



## The MMR vaccine and autism: Sensation, refutation, retraction, and fraud

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In 1998, Andrew Wakefield and 12 of his colleagues[1] published a case series in the *Lancet*, which suggested that the measles, mumps, and rubella (MMR) vaccine may predispose to behavioral regression and pervasive developmental disorder in children. Despite the small sample size ( $n=12$ ), the uncontrolled design, and the speculative nature of the conclusions, the paper received wide publicity, and MMR vaccination rates began to drop because parents were concerned about the risk of autism after vaccination.[2]

Almost immediately afterward, epidemiological studies were conducted and published, refuting the posited link between MMR vaccination and autism.[3,4] The logic that the MMR vaccine may trigger autism was also questioned because a temporal link between the two is almost predestined: both events, by design (MMR vaccine) or definition (autism), occur in early childhood.

The next episode in the saga was a short retraction of the interpretation of the original data by 10 of the 12 co-authors of the paper. According to the retraction, “no causal link was established between MMR vaccine and autism as the data were insufficient”. [5] This was accompanied by an admission by the *Lancet* that Wakefield *et al.*[1] had failed to disclose financial interests (e.g., Wakefield had been funded by lawyers who had been engaged by parents in lawsuits against vaccine-producing companies). However, the *Lancet* exonerated Wakefield and his colleagues from charges of ethical violations and scientific misconduct.[6]

The *Lancet* completely retracted the Wakefield *et al.*[1] paper in February 2010, admitting that several elements in the paper were incorrect, contrary to the findings of the earlier investigation.[7] Wakefield *et al.*[1] were held guilty of ethical violations (they had conducted invasive investigations on the children without obtaining the necessary ethical clearances) and scientific misrepresentation (they reported that their sampling was consecutive when, in fact, it was selective). This retraction was published as a small, anonymous paragraph in the journal, on behalf of the editors.[8]

The final episode in the saga is the revelation that Wakefield *et al.*[1] were guilty of deliberate fraud (they picked and chose data that suited their case; they falsified facts).[9] The *British Medical Journal* has published a series of articles on the exposure of the fraud, which appears to have taken place for financial gain.[10–13] It is a matter of concern that the exposé was a result of journalistic investigation, rather than academic vigilance followed by the institution of corrective measures. Readers may be interested to learn

that the journalist on the Wakefield case, Brian Deer, had earlier reported on the false implication of thiomersal (in vaccines) in the etiology of autism.[14] However, Deer had not played an investigative role in that report.[14]

The systematic failures which permitted the Wakefield fraud were discussed by Opel *et al.*[15]

## IMPLICATIONS

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Scientists and organizations across the world spent a great deal of time and money refuting the results of a minor paper in the *Lancet* and exposing the scientific fraud that formed the basis of the paper. Appallingly, parents across the world did not vaccinate their children out of fear of the risk of autism, thereby exposing their children to the risks of disease and the well-documented complications related thereto. Measles outbreaks in the UK in 2008 and 2009 as well as pockets of measles in the USA and Canada were attributed to the nonvaccination of children.[7] The Wakefield fraud is likely to go down as one of the most serious frauds in medical history.[9]

Scientists who publish their research have an ethical responsibility to ensure the highest standards of research design, data collection, data analysis, data reporting, and interpretation of findings; there can be no compromises because any error, any deceit, can result in harm to patients as well harm to the cause of science, as the Wakefield saga so aptly reveals. We sincerely hope that researchers will keep this ethical responsibility in mind when they submit their manuscripts to the *Indian Journal of Psychiatry*.

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