

MMR Vaccine Does Not Cause Autism

Examine the evidence!

There is no scientific evidence that MMR vaccine causes autism. The question about a possible link between MMR vaccine and autism has been extensively reviewed by independent groups of experts in the United States, including the National Academy of Sciences' Institute of Medicine (now renamed the National Academy of Medicine). These reviews have concluded that the available epidemiologic evidence does not support a causal link between MMR vaccine and autism.

The suggestion that MMR vaccine might lead to autism had its origins in gastroenterology research by Andrew Wakefield in the United Kingdom. In 1998, Wakefield and colleagues published an article in The Lancet claiming that the measles vaccine virus in MMR caused inflammatory bowel disease, allowing harmful proteins to enter the bloodstream and damage the brain.

The validity of this finding was later called into question when it could not be reproduced by other researchers. In addition, the findings were further discredited when an investigation found that Wakefield did not disclose he was being funded for his research by lawyers seeking evidence to use against vaccine manufacturers. As a result, Wakefield was permanently barred from practicing medicine in the United Kingdom and The Lancet retracted the original article in 2010.

RETRACTED: *Ileal-Lymphoid-Nodular Hyperplasia, Non-Specific Colitis, and Pervasive Developmental Disorder in Children.* Wakefield AJ et al. *Lancet* 1998; 351(9103):637-41. Subjects: 12 children with chronic enterocolitis and regressive developmental disorder.

"A Statement by the Editors of the Lancet," *Lancet* 2010; 363(9411):820-1, **The editors fully retract this paper from the published record:** <http://download.thelancet.com/flatcontentassets/pdfs/S0140673610601754.pdf>

The following list of articles published in peer-reviewed journals is provided so that parents and practitioners can themselves compare the balance of evidence about MMR vaccine and autism.

More than 25 articles refute a connection between MMR vaccine and the development of autism

1. Early Exposure to the Combined Measles-Mumps-Rubella Vaccine and Thimerosal-containing Vaccines and Risk of Autism Spectrum Disorder. Uno Y et al. *Vaccine* 2015;33(21):2511-6. This case-control study investigated the relationship between the risk of Autism Spectrum Disorder (ASD) onset, and early exposure to MMR vaccine and thimerosal measured from vaccinations in the highly genetically homogenous Japanese population.

CONCLUSION: No convincing evidence was found in this study that MMR vaccination and increasing thimerosal dose were associated with an increased risk of ASD onset.

LINK: www.ncbi.nlm.nih.gov/pubmed/25562790

2. Autism Occurrence by MMR Vaccine Status among US Children with Older Siblings with and without Autism. Jain A et al. *JAMA* 2015;313(15):1534-40. The objective of this study was to investigate Autism Spectrum Disorder (ASD) occurrence by MMR vaccine status in a large sample of US children who have older siblings with and without ASD.

CONCLUSION: In this large sample of privately insured children with older siblings, receipt of the MMR vaccine was not associated with increased risk of ASD, regardless of whether older siblings had ASD. These findings indicate no harmful association between MMR vaccine receipt and ASD even among children already at higher risk for ASD.

LINK: www.ncbi.nlm.nih.gov/pubmed/25898051

3. Vaccines Are Not Associated with Autism: An Evidence-based Meta-analysis of Case-control and Cohort Studies. Taylor LE et al. *Vaccine* 2014;32(29):3623-9. A meta-analysis to summarize available evidence from five cohort studies involving 1,256,407 children and five case-control studies involving 9,920 children.

CONCLUSION: Vaccination is not associated with the development of autism or autism spectrum disorder (ASD). Furthermore, the components of the vaccines (thimerosal or mercury) or multiple vaccines (MMR) are not associated with the development of autism or ASD.

LINK: www.ncbi.nlm.nih.gov/pubmed/24814559

4. Vaccines for Measles, Mumps and Rubella in Children. Demicheli V et al. *Cochrane Database Syst Rev.* 2012 Feb 15. Literature review of 5 randomized controlled trials, 1 controlled clinical trial, 27 cohort studies, 17 case-control studies, 5 time-series trials, 1 case cross-over trial, 2 ecological studies, 6 and self-controlled case series studies involving in all about 14,700,000 children and assessing effectiveness and safety of MMR vaccine (2004-2011).

CONCLUSION: Exposure to the MMR vaccine was unlikely to be associated with autism, asthma, leukaemia, hay fever, type 1 diabetes, gait disturbance, Crohn's disease, demyelinating diseases, bacterial or viral infections.

LINK: www.ncbi.nlm.nih.gov/pubmed/22336803

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- 5. Immunization Safety Review: Adverse Effects of Vaccines: Evidence and Causality.** Institute of Medicine. *The National Academies Press*: 2011. Consensus Report.
- CONCLUSION:** Evidence favors rejection of five vaccine-adverse event relationships, including MMR vaccine and autism. Overall, the committee concludes that few health problems are caused by or clearly associated with vaccines.
- LINK:** www.iom.edu/reports/2011/adverse-effects-of-vaccines-evidence-and-causality.aspx
- 6. Lack of Association Between Measles-Mumps-Rubella Vaccination and Autism in Children: A Case-Control Study.** Mrozek-Budzyn D et al. *Pediatr Infect Dis J.* 2010;29(5):397-400. The 96 cases with childhood or atypical autism, aged 2 to 15, were included in the study group. Controls consisted of 192 children individually matched to cases by year of birth, sex, and general practitioners.
- CONCLUSION:** The study provides evidence against the association of autism with either MMR or a single measles vaccine.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/19952979
- 7. Measles Vaccination and Antibody Response in Autism Spectrum Disorders.** Baird G et al. *Arch Dis Child* 2008; 93(10):832-7. Subjects: 98 vaccinated children aged 10-12 years in the UK with autism spectrum disorder (ASD); two control groups of similar age: 52 children with special educational needs but no ASD and 90 children in the typically developing group.
- CONCLUSION:** No association between measles vaccination and ASD was shown.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/18252754
- 8. Lack of Association between Measles Virus Vaccine and Autism with Enteropathy: A Case-Control Study.** Hornig M et al. *PLoS ONE* 2008; 3(9):e3140. Subjects: 25 children with autism and GI disturbances and 13 children with GI disturbances alone (controls).
- CONCLUSION:** This study provides strong evidence against association of autism with persistent MV RNA in the GI tract or MMR exposure.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/18769550
- 9. Immunizations and Autism: A Review of the Literature.** Doja A, Roberts W. *Can J Neurol Sci.* 2006; 33(4):341-6. Literature review.
- CONCLUSION:** Our literature review found very few studies supporting this theory, with the overwhelming majority showing no causal association between the Measles-Mumps-Rubella vaccine and autism.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/17168158
- 10. No Evidence of Persisting Measles Virus in Peripheral Blood Mononuclear Cells from Children with Autism Spectrum Disorder.** D'Souza Y et al. *Pediatrics* 2006; 118(4):1664-75. Subjects: 54 children with autism spectrum disorder and 34 developmentally normal children
- CONCLUSION:** There is no evidence of measles virus persistence in the peripheral blood mononuclear cells of children with autism spectrum disorder.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/17015560
- 11. MMR-Vaccine and Regression in Autism Spectrum Disorders: Negative Results Presented from Japan.** Uchiyama T et al. *J Autism Dev Disord* 2007; 37(2):210-7. Subjects: 904 children with autism spectrum disorder. (Note: MMR was used in Japan only between 1989 and 1993.)
- CONCLUSIONS:** During the period of MMR usage no significant difference was found in the incidence of regression between MMR-vaccinated children and non-vaccinated children. Among the proportion and incidence of regression across the three MMR-program-related periods (before, during and after MMR usage), no significant difference was found between those who had received MMR and those who had not. Moreover, the incidence of regression did not change significantly across the three periods.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/16865547
- 12. Pervasive Developmental Disorders in Montreal, Quebec, Canada: Prevalence and Links with Immunizations.** Fombonne E et al. *Pediatrics.* 2006;118(1):e139-50. Subjects: 27,749 children born from 1987 to 1998 attending 55 schools.
- CONCLUSION:** The findings ruled out an association between pervasive developmental disorder and either high levels of ethylmercury exposure comparable with those experienced in the United States in the 1990s or 1- or 2-dose measles-mumps-rubella vaccinations.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/16818529
- 13. Is There a 'Regressive Phenotype' of Autism Spectrum Disorder Associated with the Measles-Mumps-Rubella Vaccine? A CPEA Study.** Richler J, Luyster R, Risi S, et al. *J Autism Dev Disord.* 2006 Apr;36(3):299-316. A multi-site study of 351 children with Autism Spectrum Disorders (ASD) and 31 typically developing children used caregiver interviews to describe the children's early acquisition and loss of social-communication milestones.
- CONCLUSION:** There was no evidence that onset of autistic symptoms or of regression was related to measles-mumps-rubella vaccination.
- LINK:** www.ncbi.nlm.nih.gov/m/pubmed/16729252
- 14. Relationship between MMR Vaccine and Autism.** Klein KC, Diehl EB. *Ann Pharmacother.* 2004; 38(7-8):1297-300. Literature review of 10 studies.
- CONCLUSION:** Based upon the current literature, it appears that there is no relationship between MMR vaccination and the development of autism.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/15173555
- 15. Immunization Safety Review: Vaccines and Autism.** Institute of Medicine. *The National Academies Press*: 2004. Consensus report.
- CONCLUSION:** The committee concludes that the body of epidemiological evidence favors rejection of a causal relationship between the MMR vaccine and autism.
- LINK:** www.nap.edu/openbook.php?isbn=030909237X
- 16. MMR Vaccination and Pervasive Developmental Disorders: A Case-Control Study.** Smeeth L et al. *Lancet* 2004; 364(9438): 963-9. Subjects: 1294 cases and 4469 controls.
- CONCLUSION:** Our findings suggest that MMR vaccination is not associated with an increased risk of pervasive developmental disorders.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/15364187

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- 17. Age at First Measles-Mumps-Rubella Vaccination in Children with Autism and School-Matched Control Subjects:** A Population-Based Study in Metropolitan Atlanta. DeStefano F et al. *Pediatrics* 2004; 113(2): 259-66. Subjects: 624 children with autism and 1,824 controls.
- CONCLUSIONS:** Similar proportions of case and control children were vaccinated by the recommended age or shortly after (ie, before 18 months) and before the age by which atypical development is usually recognized in children with autism (ie, 24 months). Vaccination before 36 months was more common among case children than control children, especially among children 3 to 5 years of age, likely reflecting immunization requirements for enrollment in early intervention programs.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/14754936
- 18. Prevalence of Autism and Parentally Reported Triggers in a North East London Population.** Lingam R et al. *Arch Dis Child* 2003; 88(8):666-70. Subjects: 567 children with autistic spectrum disorder.
- CONCLUSIONS:** The prevalence of autism, which was apparently rising from 1979 to 1992, reached a plateau from 1992 to 1996 at a rate of some 2.6 per 1000 live births. This levelling off, together with the reducing age at diagnosis, suggests that the earlier recorded rise in prevalence was not a real increase but was likely due to factors such as increased recognition, a greater willingness on the part of educationalists and families to accept the diagnostic label, and better recording systems. The proportion of parents attributing their child's autism to MMR appears to have increased since August 1997.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/12876158
- 19. A Population-Based Study of Measles, Mumps, and Rubella Vaccination and Autism.** Madsen KM et al. *N Engl J Med* 2002; 347(19):1477-82. Subjects: All 537,303 children born 1/91–12/98 in Denmark.
- CONCLUSIONS:** This study provides strong evidence against the hypothesis that MMR vaccination causes autism.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/12421889
- 20. Neurologic Disorders after Measles-Mumps-Rubella Vaccination.** Makela A et al. *Pediatrics* 2002; 110:957-63. Subjects: 535,544 children vaccinated between November 1982 and June 1986 in Finland.
- CONCLUSIONS:** We did not identify any association between MMR vaccination and encephalitis, aseptic meningitis, or autism.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/12415036
- 21. Relation of Childhood Gastrointestinal Disorders to Autism: Nested Case Control Study Using Data from the UK General Practice Research Database.** Black C et al. *BMJ* 2002; 325:419-21. Subjects: 96 children diagnosed with autism and 449 controls.
- CONCLUSIONS:** No evidence was found that children with autism were more likely than children without autism to have had defined gastrointestinal disorders at any time before their diagnosis of autism.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/12193358
- 22. Measles, Mumps, and Rubella Vaccination and Bowel Problems or Developmental Regression in Children with Autism: Population Study.** Taylor B et al. *BMJ* 2002; 324(7334):393-6. Subjects: 278 children with core autism and 195 with atypical autism.
- CONCLUSIONS:** These findings provide no support for an MMR associated "new variant" form of autism with developmental regression and bowel problems, and further evidence against involvement of MMR vaccine in the initiation of autism.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/11850369
- 23. No Evidence for a New Variant of Measles-Mumps-Rubella-Induced Autism.** Fombonne E et al. *Pediatrics* 2001;108(4):E58. Subjects: 262 autistic children (pre- and post-MMR samples).
- CONCLUSIONS:** No evidence was found to support a distinct syndrome of MMR-induced autism or of "autistic enterocolitis." These results add to the recent accumulation of large-scale epidemiologic studies that all failed to support an association between MMR and autism at population level. When combined, the current findings do not argue for changes in current immunization programs and recommendations.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/11581466
- 24. Time Trends in Autism and in MMR Immunization Coverage in California.** Dales L et al. *JAMA* 2001; 285(9):1183-5. Subjects: Children born in 1980-94 who were enrolled in California kindergartens (survey samples of 600–1,900 children each year).
- CONCLUSIONS:** These data do not suggest an association between MMR immunization among young children and an increase in autism occurrence.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/11231748
- 25. Mumps, Measles, and Rubella Vaccine and the Incidence of Autism Recorded by General Practitioners: A Time Trend Analysis.** Kaye JA et al. *BMJ* 2001; 322:460-63. Subjects: 305 children with autism.
- CONCLUSIONS:** Because the incidence of autism among 2 to 5 year olds increased markedly among boys born in each year separately from 1988 to 1993 while MMR vaccine coverage was over 95% for successive annual birth cohorts, the data provide evidence that no correlation exists between the prevalence of MMR vaccination and the rapid increase in the risk of autism over time. The explanation for the marked increase in risk of the diagnosis of autism in the past decade remains uncertain.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/11222420
- 26. Autism and Measles, Mumps, and Rubella Vaccine: No Epidemiological Evidence for a Causal Association.** Taylor B et al. *Lancet* 1999;353 (9169):2026-9. Subjects: 498 children with autism.
- CONCLUSION:** Our analyses do not support a causal association between MMR vaccine and autism. If such an association occurs, it is so rare that it could not be identified in this large regional sample.
- LINK:** www.ncbi.nlm.nih.gov/pubmed/10376617