

Study Links the Autism Risk to the proximity of Mercury emitting sources

October 2, 2006

January 15, 2008 (revised)

**University of Texas Health Science Center
San Antonio**

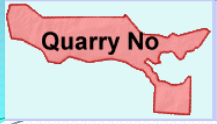
**Dr. Raymond Palmer, Dr. Steve Blanchard, and
Robert Wood**



Position Statement

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- **No Issuance of permit**
- **Move Lehigh facility to another location**



Autism Epidemic in the U.S.

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- 40,000 children diagnosed in 2009
- 12/09 –CDC confirms autism rate is
 - 1-in-91 children;
 - 1-in-57 for boys
- 1% of children in US are diagnosed with autism



UT Study Sources of Data

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➤ **Sources of data used in the study**

- Data for environmentally released mercury were from the "United States Environmental Protection Agency Toxics Release Inventory." Data for releases by coal-fired power plants came from the same inventory and from the Texas Commission for Environmental Quality.
- Data for school district autism rates came from the Texas Education Agency



UT Study Highlights

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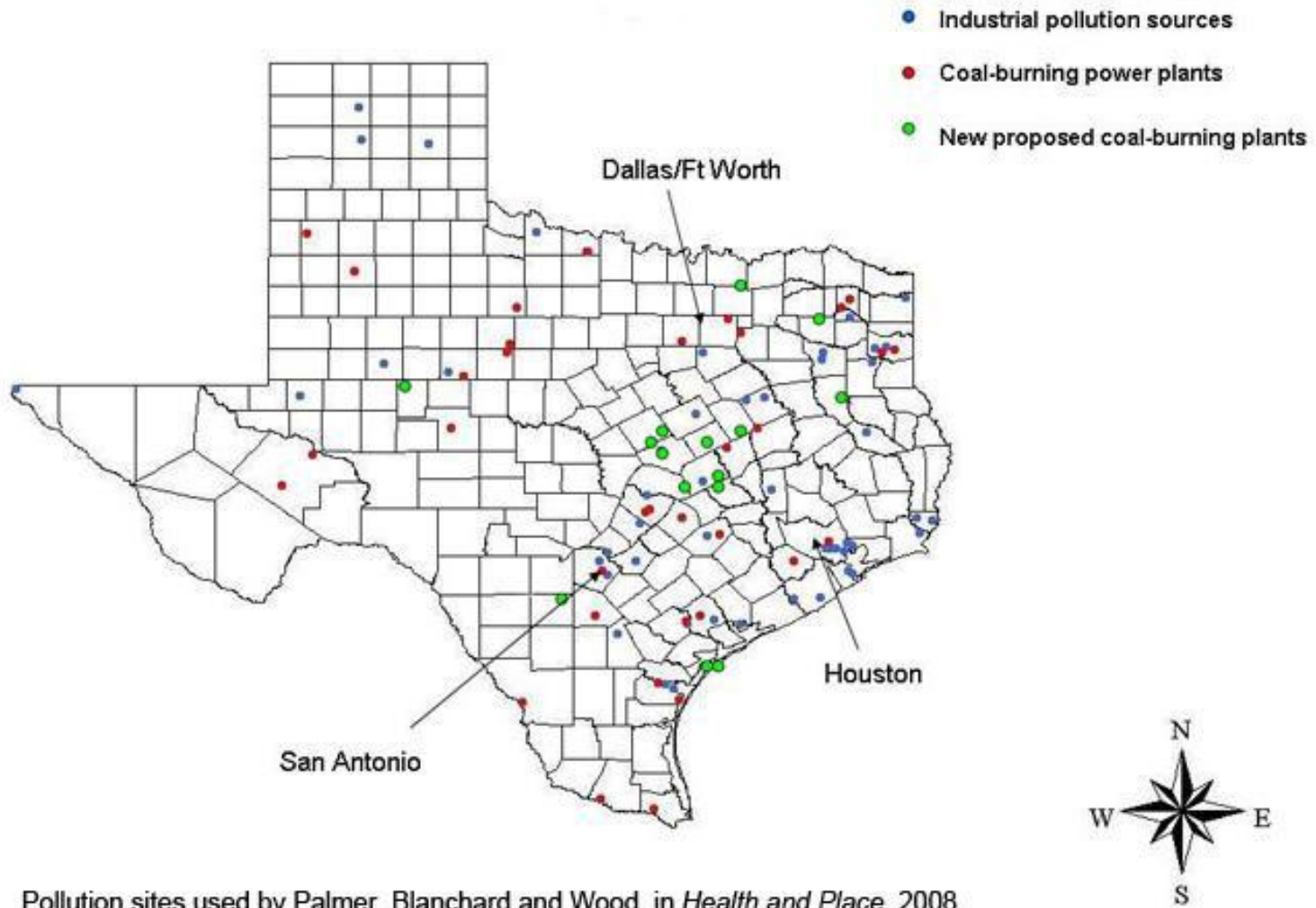
- Mercury-release data examined were from 95 facilities in Texas (39 coal-fired power plants, and 56 industrial facilities)
- Autism rates examined were from 1,040 Texas school districts.
- For every 1,000 pounds of mercury released by all industrial sources in Texas into the environment in 1998, there was a corresponding 2.6 percent increase in autism rates in the Texas school districts in 2002.
- For every 1,000 pounds of mercury released by Texas power plants in 1998, there was a corresponding 3.7 percent increase in autism rates in Texas school districts in 2002.
- Autism prevalence diminished 1% to 2% for every 10 miles from the source
- Mercury exposure through fish consumption is well documented, but very little is known about exposure routes through air and ground water.
- There is evidence that children and other developing organisms are more susceptible to neurobiological effects of mercury.



Texas Mercury Pollution Sources

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Geographic Location of Mercury Pollution Sources



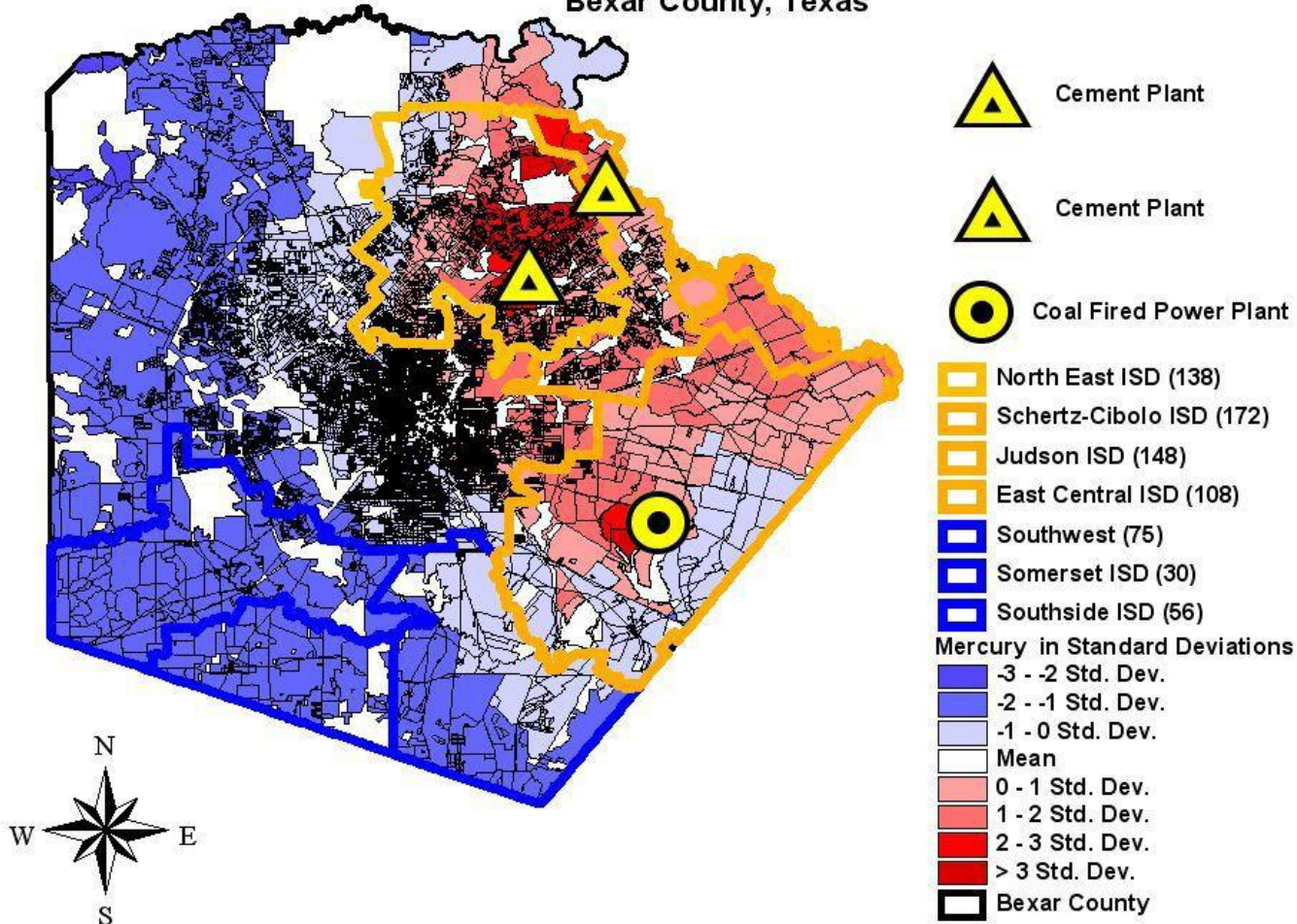
Pollution sites used by Palmer, Blanchard and Wood, in *Health and Place*, 2008



Mercury Estimates –Std. Deviations

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EPA 2002 Mercury Estimates at the City Block Level (Census 2000)
in Standard Deviations
With Unified School Districts with Highest Relative Risk (>1)
and Lowest Relative Risk (<1) for 2004
And With Three Point Sources of Mercury Emission
Bexar County, Texas





UT Study Impact

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After review of University of Texas Medical Center and the direct negative health impact on communities across the state, the Texas State legislature reduced the number of future coal-burning power plants to be built in the state from 15 to 3.



UT Future Studies

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“We suspect low-dose exposures to various environmental toxicants, including mercury, that occur during critical windows of neural development among genetically susceptible children may increase the risk for developmental disorders such as autism”

Dr. Robert Palmer

University of Texas, Medical Center, San Antonio

“...mercury ends up in cord blood, enters the placenta and into a developing fetus. A future study of blood samples in areas where conception occurred (down the street level) would be helpful in determining a hypothesis of high levels of ambient mercury in a region could be linked to genetic susceptibilities being triggered. Thus, there are potential consequences living in such an area, especially for pregnant women.”

Dr. Steve Blanchard (UT research team member)



EPA Estimate of Mercury Releases

- The U.S. Environmental Protection Agency (EPA) estimated environmental mercury releases at 158 million tons annually nationwide in the late 1990s
- According to the Centers for Disease Control and Prevention, eight percent (8%) of American women of childbearing age have mercury in their bodies at levels high enough to put their babies at risk of birth defects, loss of IQ, learning disabilities and developmental problems.



Quarry No

Autism Rate in Cupertino

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Students with Autism: 2008

Region	Rate per 1,000	Range: 0 - 25.0
Santa Clara County	8.6 8.6	

Region	Rate per 1,000	Range: 0 - 25.0
Alum Rock Union Elementary	6.8	
Berryessa Union Elementary	11.8	
Cambrian Elementary	4.2	
Campbell Union Elementary	5.6	
Campbell Union High	5.9	
Cupertino Union Elementary	15.4 15.4	
East Side Union High	5.6	
Evergreen Elementary	12.5	
Franklin-McKinley Elementary	7.9	
Fremont Union High	8.9	
Gilroy Unified	5.7	
Lakeside Joint Elementary	LNE	
Loma Prieta Joint Union Elementary	LNE	
Los Altos Elementary	8.2	
Los Gatos Union Elementary	5.9	
Los Gatos-Saratoga Joint Union	6.6	
Luther Burbank Elementary	LNE	
Milpitas Unified	9.4	
Montebello Elementary	N/A	
Moreland Elementary	11.2	
Morgan Hill Unified	6.0	
Mountain View-Los Altos Union	5.0	
Mountain View-Whisman Elementary	12.9	
Mt. Pleasant Elementary	10.6	
Oak Grove Elementary	9.4	

Orchard Elementary	15.7 15.7	
Palo Alto Unified	9.3	
San Jose Unified	7.4	
Santa Clara Unified	9.6	
Saratoga Union Elementary	12.1	
Sunnyvale Elementary	12.9	
Union Elementary	11.3	

Definition: Number of public school students with autism who are enrolled in special education per 1,000 students. District level data show district of residence; that is, the district in which students live. Some students with disabilities attend school outside their district of residence.

Data Source: State of California Department of Education, DataQuest. <http://data1.cde.ca.gov/dataquest/> Retrieved 10/01/08.

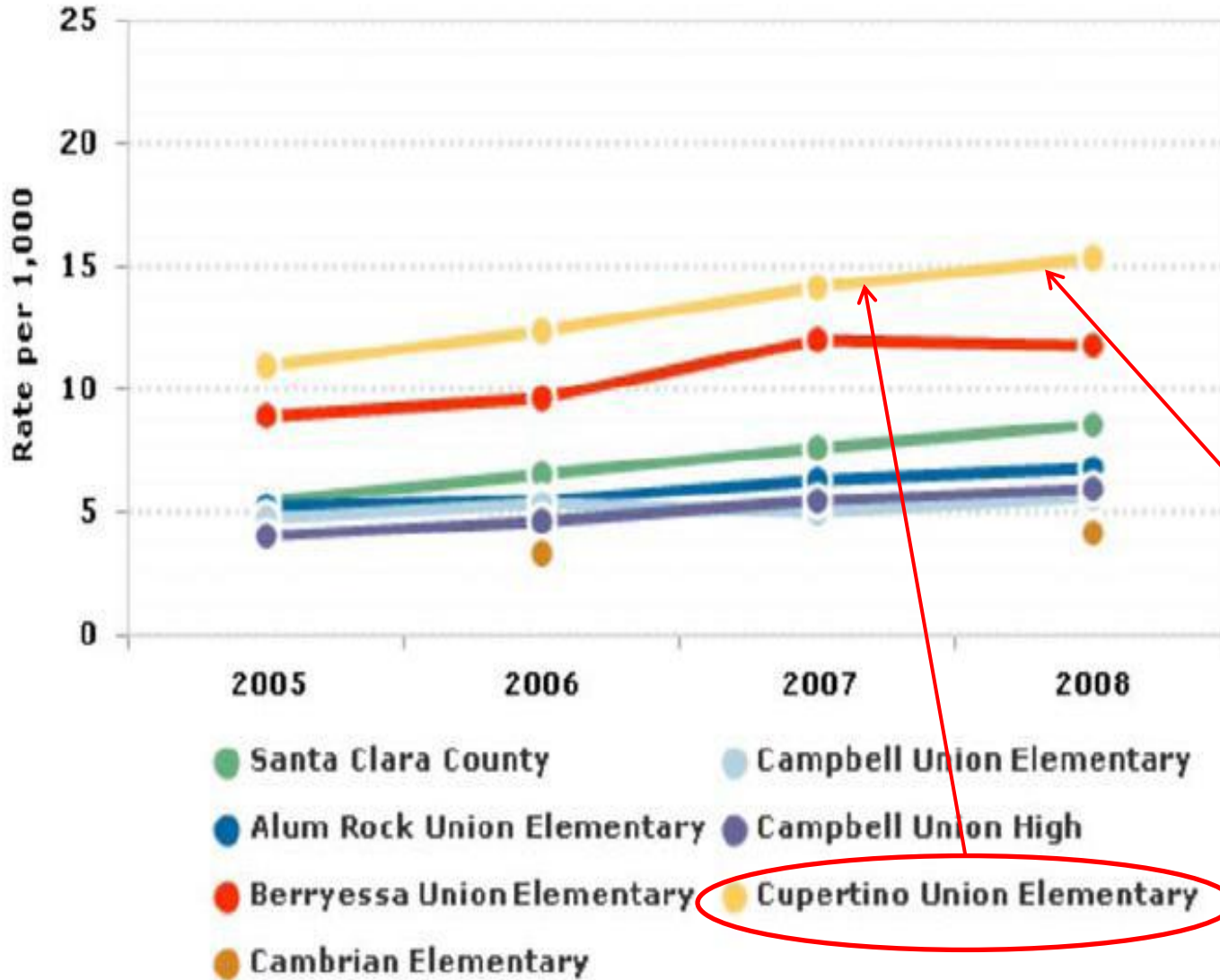
Footnote: Years presented are the final year of a school year, e.g., 2006-2007 is shown as 2007. LNE (Low Number Event) means that the number of cases was less than 10, too small to calculate a rate.

- Orchard Elementary ranks #1
- Cupertino Union ranks #2 (almost double the autism rate of Santa Clara County)

Source: State of California
Dept of Education



Autism Trend in Cupertino



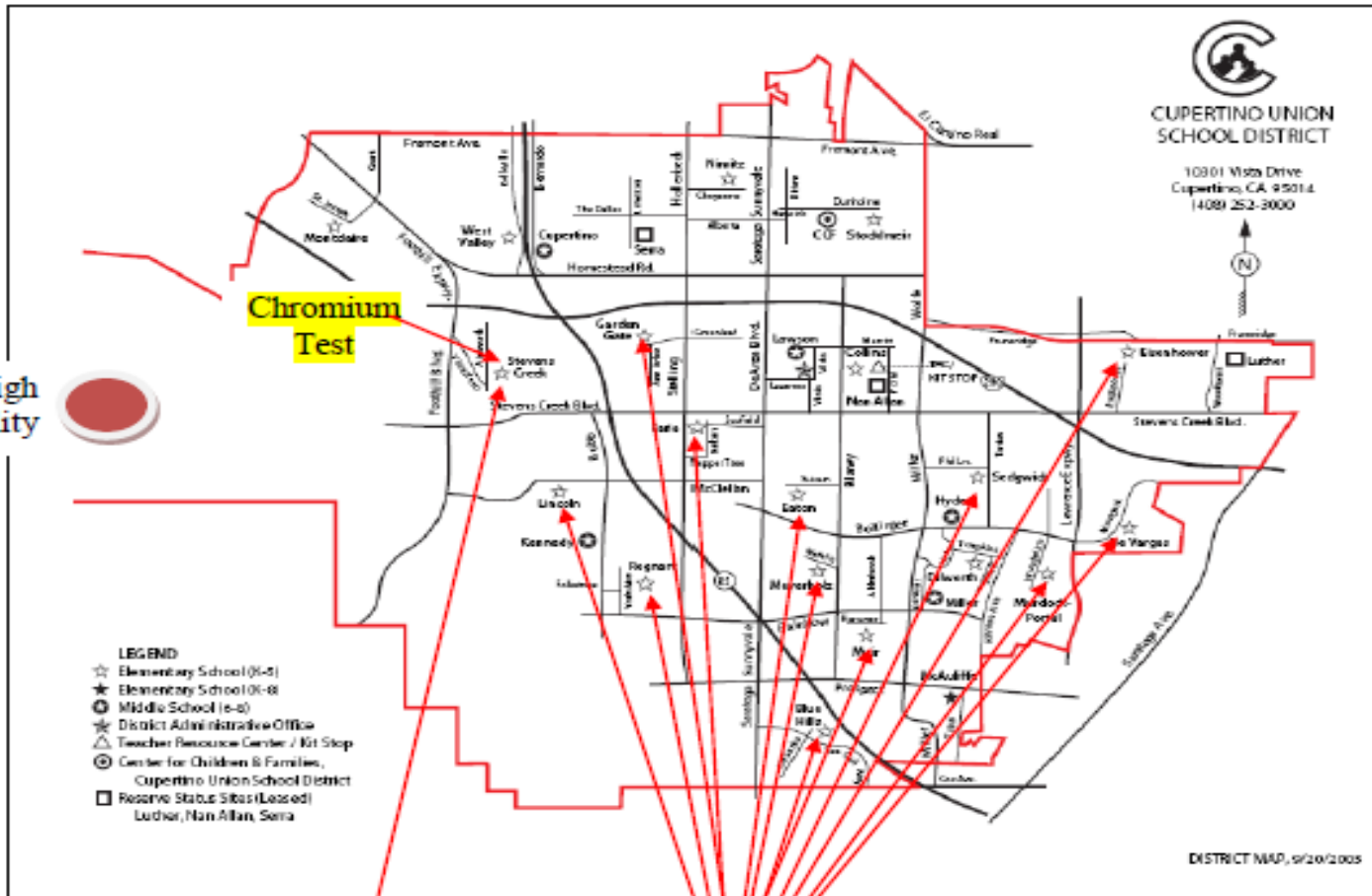
~ 30% increase in 3 years
~ 300% higher than Alum Rock & Campbell



Chromium Testing Inaccurate

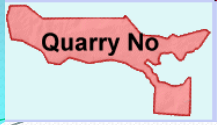
Cupertino Union School District Map

Lehigh facility



Stevens Creek Elementary school located here

11 other elementary schools only located to the southeast of where the Chromium test was conducted. Wind pattern is more southeasterly than northwesterly.



Teacher & Aide Ratio: District \$Cost ^{WVCAW}

1st Grade Special Needs classroom

- 8-12 students
- 1 teacher
- 3 aides
- 1-2 additional specialists (speech, physical therapist, etc.) attend class weekly for 1 or more students for an hour or more

4th Grade mainstream (normal) classroom

- 32 students
- 1 teacher

San Antonio, Texas



USA Today Study -Cupertino

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Stevens Creek Elementary

School District: Cupertino Union



National Rank: **28th percentile**

35,316 of 127,809 schools have worse air

Exposure to cancer-causing toxics: Ranked 4 of 10

Note: Rankings are based on modeled concentrations and severity of chemicals known or believed to cause cancer.

Exposure to other toxic chemicals: Ranked 3 of 10

Note: Rankings are based on modeled concentrations of chemicals that cause health problems other than cancer.

Chemicals most responsible for the toxicity outside this school

Hydrochloric acid 43% of overall toxicity

Mercury and mercury compounds 37% of overall toxicity

Nickel and nickel compounds 12% of overall toxicity

Chromium and chromium compounds 4% of overall toxicity

Manganese and manganese compounds 1% of overall toxicity

Polluters most responsible for toxics outside this school

Lehigh Cement Cupertino, California

United States Pipe & Foundry Co LLC Union City, California



Autism Rate

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Youth disorders

The latest figures on autism show the average rate is nearly one in 150, higher than previously thought.

Prevalence of developmental disorders among 8-year-old children, per 1,000

Mental retardation



Autism



Cerebral palsy



Hearing loss



Vision impairment



Rate is now:

1-in-91 for children;
1-in-57 for boys!!

NOTE:
Figures from a 2000 study in Atlanta, except autism rate, which is from a 2002 study in 14 states

SOURCE: Centers for Disease Control and Prevention

AP



What is Autism?

Autism is a brain development disorder characterized by impaired social interaction and communication, and by restricted and repetitive behavior, and difficulties with play and leisure activities. These signs all begin before a child is three years old.[1] Autism involves many parts of the brain; how this occurs is not well understood.[2] Autism is one of five disorders diagnosed under a group of developmental disorders called "Autism Spectrum Disorders" (ASD's). The other ASD's are Asperger Syndrome, Rett Syndrome, childhood disintegrative disorder, and Pervasive developmental disorder not otherwise specified (PDD-NOS).

Autism has a strong genetic basis, although the genetics of autism are complex and it is unclear whether ASD is explained more by rare mutations, or by rare combinations of common genetic variants.[3]



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