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Public risk perception of vaccination

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Barring one particular study in 1998, nearly all the leading health organisations including the Center for Disease Control (CDC) and the National Institute for Health (NIH) in the US say that there is no relationship between vaccines and autism. Yet many parents are convinced there is more to the story, and doubts about the safety and risks of vaccines linger in their minds. What's new to the controversy when a journal, Lancet, recently retracted the 1998 study?

The concern over MMR began when Dr Andrew Wakefield, a British gastroenterologist (who now lives in the US), tested 12 youngsters in a 1998 study with and without autism and found a possible link between measles virus in the gut and autism. The theory presented was that certain children have a genetic pre-disposition to immune issues -- and that a variety of environmental toxins begin to attack the child's immune system early on causing the autistic response.

Here, the vaccines are known to stimulate the immune system, which may put stress on the cell function of a child. However, other studies done in Britain, Japan and Finland have found no connection between MMR shots and autism.

Most recently, Lancet retracted Wakefield's 1998 study saying its selection of participants may have been biased and that he committed several breaches of ethics in his work. Six years ago, 10 of the 13 co-authors on the study got queasy about the findings and disowned the paper, fearing it could damage public health efforts. This is because the study was exceptionally cautious in its conclusions, "We did not prove an association between measles, mumps, and rubella vaccine and the syndrome [colitis and autism] described."

"We have identified a chronic enterocolitis in children that may be related to neuropsychiatric dysfunction. In most cases, onset of symptoms was after measles, mumps, and rubella immunisation. Further investigations are needed to examine this syndrome and its possible relation to this vaccine."

That is cautious language, and 12 patients constitute a tiny study. But Wakefield presented the findings forcefully at the time, saying the study raised a "moral issue" that called for "urgent further research," according to a BBC story. He said he couldn't support giving the vaccine to children. The final assault on the paper came with newer facts. Children who were supposedly "consecutively referred" to the investigators were not. There was evidence of a pick-and-choose recruitment bias, which discredits the conclusions. What's more, Wakefield breached ethics standards because he said the kids were referred to him for stomach problems even though he knew that some were part of a lawsuit against MMR vaccine manufacturers. Wakefield even got paid for advisory work on that very lawsuit and had a hand in a patent for a competing vaccine being developed, Sunday Times investigation revealed.

Wakefield continues to deny any wrongdoing, but many scientists consider the damage already done: in the decade since publication of the Lancet study, measles vaccination rates fell in Britain. During that time, cases of measles in England and Wales rose 25-fold to 1,370 cases in 2008, according to the British Health Protection Agency. Why is this so? People's risk perception.

A growing body of research indicates that people making decisions interpret the chances of encountering rare events, such as a child developing tragic complications from a vaccine, in dramatically different ways.

"There's an explosion of interest in studying how people acquire the information on which they base risky decisions," says psychologist Craig Fox of the University of California, Los Angeles. People who learn about the likelihood of encountering a low-probability, high-impact event via descriptions that include precise probabilities tend to overestimate, by a lot, the chances of that event actually occurring.

Vaccine-phobic parents have typically never seen a child sink into autism after an MMR injection and never will. However, they have heard scary secondhand accounts, read celebrity-penned tales of vaccine horrors and scanned government statistics on the minuscule but still real chances of side effects unrelated to autism. These parents sit on what might be called the "descriptive cusp" of risky decision-making. External information prompts them to overestimate kids' likelihood of suffering actual MMR side effects. Autism looms menacingly in this context.

But there's another side to the risk: the experience of the doctors. Since 2003, investigators have documented a strong tendency for people to underestimate the actual likelihood of rare events when using experience as a guide. Unlike parents, doctors weigh vaccine side-effect statistics and tales of terrors against a rich vein of personal experience. As a result, a doctor would tend to underestimate the possibility of patients developing real but infrequent vaccination side effects like autism and are befuddled by parents' unfounded autism concerns.

It is possible that the news of the recent retraction of the 1998 study by Lancet causes people now to overestimate this piece of descriptive evidence. So it stands to reason that reluctant parents, upon reading about the retraction, will drag their kids to the doctor for a shot and a lollipop!

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