

Offit Paul: Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure

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In *Autism's False Prophets*, Paul Offit, M.D., Maurice R. Hilleman Professor of Vaccinology, Professor of Pediatrics at The University of Pennsylvania, and co-inventor of a rotavirus vaccine, makes an important contribution to popular debates about the etiology and treatment of autism spectrum disorders. The book is arguably the most detailed and thorough history available of the current anti-vaccine movement and the increasingly widespread popular belief that vaccines and/or ingredients in vaccines are related both to autism and the changing prevalence of autism. Offit provides a sustained scientific attack against the misinformation disseminated by the media and a small but vocal group of anti-vaccine advocates. He pays special attention to the therapies and therapists (autism's "false prophets") that emerged out of the current anti-vaccine movement. And by situating the autism debate in the larger context of the complex interactions between science, society, and politics, Offit identifies a set of problems that will resonate with nearly all medical scientists, whatever their field of expertise.

Offit argues that false information, unscientific hypotheses, and inaccurate and simplistic media coverage on autism and vaccines are hurting the public health. In order to correct the misinformation, he focuses on the most common public fallacy about autism today: that the measles mumps rubella vaccine (MMR) and/or the mercury containing preservative, thimerosal, which was in many vaccines (but not in the MMR) until late 2001, cause autism. Public fears about MMR and thimerosal led to a decline in vaccination rates and an increase in preventable illness. For example, in 1995, 92% of British 2-year-olds

were vaccinated against measles, and there were 112 recorded cases of the disease in the UK. A decade later, only 81% of 2-year-olds had received the vaccine and there were 958 cases. According to the World Health Organization, in 2005, 242,000 people died of measles worldwide, but because of the previous success of vaccine programs, most Europeans and Americans have never seen a case of measles and do not understand its dangers. Measles is on the rise in the US, as evidenced by scores of cases in Iowa in 2004, Indiana in 2005, and Massachusetts in 2006. So far in 2008, the US is having the worst outbreak of measles in years.

The MMR fears first developed in 1995 when a doctor in England, Andrew Wakefield, published a paper in *The Lancet* claiming that a number of children had developed autism within a month after receiving the MMR. Although it is well known that the onset of autism is typically insidious, thus making it difficult to identify a moment when an autistic child's disorder begins, many found Wakefield's thesis plausible. It seemed to make little difference to the media and the wider public when it was revealed that Wakefield had serious conflicts of interest he had failed to disclose, that the majority of the co-authors retracted their support for the paper's conclusions, and that *The Lancet* issued a partial retraction of the paper. Nor did it seem to make a difference when ten subsequent studies refuted the hypothesis that the MMR vaccine is linked to autism.

The thimerosal story is less straightforward and must be attributed to a number of different players, such as Neal Halsey (a well respected vaccine expert), US government agencies responsible for overseeing immunization policy, politicians with a personal relationship to autism, such as Dan Burton (R-IN), two single-minded journalists named David Kirby and Dan Olmsted, small interest groups, such as SafeMinds (with which Kirby has been involved) and

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Generation Rescue, and a cadre of physicians (especially the doctors associated with the Defeat Autism Now! or DAN!, protocol) willing to profit from the vaccine fears and to advocate treatments for purported heavy metal poisoning.

In 1997, in response to Congressman Frank Pallone's amendment to an FDA reauthorization bill requiring the FDA to analyze the mercury content in drugs and foods, federal officials investigated whether the amount of mercury infants received in vaccines was safe. They found that there were no safety guidelines for the particular kind of mercury, ethyl mercury, contained in the vaccine preservative. Erring on the side of caution, Halsey, then head of the vaccine advisory committee of the American Academy of Pediatrics (AAP), recommended that thimerosal be removed from vaccines. By the summer of 1999, in response to Halsey's threat to publicly suggest that the removal of thimerosal was an urgent public health issue, the AAP and the Public Health Service (PHS) reluctantly issued a joint statement that Offit calls "contradictory and confusing." After noting that "there are no data or evidence of any harm caused by the level of exposure" to ethylmercury in the immunization schedule, the statement continued:

On the one hand, there is the known serious risk of disease and death caused by failure to immunize infants. On the other hand, there is the unknown and probably smaller risk, if any, of neurodevelopmental effects posed by exposure to thimerosal.

When coupled with increased public awareness of new, higher prevalence rates of autism that last sentence was all that was needed to set vaccine fears in motion. But Offit notes that the AAP went even further by stating, in its own press release, that while the current levels of thimerosal were safe, "reducing those levels of thimerosal will make safe vaccines even safer." How could removing something safe from vaccines make them safer? In highly readable prose—sparse, fast-paced, and captivating—*Autism's False Prophets* chronicles the firestorm that ensued among parents, journalists, politicians, advocates, and bloggers. For it seemed that the government was stating that thimerosal was indeed harmful. The ultimate decision to remove thimerosal from vaccines was, for many observers, proof of thimerosal's dangers and validation of their belief that the US government had known all along about its relationship to neurodevelopmental disorders.

Offit stresses that scientists addressed public concerns quickly in academic journals. Ten expensive studies refuted the hypothesis that the MMR vaccine causes autism, and six others failed to show any relationship between the vaccine preservative thimerosal and autism. In fact, since thimerosal was removed in 2002, autism rates have

continued to climb. But if one reads many of the blogs about autism on the Internet, watches Larry King and Oprah, and listens to the speeches and comments from congressmen and political candidates, it is as if these studies never happened. When Robert F. Kennedy Jr. falsely stated in *Rolling Stone Magazine*, on CNN, and "The Daily Show," that there are "hundreds of studies" showing that vaccines cause autism, scientists ignored him. I searched the media in vain for any scientific response to Jenny McCarthy's unsubstantiated claim on "Larry King Live" that autism is "a global epidemic."

In part because of the increasing popularity of non-scientific opinions on the causes of autism and its changing prevalence, parents of children with autism often turn to unproven therapies, a few of them dangerous, some of them uncomfortable, most useless, and nearly all expensive and not covered by insurance (a notable exception is chelation, which is, inexplicably, covered by US military health insurance). Many treatments, like chelation, a process of removing heavy metals from the child's body, are not based on any plausible scientific hypothesis about the relationship between an environmental insult and the pathophysiology of autism. Other therapies include anti-fungal treatments, hyperbaric oxygen chamber, restricted diets, treatment with secretin, hippotherapy, and injections of agents to reduce testosterone levels in both boys and girls. They are a direct result of particular theories of causation popularized in the media and the blogosphere. For there is no reason for a parent or a clinician to pursue chelation unless one believes that heavy metals are implicated in autism, no reason to pursue a gluten and casein free diet unless one believes that food allergies are implicated. Alternative theories and therapies are thus mutually reinforcing.

Indeed, thousands of parents today remain convinced that mercury is to blame, and they are supported by a group of fringe scientists and doctors, none of them specialists in autism, such as Mark and David Geier (a physician and his college educated son), whose research is conducted in the basement of their house under the supervision of an institutional review board that includes Mark and David Geier, Lisa Sykes and Kelly Kerns (two anti-thimerosal activists), John Young (a business partner of Mark Geier's), Clifford Sheomaker (an anti-vaccine lawyer), and Anne Geier (Mark Geier's wife).

If there is a weakness in this fine book, it is Offit's focus on popular theories of autism etiology and relative inattention given to the role of epidemiology in stimulating public concern. His focus suggests that the parents and pseudo-scientists described in the book are concerned primarily with autism, but they are, arguably, just as concerned that vaccines caused the so-called autism epidemic. Offit writes at length about the epidemiological

studies of MMR and thimerosal, but does not offer a sustained critique of the fears of an epidemic. He might have more fully described, for example, the myriad reasons for the increase in the prevalence of autism (for example, changes in diagnostic criteria, the emergence of the notion of an autism spectrum, improved epidemiological methods, diagnostic substitution, and the role of the Individuals With Disabilities Education Act). One could argue that misunderstandings about the safety and dangers of vaccines are epiphenomenal to more foundational misunderstandings of epidemiological data.

For now, the conspiracy theories, the anger, and the desperation persist, and, as a parent, I'm not surprised. I know how many of the parents who hire the alternative health care practitioners feel: they want to *do* something. When my own daughter was diagnosed with autism in 1994, our doctor recommended she have speech therapy, but there was little else he could recommend. For a toddler, the medical recommendation is often "watch and wait." But when parents visit the physicians Offit describes, they become subject to a seductive message: there is much that you can do, and your child may recover or even be cured.

The physicians may order blood and urine tests for organic acid, heavy metals, and fungus infections, and assess of immune function. They may prescribe acupuncture, a gluten and casein free diet, and supplements like carnitine, and megavitamins. Pursuing alternative therapies, even those for which there is no apparent medical justification, is psychologically comforting.

Autism's False Prophets can help health professionals address some of these parents' needs. Scientists, doctors, and therapists can follow Offit's lead and reach out to the public, even if it means telling parents the uncomfortable truth that there is no single government, substance, or gene to blame for autism. Scientists will not easily satisfy parents' need for proof and certainty because science always leaves room for the unknown, for new discoveries, and for study findings to be invalidated, and because science is rarely as convincing as are the words of friends, neighbors, and the anecdotes posted of dozens of health-related websites. What health professionals can do, however, is tell parents that sometimes science moves very slowly and always contains uncertainty, but that in this case science on vaccines and autism moved at great speed.