

## Breaking the Silence on Vaccines, Measles and Autism

**Utibe Effiong\***

*Internal Medicine physician, MidMichigan Health - University of Michigan Health System, Michigan, USA*

**\*Corresponding Author:** Utibe Effiong, Internal Medicine physician, MidMichigan Health - University of Michigan Health System, Michigan, USA.

**Received:** March 15, 2019; **Published:** March 25, 2019

Last week UNICEF warned that global cases of measles are surging to alarmingly high levels. Worldwide, 98 countries reported more cases of measles in 2018 compared to 2017, eroding progress against this highly preventable, but potentially deadly disease. Nearer home, here in the United States, the CDC has confirmed more than 200 cases of measles from 11 states in just the first two months of the year. There were 372 cases in the whole of last year. The trend is indeed alarming.

After reading online comments over the past few weeks and recently engaging in a heated Twitter chat with people who do not believe in vaccines, I realized there are many who still see a link between vaccines and autism. This belief is largely based on discredited and retracted research by Andrew Wakefield, a British physician who was struck off the medical register in 2010 for deliberately falsifying his findings. But once fear-inducing information has spread, it is hard to take it back. For this reason, fears that vaccinations may be connected to the development of autism in children are still alive and well.

As a parent, I can understand the visceral fear of possibly placing your child in harm's way. But the reality is, you can potentially cause them more harm by not vaccinating. Vaccines have saved lives and eliminated diseases, such as polio in the United States. My home country of Nigeria benefited immensely from the eradication of smallpox through a global vaccination effort.

Despite the proven benefits of vaccines, misinformation still spreads fear and can be dangerously misleading, so public health experts have developed guides to help separate unfounded fears from serious risks. One set is Hill's Criteria for Causation, named after the British Epidemiologist, Sir Austin Bradford Hill, who clearly demonstrated the connection between cigarette smoking and the development of lung cancer. Hill's criteria are widely accepted in the modern era as a logical structure for investigating and defining causality in epidemiological study. How do concerns that vaccines cause autism stack up against these?

Autism is a brain disorder that impairs a person's behavior and ability to communicate and interact with others. According to the World Health Organization (WHO), "the umbrella term 'autism spectrum disorders' (ASDs) covers conditions such as autism, childhood disintegrative disorder and Asperger syndrome." The prevalence of autism in the United States increased by an astounding 754 percent from 1994 to 2005. The numbers have risen from 1 in 2,500 children in 1985 to 1 in 68 children in 2014. The rapidly increasing number of children being diagnosed with autism has contributed to the persistent fear that vaccines cause it.

The WHO and the U.S Centers for Disease Control and Prevention (CDC) both agree that scientific evidence indicates that various factors, both genetic and environmental, contribute to the onset of autism spectrum disorders by influencing early brain development. The measles, mumps, rubella (MMR) vaccine is one environmental factor that some have linked to the development of autism. But do the links that have been drawn actually infer causation?

As a physician and public health scientist, the concept of causation underlies much of my work. Ideally, the way to solve a problem is to identify and tackle its cause. For many health problems the culprit is not clearly apparent. Yet assuming the wrong cause for a problem

and addressing it can easily cause more problems than are resolved. This is where the role of evidence in understanding cause and effect is so important.

In thinking through the evidence, Hill's criteria for causation propose are a powerful guide to separating out factors that lead to problems, from those that do not. There are nine criteria he identified and among them, strength (of association), plausibility and analogy are those that have been most frequently used by opponents of vaccines to establish a causal link between vaccination and autism. But how strong is the evidence?

It is true that there has been an increase in the prevalence of autism as vaccine coverage has increased over the past few decades. It is also true that organic mercury is a neurotoxin. Up until 2001 in the U.S., several vaccines contained small amounts of the mercury compound thimerosal as a preservative. It is tempting therefore to assume a connection between the two.

However, well-designed epidemiological studies have not revealed any statistically significant association between the MMR vaccine and autism. This is also true for case-control studies that have compared autistic children to those without autism with regards to exposure to vaccines. And importantly, not all forms of organic mercury are equal when it comes to toxicity: thimerosal contains the compound ethylmercury, which is safe, as opposed to methylmercury, the compound people are regularly exposed to when we eat fish.

The bottom line is this: the fact that events A and B occur together does not mean that A caused B and vice versa. When examined in the light of Hill's other six criteria, the vaccines-cause-autism arguments still do not hold up.

- **Consistency:** Autism also occurs in unvaccinated children.
- **Specificity:** Autism does not occur in every (MMR) vaccinated child.
- **Temporality:** The development of autism is not related to the time of vaccination.
- **Biological gradient:** The incidence of autism among vaccinated children does not increase with the number of vaccines received.
- **Coherence:** Follow up studies show no significant elevation in blood mercury levels following vaccination.
- **Experiment:** Most vaccinated children do not develop autism.

It is in the light of these facts that the WHO and the CDC continually reassure the public about vaccine safety. Like drugs, vaccines are safe and save lives in the vast majority of cases when used as directed, and they do not cause autism.

I left our Twitter debate with a promise to write a convincing piece. It is my hope that this post will at the least help some people consider other alternatives to the cause of autism. For me and most public health scientists, the jury is in: vaccines are innocent in this matter.

**Volume 3 Issue 4 April 2019**

**©All rights reserved by Utibe Effiong.**