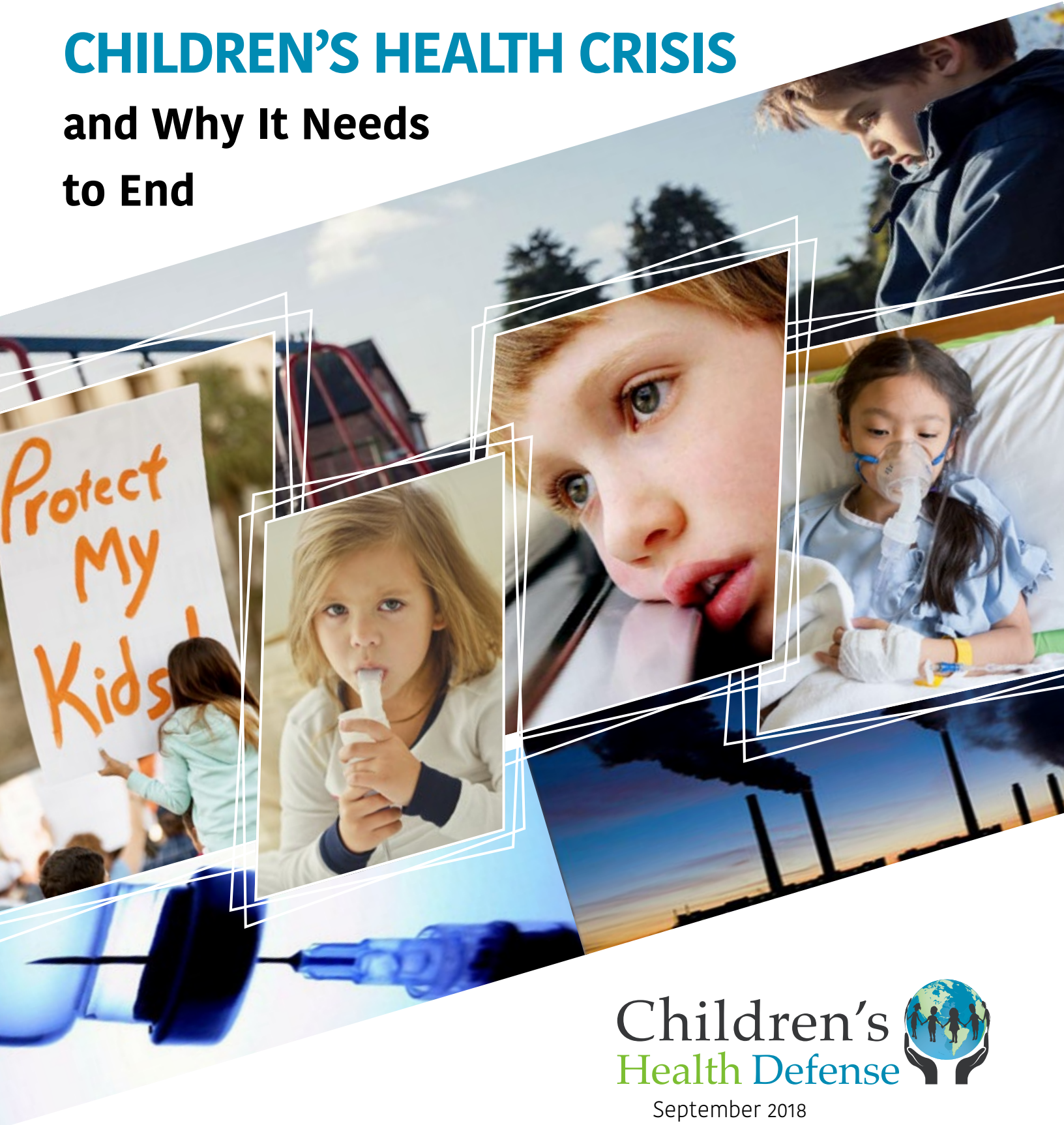


# GENERATION SICK:

The Facts Behind the  
**CHILDREN'S HEALTH CRISIS**  
and Why It Needs  
to End



Children's  
Health Defense



September 2018

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# EXECUTIVE SUMMARY

- ◆ American children have never been sicker. Over half (54%) are suffering from one or more chronic illnesses, with the late 1980s and early 1990s viewed as the gateway period that launched the decline.
- ◆ Many chronic illnesses have doubled since that time. The “4-A” disorders—autism, attention deficit hyperactivity disorder, asthma and allergies—have experienced meteoric growth, affecting children’s quality of life and contributing to premature mortality. The spike in autism prevalence has been particularly dramatic, with prevalence as high as 3% (one in 34 children) in some regions. Pediatric autoimmune conditions also are on the rise.
- ◆ U.S. children are far more likely to die before their first birthday than infants in other wealthy countries and life expectancy is falling, driven largely by rising death rates in adolescents and younger adults. Suicide is the second leading cause of death in teens, half of whom are reported to have at least one mental, emotional or behavioral disorder.
- ◆ The proportion of public school children using special education services is skyrocketing, with estimates ranging from 13% to 25% of school populations.
- ◆ Health authorities are incapable of explaining the reason for these dramatic shifts. Mounting evidence indicates that environmental toxins are the principal culprits.
- ◆ Children are exposed to many neuro- and immunotoxins that interact synergistically to damage their health. These toxins include heavy metals; pesticides and herbicides such as glyphosate; fluoride; bisphenol A; air pollutants; per- and polyfluoroalkyl substances; phthalates; flame retardants; acetaminophen; food additives; and aspartame.
- ◆ Tellingly, children’s health began worsening at precisely the same time that the U.S. started expanding the types and total number of vaccines required for school attendance.
- ◆ Studies have linked vaccines and toxic vaccine ingredients to a wide range of adverse health outcomes, including neurodevelopmental disorders, allergies, seizures and many others. Time trend analyses show strong correlations between autism and total number of vaccines by 18 months as well as exposure to aluminum vaccine adjuvants.
- ◆ Vaccines administered during pregnancy can induce an inflammatory response in the mother that can cross the placenta and potentially harm the fetal brain.
- ◆ The social and economic fallout from these health challenges is hitting home hard—with adverse impacts on intelligence, fertility, household and government finances, employment, productivity, military recruitment and more. The disproportionately high level of neurodevelopmental disability in males versus females is also reshaping society.
- ◆ Mystifyingly, there is almost no outcry in medical, public health or government circles to find answers and solutions.



There is no crisis that more urgently requires attention than the heavy burden of chronic illnesses affecting over half of our nation’s children. Robert F. Kennedy, Jr. has launched Children’s Health Defense to address this crisis.



## INTRODUCTION

**A**merican children are suffocating under an avalanche of chronic ailments, developmental disabilities and mental health challenges.<sup>1</sup> For several decades, American children have displayed poorer health outcomes than children in other wealthy nations, notwithstanding substantially higher per capita health care spending on children in the U.S.<sup>2</sup> This chronic illness burden is serious and historically unprecedented.

In a 2004 report, the National Research Council and Institute of Medicine called attention to the rising tide of ill health in American children and its long-term implications, warning that “the nation cannot thrive if it has large numbers of unhealthy adults.”<sup>3</sup> Ten years later, in *Lancet Neurology*, pediatric experts lamented the pandemic of neurodevelopmental toxicity in chil-

dren that is “silently eroding intelligence, disrupting behaviors, truncating future achievements and damaging societies.”<sup>4</sup> Despite these and other admonitions, U.S. agencies and officials have paid little meaningful attention to the children’s health crisis.

Environmental toxins are key contributors to the “new morbidities of childhood.”<sup>5</sup> Published peer-reviewed science takes note, in particular, of the major changes made to the childhood vaccine schedule beginning in the late 1980s and the persistent presence of proven neurotoxins in vaccines. If the current disastrous state of affairs continues unchecked and nothing is done to protect children from increasingly pervasive toxins, the consequences—for individuals, families, communities and the country as a whole—will reverberate for decades to come.



# GENERATION SICK

A staggering array of neurodevelopmental conditions, autoimmune illnesses, atopic disorders and mental health problems affects children in the U.S., often from birth. In many instances, multiple conditions overlap,<sup>6</sup> or one condition increases the risk for subsequent disorders.<sup>7</sup> In 2011, a widely cited survey provided a revealing snapshot of American children's suboptimal health status. The study found that over two-fifths (43%) of children had at least one of 20 chronic health conditions, and this proportion rose to over half (54%) of children when the investigators added obesity and developmental and behavioral risks to their analyses.<sup>8</sup> The numerous health conditions assessed by the researchers ranged from learning disabilities to diabetes to depression.

Another national study, published in the *Journal of the American Medical Association (JAMA)* in 2010, zeroed in on the deterioration in children's health over time. From 1988 to 2006, there was a doubling of the prevalence of four

types of chronic conditions (obesity, asthma, behavior/learning problems and "other" physical conditions), which rose from 12.8% to 26.6% of American children and youth.<sup>9</sup>

## Autism Spectrum Disorders

Four diagnoses, sometimes called the "4-A" disorders,<sup>10</sup> are among the most prevalent in their impact on children's quality of life: autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), asthma and allergies. The spike in autism prevalence has been particularly dramatic,<sup>11,12</sup> as indicated by national special education data<sup>13</sup> from the 1980s and 1990s and regional surveillance data<sup>14</sup> collected by the Centers for Disease Control and Prevention (CDC) starting in 2000 (see "Autism Prevalence in Children Over Time"). The most current CDC figure—one in 59 young people—pertains to children born in 2006.<sup>15</sup> However, more recent federal data for 3- to 17-year-olds have identified autism in one in 45 children, as of 2014, and one in 36 in 2016—a 23% increase in two years.<sup>16</sup>



## Autism Prevalence in Children Over Time

- ◆ **1992: 1 in 2,850**  
(10-year-olds born in 1982, special education data)
- ◆ **2000: 1 in 550**  
(10-year-olds born in 1990, special education data)
- ◆ **2008: 1 in 88**  
(8-year-olds born in 2000, CDC surveillance data)
- ◆ **2014: 1 in 59**  
(8-year-olds born in 2006, CDC surveillance data)

Multiple comorbidities frequently worsen the impact of ASD. Epilepsy, for example, is present in at least one-fifth of children with autism.<sup>17</sup> Up to 50% of ASD children engage in self-injurious behaviors, which are associated with “poorer cognitive and adaptive outcomes.”<sup>18</sup>

Dr. Walter Zahorodny of Rutgers Medical School runs the CDC’s autism and developmental disabilities monitoring program in New Jersey, which is not only the nation’s longest-running and most comprehensive autism surveillance site but also the state reporting the highest autism prevalence as of 2014—one in 34 eight-year-olds (3%) and one in 22 boys (4.5%).<sup>19</sup> Following the release of the CDC’s most recent ASD estimates in May 2018,<sup>20</sup> Dr. Zahorodny declared autism an “urgent public health concern,” citing “a true increase of approximately 150% to 200% in the period since 2000.”<sup>21</sup> Zahorodny also suggested that New Jersey’s higher autism rate not only may represent a more accurate picture of what is going on in the metropolitan U.S. as a whole—due to variations in how thoroughly other states conduct surveillance<sup>22</sup>—but that New Jersey itself may still be underestimating autism.<sup>23</sup>

### Attention Deficit Hyperactivity Disorder

Like autism, diagnoses of ADHD are on the rise.<sup>24</sup> In fact, some researchers view ASD and ADHD as “different manifestations of one overarching disorder,”<sup>25</sup> and the revised criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) allow for a joint ADHD-ASD diagnosis.<sup>26</sup> A population-based study published in 2015, which meticulously gathered reports from both teachers and parents, suggested that ADHD might affect up to 16% of elementary-school children (roughly one in six),<sup>27</sup> which is three

*“This is a very significant change with[in] a relatively small period of time. . . It’s very concerning, very alarming, very disappointing, very important to take into account and to acknowledge. . . These estimates are not at all due to [a] changing definition of autism, . . . so zero is due to shifting autism diagnosis.*

*. . . The increase in autism prevalence is pushed quite significantly by children with significant levels of impairment and with co-occurring cognitive impairments, so it’s not just slightly affected children that are making the estimates percolate upward. Autism is increasing across the board. . . It is important to acknowledge what’s true.”*

—Dr. Walter Zahorodny, Director  
Autism and Developmental Disabilities Monitoring (ADDM) Network, New Jersey

times higher than the estimated ADHD prevalence (5%) cited in the DSM-5.<sup>28</sup> According to the CDC, ADHD diagnoses rose by 42% in less than a decade (2003–2011) for children and adolescents ages 4-17, translating into an average annual increase of 5%.<sup>29</sup> Almost two-thirds (64%) of children and teens diagnosed with ADHD “had at least one other mental, emotional or behavioral disorder,” including behavior or conduct problems, anxiety, depression, ASD and/or Tourette syndrome.<sup>30</sup> Adults diagnosed with ADHD in childhood have been shown to be more susceptible to drug dependence than peers without a history of ADHD.<sup>31</sup>

### Asthma

Asthma morbidity in the U.S. is at an all-time high, as suggested by a nationally representative study of kindergarten-age children born in 2001: nearly one in five kindergartners (18%) had asthma, while 7% had been either hospitalized or taken to an emergency room for asthma-related reasons.<sup>32</sup> The CDC’s somewhat lower estimate suggests that one in ten children have asthma, but the agency’s figures are much higher for some subgroups, such as non-Hispanic black children (17%).<sup>33</sup> Researchers have posited that the growing prevalence of asthma may be an indicator of “increased population risk for the development of other



**...nearly one in five kindergartners (18%) had asthma, while 7% had been either hospitalized or taken to an emergency room for asthma-related reasons.**

chronic non-communicable autoimmune diseases.”<sup>34</sup> They also note that adverse environmental exposures during fetal and early infant life can set the stage for asthma later on.<sup>35</sup>

## Allergies

Allergies have become one of the most common conditions affecting children in the U.S., increasing by an estimated 50% from 1997 to 2011.<sup>36</sup> About one in 13 American children (approximately two per classroom) has at least one food allergy, and two-fifths of those with food allergies (39%) have a history of severe reactions.<sup>37</sup> Food-allergy-related ambulatory care visits and hospitalizations tripled from 1993 to 2006.<sup>38</sup> For the decade from 2007 to 2016, a nationwide analysis of billions of privately billed health care claims found that claims for diagnosed anaphylactic food reactions rose 377%.<sup>39</sup> Anaphylactic outcomes are worse when other conditions such as asthma or other allergies also are present.<sup>40</sup> Peanuts appear to be the top anaphylaxis-causing food (see “Peanut Allergies”).<sup>41</sup>

## Other Chronic Conditions

Many other chronic conditions are beleaguering America’s children, including autoimmune diseases such as diabetes and various forms of juvenile arthritis.<sup>42</sup> For example, the prevalence of type 1 diabetes in youth (age 19 or younger) increased by 21% from 2001 to 2009, according to a study in *JAMA*, which also reported a 31% increased prevalence of type 2 diabetes in 10- to 19-year-olds over the same time frame.<sup>43</sup> A study of type 1 diabetes incidence (new cases) in both children and adults from 2001 to 2015 found that incidence increased by 1.9% per year in youth (0-19 years) while actually falling by 1.3% in adults; the incidence rate was greatest in the 10- to 14-year age group.<sup>44</sup> The authors concluded that “the increase in incidence

rates in youth, but not adults, suggests that the precipitating factors of youth-onset disease may differ from those of adult-onset disease.”<sup>45</sup> Pediatric diabetes of both types increases the risk of cardiovascular and other complications.<sup>46</sup> In addition, diabetes often co-occurs with other autoimmune conditions—including celiac disease, Crohn’s disease, thyroid and adrenal disorders, rheumatoid arthritis, systemic lupus erythematosus (SLE) and the neuromuscular disease myasthenia gravis.<sup>47, 48, 49</sup>

Overweight and obesity are also significant problems for American children, even at the youngest ages. A study published in the *New England Journal of Medicine* that followed kindergartners for almost a decade (1998–2007) found that one-fifth (20.8%) were obese by eighth grade—up from 12.4% in kindergarten—and the separate category of “overweight” also rose over the nine-year period (from 14.9% to 17%).<sup>50</sup> The study’s results highlighted the long-term risks of early-onset weight gain: children who started kindergarten overweight were four times more likely to become obese by eighth grade as normal-weight kindergartners. Further illustrating the health risks of obesity, CDC researchers have reported that adolescents with either obesity or a developmental disorder have “higher prevalences of common respiratory, gastrointestinal, dermatological and neurological conditions/symptoms” compared to non-obese teens without developmental disabilities—and obesity rates are elevated among adolescents with developmental disabilities, especially autism.<sup>51</sup>

## Mortality and Sudden Infant Death Syndrome

In addition to prompting serious morbidity, many chronic conditions—including diabetes,<sup>52</sup> obesity,<sup>53</sup> epilepsy,<sup>54</sup> autism<sup>55</sup> and more—are contributing



### Peanut Allergies

An Indiana University study of children with peanut allergy found the following:

- ▶ The median age of peanut allergy onset was 12 months.
- ▶ Over a third (35%) of the children experienced anaphylaxis upon their very first peanut exposure.
- ▶ Over one-fourth (28%) had more severe reactions the second time they were exposed to peanuts.
- ▶ From 40% to 60% of peanut-allergic children also had asthma, atopic dermatitis and/or other food allergies.

SOURCE: Leickly FE, Kloepfer KM, Slaven JE, Vitalpur G. Peanut allergy: an epidemiologic analysis of a large database. *J Pediatr* 2018;192:223-228.e1.

to premature mortality. A letter published in the *British Medical Journal* (BMJ) suggested that those with ASD “die 16 years sooner on average than they otherwise would,” with epilepsy representing a major aggravating factor, “especially in those whose autism is severe.”<sup>56</sup> Data from California confirm a “higher than expected rate of mortality in individuals with autism and epilepsy than autism alone.”<sup>57</sup>

The other 4-A disorders, too, are linked to increased mortality rates. ADHD’s association with premature mortality is particularly pronounced in the presence of other behavioral diagnoses such as oppositional defiant disorder, conduct disorders and substance use disorders but also simply resulting from accidents<sup>58</sup> and “unnatural” causes.<sup>59</sup> For example, adolescents and young adults diagnosed with ADHD have a greater risk of motor vehicle crashes.<sup>60</sup> Where asthma is concerned, asthma-related mortality declined in the U.S. for several decades but began exhibiting “a substantial, progressive increase” around the 1990s, a trend that “stands in contrast to those in most other western countries.”<sup>61</sup> As for anaphylaxis, an estimated 1% of hospitalizations for anaphylaxis are fatal, and “the unpredictable possibility of fatal anaphylaxis can lead to significant anxiety and restriction of daily activities.”<sup>62</sup>

U.S. infant and child mortality rates compare unfavorably to other wealthy nations: “By the 1990s and into the 2000s, the U.S. ranked lowest of...twenty nations in terms of child mortality rates.”<sup>63</sup> Stated another way, U.S.-born children are 76% more likely to die before their first birthday than infants in the other wealthy countries.<sup>64</sup> For children who survive infancy, overall life expectancy is declining, with Americans “dying at a faster rate and...

dying younger”<sup>65</sup> and life expectancy ranked near the bottom compared to 18 other developed nations.<sup>66</sup> From 2015 to 2016, increased death rates in the younger age groups—15–24 (7.8%), 25–34 (10.5%) and 35–44 (6.7%)—were key drivers of the drop in life expectancy.<sup>67</sup> A 2016 study in JAMA that examined cause-specific U.S. mortality rates since 1980 found that neurological disorders were the third leading cause of death as of 2014.<sup>68</sup>

Sudden infant death syndrome (SIDS) is the leading cause of post-neonatal infant mortality in the U.S.<sup>69</sup> By definition,<sup>70</sup> SIDS describes death that occurs in a “seemingly normal, healthy infant under one year of age” that is both unexpected and unexplainable—although there is mounting evidence that SIDS may be “medically induced through vaccination”<sup>71</sup> (see section on “Environmental Triggers”). Illustrating somewhat circular logic, the CDC places SIDS under the broader umbrella of “sudden unexpected infant deaths” (SUID) and considers SIDS to represent just one type of SUID, with the two other SUID categories being deaths from “unknown causes” and “accidental suffocation and strangulation in bed” (ASSB).<sup>72</sup> The agency reported falling SIDS rates in the 1990s (and stationary rates since then), but a 2006 analysis by some of the CDC’s own researchers found that most of the apparent decline was an artifact of changes in cause-of-death classification in favor of “cause unknown/unspecified” and ASSB.<sup>73</sup> Other SIDS reporting anomalies,<sup>74</sup> the inadequacies of death certificates as a source of complete information<sup>75</sup> and the “complicated” and “convoluted” process involved in creating and registering causes of death for public records<sup>76</sup> all suggest that SIDS deaths may be considerably underreported.



**U.S.-born children are 76% more likely to die before their first birthday than infants in other wealthy countries.**





# MENTAL HEALTH

The proliferation of mental health diagnoses in young people overlaps considerably with trends in diagnosed [neurodevelopmental disorders](#).<sup>77</sup> In fact, psychiatry combines many conditions under the [broad rubric](#) of “mental, emotional and behavioral” (MEB) disorders (see “Mental, Emotional and Behavioral Disorders Diagnosed in Children and Adolescents”).<sup>78</sup> Mental health problems also frequently intersect with physical conditions such as [asthma, diabetes and epilepsy](#), which are more often present in children with mental disorders than in children without such disorders.<sup>79</sup> Pediatric [hospital admissions](#) for non-behavioral disorders result in higher costs and longer stays when they are comorbid with behavioral disorders.<sup>80</sup>

One of the few large-scale surveys to focus on MEB disorders specifically in childhood (rather than adulthood) was the [National Comorbidity Survey-Adolescent Supplement \(NCS-A\)](#), conducted from 2001 to 2004. The NCS-A found that half of U.S. youth (ages 13-18) had been diagnosed with

at least one MEB disorder—including one in five with behavior disorders and three in ten with anxiety disorders—with the impairments rated as “severe” in roughly one-fourth of the affected teens.<sup>81</sup> For many of the young people, onset and diagnosis occurred well before adolescence. Reviewing the evidence, the National Research Council and Institute of Medicine reported in 2009 that “early MEB disorders should be considered [as commonplace as a fractured limb](#): not inevitable but not at all unusual.”<sup>82</sup>

## Medicated Youth

In 2010, [mood disorders](#) (which include both bipolar and depressive disorders) were the most frequent principal diagnosis given to hospitalized children ages 1-17—up 80% since 1997.<sup>83</sup> The change from 1997 to 2010 largely was driven by a [fourfold increase in the hospitalization rate](#) for bipolar disorders, especially in the 10-14 and 15-17 age groups.<sup>84</sup>

Among youth with bipolar disorder, researchers have described [comorbid](#)

## Mental, Emotional and Behavioral Disorders Diagnosed in Children and Adolescents

- ◆ Anxiety disorder
- ◆ Attention deficit hyperactivity disorder
- ◆ Autism spectrum disorder
- ◆ Bipolar disorder
- ◆ Conduct disorder
- ◆ Depression
- ◆ Disruptive behavior disorder
- ◆ Drug abuse/dependence
- ◆ Eating disorder
- ◆ Obsessive-compulsive disorder
- ◆ Oppositional defiant disorder
- ◆ Pervasive developmental disorder
- ◆ Posttraumatic stress disorder
- ◆ Schizophrenia

ADHD as “nearly universal,”<sup>85</sup> and ADHD and anxiety disorders are in fact coming to be viewed as common precursors of bipolar disorder.<sup>86</sup> The trend toward increased diagnosis of both ADHD and bipolar disorder has prompted increased use by young people of inpatient and outpatient mental health services<sup>87</sup> as well as an “exponential” increase in the prescribing of medication.<sup>88</sup> Nationally, a survey of children with special health care needs conducted in 2009–2010 found that 74% of ADHD-diagnosed children ages 4–17 had received medication treatment in the past week.<sup>89</sup> For both ADHD and bipolar disorder, pharmacologic treatment relies heavily on powerful psychostimulants, antipsychotics and mood stabilizers. Reporting on data collected in 2011–2012, researchers noted that a large proportion (44%) of very young children diagnosed with ADHD (2- to 5-year-olds) were taking medication, most commonly central nervous system stimulants.<sup>90</sup>

Some researchers question whether widespread administration of mind-altering psychostimulants to young children is either safe or “meaningfully beneficial.”<sup>91</sup> Many of the drugs so freely prescribed carry risks that include the potential to actually worsen mania, foster addiction or lead to further medication.<sup>92, 93</sup> In the push for increased treatment, clinicians have largely ignored these risks. Moreover, special education funding policies have created financial incentives in some states to actively identify and medicate children with ADHD. In those

*“The long-term effects of those [ADHD] drugs on a young brain and body have not been well studied, and the side effects can be numerous, including poor appetite, sleeplessness, irritability and slowed growth.”*

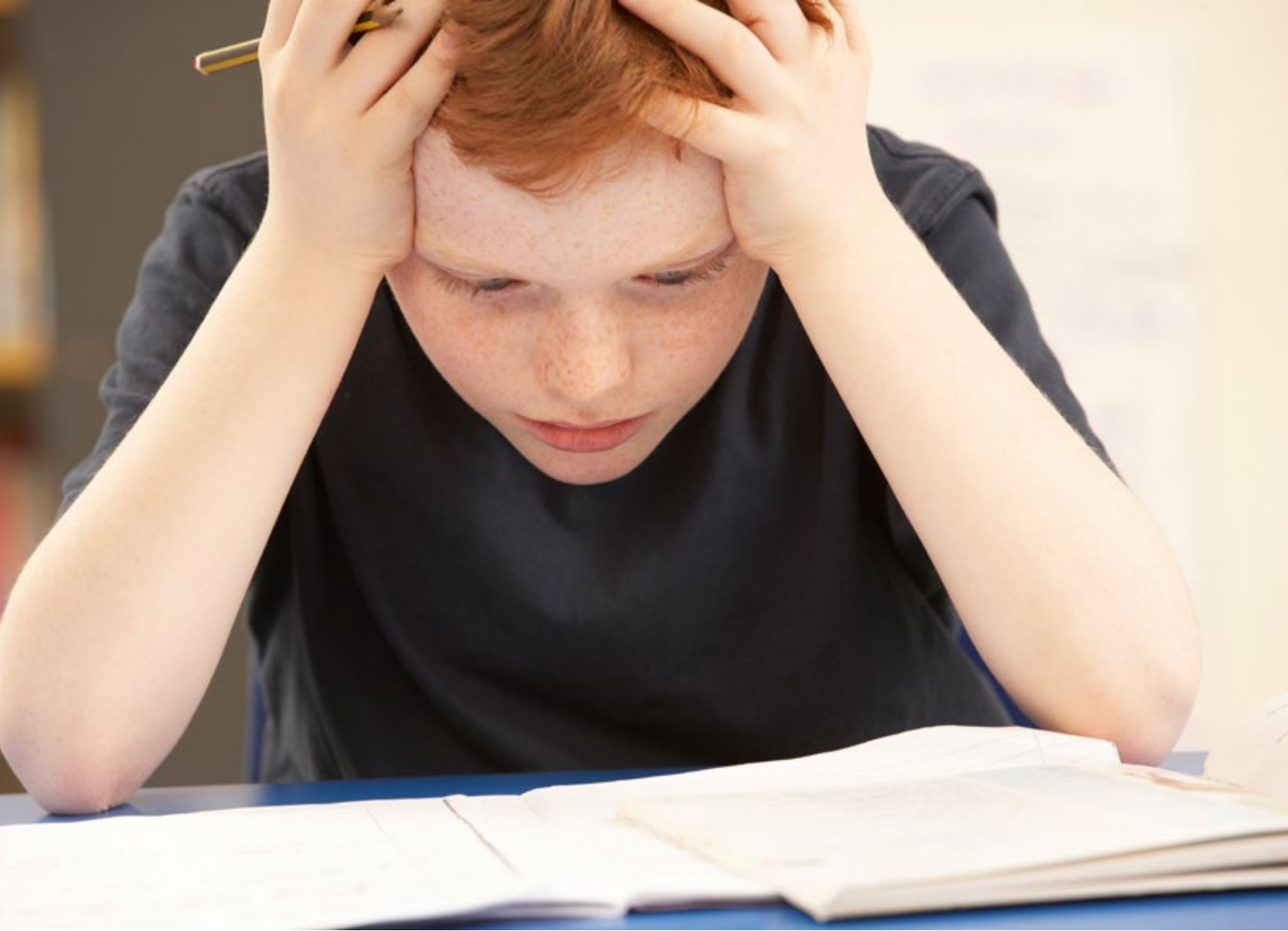
*The Washington Post, “CDC warns that Americans may be overmedicating youngest children with ADHD,” May 3, 2016.*

states, children are “about 15 percent more likely to report having ADHD and...about 22 percent more likely to be taking medication for ADHD,”<sup>94</sup> illustrating a medical ethicist’s comments about the “muddier” aspects of psychiatric diagnosis and the variability “as regards who and what drive [diagnostic] practices.”<sup>95</sup>

Another class of drugs, the selective serotonin reuptake inhibitors (SSRIs) commonly prescribed for depression and anxiety disorders, have raised persistent concerns about their potential to promote suicidality, aggression or other unwanted outcomes in children and adolescents.<sup>96</sup> In 2016, the Nordic Cochrane Centre systematically reviewed clinical study reports from 70 trials of SSRIs and similar drugs and described substantial under-reporting of harms.<sup>97</sup> Even with the under-reporting, the reviewed evidence linked the drugs to a doubling in the risk of suicidality and aggression in children and adolescents. In the U.S., suicide is now the second leading cause of death for teens and young adults (ages 10 to 35).<sup>98</sup> Teenage hospitalizations for contemplating or attempting suicide roughly doubled from 2008 to 2015.<sup>99</sup>



**Suicide is now the second leading cause of death for teens and young adults.**



# SPECIAL EDUCATION

**W**ith developmental disabilities affecting at least one in six U.S. children,<sup>100</sup> the National Center for Education Statistics conservatively reports that about 13% of public school students receive special education services for disabilities or impairments (see “Special Education Services”).<sup>101</sup> However, media reports from small towns and large cities all over the country suggest that use of special education services in some school districts is far higher—involving upwards of 20% of students in many localities.<sup>102, 103</sup> Whereas about 4.1 million U.S. children received special education services under the In-

dividuals with Disabilities Education Act (IDEA) in the early 1980s, about 6.7 million were receiving services by 2004—a 63% increase in the number of children served<sup>104</sup> despite a relatively stable school-age population.<sup>105</sup>

## Changing Schools

The school experience is changing for both students and educators. Recently published literature illustrates researchers’ increasing preoccupation with developmental coordination disorders,<sup>106</sup> problem behaviors,<sup>107</sup> social skills,<sup>108</sup> nonverbal communication aids,<sup>109</sup> classroom policies for inclusion<sup>110</sup> and special education

According to the federal government, 13% of public school students (ages 3-21) received special education services in 2015-16:

- ◆ Specific learning disabilities (34% of special ed. students)
- ◆ Speech/language impairments (20%)
- ◆ Other health impaired (14%)
- ◆ Autism (9%)
- ◆ Developmental delays (6%)
- ◆ Intellectual disabilities (6%)
- ◆ Emotional disturbances (5%)
- ◆ Multiple disabilities (2%)
- ◆ Hearing/orthopedic impairments (2%)

workforce training.<sup>111</sup> Tactics such as restraint, seclusion and “calming” or “recovery” rooms also have made their way into educators’ toolkit;<sup>112</sup> in one rural state, schools’ use of seclusion and restraint for students experiencing “violent outbursts” nearly doubled over five years (2013–2018), amounting to 27 instances per school day.<sup>113</sup> Schools’ overreliance on so-called “recovery” rooms has attracted controversy in a number of settings.<sup>114</sup>



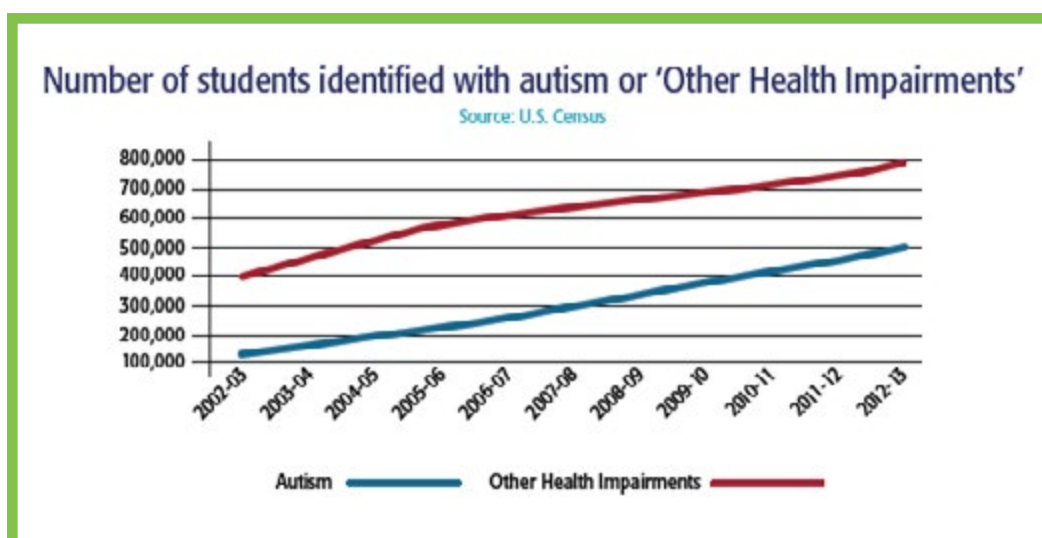
A further marker of the challenges that school systems, educators and families are facing is the shifting profile of special education recipients away from primarily physical conditions toward conditions that are developmental, emotional and/or behavioral.<sup>115</sup> From 2005 to 2015, the number of children (ages 6-21) in the “specific learning disabilities” category fell (this category includes, for example, dyslexia), but the number of children classified as having autism or “other health impairments” rose sharply—165% for autism and 51% for other health impairments.<sup>116</sup> The latter is a catch-all grouping that includes physical conditions such as epilepsy and mobility impairments and diagnoses such as ADHD and bipolar disorder.

### Soaring Special Education Budgets

The growing demand for more intensive special education services is having crippling spillover effects on municipal and school system budgets,<sup>118</sup> households<sup>119</sup> and, ultimately, taxpayers. On average, students who receive special education services cost schools more than double what students who do not receive special services cost.<sup>120</sup>

In the 1999-2000 school year, the U.S. spent a total of \$50 billion on special education.<sup>121</sup> Almost two decades later, however, there is a conspicuous lack of information about the financial bottom line for special education. As the Education Commission of the States

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puts it, “spending patterns may have changed dramatically [since 2000], but there is no way of knowing without the proper data.”<sup>122</sup>

At the state level, many states are grappling with the difficulty of financing the upward spiral of special education needs.<sup>123</sup> In Michigan, as one example, total special education expenditures reported by school districts in fiscal year 2010 were 60%

higher than in fiscal year 2000 due to the “steady increase in enrollment”; over that time period, inflation-adjusted per-pupil spending rose by 17% for special education students versus a 1.4% rise in overall K-12 spending.<sup>124</sup> Much of the increase was dedicated to more “special education aides in the classroom, the rising number of specialists, and the costs of diagnostic and professional support services.”<sup>125</sup>

*“What we’re seeing is that about half of that population [of students with autism] are kids with pretty severe disabilities, major behavior issues, medical issues; they’re probably some of the most complicated issues that school divisions face. The costs associated with educating kids with disabilities has significantly increased.”<sup>117</sup>*

—John Eisenberg, president, National Association of State Directors of Special Education



# ENVIRONMENTAL TRIGGERS: OBVIOUS CULPRITS

**S**tudy after study points to the late 1980s and early 1990s as the gateway time period when the decline in American children’s health began—a decline so precipitous that genetics cannot explain it. Instead, the growing scientific consensus is that environmental toxins are cueing epigenetic changes—*de novo* genetic changes that “spontaneously arise within the child and are not present in the parents’ genes.”<sup>126</sup> By controlling which genes switch on and off, these epigenetic mechanisms regulate initiation of and susceptibility to the chronic non-communicable diseases that are now so prevalent.<sup>127</sup> Discussing the disappointing results of genetics research “despite high expectations and high costs,” one group of researchers proposes finding answers to “elusive” chronic ailments such as allergies and asthma by exploring the strong link between epigenetic mechanisms, environmental stimuli and developmental processes.<sup>128</sup>

## The Ballooning Vaccine Schedule

Clearly, many chemicals have toxic properties capable of prompting epigenetic changes,<sup>129</sup> but the sudden jump in childhood illnesses that began three decades ago—at precisely the same time that the CDC started expanding the types and total number of vaccines required for school atten-

## Synergistic Neurotoxicity

Toxicologists know that exposure to multiple metals is far more neurotoxic than exposure to a single metal, in particular during early life. Retired University of Kentucky chemistry professor Boyd Haley noted years ago that multiple exposures are *not additive but synergistic*. Government regulators also are well aware of these facts. The agencies in charge of protecting human health use “lethal dose” (LD) estimates from studies in mice or rats to characterize the toxicity of a given substance or combination of substances. An LD of “1” (LD1) refers to the dose that would cause death in 1% of subjects (one in 100). A study conducted 40 years ago showed that an LD1 of mercury administered together with a fraction (0.05%) of the LD1 of lead killed not 2% but 100% of the animals!

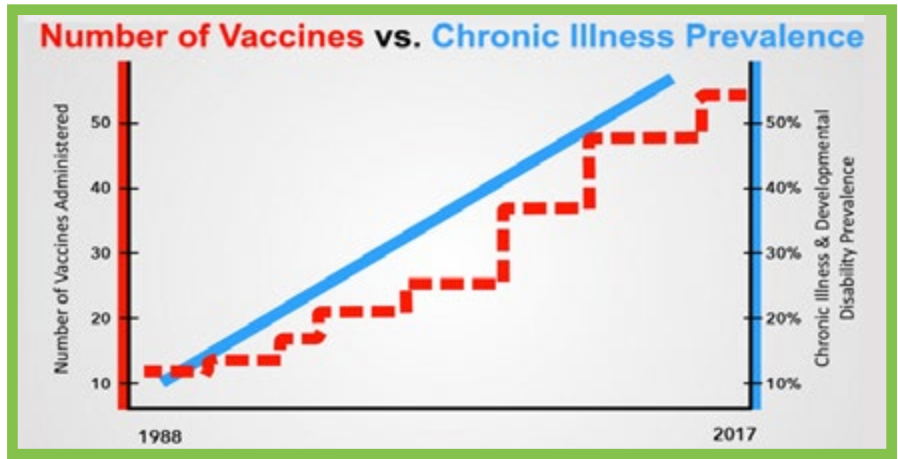
SOURCES: Haley BE. Report on mercury toxicity from dental amalgams and thimerosal. Presented to Congressional Hearing, May 8, 2003. Schubert J, Riley EJ, Tyler SA. Combined effects in toxicology—a rapid systematic testing procedure: cadmium, mercury, and lead. *J Toxicol Environ Health* 1978;4(5-6):763-776.

dance—is a major clue that cannot be dismissed or ignored. The stated aim of vaccination is to stimulate an immune response, but in doing so, vaccines bypass the body’s normal defenses and introduce a range of potentially troublesome ingredients (disclosed substances as well as contaminants): neurotoxic heavy metals such as aluminum and mercury (in the form of the preservative [thimerosal](#)<sup>130</sup>); carcinogenic [formaldehyde](#); <sup>131</sup> [gene DNA fragments](#); <sup>132</sup> [carrier proteins](#); <sup>133</sup> [pathogenic retroviruses](#); <sup>134</sup> [metallic micro- and nanoparticles](#); <sup>135</sup> the herbicide [glyphosate](#); <sup>136</sup> antibiotics such as [neomycin](#); <sup>137</sup> [squalene nanoemulsions](#); <sup>138</sup> and more. There is also growing evidence that when combined, some of these ingredients have [synergistic effects](#) that result in [exponentially greater toxicity](#).<sup>139, 140</sup>

In the [1970s and 1980s](#), American children typically received three types of vaccines.<sup>141</sup> By [2017](#), they received (beginning prenatally and continuing on the day of birth and up to age 18) up to 56 doses of injected or oral vaccine for 16 diseases, representing exposure to as many as 232 different antigens.<sup>142</sup> Moreover, whereas only about [half of American two-year-olds](#) in the late 1980s had completed their recommended series of vaccines,<sup>143</sup> a decade later, about [nine in ten](#) 19- to 35-month-olds were receiving all or most recommended vaccines.<sup>144</sup>

### Thimerosal

Many of the vaccines added to the childhood schedule beginning around 1989 contained thimerosal (see “Hepatitis B Vaccination”). In vitro and animal studies consistently have shown that even low doses of thimerosal are active against brain cells and that thimerosal’s [toxic effects are cumulative](#).<sup>145</sup> By 1999, when the expanded vaccine schedule called for children to receive 19 vaccine injections by



age two, [11 contained thimerosal](#).<sup>146</sup> Children born in the 1990s could be injected with up to [237.5 micrograms of mercury](#) by their second birthday and over 60 micrograms at a single doctor’s visit.<sup>147</sup>

In 1999, in response to pressure from Congress and the public, the U.S. Public Health Service and the American Academy of Pediatrics called for the [phase-out of thimerosal-containing vaccines](#).<sup>148</sup> Although these entities continued to characterize thimerosal’s risks as trivial, [numerous peer-reviewed clinical and epidemiologic studies](#)<sup>149</sup> published since 2000 support a role for thimerosal in contributing to [ASD](#)<sup>150</sup> and [other neurodevelopmental disorders](#).<sup>151</sup> When the government and vaccine manufacturers initiated the [reduction of thimerosal-containing vaccines in 2001](#),<sup>152</sup> the “phase-out” was both gradual and partial because regulators allowed unexpired thimerosal-containing vaccines to remain on doctors’ shelves [until 2003](#) and simultaneously launched new recommendations for thimerosal-containing influenza vaccines.<sup>153</sup> To this day, many influenza vaccine formulations contain [25 micrograms](#) of thimerosal per flu shot.<sup>154</sup> In addition, [companies still use thimerosal](#) to impede bacterial growth during the manufacturing process for some vaccines.<sup>155</sup>

### Hepatitis B Vaccination

An epidemiologic study of 7- to 8-year-old boys born between 1994 and 2007 compared those who did and did not receive thimerosal-containing hepatitis B vaccines as infants. They found that the thimerosal group was at significantly higher risk (ninefold) of subsequently receiving special education services, representing excess educational costs to the U.S. of about \$180 billion.

SOURCE: Geier DA, Kern JK, Homme KG, Geier MR. A cross-sectional study of the association between infant hepatitis B vaccine exposure in boys and the risk of adverse effects as measured by receipt of special education services. *Int J Environ Res Public Health* 2018;15(1):pii:E123.

## Aluminum Adjuvants

Although the thimerosal content of vaccines fell somewhat by the mid-2000s, concurrent changes to the pediatric vaccine schedule dramatically increased children's exposure to aluminum adjuvants,<sup>156</sup> particularly for children who received all recommended vaccines in their earliest months. A joint Kaiser Permanente and CDC study published in 2015 showed that for fully vaccinated two-year-olds born after 2004, exposure to aluminum was 11% to 26% higher than for children "undervaccinated" before age two.<sup>157</sup> In 2014, a researcher who explored "the premise that the sharp increase in autism...logically must be driven by a corresponding increase either in a single environmental exposure or in the collective influence of multiple environmental exposures"<sup>158</sup> found that two vaccine-related indices—cumulative total number of vaccines by 18 months and cumulative aluminum adjuvant exposure—had time trends that closely matched the rise in autism. (Two of ten other environmental toxicants examined—glyphosate and flame retardants—also were temporally associated with autism.)

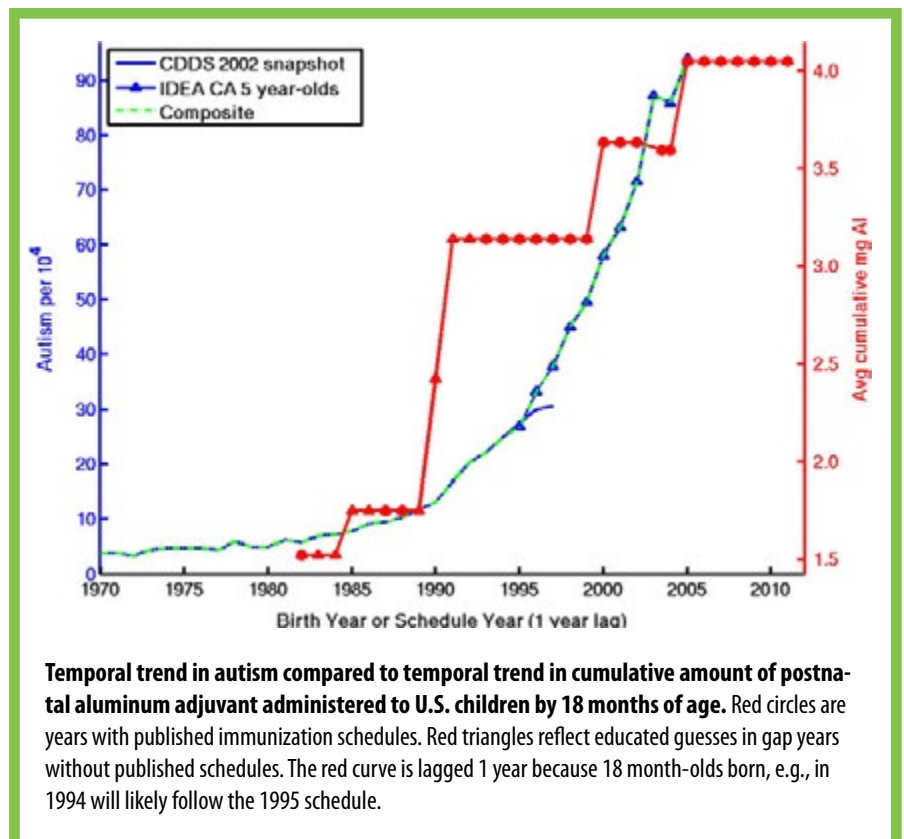
Other researchers concur that aluminum-based vaccine adjuvants are an important contributor to ASD<sup>159</sup> and other neuropathological conditions.<sup>160</sup> In fact, the aluminum particles in the adjuvants have "migratory capabilities" that allow them to travel to "sites distant to the injection site," including the brain.<sup>161</sup> A first-ever study of aluminum in ASD brain tissue documented "some of the highest values for brain aluminum content ever measured in healthy or diseased tissues."<sup>162</sup> In 2017, one of the authors of the brain tissue study (from the United Kingdom), along with two other leading scientists in the field of aluminum adjuvant toxicity (from Canada and France, respectively), submitted formal letters to

*"The safety of aluminum adjuvants in vaccines has not been properly studied in humans even though... a baby may be injected with up to 3,675 micrograms of aluminum adjuvant by six months of age. ... The CDC's claim on its website that 'Vaccines Do Not Cause Autism' is wholly unsupported."*

Christopher A. Shaw, PhD, Professor, University of British Columbia

all the major public health agencies in the U.S. to call attention to the strong evidence that aluminum adjuvants disrupt developmental processes. All three scientists concluded that "more research on the role of aluminum adjuvant in vaccines and neurological disorders, including ASD, is essential and urgently required."<sup>163</sup>

Aluminum-containing vaccines also have been linked to the epidemic of childhood food allergies. In 2016, University of Virginia researchers noted that "The era of food allergy began with the post-millennial generation, the same faction who received new immunizations during early childhood.



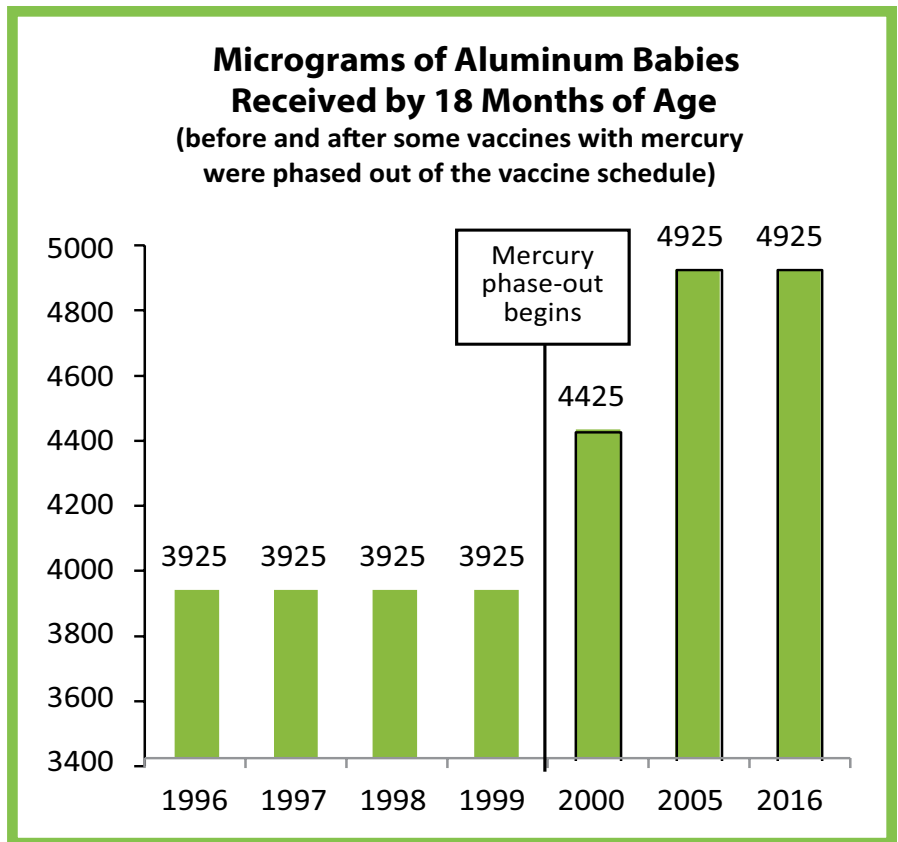


Many of these vaccines contain alum, an adjuvant known to induce allergic phenotypes.<sup>164</sup> Back in 2000, a study conducted by public health researchers at the University of California-Los Angeles reported a substantially increased long-term risk of allergies and related respiratory symptoms in children or adolescents vaccinated with either diphtheria-tetanus-pertussis (DTP) vaccine or tetanus vaccine compared to unvaccinated children or adolescents. Noting the widespread coverage of these vaccines in U.S. children, the authors cautioned that “the number of allergies and allergy-related conditions attributable to DTP or tetanus vaccination in the United States may be very high.”<sup>165</sup> In 2008, Canadian researchers also confirmed an association between diphtheria-pertussis-tetanus (DPT) vaccination and asthma, noting the potential for asthma risk reduction through delayed administration of the first dose.<sup>166</sup>

Studies indicate that vaccination can trigger autoimmune disease as a result of reactions to aluminum adjuvants perhaps operating synergistically with other vaccine components such as antigens and preservatives (see “Autoimmune Disease and Vaccination”).<sup>167</sup> A case report on four previously healthy individuals (ages 14 to 48) documented a clear temporal relation between tetanus vaccination and the subsequent (and sometimes sudden) emergence of one or more autoimmune diseases, which appeared within three weeks to six months.<sup>168</sup> The review’s authors emphasized “the importance of vaccines and their adjuvants in the induction of autoimmune diseases,”<sup>169</sup> particularly since aluminum adjuvants can persist in the body for years.<sup>170</sup>

### Contaminants and the MMR Vaccine

A variety of adverse events have been documented in association with the measles-mumps-rubella (MMR) vac-



SOURCE: Miller NZ. Aluminum in childhood vaccines is unsafe. *Journal of American Physicians and Surgeons* 2016;21(4):109-117.

### Autoimmune Disease and Vaccination

According to a 2017 review article, studies have established a connection between autoimmune disease and vaccination for the following diseases and vaccines, at a minimum:

- ▶ **Guillain-Barré syndrome** after swine flu vaccination
- ▶ **Immune thrombocytopenia** after measles-mumps-rubella (MMR) vaccination
- ▶ **Reactive arthritis** after hepatitis B, rabies or tetanus toxoid (TTd) vaccination
- ▶ **Systemic lupus erythematosus (SLE)** and other autoimmune diseases after either hepatitis B virus (HBV) or human papillomavirus (HPV) vaccination.

In addition, the review authors’ own work documented the following temporal associations:

- ▶ **Anti-phospholipid syndrome** after Td vaccination
- ▶ **Dermatomyositis** after diphtheria-tetanus-acellular pertussis (DTaP) vaccination
- ▶ **SLE** after TTd vaccination
- ▶ **Type 1 diabetes** and **SLE** after DTaP vaccination

SOURCE: Ruhrman-Shahar N, Torres-Ruiz J, Rotman-Pikielny P, Levy Y. Autoimmune reaction after anti-tetanus vaccination—description of four cases and review of the literature. *Immunol Res* 2017;65:157-163.

cine, and researchers have linked some of them—including ASD—to contaminants in the vaccine, including glyphosate.<sup>171</sup> Dr. Stephanie Seneff of the Massachusetts Institute of Technology (MIT) has observed, for example, that the severity of MMR-related reactions has increased in tandem with greater use of glyphosate on U.S. crops; when the brain’s “immune system” develops vaccine-induced antibodies to molecules rendered abnormal by glyphosate contamination, the antibodies can become autoantibodies and trigger an autoimmune attack on the nerve fibers in the brain, causing symptoms of autism.<sup>172</sup> Another problem with the MMR vaccine, reported in 2015 in *Issues in Law and Medicine*, has to do with the vaccine’s manufacture using human fetal cell lines that leave “unacceptably high levels of fetal DNA fragment contaminants” in the vaccine, again playing a potentially causal role in ASD.<sup>173</sup>

Recent studies have suggested that African-Americans may be particularly susceptible to neurological disorders such as autism<sup>174</sup> and may have more severe forms of autism.<sup>175</sup> Information about a heightened risk of autism in African-American boys emerged in research conducted by the CDC in the early 2000s, but the agency chose not to mention the strong association in its 2004 article in *Pediatrics*.<sup>176</sup> Following subsequent whistleblower disclosure of the CDC fraud, an independent researcher reanalyzed the data and published a highly credible study showing that, for African-American boys, those who received the MMR vaccine prior to age three were 3.36 times more likely to receive an autism diagnosis than those who received the vaccine after age three. *Translational Neurodegeneration* published the reanalysis but later retracted the article in violation of scientific publishing norms.<sup>177</sup>

## Newer-Generation Vaccines

The hepatitis B vaccine was the first synthetic vaccine put into use. The vaccine is made through the use of recombinant DNA technology (gene splicing), which involves inserting selected hepatitis B genes into common baker’s yeast (called an “expression system”) and then using the yeast to produce vaccine antigens.<sup>178</sup> (Other types of recombinant vaccines rely on bacteria, mammalian cells or insect cells as expression systems.)

Yeast-based vaccines have been linked to a rise in autoimmunity due to the similarity between yeast components and certain human proteins.<sup>179</sup> In 2016, Chinese researchers published the results of an animal model experiment in mice that delved into the impact on the brain of a yeast-based hepatitis B vaccine manufactured by one of the country’s leading vaccine companies. Using “the same vaccine and a similar time schedule to those used for human infant vaccination,” the researchers reported that early hepatitis B vaccination induced “impairments in behavior and hippocampal neurogenesis,” supporting “the long-suspected potential association of [the vaccine] with certain neuropsychiatric disor-

The severity of MMR-related reactions has increased in tandem with greater use of glyphosate on U.S. crops.



ders such as [autism and multiple sclerosis](#).<sup>180</sup> Prior to that study, in 2013, the safety of the hepatitis B vaccine was called into question when reports surfaced of [Chinese infants dying](#) “within hours or even minutes” after receiving the vaccine.<sup>181</sup>

## Vaccines During Pregnancy

Changes to the vaccine schedule initiated in the mid-2000s extended the window of exposure to neurotoxic vaccine ingredients—particularly thimerosal and aluminum—to the prenatal period. The [CDC began strongly promoting influenza vaccines](#), some of which contain thimerosal, for pregnant women around 2006,<sup>182</sup> as well as [pushing annual flu shots](#) for all children over six months of age.<sup>183</sup> Accumulating research indicates that flu vaccines administered during pregnancy can induce an inflammatory response in the mother that can cross the placenta and potentially cause harm to the fetal brain during critical windows of neurodevelopment, including harm associated with autism. A 2011 study found an increase in two [inflammatory markers](#), C-reactive protein (CRP) and tumor necrosis factor-alpha (TNF- $\alpha$ ) in pregnant women given a seasonal flu vaccine.<sup>184</sup> Increases in these inflammatory compounds indicate a significant level of inflammation, which, in the study, was identified during the first two days following vaccination. There is good reason to be alarmed by these findings. A 2014 study of more than 1.2 million pregnant women found that elevations in CRP (the same marker of inflammation that increases after influenza vaccination) were associated with a [43% greater risk of having a child with autism](#).<sup>185</sup> A 2017 study in *JAMA Pediatrics* tied these two sets of results together, showing an [elevated risk of birth defects and autism in the offspring](#) of mothers who received influenza vaccines during pregnancy.<sup>186</sup>

Other [recent studies](#) have revealed an [increased risk of miscarriage](#) in association with influenza vaccination.<sup>187, 188</sup>

In 2011, [CDC additionally recommended](#) that all pregnant women get the aluminum-containing tetanus-diphtheria-acellular pertussis (Tdap) vaccine.<sup>189</sup> [Tdap coverage in pregnancy increased](#) substantially following the CDC’s 2011 recommendation, particularly in women who also received other vaccines during pregnancy.<sup>190</sup> [Researchers have issued warnings](#) about both the short-term and long-term risks of toxin-induced developmental disruption: “Many of these toxins have immediate and recognisable deleterious effects on the embryo, foetus or neonate, but a few are insidious and leave a legacy of health issues that may emerge in later life.”<sup>191</sup>

## SIDS

As already mentioned, SIDS is one of the top causes of infant deaths in the U.S., and evidence increasingly points to vaccines as one likely explanation (see “Vaccines and SIDS”). Without even counting the vaccines administered prenatally, American infants receive [more vaccines in their first year](#) than infants anywhere in the world and far more than in the 1980s.<sup>192</sup> Many of those vaccines are administered in bundles at well-baby visits around two and four months—exactly when [nine out of ten SIDS deaths](#) occur.<sup>193</sup>

In one SIDS study, Italian researchers conducted histological examinations of over 100 young SIDS victims for whom detailed clinical and environmental information was available; in 12% of the cases, the SIDS deaths occurred [within one to seven days](#) of the infant receiving a hexavalent vaccine for diphtheria, tetanus, acellular pertussis, *Haemophilus influenzae* type B, poliovirus and hepatitis B.<sup>194</sup> Based on the histological results, the authors deemed it plausible



## Vaccines and SIDS

Italian researchers described the case of a three-month-old infant who died within 24 hours of receiving a hexavalent vaccine. Drawing on clinical data, postmortem findings and immunohistochemical and laboratory analyses, the investigators concluded that “acute respiratory failure likely due to post hexavalent immunization-related shock was the cause of death.”

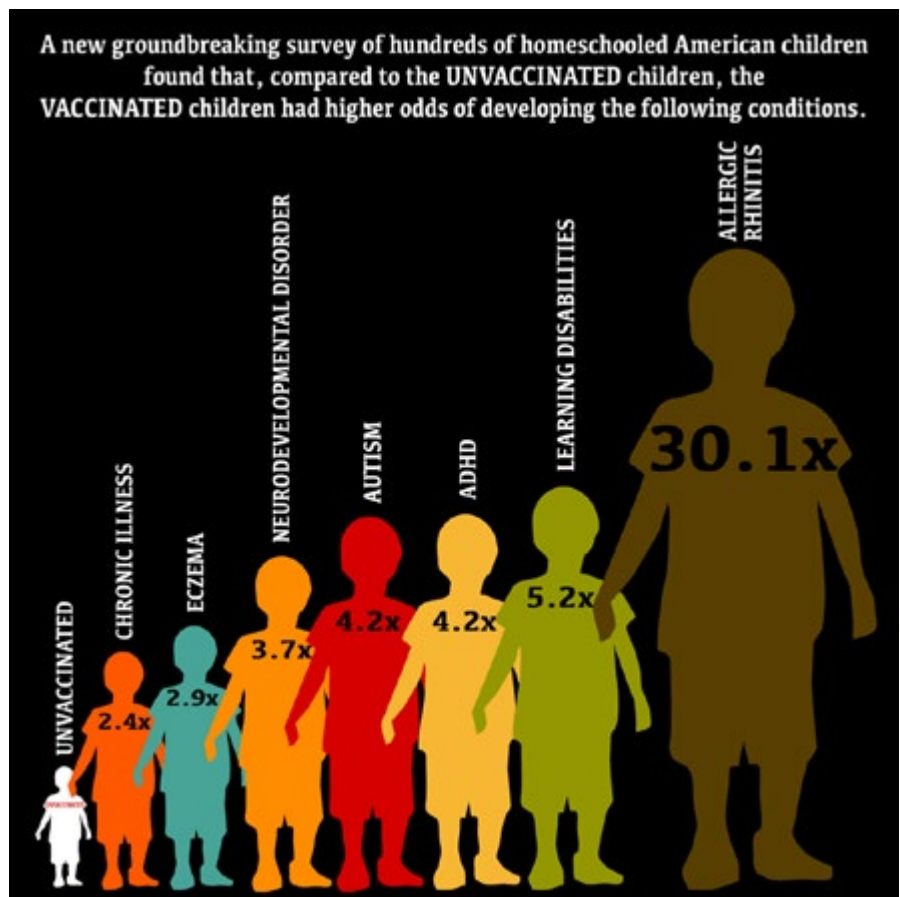
SOURCE: D’Errico S, Neri M, Riezzo I et al. Beta-tryptase and quantitative mast-cell increase in a sudden infant death following hexavalent immunization. *Forensic Sci Int* 2008;179(2-3):e25–e29.

that “vaccine components could have a direct role in sparking off a lethal outcome in vulnerable babies.” In 2017, the [U.S. Court of Federal Claims](#) agreed, ruling that there was “preponderant evidence” supporting a claim that vaccines “caused or substantially contributed” to a 2011 SIDS death.<sup>195</sup> The court, which has a notoriously high burden of proof, also ruled that the death could not be attributed to non-vaccine-related factors.

### Vaccinated Versus Unvaccinated

Answering vital questions about vaccines’ role in fostering chronic illness in children requires looking at total health outcomes in vaccinated versus unvaccinated children. The CDC has never conducted such a study. However, evidence has been accumulating from other sources that highlights pronounced differences between the two groups.

A pilot study published in 2017, conducted in four U.S. states, [compared the health of vaccinated and unvaccinated 6- to 12-year-old homeschool children](#), 39% of whom were unvaccinated.<sup>196</sup> The study found that vaccinated children had a more than twofold greater odds of having been diagnosed with any chronic illness compared to unvaccinated children, and a roughly fourfold greater odds of a diagnosed neurodevelopmental disorder (learning disabilities and/or ADHD and/or ASD) as well as a far greater likelihood of having one or more allergic conditions (see table). The vaccinated children also were significantly more likely to use medications, to have visited a doctor when sick (past year) or to have had a hospital stay (ever). A large 2013 study likewise found



Source: Graphic courtesy CMSRI.org, in reference to Mawson AR, Ray BD, Bhuiyan AR, Jacob B. Pilot comparative study on the health of vaccinated and unvaccinated 6- to 12-year-old U.S. children. *J Transl Sci* 3.

that children vaccinated according to the standard schedule had [significantly more outpatient and emergency department visits](#)—both overall and for acute illness—than “undervaccinated” children.<sup>197</sup>

In 1992, New Zealand researchers who compared the health status of vaccinated and unvaccinated children discovered that the incidence of 10 out of 11 chronic conditions (including asthma, tonsillitis, hyperactivity and “slow development of motor skills”) was [two to ten times higher in the vaccinated children](#).<sup>198</sup> New Zealand’s [pediatric vaccination schedule](#) is similar to the U.S. schedule.<sup>199</sup>

Children vaccinated according to the standard schedule had significantly more outpatient and emergency department visits than “undervaccinated” children.



# SOCIETAL IMPACT

## Intelligence

**A**s study after study tallies up the toll that children's ill health is exacting from families and communities, few are taking a step back to consider the disturbing longer-term implications for society as a whole. One hint of future challenges comes from studies that have examined changes in cognitive scores over time, conducted in other high-income countries that, like the U.S., mandate numerous pediatric vaccines. For example, a 2018 analysis of cognitive ability scores from Norwegian military conscripts (covering cohorts born from 1962 to 1991) has reported "large changes in average cohort intelligence [that] reflect environmental factors."<sup>200</sup> A similar assessment in 2008 in Denmark noted across-the-board declines in young adult males' cognitive scores even in the short period from 1998 to 2004.<sup>201</sup> The puzzled Danish researchers reported that "the declines... seem to be real, [but] it is not easy to account for them."

## Declining Fertility

In May 2018, the CDC reported on another population-level decline, releasing its quarterly estimates of the U.S. fertility rate.<sup>202</sup> Fertility in the U.S. has been falling for a decade,<sup>203</sup> and fertility rates in the past several years represent the lowest levels ever recorded.<sup>204</sup> Although demographers have pronounced the decline "one of the big demographic mysteries of recent times,"<sup>205</sup> there is growing cause to suspect that over-vaccination and the epidemic of ill health that is following in the vaccine program's wake may be contributors. As one example, poly-sorbate 80, an emulsifier used in some vaccines, has been shown to have effects on female reproductive organs in animal models.<sup>206</sup>

The human papillomavirus (HPV) vaccine—widely administered to adolescents and young adults—warrants even more attention, given its documented association with primary ovarian insufficiency (POI) in young women (see

Fertility in the U.S. has been falling for a decade, and fertility rates in the past several years represent the lowest levels ever recorded.

“Primary Ovarian Insufficiency and HPV Vaccination”).<sup>207</sup> To explain the rising number of cases of POI being reported following HPV vaccination, researchers have speculated that the vaccines’ aluminum adjuvants offer a possible mechanism, particularly since animal studies “have shown [aluminum exposure](#) to inhibit expression of female reproductive hormones and to induce histologic changes in the ovaries.”<sup>208</sup> [Unsafe levels of aluminum adjuvants](#) are present in other vaccines as well.<sup>209</sup>

A 2018 study in the *Journal of Toxicology and Environmental Health* examined U.S. data for eight million young women ages 25-29 for the period from 2007 to 2014, finding [significant differences in fertility according to HPV vaccination status](#): among women who had not received the vaccine, approximately 60% had been pregnant at least once, versus only 35% of HPV-vaccinated women, and for married women, the respective percentages were 75% versus 50%.<sup>210</sup> Calling for further study of the HPV vaccine’s effects on fertility, the researcher noted that “if 100% of females in this study had received the HPV vaccine, data suggest the number of women having ever conceived would have fallen by [2 million](#).”<sup>211</sup>

## Economic and Workplace Impacts

The epidemics of neurodevelopmental disorders and chronic illness in young people also portend widespread economic and social impacts. At the family level, a 2014 *JAMA Pediatrics* article estimated the lifetime [cost of caring for a person with ASD](#) and intellectual disability to be roughly \$2.4 million (\$1.4 million for ASD without intellectual disability), covering cost categories such as special education services, residential care and parental and individual productivity loss.<sup>212</sup> In addition to the effects on family budgets, governmental outlays for special

education and chronic disease management continue to climb.

A number of publications have addressed the employment challenges faced by individuals with ASD and other developmental disabilities, even while trying to cast “[neurodiversity](#)” as a “competitive advantage.”<sup>213</sup> Individuals with ASD represent “the most expensive group [for whom] to provide vocational rehabilitation services”; some cost-benefit experts wishfully have suggested that they may pay off as a “[worthwhile investment](#).”<sup>214</sup> Despite media cheerleading of workforce “inclusion” and what is described as a “cultural shift in the workplace,”<sup>215</sup> at present, the [labor force participation rate](#) for individuals with disabilities (20%) still lags far behind the rate for individuals without disabilities (69%).<sup>216</sup>

## Male Bias

One of the most neglected but vital topics with long-term societal ramifications is the consistently disproportionate impact of neurodevelopmental disorders on boys. There are at least two boys for every girl with a neurodevelopmental disorder, and the male-to-female ratio is roughly four and five to one, respectively, for [ASD](#)<sup>217</sup> and [ADHD](#).<sup>218</sup> Evidence from numerous studies indicates that “the [brain in males is more vulnerable](#) to many toxic exposures than it is in females,” with plausible biological mechanisms to explain this heightened vulnerability.<sup>219</sup> For example, males tend toward a [greater neuroinflammatory response](#),<sup>220</sup> and testosterone appears to enhance and potentiate neurotoxicity. Illustrating males’ heightened vulnerability to neurotoxins, [mercury toxicity research](#) has shown that “thimerosal toxicity to neurons was significantly increased by co-exposure with testosterone, whereas estrogens significantly reduced the toxicity of thimerosal to neurons.”<sup>221</sup>

## Primary Ovarian Insufficiency and HPV Vaccination

Case reports have described adverse reproductive effects of the HPV vaccine. In one, three young women with no prior abnormalities presented with secondary amenorrhea following HPV vaccination at ages 14, 13 and 21, respectively. All three subsequently received a diagnosis of primary ovarian failure (POF). “No other possible causes of POF were identified other than the HPV vaccine.” In a second report, young women ages 16, 16 and 18 (at diagnosis) presented with “idiopathic premature ovarian insufficiency” following HPV vaccination. The case series authors noted that “enduring ovarian capacity and duration of function following vaccination is unresearched in preclinical studies, clinical and postlicensure studies.”

SOURCES: Colafrancesco S, Perricone C, Tomljenovic L, Schoenfeld Y. Human papilloma virus vaccine and primary ovarian failure: another facet of the autoimmune/inflammatory syndrome induced by adjuvants. *Am J Reprod Immunol* 2013;70(4):309-316. Little DT, Ward HR. Adolescent premature ovarian insufficiency following human papillomavirus vaccination: a case series seen in general practice. *J Investig Med High Impact Case Rep* 2014;2(4):2324709614556129.

## Unfit to Serve

A sector where young people's health challenges already are making themselves felt is in the military. In February 2018, the Heritage Foundation released a report on the "looming national security crisis" that called attention to this issue.<sup>222</sup> The report's authors drew on data compiled in 2009 by Mission: Readiness (an organization formed by over 700 retired admirals, generals and top military leaders) showing that more than seven in ten young Americans aged 17 to 24 are ineligible to serve in the U.S. military.<sup>223</sup> As summarized by the Heritage Foundation, this means that "over 24 million of the 34 million people of that age group cannot join the armed forces—even if they wanted to." The two reports pinpoint health problems as the largest single reason for ineligibility (32%), along with problems associated with weight/physical fitness (27%), education (25%) and criminality (10%). In addition to widespread overweight and obesity, problems cited in the reports as evidence of American youth's health crisis include asthma, hearing and eyesight problems, mental illness and recent treatment for ADHD.<sup>224</sup>

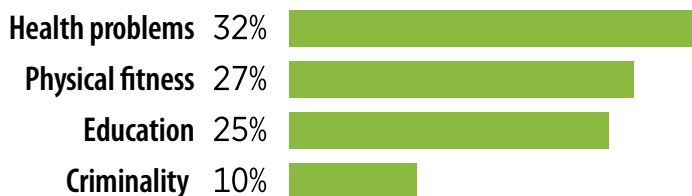


In the realm of education, the Heritage report notes that far too many young people are unable to meet the military's basic education requirements: "a minimum level of education [high school or equivalent], a basic understanding of written and cognitive skills, and enough 'stick-to-itiveness' to complete an organized program."<sup>225</sup> Interestingly, Army recruits from the ten Southern states that represent the military's top recruiting region (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North and South Carolina, Tennessee and Texas)

are "the most unfit and prone to injury in training."<sup>226</sup> Those states also have some of the highest levels of pediatric vaccine coverage in the U.S., with upwards of 96% coverage in kindergartners in six of the ten states.<sup>227</sup>

### Unable to Serve

About 75 percent of Americans ages 17–24 would not be able to join the military. Of those, here are the four largest reasons:



**NOTE:** Individuals may be rejected for more than one reason.

**SOURCE:** Mission: Readiness, "Ready, Willing, and Unable to Serve," 2009, <http://cdn.missionreadiness.org/MR-Ready-Willing-Unable.pdf>; and Spoehr T, Handy B, "The Looming National Security Crisis: Young Americans Unable to Serve in the Military," *The Heritage Foundation*, February 13, 2018.



## ROBERT F. KENNEDY, JR.'S RESPONSE: CHILDREN'S HEALTH DEFENSE

The magnitude of challenges facing today's children is enormous, and the incalculable social and economic fallout is already hitting home. It is mystifying, therefore, that there is almost no outcry in medical, public health and government circles to find answers and solutions. Even a cursory review of the abundant scientific literature not only illustrates numerous facets of children's chronic illness burden but also persuasively shows that the unwieldy U.S. vaccine program and the many neurotoxic ingredients in vaccines bear at least some responsibility for launching, aggravating and perpetuating the crisis.

### Inadequate Oversight

Despite the hypnotic mantra that all vaccines are "safe and effective" all the time for everyone, the science shows the opposite. Until 2013, the [CDC's Advisory Committee on Immunization Practices \(ACIP\)](#) did not use any systematic or evidence-based framework to guide its influential recommendations

to expand the pediatric vaccine schedule,<sup>228</sup> relying instead on [flawed \(or even "gerrymandered"\) science](#).<sup>229</sup> Moreover, most vaccines added to the childhood vaccine schedule underwent little more than [a few days or weeks of safety testing](#) before their approval.<sup>230</sup> Even corporate observers recognize that the CDC and U.S. Food and Drug Administration (FDA)—the very agencies charged with protecting children's health—have succumbed to [conflicts of interest and ethical lapses](#) that, for decades, have driven their regulatory agendas in an industry-friendly direction.<sup>231</sup>

### Simple Steps to Protect Children

1. **Feed children wholesome foods** that, as much as possible, are organic and free of genetically modified (GMO) ingredients.
2. **Reduce the use of chemicals in the home** by avoiding scented household items (e.g., scented personal care products, air fresheners, dryer sheets) and toxic detergents and cleaning agents (vinegar and baking soda work well for many purposes).
3. **Do not use herbicides or pesticides** inside or outside the house.
4. **Avoid paints, synthetic carpeting and other products** that are high in volatile organic compounds (VOCs).
5. **When finances permit, buy furniture made from solid wood** (rather than particle board or plywood) and buy mattresses made from natural materials that do not off-gas.
6. **Open the windows** at home often.
7. **Make informed medical and vaccine choices.**



As American youth's cup of health afflictions spills over, there is an urgent need for an organization that can speak on children's behalf, protecting those children who are, as yet, unharmed while giving voice to and obtaining fair play for the sick and vaccine-injured. It is also vitally important, notwithstanding the flood of pharmaceutical industry dollars regularly spent on lobbying Congress,<sup>232</sup> that legislators be educated about the need for a fully independent vaccine safety agency and the importance of correcting the funding distortions that have allowed 38 times as many research dollars to go to investigators studying genetics as to those studying environmental causes of illness.<sup>233</sup>

### Championing Children's Health

Robert F. Kennedy, Jr., has taken important steps to counter false vaccine safety claims and provide public and congressional education grounded in high-quality science. Mr. Kennedy and the Board of Directors have also broadened their scope to fully champion children's health with Children's Health Defense (CHD). Building on Mr. Kennedy's record of challenging corporate and regulatory injustice, CHD is actively promoting adherence to the precautionary principle—which means eliminating children's exposure to a range of harmful neuro- and immunotoxins with synergistic toxicity effects.<sup>234</sup> Such toxins include many prevalent substances with a questionable safety record: heavy metals (e.g., aluminum,<sup>235</sup> arsenic,<sup>236</sup> lead<sup>237</sup> and mercury<sup>238</sup>); pesticides and herbicides such as glyphosate;<sup>239</sup> fluoride;<sup>240</sup> polycyclic aromatic hydrocarbons (PAHs)<sup>241</sup> and other air pollutants;<sup>242</sup> bisphenol A (BPA);<sup>243</sup> per- and polyfluoroalkyl substances (PFASs);<sup>244</sup> phthalates;<sup>245</sup> flame retardants;<sup>246</sup> acetaminophen (paracetamol);<sup>247</sup> food additives;<sup>248</sup>

and aspartame<sup>249</sup> (see "Environmental Toxicants to Watch Out for").

CHD also is advancing Mr. Kennedy's Vaccine Safety Project agenda, which emphasizes the need for a scientifically rigorous vaccine approval process free of conflicts of interest, careful evidence-based review of existing vaccine recommendations, comprehensive reporting of vaccine-related adverse events and research on susceptibility to vaccine injury. Further elements of an approach that puts safety first might include modified vaccination schedules<sup>250</sup> and adjustments for vulnerable subpopulations such as premature infants.<sup>251</sup>

Children are the keys to a successful future and a prosperous nation. Everyone—children, parents and family, education leaders and teachers, health care and insurance providers, cutting-edge businesses that employ graduates and our country's military—has a stake in the fight to restore our children's health. There is no crisis that more urgently requires attention than the avalanche of chronic illnesses affecting over half of our nation's children.

### Environmental Toxicants to Watch Out for (a Partial List)

- ▶ Acetaminophen
- ▶ Aluminum
- ▶ Arsenic
- ▶ Aspartame
- ▶ Bisphenol A (BPA)
- ▶ Flame retardants
- ▶ Food additives
- ▶ Fluoride
- ▶ Glyphosate (and other herbicides/pesticides)
- ▶ Lead
- ▶ Mercury (ethyl- and methyl-mercury)
- ▶ Per- and polyfluoroalkyl substances (PFASs)
- ▶ Phthalates
- ▶ Polycyclic aromatic hydrocarbons (PAHs) and other air pollutants



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