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# Autism and Immunisation

## The Story Behind The Controversy

## A Guide for Parents

- Responding to arguments about immunisation
- Is the MMR vaccine safe?

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# CONTENTS



**Disclaimer :** The information provided in this booklet is only intended to be a general summary of information to the public and is not intended to take the place of any medical advice. If you require further information regarding immunising your children, please seek further advice from your doctor.

## 1. Introduction

It is widely accepted that immunisation is a normal part of childhood. For the success of any immunisation program, it is important that health care professionals and parents are well informed about the benefits and risks. Parents have the right to know the facts and health care professionals should openly discuss the feelings and perceptions of parents. Health professionals' attitudes towards parents can profoundly influence parents' decisions.

This booklet has been written especially for parents of children with autism to allay any guilt they may feel if they believe they contributed to their child's autism by choosing to vaccinate. It is hoped that this booklet will inform and guide parents in the choices they make in vaccinating their children.





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## 2. Autism and vaccination: Sorting myth from reality

All parents/carers can feel anxious and worried when it comes to vaccinating their children. It is important for health professionals to focus on the advances in evidence for the safety of vaccines, but it is also important to acknowledge parents/carers beliefs and perceptions about immunisation although they may differ from those of many health care professionals.

Since vaccination is voluntary in Australia, parents/carers should be given the opportunity to examine the evidence, ask questions and have their concerns heard Below are the three main reasons some people believe that autism is caused by vaccination.

**MYTH 1: MMR vaccine causes inflammatory bowel disease and autism**

The measles, mumps and rubella (MMR) vaccine has been linked to autistic disorder (AD) and related disorders largely because the introduction of the MMR vaccine in Australia and other parts of the developed world during the late 1980s seems to have coincided with an apparent increase in autism spectrum disorder (ASD) diagnoses.

This apparent increasing prevalence of ASD certainly deserves public attention. Whether this is due to recent widening in the diagnostic criteria, increased awareness and ability to differentiate autism from intellectual

disability and other conditions or a true increase is debatable. Furthermore, whether any increase in ASD diagnoses is linked to any type of vaccination has not been scientifically proven

A widely publicised British study investigated 12 children with regressive autism showing a variety of gut symptoms[1]. These researchers suggested that measles virus infection remaining in the gut after vaccination with the MMR vaccine causes autism[1]. In this article, the researchers linked the MMR vaccine with inflammatory bowel disease (IBD). They also suggested that the inflamed bowel lets harmful chemicals into the bloodstream and then into the brain, interfering with a child's development[1].

However, all around the world, other researchers have provided other evidence rejecting such a link. From a scientific point of view, the work by the British researchers had many flaws[2]. In particular, the research was discredited because it was funded by a body where a conflict of interest existed (i.e. a group of families of children with autism who were mounting a class action at the time). Also, the gastrointestinal symptoms were only observed after the onset of autistic symptoms. There was no control group in the study and other researchers have been unable to reproduce the findings.





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http://www.ncirs.usyd.edu.au/decisionaid/index.html.

There is also a useful table for you on the immunisation debate on the back page of the Australian Immunisation Handbook. This tool compares the effects of the diseases that are prevented by vaccines and the reported adverse reactions to the vaccine. It can also be found on line at: http://www1.health.gov.au/immhandbook/pdf/quickguide-comparison.pdf

**The decision lies in your hands.**
**You know your child best.**





So far, there are 18 noteworthy large scale epidemiological studies to discount a connection between the MMR vaccine and the development of ASD and only three studies that suggest a connection.

Of the 18 studies discounting the link, six studies looked at whether the increasing ASD rates were matched by a corresponding change in MMR vaccine coverage[3,4,5,6,7,8,9]. All these studies showed that while ASD rates continued to rise, the uptake of the MMR vaccine was basically the same over the studied period.

It is particularly noteworthy that a recent study in Japan showed a continual increase in autism rates despite a ban in the MMR vaccine in 1993[9]. The reason it was banned was due to the mumps component, which was thought to cause meningitis. In Japan, the measles, mumps and rubella vaccines are now administered separately.

In Denmark, a large study compared the incidence of ASD in vaccinated and unvaccinated populations and found them to be the same[10].

Between 22 per cent and 50 per cent of children with autism appear to develop normally then regress some time between 1 and 2 years old. There is nothing to say that this type of autism is increasing. It is also worth noting that major changes are occurring in children around 12 months, which is the age recommended in the Australian immunisation schedule for vaccination with MMR. It is a time when infants are starting to develop

language and socialise beyond the immediate family. The fact that some children are different becomes more obvious[11]. Loss of baby babble and/or not developing communicative speech some time between 12 and 18 months may be mistaken for regressive loss of speech and language.

In brief, there are no proper scientific studies proving that autism is connected with the MMR vaccine. It can't be completely ruled out that autism is caused by the MMR vaccine in a small group of unusually vulnerable children but this is extremely unlikely.

**MYTH 2: Vaccines contain mercury-based preservatives which are toxic and cause autism**

Thiomersal is a preservative that has been used in vaccines since the 1930s. Thiomersal contains ethylmercury. At high concentrations, mercury affects the nervous system (i.e. the brain and nerves in the body) and this is why some people may say it can cause autism.

However, the nervous system side effects mercury can cause are different to the manifestations of autism[12].

The claims that the content of thiomersal in vaccines exceeds safety levels are based on studies which have shown that the *cumulative* exposure to ethylmercury from vaccines in the first three





evaluated by the Therapeutics Goods Administration (TGA) after they reach the market so that any rarer adverse effects can be picked up. If any serious side effects are reported it can result in a vaccine being withdrawn from the market, as was the case in 1999 for a rotavirus vaccine in the USA, following reports of gut problems developing in some children[26]. Likewise, if there are no concerns after marketing, it confirms and reassures us that there are no major or unexpected adverse events associated with established vaccines in Australia.

It is evident parents/carers may be more anxious and worried and thus easily swayed to believe that vaccinations are unsafe[22,27]. It is inevitable that parents/carers will also be exposed to numerous negative reports from the Internet and other media resources with questionable credibility on the safety of vaccines and their alleged links to ASD[28]. To date, there is no proof whatsoever linking immunisation and autism.

It is important to bear in mind that the diseases vaccines protect against can cause death and severe disability. They can only be prevented if there is herd immunity, that is the majority of a community are vaccinated. A valuable website has been set up by the National Centre for Immunisation Research and Surveillance Australia (2004) that clearly presents the science surrounding the alleged link between MMR and autism. A decision-making checklist that helps parents/carers to make well-informed decisions regarding vaccinating with MMR can be found at the website

## 3. Conclusion

Immunisation may now be undervalued because vaccines have largely eliminated the threat of serious infectious diseases in childhood. Measles killed a quarter of a million children in England and Wales last century, but such deaths in the UK are now rare[22]. This is also apparent with other vaccine preventable diseases, such as whooping cough, diphtheria and polio. As a result, the success of immunisation programs means that many parents and health professionals have no first hand experience of many of the diseases that are prevented by immunisations and so do not appreciate how damaging these can be[22,23,24,25]. Immunisation is a casualty of its own success.

Improved sanitation and supply of clean water have prevented the spread of many infectious diseases but we remain unprotected from infectious diseases such as *Haemophilus influenzae* B unless vaccinated. One in 20 meningitis patients dies and one in four survivors has permanent brain or nerve damage. Even diseases such as tetanus have not been completely eradicated, posing a significant risk especially to very young children. About 1 in 10 patients dies if they contract the disease. Infectious diseases will claim more lives if immunisation coverage drops. All vaccine preventable diseases can result in severe disabilities if not death.

Vaccines, like all registered medications, continue to be





months of life is higher than the recommended United States Environmental Protection Agency (EPA) guidelines for methylmercury but lower than safety levels recommended by the World Health Organization (WHO)[13].

However, five points about the EPA guidelines need to be kept in mind: they are based on experiments looking at effects on the baby when in the womb rather than following birth; they are not a toxicity level but rather a cut-off point for safety; they add a 10-fold "safety factor"; they assume that ethylmercury builds up over time[14,15,16] and they also assume that ethylmercury is the same as methylmercury.

In fact, although similar in many ways, ethylmercury and methylmercury have many different characteristics. One important difference is that various experiments have shown that ethylmercury doesn't build up in the body[14,16] and, unlike methylmercury, ethylmercury doesn't pass into the brain[12]. Based on these findings, it is highly likely then, that virtually all the ethylmercury would be out of the baby's system by the time the next vaccine dose is given and any left wouldn't be able to cross into the brain anyway. In addition, the same experiments also showed that mercury levels in the blood of babies vaccinated with thiomersal-containing vaccines were well below the EPA safety threshold level. Another study showed that despite the discontinuation of thiomersal-

containing vaccines in Denmark in 1992, the incidence of autism has continued to rise[17]. A further study looked at the effects of early exposure to thiomersal on nerve and organ development and found there were no problems[18].

Despite the fact that scientists have clearly shown that thiomersal is not a cause of autism, it has stopped being used in Australian vaccines since 2000[19].

**MYTH 3: Vaccines weaken/ overwhelm the immune system which results in autism**

It has also been theorised that genetic susceptibility and excessive insult to the immature immune system with multivalent (combination) vaccines, such as MMR and diphtheria, tetanus and pertussis (DTP), has the potential to trigger a neurological autoimmune condition. There is no scientific evidence supporting this theory[20,21]. This is due to the fact that within hours of birth, a newborn baby is very capable of mounting protective humoral and cellular immune responses to vaccines. A very young baby can do this with many vaccines at a time so there is no risk giving combinations of vaccines together.





Furthermore, children who are mildly ill have the same antibody response to those who are healthy. The reason for delaying a vaccination in a child who is sick is to allow the monitoring of vaccine-induced side effects in order for them not to be confused with the symptoms of the illness. It is not because the immune system is being over-challenged or weakened as suggested. Besides, even though more vaccines are being given to children today, they are actually exposed to fewer antigens in vaccines than in the past due to the fact that technology can make vaccines in a purer form.