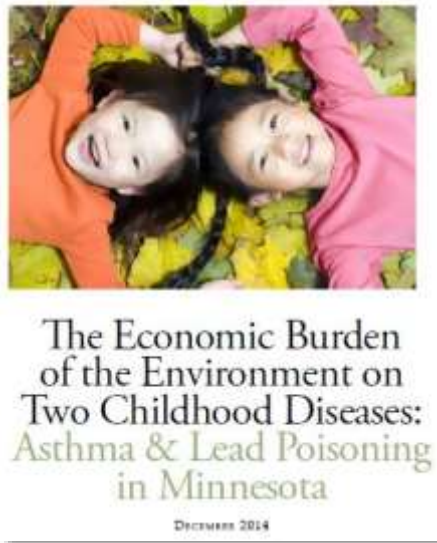
■ Number of Birth Cohort with EBLLs
● Percent of Birth Cohort with EBLLs
µg/dL means micrograms for lead per deciliter of blood

2004 birth cohort

- Around 70,000 children were born in Minnesota in 2004
- About 54,000 children (76%) born in 2004 had at least one blood lead test by age 6
- Followed through 2010

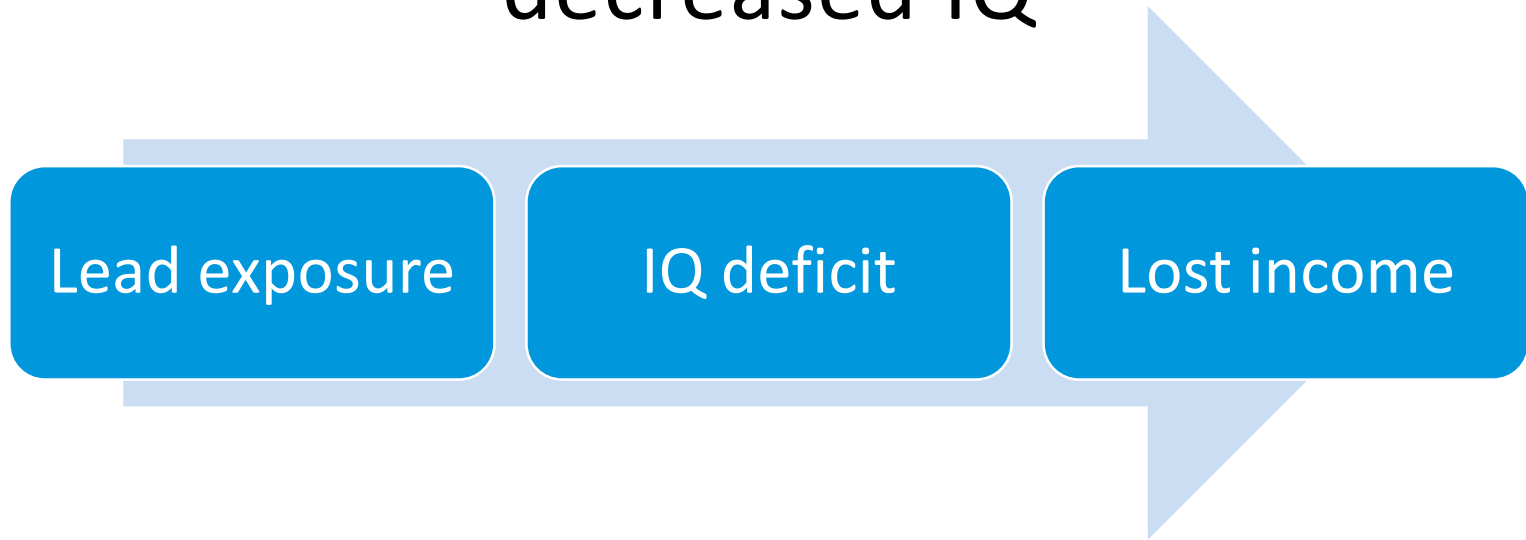


Economic burden of childhood lead poisoning



Cost of childhood lead exposure

Cost calculations limited to lost future income resulting from decreased IQ



Economic burden

Disease counts



Cost per case



Environmentally
attributable fraction (EAF)

Economic burden of childhood lead poisoning

- **Disease counts:** average peak blood lead level
- **Cost per case:** lifetime earnings lost due to IQ deficit
- **EAF:** 100%

Disease counts

- Used highest (peak) blood lead level for every child born in a single year and tested at least once before 6 years of age (2004-2010)
- Mean peak BLL for birth cohort: 2.5 $\mu\text{g}/\text{dL}$

Cost per case

- For every 1 $\mu\text{g}/\text{dL}$ increase in blood lead levels, there is a corresponding IQ deficit
- For every IQ point lost, there is a corresponding decrease in lifetime earnings
- About 1.2 IQ points lost on average and 2.9% future income

Total cost of childhood lead poisoning

- **\$1.9 billion**
- Lost potential income due to lead exposure
- For a single year of children born

Disease counts



Cost per case



Environmentally attributable fraction (EAF)

Burden of asthma and mercury in Minnesota

- Cost attributable to the environment:
 - Asthma: \$31.6 million
 - Prenatal mercury exposure: \$32.6 million



The Economic Burden
of the Environment on
Two Childhood Diseases:
Asthma & Lead Poisoning
in Minnesota

December 2014



The Economic Burden
of the Environment on
Children's Disease:
The Cost of Prenatal Mercury
Exposure in Minnesota

November 2013

Limitations

- EAFs are uncertain
- The burden is not shared equally across communities
- Costs are likely to be an underestimate

Policy implications of economic burden project

- Examples in our states:
 - Minnesota
 - California
 - New Hampshire
- National examples

Resources

- Landrigan, P.J., Schechter, C.B., Lipton, J.M., Fahs, M.C., & Schwartz, J. (2002). Environmental pollutants and diseases in American children: estimates of morbidity, mortality, and costs for lead poisoning, asthma, cancer, and developmental disabilities. *Environmental Health Perspectives*, 110(7), 721-728.
- Trasande, L., & Liu, Y. (2013). Reducing The Staggering Costs Of Environmental Disease In Children, Estimated At \$76.6 Billion In 2008. *Health Affairs*, 30(5), 863-870.
- California's burden report (asthma, cancer, lead exposures, neurobehavioral disorders): [Costs of Environmental Health Conditions in California Children](#)
- Minnesota's burden reports (asthma, lead poisoning, prenatal mercury exposure): [Economic burden of the environment on the health of children in Minnesota](#)
- New Hampshire's burden report (asthma, cancer, lead poisoning): [Economic Burden of Environmentally Attributable Illness in Children of New Hampshire](#)

Thank you

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