



The Mount Sinai Children's Environmental Health Center (CEHC)  
presents its sixth annual Educational Symposium

# Environmental Chemicals and the Developing Brain

**Wednesday, December 5, 2012 • 9:30 – 11:30 am**

[www.cehcenter.org](http://www.cehcenter.org)

# An Introduction to Children's Environmental Health

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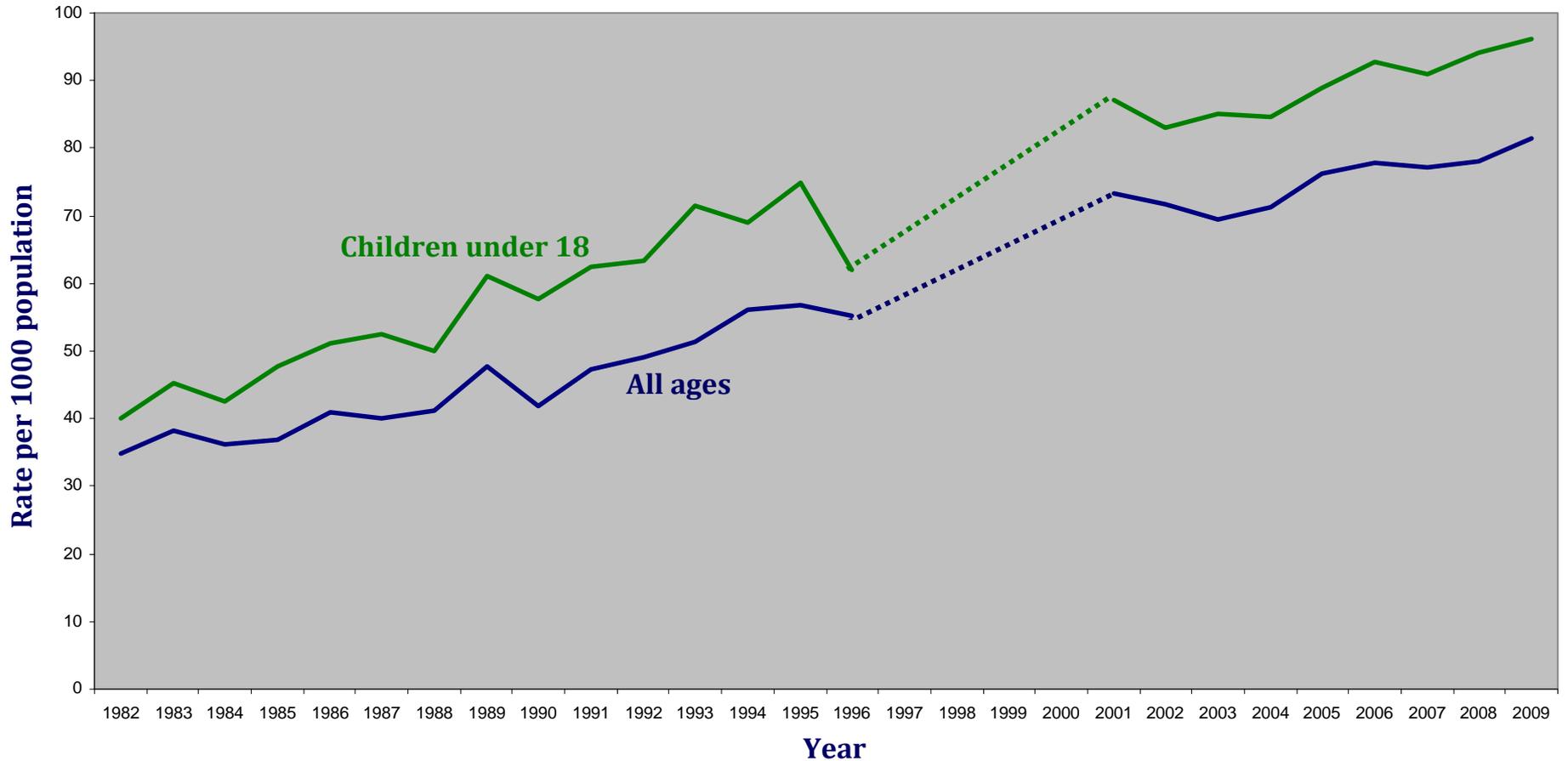
Mount Sinai School of Medicine

# Children's health and the environment: Why should we be concerned?

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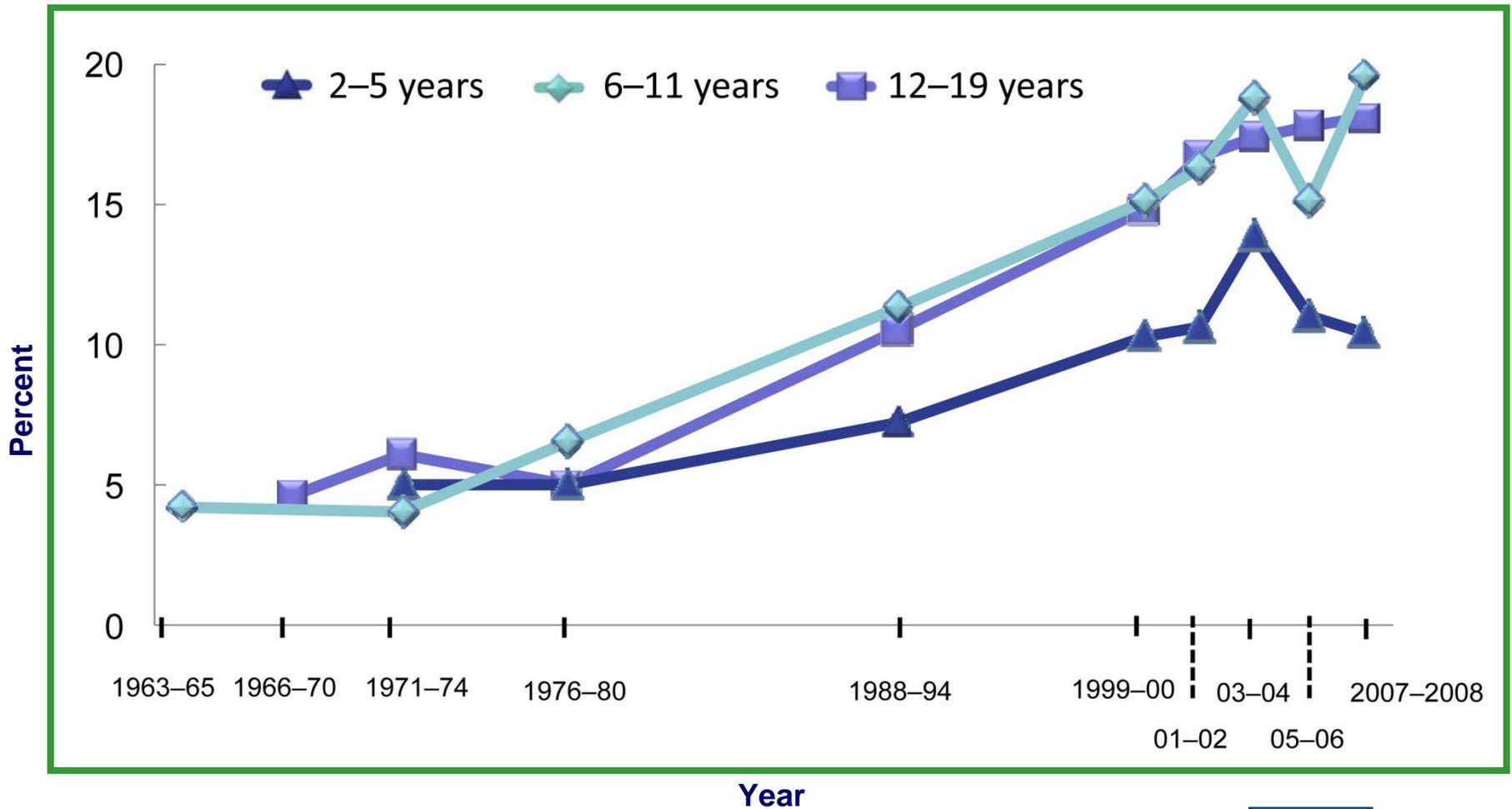
**Rates of disease in America's  
children are rising.**

# Prevalence Rates for Asthma by Age and Year in the U.S. 1982 - 2009



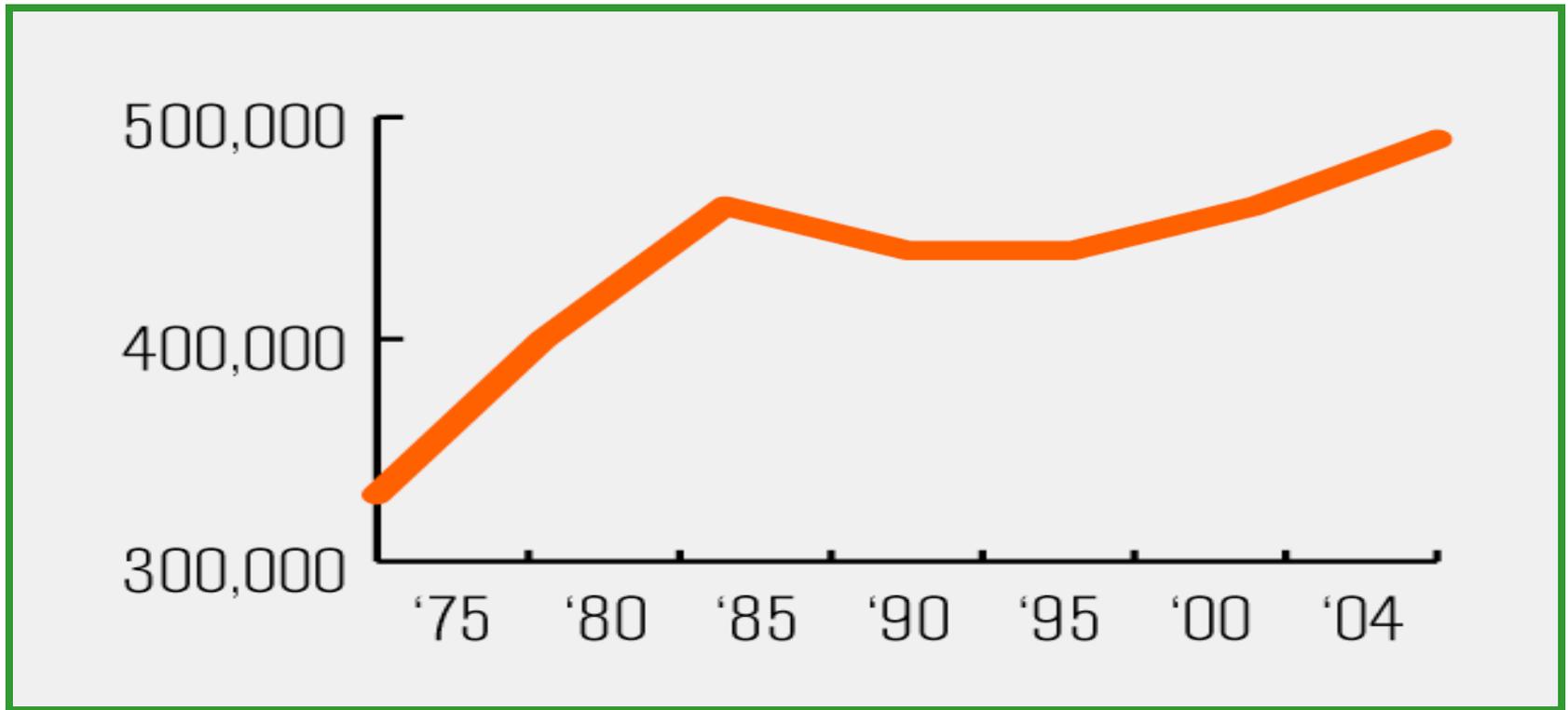
Data was not collected from 1997-2000  
Source: Centers for Disease Control and Prevention

# Rates of Obesity are Increasing in U.S. Children, 1963 - 2008



Source: Centers for Disease Control and Prevention

# Incidence of Childhood Leukemia 1975 - 2004



# Developmental Disabilities

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- Today, **1 in 6 American children** has a developmental or learning disability.
- They include:
  - ADHD
  - Autism
  - Dyslexia
  - Mental Retardation

# Autism and ADHD

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- **Autism affects 1 of every 88 American children.**
  - 23% increase from 2006.
  - 78% increase from 2002.
  - 5 times more common in boys (1 in 54 boys).
- **ADHD affects 3% to 7% of school-aged children.**
  - 5.4 million (9.5%) have been diagnosed, as of 2007.
  - More prevalent in boys (13.2%) than girls (5.6%).

# Rates are Increasing

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<b>Disability</b>	<b>Percent Change Between 1997-1999 and 2006-2008</b>
<b>Autism</b>	<b>+289.5%</b>
<b>ADHD</b>	<b>+33.0%</b>
Other developmental delay	+24.7%
Blind/unable to see at all	+18.2%
Any developmental disability	+17.1%
Seizures, past 12 months	+9.1%
Learning disability	+5.5%
Stuttered or stammered, past 12 months	+3.1%

**\* Children ages 3-17 years old**

Source: Centers for Disease Control and Prevention: Developmental Disabilities Increasing the U.S.

# Why have rates increased so dramatically?

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- **Heightened awareness and better diagnosis are only part of the story.**
- Early exposures to toxic chemicals play a role.
  - 3% LDs are due to toxic exposures in the environment.
  - 25% LDs are a result of gene-environment interactions.
- **It is now well-established and widely accepted that chemical exposures may cause profound brain damage.**
  - Critical windows of vulnerability: prenatal and early brain development.

**Childhood disease of environmental origin  
is very expensive.**

**Lead poisoning**

**\$50.9 billion**

**Autism**

**\$7.9 billion**

**Intellectual disability**

**\$5.4 billion**

**Mercury pollution**

**\$5.1 billion**

**ADHD**

**\$5 billion**

**Asthma**

**\$2.2 billion**

**Childhood cancer**

**\$95 million**

**Total yearly cost: \$76.6 billion**

# Children's health and the environment: Why should we be concerned?

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Children's environments have  
profoundly changed.

# Children's environments have changed.

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- Over **80,000 new chemicals** have been invented over the past 50 years and are found in our everyday products.
- Over **200 of these new chemicals** are found in the bodies of nearly all Americans.
- Fewer than **20% of these chemicals** have been tested for their toxic effects on children.
- Evidence is strong and increasing that **chemicals cause disease and disability.**

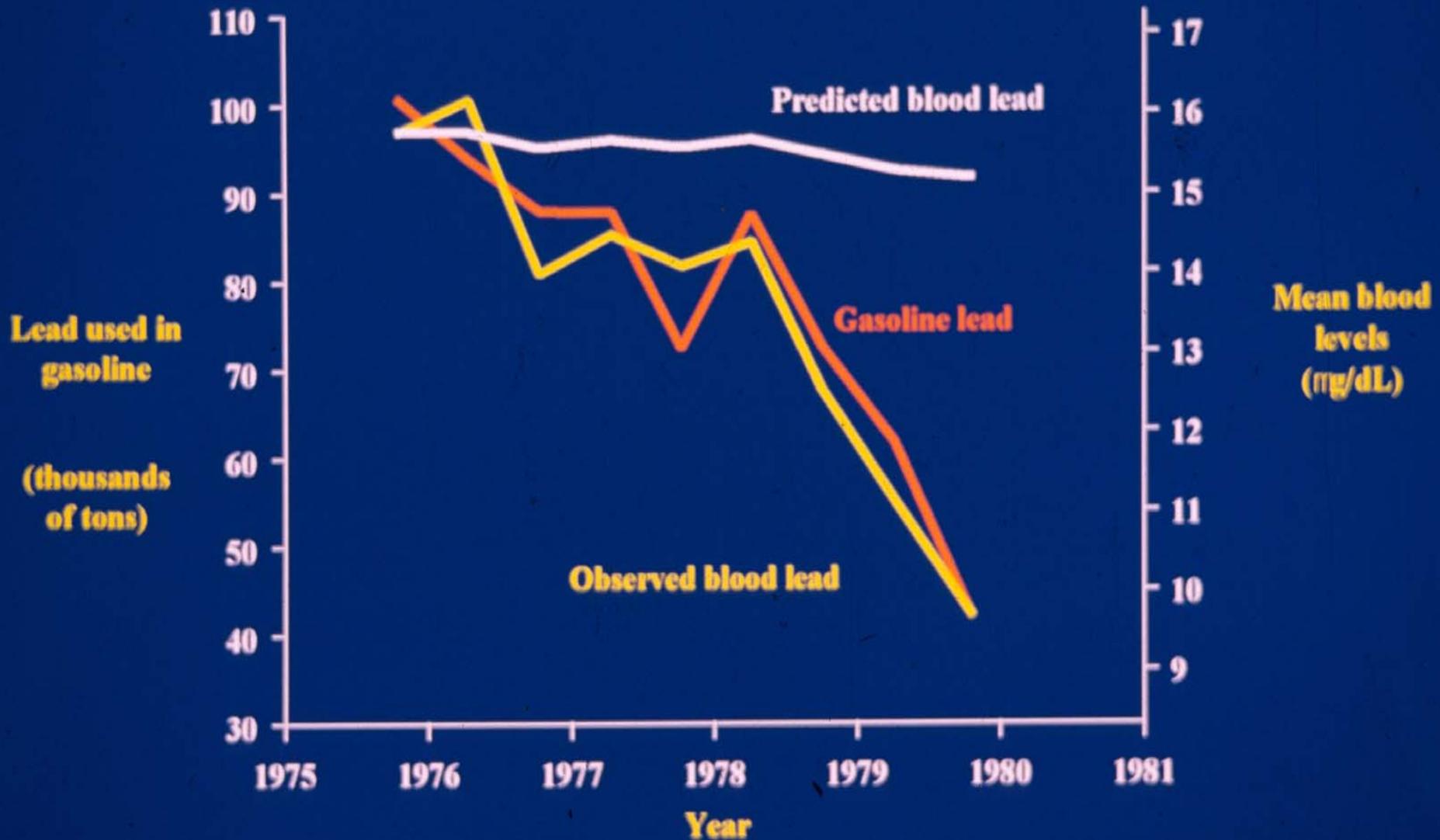
# Prevention Works!

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**Example:**  
**The Removal of Lead from Gasoline**

# Example: The Removal of Lead from Gasoline

## Decline in Blood Lead Levels Greatly Exceeded Expectation



# Health and Economic Benefits of Reducing Population Blood Lead Levels

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- Between 1976 and 1999, the mean BLL of 1-5 year old U.S. children declined by 15.1 mcg/dl – **a 90% decline.**
- Each decline of 1 mcg/dl is associated with **an increase of 0.18-0.3 IQ points.**
- Mean IQ of US children therefore **increased between 2.2 and 4.7 points.**
- Each IQ point **increases economic productivity by 1.76-2.38%.**
- The estimated economic benefit in each year's birth cohort is **\$110-319 billion.**

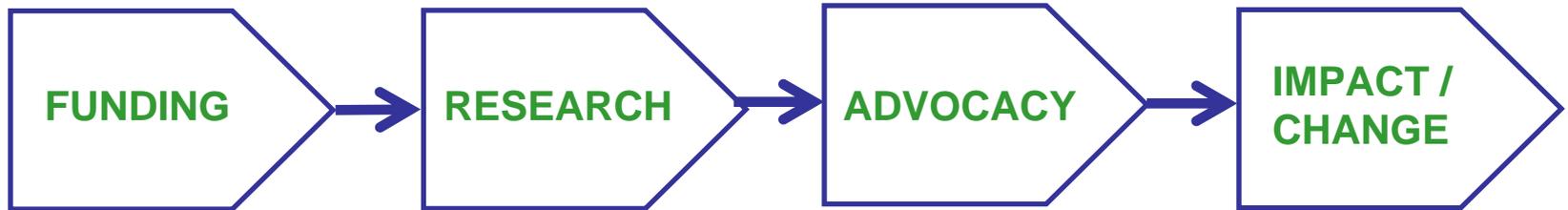
# What We Do

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The Children's Environmental Health Center (CEHC) conducts **groundbreaking research** to identify the causes of childhood diseases and **translates research findings** into solutions that protect children's health.

# What We Do

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# Since its founding, the CEHC has:

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- **Generated close to \$8 million in grants** by investing \$708,000 in pilot research project.
- **Turned research into real action** by banning biphenol A (BPA) from baby bottles and sippy cups in Suffolk County, New York and from cash receipt paper in Connecticut.
- **Become an authoritative educational source** on children's environmental health and has been featured in major media outlets, including the New York Times, CNN, Time Magazine, NBC, CBS, and the Huffington Post.
- **Established the country's premier research enterprise** in children's environmental health by recruiting internationally renowned scientists and building the first in-house lab to examine toxic chemicals.

# How do environmental chemicals impact the developing brain?