

Autism Nation: America's Chemical Brain Drain

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While autism rates in Europe have remained virtually flat for the last decade, in the US, they have risen from 1:10,000 in 1981 to 1:68 in 2014. Many studies point to the prevalence of toxins in our environment as the culprit.

As flowers burst on the scene, blossoms unfold, and lawns awaken from winter's sleep, nature's spring rituals are joyful to watch.

Unfortunately, many home owners, gardeners, landscapers, farmers and state agencies launch an anti-nature spring ritual - mounting an arsenal of poisons to kill insects and weeds. This ritual comes at a tremendous cost.

"It's time to start looking for the environmental culprits responsible for the remarkable increase in the rate of autism in California." - Irva Hertz-Picciotto, epidemiology professor at University of California, Davis.

Last month, leading scientists warned of a "silent pandemic," citing strong evidence that "children worldwide are being exposed to unrecognized toxic chemicals that are silently eroding intelligence, disrupting behaviors, truncating future achievements and damaging societies." These "brain" toxins - heavy metals, fluoride, chemicals like PCBs, toluene, solvents, flame retardants, BPA, phalates and pesticides - are found in the furniture you sit on, the clothing you wear, the air you breathe, the food you eat and soil your kids play in. And this short list of chemicals and compounds is just the tip of a very large toxic iceberg.

"It's time to start looking for the environmental culprits responsible for the remarkable increase in the rate of autism in California," said Irva Hertz-Picciotto, an epidemiology professor at University of California, Davis.

In 1981, the autism (ASD) rate in the United States was 1:10,000. In 2007, it was 1:150. In 2009, it was 1:100. In 2012, it was 1:88. In 2014, it is 1:68. At this rate of increase, by 2025 it will be 1:2, or 50 percent.

For those of you tempted to think this is just greater awareness and expansion of the criteria for diagnosis, the CDC says that since the 2012 estimate of 1 in 88 children identified with ASD, the criteria used to diagnose, treat, and provide services have not changed, but the rate has increased another 30 percent.

Meanwhile, autism rates in Europe have remained virtually flat for the last decade. Recent estimates in European countries range from 1 in 5,000 in Germany to 1 in 700 in Portugal. So what are Americans doing to harm themselves and their children's brains that Europeans aren't, besides watching Fox News?

No one knows for sure, but one thing to consider is the massive increase in Genetically Modified Organisms (GMOs) and the concomitant upsurge in pesticide and herbicide use.

David Vogel, professor at the Haas School of Business and in the Department of Political Science at the University of California, Berkeley, points out that between 1960 and 1990, American health, safety, and environmental regulations were more stringent, risk averse, comprehensive, and innovative than those adopted in Europe. Vogel's book, *The Politics of Precaution*, explains that since around 1990, global regulatory leadership has shifted to Europe.

With many types of environmental risks, extreme conservative ideologues in the US have brought regulatory protection of public health to a screeching halt. America's failure to deal with the climate crisis is probably the most conspicuous casualty. But what is happening to the brains of our children may be just as important.

In more than 60 countries around the world, including Australia, Japan, and all of the countries in the European Union, there are significant restrictions or outright bans on the production and sale of GMOs. In the US, federal agencies have approved the GMO/pesticide industrial agriculture system based on studies conducted by the same corporations that created them and profit from their sale.

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The best-selling herbicide in the world is glyphosate, originally patented and sold by Monsanto as Roundup. Glyphosate is a potent endocrine disruptor, meaning it can interfere with the production, release, transport, metabolism, or elimination of the body's natural hormones, which are the most potent biologic substances known to science. Fetuses and infants are particularly at risk, as any disruption of endocrine systems can affect brain development. Last week [a study](#) was done that proved yet again Monsanto has been lying to the public. Monsanto has defiantly proclaimed all along that Roundup breaks down quickly and doesn't accumulate in the human body. Not so. Moms Across Americas examined the breast milk of ten American women and found alarmingly high levels of the primary active ingredient in Roundup, glyphosate, in three of the ten women. The study also examined urine from 35 people across the country and found glyphosate at levels ten times higher than a similar survey done in a European population. Monsanto and regulatory bodies worldwide have based all of their regulations on the assumption that glyphosate is not bio-accumulative. Senior Monsanto scientist Dan Goldstein even [recently stated](#), "If ingested, glyphosate is excreted rapidly, does not accumulate in body fat or tissues, and does not undergo metabolism in humans. Rather, it is excreted unchanged in the urine."

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Recent research published in the [*New England Journal of Medicine*](#) compared brain autopsies of autistic children, who had died from unrelated causes, to those of normal children. Autistic brains demonstrated abnormal patches of disorganized neurons disrupting the usual distinct layers in the brain's cortex. The primary implication of the research is the abnormalities almost certainly had to have occurred in utero during key developmental windows between 19 to 30 weeks gestation. Perhaps even more important than the dose of a toxin is the timing of the exposure, and presence or absence of other facilitators or synergistic toxins. Other research suggests an even longer list of toxic substances can irreversibly interfere with the delicate process of organizing fetal brain architecture. It is a popular misconception, fed in part by weak government regulations, that toxins produce an all or nothing effect. Levels above "safe" doses

are acknowledged to be harmful, but below "safe" levels are misinterpreted as harmless. But that's not how the body works, especially the developing brain. Brain-damaging chemicals can provoke the entire spectrum of outcomes, from imperceptible changes to severe neurologic handicaps. Furthermore, the absence of cognitive or behavioral problems in childhood is not necessarily evidence that an early exposure to a neurotoxin had no adverse effect on brain development. In fact, studies in both animals and humans have demonstrated that some substances cause damage to the brain that is manifested only in the delayed onset of learning problems, attention deficits, and changes in emotional regulation, which can have long-term consequences in teenage and adult years. The immature brain of an embryo, fetus, or infant is at risk for significant and permanent damage from exposure to chemicals, like pesticides, at levels that may have no detectable impact on adults. Consequently public policies that too often focus on adults fail to protect developing brains during pregnancy and early infancy.

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Most pesticides work by causing chemical disruption of the brain and nervous system of insects. In fact, many pesticides are merely derivations of chemical warfare agents of the World War I and World War II era, i.e. nerve gases. It should be no surprise, then, that human nerve cells could also be affected, especially when considering that at the critical embryonic stage, the human fetal brain is no larger than that of many insects. Research confirms that mothers more exposed to commonly used, "safe" pesticides bear children with lower intelligence (1,2,3,4,5), structural brain abnormalities (6), behavioral disorders, compromised motor skills (7,8), higher rates of brain cancer (9), and smaller head size (10).

In December 2013, the European Food Safety Authority ruled that the controversial pesticides linked to declines in bee populations, the neonicotinamides, may adversely affect the development of neurons and brain structures in unborn babies.

Adult neurologic diseases like Parkinson's and an acceleration of cognitive decline are more common in adults with even modest exposure to "legal"

pesticides ([11](#), [12](#)). Adults with high levels of DDT metabolites are four times more like to have Alzheimer's ([13](#)).

In May 2007, 200 of the world's foremost pediatricians, toxicologists, epidemiologists and environmental scientists at a worldwide conference issued [this warning](#), "Given the ubiquitous exposure to many environmental toxicants, there needs to be renewed efforts to prevent harm. Such prevention should not await detailed evidence on individual hazards. ... Toxic exposures to chemical pollutants during these windows of increased susceptibility can cause disease and disability in childhood and across the entire span of human life." The scientists explained that exposure to common chemicals skewed the development of critical organs in fetuses and newborns, increasing their chances of developing diabetes, cancer, attention deficit disorders, thyroid damage, diminished fertility, and other conditions in later life.

In October 2013, the American College of Obstetricians and Gynecologists and the American Society for Reproductive Medicine, representing well over 50,000 physicians and other health-care professionals, issued a joint statement: "Patient exposure to toxic environmental chemicals and other stressors is ubiquitous, and preconception and prenatal exposure to toxic environmental agents can have a profound and lasting effect on reproductive health across the life course." On their website they stated further that, "Reproductive and health problems associated with exposure to toxic environmental agents: Miscarriage and stillbirth, Impaired fetal growth and low birth weight, Preterm birth, Childhood cancers, Birth defects, Cognitive/intellectual impairment, Thyroid problems." The Standing Committee of European Doctors - which brings together the continent's top physicians' bodies, including the British Medical Association, stated, "[Chemical pollution represents a serious threat to children, and to Man's survival.](#)"

In June 2009, the Endocrine Society, comprised of 14,000 hormone researchers and medical specialists in more than 100 countries, warned that "even infinitesimally low levels of exposure [to endocrine-disrupting chemicals] - indeed, any level of exposure at all - may cause endocrine or reproductive abnormalities, particularly if exposure occurs during a critical developmental window. Surprisingly, low doses may even exert more potent effects than higher doses." And in November 2009, the American Medical Association Board of

Delegates approved a resolution that called on the federal government to minimize the public's exposure to BPA and other endocrine-disrupting chemicals. The measure was advanced by the Endocrine Society, the American Society for Reproductive Medicine and the American College of Obstetricians and Gynecologists.

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Americans are exposed to over 83,000 industrial chemicals as part of modern civilization. Virtually all pregnant women are walking chemical repositories. Tracking 163 chemicals, 99 percent of pregnant women tested positive for at least 43 different chemicals ([14](#)).

Other studies show that the average newborn enters the world on day one "pre-polluted," harboring hundreds of chemicals and heavy metals acquired during intrauterine life, and many of those undoubtedly reach the brain during critical windows of embryonic development. None of those chemicals enhance the natural process of brain maturation; many of them are known to be toxic to neurons and brain tissue.

With alarming, and still rising, rates of autism and behavioral disorders in the US, public health officials and politicians should be running around with their hair on fire determined to find out exactly what is happening and why, and most importantly how to stop it. But the current American aversion to holding powerful industries accountable for anything makes it virtually certain that regulatory agencies will continue to turn a blind eye to most, if not all, of the likely environmental triggers of autism. The tragic decline in America's collective intellectual prowess, and the chemical assault on our children's brains, are spiraling toward catastrophe.

Notes:

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