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Debate Over Autism-Vaccine Link Intensifies

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Sallie Bernard and Morton Ann Gernsbacher, PhD, have something in common. Each is the mother of a child with autism.

Both of these mothers care deeply about their children. They care deeply about other children, too -- especially those with autism. But they could not differ more on what they think needs to be done for them.

Bernard is the executive director of Safe Minds. Her organization is working hard to warn parents that mercury -- especially thimerosal, a form of mercury once used in U.S. childhood vaccines -- is the likely cause of an epidemic of autism.

Gernsbacher, president elect of the American Psychological Society and professor of psychology at the University of Wisconsin-Madison, warns us not to believe in an autism epidemic. "False epidemics elicit false causes," she wrote in the April issue of Current Directions in Psychological Science.

Read Web MD's ["What Raises a Baby's Risk of Autism?"](#)

Renewed Controversy

Last year, it looked as though the book might finally close on the vaccine/autism debate.

A blue-ribbon panel convened by the independent Institute of Medicine (IOM) reviewed the evidence. It did not create many waves when it rejected the idea that the MMR (measles/mumps/rubella) vaccine might cause autism. That theory was retracted by nearly all of the researchers who originally proposed it.

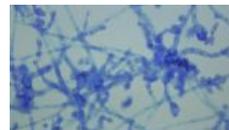
The IOM committee then flatly rejected the idea that vaccines containing thimerosal could cause autism.

Bernard wasn't convinced. Neither was Robert F. Kennedy Jr., senior attorney for the Natural Resources Defense Council. Kennedy's recent article for Rolling Stone and Slate -- followed by a scathing Wall Street Journal editorial -- set off a flurry of public interest.

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Kennedy indicts thimerosal as a likely cause of autism. And he accuses the CDC, the FDA, the IOM, the World Health Organization, and the American Academy of Pediatrics of helping drug companies hide or misrepresent the evidence.

What is this evidence? WebMD takes a look.

Read Web MD's "[Mercury in Air Pollution: A Link to Autism?](#)" 

Is There Really an Autism Epidemic?

Fact: Autism rates have been going up. Recent years have seen a higher percentage of kids getting diagnosed with autism. The trend seems to have begun in the 1980s and to have picked up speed in the 1990s.

Eric Fombonne, MD, FRCPsych, of the Institute of Psychiatry at King's College, London, has studied autism in the U.K.

"From our data, we can say that we have a prevalence that is 62 cases per 10,000 children," he told WebMD in a 2001 interview. "In the mid-1960s, we showed rates of 4 cases per 10,000."

Isn't this the sign of an epidemic? Not necessarily.

"You cannot compare studies now to studies from 30 years ago," Fombonne said. "It would be comparing oranges not with apples, but with sheep."

Children with autism vary widely. It was not until 1940 that this constellation of problems with social interaction, communication, and focused interest came to be called autism. And it was not until 1980 that the diagnosis of autism was formalized.

In 1994, the diagnosis changed again. Kids diagnosed with autism from 1980 through 1993 had to meet six mandatory criteria. The new 1994 definition offered 16 optional criteria, only eight of which had to be met. Gernsbacher says the 1994 diagnosis made it much easier for a child to be labeled autistic.

The federal Individuals with Disabilities Education Act, passed in 1991, assures appropriate public education for children with autism. Soon after, schools began reporting high numbers of students with autism. Those numbers keep going up. But that doesn't mean there's an autism epidemic, Gernsbacher says, any more than increased sales of petite clothing means women are getting smaller.

"My hunch is that if we looked at the production and purchase of petite-sized clothing we'd see a greatly increasing trend in the number of petite-sized garments produced and purchased over the past two decades," she says. "Should we therefore conclude that U.S. women are getting increasingly more petite? Probably not. There was probably always a contingent of petite-sized women, and their needs are being increasingly better met."

Gernsbacher points to data from Fombonne and others suggesting that there are 5.8 to 6.7 autism cases among every 1,000 U.S. children. If that's so, we haven't found them all yet. Even Oregon, which led the nation with 4.3 autism cases per 1,000 children in 2002-2003, still has a way to go. Other states lag much farther behind.

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Read Web MD's ["Allergies, Asthma May Play Role in Autism."](#) ↗

Of-Cited Study Questioned

A 2002 pilot study by the MIND Institute of the University of California, Davis, looked at the issue of whether autism rates are really getting higher -- or whether we're just getting better at finding kids with autism.

Study leader Robert Byrd, MD, MPH, associate professor of clinical pediatrics at the University of California, Davis, says the study data suggest that any "loosening" of diagnostic criteria had no effect on autism rates in California. This study, despite shortcomings Byrd readily admits, is widely cited as proof that the autism epidemic is real.

The MIND study compared autistic kids born in 1982-1985 to kids born in 1993-1995. Using the current criteria for diagnosis, Byrd's team found that the more recently diagnosed kids were nearly as severely autistic as those in the earlier group.

"In both groups, they on average aren't just barely meeting the threshold to be called autism -- they are almost double the threshold," Byrd tells WebMD.

MIND Institute executive director Robert Hendren, DO, also defends the study findings.

"This study is just one data point that exists, not the final word on the subject," Hendren says. "But based on this study, we say the increase in autism incidence is not a matter of changing diagnostic practices."

Gernsbacher says the findings are based on backward reasoning. Her main point: The study uses the current, looser definition of autism to look at children diagnosed under a more strict definition. Then it mistakenly concludes that since those kids meet the looser definition, the new definition made no difference.

A 2005 study by Craig J. Newschaffer, PhD, and colleagues at the Johns Hopkins Center for Autism and Developmental Disabilities Epidemiology shows "a drastic increase in the prevalence of the autism classification." The study concludes that it's important to find out how much of this is due to a change in diagnosis and how much is due to "real changes in risk."

Read Web MD's ["Early Autism Signs Identified in Infants."](#) ↗

Collision: Autism Rise, Vaccine Concern

Fact: Nobody knows what causes autism. Nobody is even sure whether autism in all its different forms has one cause or many. Since autism runs in families, nearly everyone agrees there's a genetic link. Might that link be something that makes some people especially sensitive to something in the environment?

One of the heartbreaking peculiarities of autism is that a child will seem to be developing normally. Then, suddenly, at age 2 to 4, everything seems to go wrong.

That's just when kids are getting their vaccinations. To many parents, a vaccine/autism link seems obvious. Until very recently, many parents believed the problem was with the measles/mumps/rubella vaccine.

Although many people still cling to this idea, most have come to reject it.

But until recently, many other vaccines contained a mercury-based preservative called thimerosal. Vaccines used to get contaminated with germs. Those germs killed kids. So drug companies used thimerosal to save lives. It worked.

Oddly -- for a substance given to nearly every child in the U.S. -- nobody really knew much about thimerosal.

Even now, says toxicologist Thomas Burbacher, PhD, very little is known. Burbacher is associate professor of environmental and occupational health sciences and director of the infant primate research lab at the National Primate Research Center, University of Washington.

"It is incredible so many millions of kids have been vaccinated with this compound with so little data on it," Burbacher tells WebMD. "But line it up with everything else. A lot of information is missing on a lot of compounds in daily use. And a lot of people thought the amount the kids were getting was so small, it was not a priority."

The Thimerosal Debate and the EPA

Thimerosal is 49 percent ethyl mercury. A closely related form of mercury, methyl mercury, is a known toxin. Since nothing was known about thimerosal, safety measures were based on what was known about methyl mercury. Everybody thought that thimerosal would be safe if the doses given to kids were below the toxic dose for methyl mercury.

But three things happened. One was that kids started getting more and more vaccines containing thimerosal. Meanwhile, the U.S. Environmental Protection Agency got new information and lowered what it considered to be a toxic dose of methyl mercury.

"In the 1990s, those two lines merged," Burbacher says. "Someone at the FDA noted that when you add all the vaccines up they totaled more than the new EPA standard for methyl mercury. So then the other thing that occurred, during that same time period, was an increase in rates of autism diagnosis."

By 1999, thimerosal was in 30 U.S. vaccines -- some, like the DTaP, Hib, and hepatitis B vaccines, given to infants. In July 1999, the American Academy of Pediatrics and the U.S. Public Health Service recommended removing thimerosal from vaccines. By March 2001, all vaccines recommended for U.S. children were available in thimerosal-free versions. However, the preservative is still used in multiuse vials of flu vaccines and in childhood vaccines for use in developing nations.

Kids vaccinated between 1989 and 2003 are what Kennedy calls the Thimerosal Generation.

As it turns out, thimerosal is not as much like methyl mercury as previously thought. That's both good and bad, Burbacher notes. In recent monkey studies, Burbacher has found that the body eliminates thimerosal much more quickly than it eliminates methyl mercury. Thimerosal leaves two or three times less mercury in the body than methyl mercury.

But Burbacher also found that thimerosal deposits something called inorganic mercury in the brain -- twice as much as from the same dose of

methyl mercury. Inorganic mercury isn't supposed to do anything. But there's troubling evidence that it might -- evidence Burbacher and others are only now beginning to investigate.

People who think thimerosal is safe usually point to the rapid-clearance finding. Those who think it unsafe, Burbacher says, point to the increased deposits of inorganic mercury in the brain.

The IOM as Jury

It's common, in matters of scientific dispute, to turn to the National Academy of Sciences for an answer. And when the question is medical, the dispute goes to the IOM, which then convenes a panel of nationally recognized experts to decide the matter.

For thimerosal, the IOM convened these juries not once, but twice.

In 2001, the first IOM committee concluded that there wasn't enough evidence to say whether thimerosal was safe or unsafe.

In 2004, the most recent committee rejected the idea that vaccines containing thimerosal cause autism.

Kennedy writes that the committee findings were preordained in "secret" meetings with drug companies playing the tune. He says the committee ignored "truckloads of studies" that show thimerosal accumulates in the brains of lab animals, and he says the studies of autism trends on which the IOM relied are "disastrously flawed."

"When we first heard the IOM committee was meeting, we said the meeting was premature," Safe Minds' Bernard tells WebMD. "We told them to wait, that more research is coming out. They ignored us. They went ahead and had their meeting and missed a lot of evidence."

WebMD asked committee chairwoman Marie C. McCormick, MD, ScD, to comment. McCormick is professor of maternal and child health at Harvard School of Public Health.

"We had to make two kinds of assessments," McCormick tells WebMD. "One was, did we see any evidence thimerosal was associated with autism. We had five epidemiologic studies. None were perfect. But all pointed in the same direction of no association."

Those five studies included five observational studies, using different methods, looking for an association between autism and vaccination in Sweden, Denmark, the U.S., and the U.K. None was found. Autism rates continued to rise even after thimerosal was removed from vaccines.

Each of the studies had flaws. But they weren't nearly as flawed as Kennedy suggests, says IOM spokeswoman Christine Stencel.

"The IOM committee certainly knew of these issues and found the studies were relevant, that they were well designed, and that their data are valid," Stencel says.

But what of the "truckloads" of studies to which Kennedy points?

"We looked at basic science and asked if there was any indication of how thimerosal could cause autism," McCormick says. "We looked at over 200

scientific articles, and the evidence linking thimerosal to autism is purely theoretical at best."

This does not satisfy Bernard. She doesn't think the evidence proves thimerosal causes autism. But she does think the evidence points in that direction. If researchers don't follow up, she fears, valuable time will be lost.

"If you assume that there is a connection between mercury exposure and an outcome of autism, then by studying what mercury does, you will come a lot closer to learning how to treat these kids," Bernard says. "And if you find a role for mercury, we can do a lot more in terms of prevention. You can't just have effective treatment -- in today's science -- without understanding the root cause."

Final Answer Coming Soon

Nearly everyone soon expects the controversy to end. One reason is that the CDC is planning a massive, definitive study.

The other reason is that very soon, all the kids who got thimerosal in vaccines will have reached the ages when autism should appear -- or not. If there's no big drop in autism rates, thimerosal won't be much of an issue.

Still at issue, however, is the very real threat of mercury poisoning from the environment -- a threat the world has only begun to deal with.

Advice for Parents

Meanwhile, Bernard advises parents to be informed.

"I think for pregnant women or those with babies, I would have them ask their doctor for flu vaccine that does not have thimerosal in it," she says. "And I would ask them to support efforts by the government to look into what these various environmental toxins, including mercury and mercury from medical products, are doing to our children. And they should try to avoid exposures."

McCormick advises parents to look at the bottom line.

"To parents, I say the risk of the wild-type diseases that are being prevented by vaccines is very, very real," she says. "You are trading the risk of these real diseases against a risk we cannot substantiate for these vaccines, which we don't have to do any more, because vaccines are now thimerosal free. If the choice must be between a thimerosal vaccine and no vaccine, take the thimerosal vaccine. But the flu vaccine is available in single dose vials without mercury. You do have a choice now."

Visit [WebMD's Parenting Center](#) 

By [Daniel J. DeNoon](#), reviewed by [Michael W. Smith, MD](#)

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