

Harpocrates Speaks

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MMR, the CDC and Brian Hooker: A Guide for Parents and the Media

The anti-vaccine community has been in a tizzy lately over a supposed "CDC whistleblower", Dr. William W. Thompson, who, according to them, revealed fraud at the United States Centers for Disease Control and Prevention (CDC). To bolster their claim, they point to a new study from one of their own, Brian S. Hooker, that purports to show evidence of an increased risk of autism among African American boys who receive their first MMR vaccine late. However, the claims appear to be hollow and unfounded, and so they have chosen to rely on emotional arguments that may sound convincing to those who are not familiar with the issues and people involved. In a truly egregious fashion, they have erroneously and cynically compared this whole thing to the [Tuskegee syphilis study](#), and equated the CDC with Adolf Hitler, Josef Stalin and Pol Pot, combined.

With that in mind, here is a brief FAQ for parents, news media and others to help them understand what the claims are and what the evidence actually says. The questions below have been raised or implied by anti-vaccine activists. Hopefully, this will prevent inaccurate reporting and help parents feel reassured about the MMR vaccine.

Did the CDC commit fraud?

A small group of vocal activists claim that the CDC committed fraud by intentionally covering up data. This group, which blames vaccines for a wide range of problems, offers no evidence in support of this claim. The closest they come is pointing to [a statement](#) released by a CDC researcher, William W. Thompson, in which he mentions a scientific disagreement over what data to publish in a 2004 paper on which he was an author ("[Age at first measles-mumps-rubella vaccination in children with autism and school-matched control subjects: a population-based study in metropolitan Atlanta](#)"). The study examined the age of first MMR vaccination and autism but found no association. While one could read into Thompson's statement an implication of wrongdoing, he does not allege any fraud either on his part nor on the part of the rest of the team associated with the 2004 paper. Even though his statement makes no mention of fraud, some people who wish to scare people about vaccines and make others distrust the CDC point to his statement as evidence of fraud.

Did the CDC hide data from the public?

No. The data set used by the CDC in the 2004 paper has always been available to qualified researchers. [Instructions on how to access these data](#) are available on the CDC web site.

Did the CDC cover up a finding that the MMR vaccine is linked to autism?

From the facts that are known at this time, the CDC does not appear to have covered up anything. In 2004, the CDC conducted a study examined children with autism (cases) and those who don't have autism (controls), then looked at the age of MMR vaccination to see if cases were more likely to have been immunized at a certain age than controls. While no clear association was discovered, they did notice that there was an odd finding that more cases than controls were vaccinated later than 24 months of age but before 36 months of age. To see if this apparent association was real, they gathered more information from state birth certificate records for all study subjects that had a Georgia birth certificate. This additional information allowed them to see if there might have been some other factor (e.g., birth weight, parents' age, mother's education level, etc.) that might have been responsible for the strange finding. Once the

researchers controlled for these additional factors, the anomaly disappeared, meaning that there was no connection between MMR vaccination and autism. The published paper included the results of the birth certificate analysis by race and age at first MMR vaccination, but did not include a racial comparison from the larger group for age at first vaccination, because racial information was not available for all subjects, and that strange finding from the larger group was not reliable. Furthermore, as the subgroup analysis showed, that initial finding was wrong. In response to the noise from the anti-vaccine movement, the [CDC released a statement](#) in support of their original study.

Did CDC lie when they said they got more information from birth certificate records?

No. Many anti-vaccine activists, [including Brian Hooker](#), have stated that the birth certificates do not contain the information the CDC researchers stated they obtained from them (birth weight, mother's education, etc.). While the birth certificates that parents receive have limited information, a more [complete worksheet](#) (PDF) is completed by the hospital staff and kept on file with the state. The information on the Georgia state birth worksheet is similar to the [U.S. Standard Certificate of Live Birth](#) (PDF). These complete birth records have information on birth weight, whether the birth was premature or at term, if the baby was a twin/triplet/etc., the mother's education level, and so on. The CDC researchers used these complete birth certificate records in their 2004 study. More information on the standard birth worksheet, including revisions, can be found on the CDC's [National Vital Statistics System](#) web site.

Did CDC use the birth certificate requirement to exclude African Americans from the study?

No. An early claim among anti-vaccine activists was that the CDC researchers only required birth certificates for African American children in their study so they could exclude them from the birth certificate subgroup analysis. This, so the claim goes, was so they could hide an association between MMR vaccine and autism among African American boys. But the researchers used birth certificates for *all* of the children in their study. This is illustrated in Table 2 from the 2004 study (reproduced here for commentary):

TABLE 2. Characteristics of Cases and Control Subjects in the Total Sample and the Birth Certificate Sample

Variable Category	Total Sample				Birth Certificate Sample			
	Controls		Cases		Controls		Cases	
	n	%	n	%	n	%	n	%
Age (y) in 1996								
3-5	623	34	214	34	376	37	127	36
6-10	1201	66	410	66	644	63	228	64
Gender								
Male	1462	80	500	80	809	79	282	79
Female	362	20	124	20	211	21	73	21
Race								
White	918	50	333	53	571	56	199	56
Black	636	35	230	37	384	38	137	39
Other	174	10	40	6	65	6	19	5
Missing	96	5	21	3	0	0	0	0
Maternal age (y)								
<20					95	9	15	4
20-34					803	79	280	79
35+					122	12	60	17
Maternal education (y)								
≤12					466	46	135	38
13-15					253	25	100	28
16+					301	30	120	34
Birth weight (g)								
0-1499					11	1	12	3
1500-2499					52	5	37	10
2500+					957	94	306	86
Multiplicity								
Singleton					990	97	329	93
Twin+					30	3	26	7
Parity								
First born					452	44	149	42
Second or higher					560	55	204	57
Missing					8	1	2	1
Total	1824	100	624	100	1020	100	355	100

Click to enlarge.

From: [DeStefano, et al. \(2004\)](#). "Age at First Measles-Mumps-Rubella Vaccination in Children With Autism and School-Matched Control Subjects: A Population-Based Study in Metropolitan Atlanta"

The birth certificate requirement was not used to suppress data on African Americans. This anti-vaccine claim appears to have been made specifically to exploit race and stir up fear and anger in the African American population.

Was the decision to use birth certificates arbitrary and irrelevant?

No. As the authors of the 2004 study note (emphasis added):

Among case and control children whose records we were able to match with Georgia birth certificate files, we performed a subanalysis *to evaluate possible confounding by differences in birth and maternal characteristics*.

The full study population data showed a possible association between age of first MMR and autism, but the data did not contain information that may have pointed to other causes of that association. The birth records did have that information, and allowed the researchers to discover that the MMR was *not* associated with autism.

Did a new study find that there is an increased risk of autism in African American boys?

[A study](#) ("[Measles-mumps-rubella vaccination timing and autism among young african american boys: a reanalysis of CDC data](#)") published in August 2014 in the journal *Translational Neurodegeneration* by Brian S. Hooker did conclude that there was an increased risk of autism in African American boys who were given their first MMR vaccine between 24 and 31 months of age (Hooker cut off at 31 months, rather than 36 months as in the CDC study, because, after excluding low birth weight infants, there were "insufficient cases" at 36 months; the subgroup he analyzed is different than in the CDC's study). His study also found that there was no association between MMR and autism at other ages, nor was there any association for African American girls nor for children of any other racial category. However, his results regarding African American boys are almost certainly wrong.

The original 2004 study by the CDC was what is called a case-control study. (A [case-control study](#) takes two matched groups, one with a condition and one without, and looks to see how likely or frequently they were exposed to a potential risk factor. It can suggest associations, but usually doesn't prove causation.) The data for that study were collected with the case-control design in mind. Hooker's study appears to be a cohort study, which is a completely different type of study design, yet he used the same CDC data set that was designed for a case-control study. (A [cohort study](#) starts with people who do not have the disease of interest, then follows them to see if different levels of exposure to a suspected risk factor increases the risk of the disease or condition of interest.) Using data designed for use in one type of study design in a study with a completely different design can introduce errors into the analysis. Hooker then used an inappropriate statistical analysis (either [Pearson's chi-squared test](#), as mentioned in the Methods, or [Fisher's exact test](#), as noted in the tables) to analyze the data. This type of test ignores variables that can skew results, as well as making a small signal seem very large. [Hooker admitted in a presentation at an anti-vaccine conference](#) (around the 17:00 mark) on August 29, 2014 that he used a very simple technique, that "simplicity is elegance", and that he prefers to do simple things rather than intellectually challenging things. However, elegant does not mean correct; his "simple" analysis ignored [confounding variables](#). Another shortcoming of the study is that Hooker does not report the number of individuals included in his subgroup analyses. The size of the groups matters. The smaller the group, the more likely a finding is due to chance. Since publication, the journal has withdrawn Hooker's study due to [concerns about the validity of its conclusions as well as possible conflicts of interest](#) that were not disclosed by Hooker or the peer reviewers who reviewed the study.

Who is Brian Hooker?

Brian S. Hooker is the father of an autistic child. He has a degree in biochemistry, but has no formal training in statistics or epidemiology, nor is he trained in any field pertinent to the study of vaccines or autism (e.g., immunology, vaccinology, childhood development, developmental psychology, etc.). Hooker has an [open case claiming vaccine injury](#) for his son before the Vaccine Court. He is also a [board member](#) of an anti-vaccine organization called Focus Autism. Focus Autism is the organization that funded Hooker's study. Hooker is also [ideologically opposed](#) to vaccines and the CDC, as evidenced by an email he sent to former director of the CDC, Julie Gerberding, in which he wrote, "I would personally urge you to review the *Book of*

Matthew 18:6 and consider your own responsibility to all children of the U.S. including my own son." The referenced Bible passage reads (King James Version):

But whoso shall offend one of these little ones which believe in me, it were better for him that a millstone were hanged about his neck, and that he were drowned in the depth of the sea.

What do you mean by undisclosed "conflicts of interest"?

Authors of scientific articles are supposed to provide a clear statement of any conflicts of interest that might bias their results. The purpose is to make the reader aware of what might influence the author's conclusions regarding the data and findings they are reporting. In his study, Brian Hooker only disclosed that he "has been involved in vaccine/biologic litigation". The statement implies that he is not currently involved in litigation related to vaccines. In reality, Hooker has an [active case](#) before the Vaccine Court in which he is suing the government for what he claims is his son's vaccine-induced autism. He stands to benefit from studies that find a connection between vaccines and autism. He also fails to disclose that he is a [board member](#) of the anti-vaccine organization Focus Autism, which funded the study.

The journal in which Hooker published his study, *Translational Neurodegeneration*, allows authors to submit suggestions for possible reviewers. These reviewers ought to be experts in the relevant fields and should not have strong personal or business ties to the study authors. The journal may choose to use the reviewers suggested by the authors, or they might pick researchers who have published papers previously in the same journal on the same or related subject. We do not know who the reviewers were, but there are some likely candidates, none of whom are qualified to act as peer reviewers and have numerous conflicts of interest, including working relationships with Hooker.

Did Hooker's study prove Andrew Wakefield right?

No, it did not. Andrew Wakefield has long advocated the belief that the MMR vaccine causes autism. If we ignore all of the flaws in Hooker's 2014 study and assume that his findings are accurate, Hooker's study shows that the MMR is *not* associated with autism. In other words, Hooker's study, if it is accurate, proves Andrew Wakefield (and much of the anti-vaccine movement) wrong. The only group in which Hooker found an association (and even that association is not proof of causation) was among African American boys who got the MMR vaccine late (between 24 and 31 months). But, as noted above, Hooker's study was quite flawed and so his findings are very likely incorrect.

The Bottom Line

Despite much noise being made by the small, yet incredibly vocal, anti-vaccine community, there is no evidence of fraud on the part of the CDC, nor is there convincing evidence of any cover-up. Brian S. Hooker's study contains a number of flaws leading to a spurious, and biologically implausible, conclusion. In fact, the quality of the study is such that the journal that published it [withdrew it pending further investigation](#), citing serious concerns about the validity and potential conflicts of interest. This entire issue is, in reality, much ado about nothing. It is just another example of anti-vaccine activists doing bad science to put your children at greater risk of harm, all because they cannot accept their own children as they are.
