



# **Autism Primer**

**Provided by the Coalition for SafeMinds**

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## What is autism?

- Autism is a complex developmental disability that causes problems with social interaction and communication. Symptoms usually start before age three and can cause delays or problems in many different skills that develop from infancy to adulthood.<sup>1</sup>
- Autism Spectrum Disorder (ASD) is a group of disorders with similar symptoms that can range from mild to severe. The ASD category currently includes Autism, Asperger Syndrome, and Pervasive Developmental Disorder Not Otherwise Specified<sup>1</sup>
- The main signs and symptoms of autism involve problems in the following:<sup>1</sup>
  - Communication - both verbal (spoken) and non-verbal (unspoken, such as pointing, eye contact, and smiling)
  - Social - sharing emotions, understanding how others think and feel, and conversing
  - Routines or repetitive behaviors (also called stereotyped behaviors) - such as repeating words or actions, obsessively following routines or schedules, and repetitive play
- Autism often exists with co-morbid conditions such as gastrointestinal disorder, abnormal hearing, abnormal pain sensitivity, immune dysfunction, motor coordination deficits, epilepsy, and other adverse conditions<sup>2</sup>
- Autism patients typically have abnormal biomarkers in blood and urine, suggesting a disorder with adverse affects throughout the body<sup>2</sup>

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<sup>1</sup> Autism Spectrum Disorders, NIH website

{<http://www.nichd.nih.gov/health/topics/asd.cfm>}

<sup>2</sup> See item #12 at

[http://www.smartvax.com/index.php?option=com\\_content&view=article&id=110](http://www.smartvax.com/index.php?option=com_content&view=article&id=110)

## Key points on autism

- The CDC estimates that autism affected 1 in 110 children (91 per 10,000)<sup>1</sup> in the US in the 1998 birth cohort (CDC has not reported on later birth years), an exponential increase from < 3 cases per 10,000 in the 1970's<sup>2</sup>
- The CDC estimates 730,000 kids with autism under 21, with health care costs for those with autism are 4 to 6 times as high as comparable kids and an estimated lifetime cost for autism of \$3.2M<sup>1</sup> (\$120B per birth cohort)
- 2008 California research found that the increase in autism prevalence is not fully explained by diagnostic changes or inclusion of milder cases<sup>3</sup>
- 2010 EPA study identified the 1988 birth cohort as a 'change point' at which autism prevalence began rapidly increasing<sup>4</sup>
- Autism has a huge impact on families. Most immediate family members are "one issue" voters. It affects parents, grandparents and we are now getting large numbers of siblings who are old enough to vote. It has a major impact on teachers, school budgets, Medicaid, and first responder services.
- 2011 paradigm-shifting research demonstrated that autism is primarily environmental rather than genetic<sup>5</sup>
- Emerging scientific view amongst public health officials is that autism is caused by environmental factors in genetically susceptible children<sup>6</sup>

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<sup>1</sup> [Autism Spectrum Disorders](http://www.cdc.gov/ncbddd/autism/index.html) {http://www.cdc.gov/ncbddd/autism/index.html}

<sup>2</sup> [What's Going On? The Question of Time Trends in Autism](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1497666/pdf/15504445.pdf) {http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1497666/pdf/15504445.pdf}

<sup>3</sup> [New Study: Autism Linked to Environment](http://www.scientificamerican.com/article.cfm?id=autism-rise-driven-by-environment) {http://www.scientificamerican.com/article.cfm?id=autism-rise-driven-by-environment}, an article about the study "The Rise in Autism and the Role of Age at Diagnosis" by Irva Hertz-Picciotto published in *Epidemiology*, Volume 20, Number 1, January 2009

<sup>4</sup> [EPA Study: Autism Boom Began in 1988, Environmental Factors Are Assumed](http://www.huffingtonpost.com/david-kirby/autism-vaccine-epa-study_b_548837.html) {http://www.huffingtonpost.com/david-kirby/autism-vaccine-epa-study\_b\_548837.html}, an article about the EPA study by McDonald and Paul "Timing of Increased Autistic Disorder Cumulative Incidence" published in *Environmental Science & Technology* in 2010}

<sup>5</sup> [Study debunks autism as a primarily genetic disorder](http://www.universityofcalifornia.edu/news/article/25879) {http://www.universityofcalifornia.edu/news/article/25879}

<sup>6</sup> Per Frances Collins (director of NIH), Tom Insel (director of NIMH & IACC) as referenced in [Top Scientists Calling for Environmental Research into Autism](http://www.smartvax.com/index.php?option=com_content&view=article&id=111)

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# A Paradigm Shift is Occurring

From

A rare tragic disorder  
– constant prevalence

Clear, if complex, genetic causes

Outcomes are inevitably determined  
in utero

A neurology problem

The best (and only) treatment is  
behavioral therapy

The children are defective

To

An alarmingly frequent disease  
■ rising incidence

An environmental disease, with  
possible genetic vulnerability factors

Outcomes result from preventable  
events in otherwise normal children

A multi-disciplinary problem, spanning  
toxicology, epidemiology, neurology,  
immunology, gastroenterology, etc.

Many opportunities for prevention,  
treatment and recovery

The children are sick

## Success-based Research Strategy

- Redirect NIH resources to research on environmental causes of autism and associated promising treatments. There are a number of promising research avenues that could be quickly explored with the right focus and funding priorities
- For background, supporting research, and analysis of current research funding, see the SafeMinds brief “Environment Vs. Genetics: Why the Autism Epidemic Demands a New Approach”<sup>1</sup> which explains:
  - *“The current infrastructure for autism research is misallocating funds based on an outdated paradigm that autism is primarily a genetic disorder. In order for meaningful progress to be made towards prevention and treatment, we must identify and investigate the environmental factors which have been implicated throughout the history of autism.”*

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<sup>1</sup> SafeMinds brief: “Environment Vs. Genetics: Why the Autism Epidemic Demands a New Approach”

<http://safeminds.org/research/docs/Environment%20Vs%20%20Genetics%20Brief.pdf>

## Vaccines-Autism Overview

- Many parents of children with autism believe that environmental factors (including, but not limited to, vaccines) caused their child's autism
- The general public is concerned<sup>1</sup>:
  - 54% of American parents are concerned about adverse effects of vaccines
  - 25% think some vaccines cause autism
  - 89% rate vaccine safety as a top research priority
- It is known that unvaccinated children have developed autism, so vaccines are viewed by some as 'sufficient but not necessary' to cause autism (with other environmental factors also being sufficient to cause autism)
- To formulate a successful autism research strategy, one must understand how fear of a potential vaccine-autism link limits research into environmental factors on autism:
  - Vaccine-autism hypotheses have not been adequately studied due to fear of impact to vaccination program (as described in this [interview](#)<sup>2</sup> by Bernadine Healy, former director of NIH)
  - Additionally, there is a reluctance to study plausible environmental factors (e.g. mercury or aluminum from non-vaccine environmental sources) because of their inclusion in vaccines

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<sup>1</sup> a [2010 survey](#) found that 54% of parents are concerned about the adverse effects of vaccines and 25% think some vaccines cause autism in healthy children, and a [2010 poll](#) found that 89% of parents rate vaccine safety as a top priority in children's health research

{[http://smartvax.com/index.php?option=com\\_content&view=article&id=49&Itemid=48](http://smartvax.com/index.php?option=com_content&view=article&id=49&Itemid=48)}

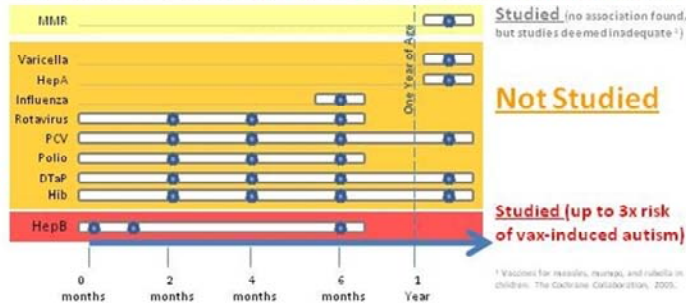
<sup>2</sup> "The Open Question on Vaccines and Autism" {[http://www.cbsnews.com/8301-500803\\_162-4090144-500803.html?tag=contentMain%3bcontentBody](http://www.cbsnews.com/8301-500803_162-4090144-500803.html?tag=contentMain%3bcontentBody)}

# Vaccine-Autism link needs further study

6 of the 7 vaccines in an infant's first year have not been studied for autism prevalence in children who received vs did not receive the vaccine

The 7<sup>th</sup> vaccine administered in 1<sup>st</sup> year (Hepatitis B) was associated in 2010 study with a 3x risk of autism<sup>1</sup>

## Most Vaccines not studied for Autism in children who received vs didn't receive the vaccine



- Several plausible vaccine-autism hypotheses have not been studied, including:
  - conjugate vaccines (new in 1988) causing an immune response that disrupts neuron myelination<sup>2</sup>
  - aluminum adjuvants, which carry a risk of autoimmunity & long-term brain inflammation<sup>3</sup>
- Two hypotheses have been studied: MMR vaccine and mercury preservative
  - Studies designed to exonerate the MMR vaccine and the mercury preservative have found no association with autism, but there are significant questions about the validity of those findings<sup>1</sup>

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<sup>1</sup> [Why is the vaccine-autism question far from answered?](http://smartvax.com/index.php?option=com_content&view=article&id=58&Itemid=56)

{[http://smartvax.com/index.php?option=com\\_content&view=article&id=58&Itemid=56](http://smartvax.com/index.php?option=com_content&view=article&id=58&Itemid=56)}, from the SmartVax website by SafeMinds

<sup>2</sup> Richmand BJ. Hypothesis: Conjugate vaccines may predispose children to autism spectrum disorders. *Med Hypotheses*. (2011), doi:10.1016/j.mehy.2011.08.019

<sup>3</sup> [Does Aluminum Cause Vaccine-Injury?](http://smartvax.com/index.php?option=com_content&view=article&id=55&Itemid=38)

{[http://smartvax.com/index.php?option=com\\_content&view=article&id=55&Itemid=38](http://smartvax.com/index.php?option=com_content&view=article&id=55&Itemid=38)}, from the SmartVax website by SafeMinds

## SmartVax: a new discourse on vaccines

- SafeMinds produced the SmartVax website<sup>1</sup> to encourage a new discourse on vaccines as medical treatments with both benefits and risks that must be weighed and researched. By pursuing scientific research on vaccine-injuries, a new immunological paradigm can be discovered that could lead to a safer and more effective vaccination program as well as treatments for many disorders thought to have an auto-immune component
- It is no longer acceptable to avoid vaccine-injury research under the old justification that “vaccine benefits outweigh the risks”. In 2011 SafeMinds provided quantitative analysis indicating that vaccine-injury risk from the current USA schedule exceeds disease risks in a low-vaccinated population, a conclusion intended as a clarion call for urgent research into vaccine-injury to make vaccines safer and more effective<sup>2</sup>



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<sup>1</sup> SmartVax {[www.SmartVax.com](http://www.SmartVax.com)} is a website produced by SafeMinds in 2011 to initiate a new discourse on vaccines

<sup>2</sup> “Weigh The Risks” section of SmartVax.com

{[http://smartvax.com/index.php?option=com\\_content&view=article&id=47&Itemid=41](http://smartvax.com/index.php?option=com_content&view=article&id=47&Itemid=41)}