

Claim: Vaccines suppress the immune system

Vaccines stimulate the immune system to fight off the specific disease. There is no evidence that they weaken the immune system.

Claim: Additives in vaccine are toxic

Vaccines can include substances like formaldehyde, thiomersal and aluminium. Each of these has a specific purpose related to vaccine manufacture or efficacy. While these are toxic in large doses, they are present in such small amounts in vaccines as not to be toxic. Although not proven to be a problem, as a precaution thiomersal has been removed from most childhood vaccines.

Claim: Vaccines are contaminated with viruses and other substances

The original polio vaccines contained a virus (SV40) as a contaminant. All vaccines are now carefully tested to make sure they have no such contaminant. Recently a new ultra sensitive test found an enzyme activity (reverse transcriptase) in some vaccines which could have been from viral contamination. Testing did not find any virus, and the activity was from the chick cells that the vaccine was grown in. These proteins and other substances from the culture of the vaccine are likely to be present in the vaccine. If so they are present in such small amounts as not to cause any problems, even if allergic to them (eg allergy to egg protein).

Claim: Immunisation causes cancer

There is no evidence to support this statement. There is a Danish study published in 1985 which showed an association between some diseases and cancers and early exposure to measles infection, possibly modified by immunoglobulin injection. It does not show, as some claim, that measles prevents cancer, nor that immunisation causes it.

The Hepatitis B vaccine prevents liver cancer. Other vaccines which can prevent cancer are being developed.

Claim: Homoeopathic immunisation is better

Homoeopathic "immunisation" has not been shown to work. It leaves children unprotected against serious, and possibly fatal, diseases. Medical homoeopaths support immunisation.

Claim: Breast milk is the best immune stimulator for your baby.

Breastfeeding can reduce the severity and frequency of chest, ear and gut infection, but may not give specific protection against other diseases. The protection from breastfeeding varies from person to person and only lasts a short time. Breastfeeding may help the baby's response to immunisation.

Breastfeeding does not provide any lasting immune memory; and no specific protection against diseases like whooping cough (pertussis)

As a parent you will have to make many decisions for the health and well being of your child. Immunisation provides specific protection from serious diseases for most children, as well as protecting the community in general. If you need more information about immunisation ask your nurse, doctor or midwife or contact -

Immunisation Advisory Centre: Ph: 0800 IMMUNE (0800 466 863)
Or visit our website www.imac.auckland.ac.nz (which has links to many other immunisation-related web sites)

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Immunisation facts Compiled by Dr Osman Mansoor

What is immunisation?

Immunisation is a medical procedure (injection or sip of fluid) which prepares the body to fight infection. New Zealand children are offered protection against nine serious diseases by the childhood immunisation programme. It is free of charge and is a simple, safe and effective way of protecting children from disease.

How does it work?

The immune system is the body's defence army (cells and antibodies). Once exposed to a foreign agent, the immune system remembers how to make the specific cells and antibodies to defeat that agent. But the first exposure causes illness. Immunisation provides that exposure without the illness by stimulating the immune system, through a vaccine. Occasionally immunisation fails to produce full immunity, but generally immunised children have milder illness.

What is a vaccine?

A vaccine is produced so that it does not cause the illness, but prepares the immune system against that disease. The polio and measles-mumps-rubella (MMR) vaccines are live viruses, modified versions of the natural ones. The diphtheria and tetanus vaccines contain inactivated toxin. The *Haemophilus influenzae* type b (Hib) and hepatitis B vaccines contain part of the cell. The hepatitis B cell part is grown from a modified yeast cell. The acellular pertussis (whooping cough) vaccines now in use in New Zealand contain only small, but essential parts of the bacterium, rather than the whole cell of the bacterium as used in earlier vaccines.

Impact of immunisation

Immunisation has been described as the medical intervention which has had the greatest impact on health. A UNICEF report (The Progress of Nations, 1996) states "immunisation can be credited with saving approximately 9 million lives a year worldwide. A further 16 million deaths a year could be prevented".

Immunisation eradicated smallpox from the world in 1977; polio is targeted for global eradication by the year 2005. Measles is likely to be next.

In New Zealand, polio and diphtheria have arguably been eliminated and the other diseases have been reduced. The effect of introducing hepatitis B and Hib vaccines can be seen on the graphs (see next page). The dramatic results in the decrease of these diseases (as in many others like polio) cannot be attributed to improved living standards.

Vaccine effectiveness

There is a large body of evidence on vaccine effectiveness. While different studies in different settings will show different results for different vaccines, most studies have found 80-95% protection. If enough children are immunised, community immunity prevents the disease circulating. Thus, even the small proportion who fail to be protected by their vaccine will be protected by the immunisation programme. This is why we need to achieve a high level of coverage.

It is possible to quote medical studies which do show varying degrees of failure. What is important is not to look at single studies, each of which has their own bias, but to look at the whole body of research.

While it is possible to debate about the actual level of protection given by a vaccine, what cannot be argued is the fact, proven over and over, that immunisation protects against disease.

Vaccine safety

Vaccines can cause reactions. The commonest are the local reactions at the injection site, fever and other symptoms of the body's response to the vaccine. More serious reactions are very rare and hardly ever cause long term problems. The risks of immunisation (compared to those of each of the nine diseases) are fully detailed in the *Childhood Immunisation* booklet, available free of charge from your doctor, nurse or public health service.

Vaccines also get the blame for anything that happens after immunisation. A good example of this is Sudden Infant Death Syndrome (SIDS or cot death). Controlled studies (including New Zealand research) have shown that immunisation is more likely to protect against SIDS, than to cause it. However, because many children with SIDS will have coincidentally had an immunisation shortly before death, immunisation is blamed. This shows the importance of careful studies to separate chance associations from real causes.

There are many people convinced that their child was 'brain damaged' by a vaccine. In fact, large controlled studies have failed to show that vaccines are responsible. While this does not prove that immunisation does not cause brain damage, if it does so it does it very rarely. Many children who appear to be developing normally, will in fact have already got brain damage. It is not until their first or second year of life, when the higher functions of the brain start manifesting that the defect becomes obvious. If this coincides with an immunisation, the vaccine gets blamed.

It can be impossible to be certain whether or not a vaccine caused a specific event in an individual child. Only controlled studies can identify real from chance associations. The Institute of Medicine (IOM) in the USA conducted extensive reviews of all the alleged adverse events. For many there is not enough evidence to either reject or accept the association. The ones which are accepted are all included in the *Immunisation Choices* booklet. These risks are compared to the considerably greater risks of the disease.

New allegations and new evidence on old ones are always coming to light. The information is reviewed internationally and in New Zealand. A recent example was the allegation about measles vaccine causing Crohn's disease and/or Autism. This came from an English group who had some data they believed supported their hypotheses. But other scientists have since failed to find this association, and the international consensus is that there is no link.

Some common myths

Claim: Immunisation is not responsible for the decline in diseases

It is true that the mortality from these diseases have declined as a result of better living conditions and advances in medical care. but healthy children can still die from these preventable diseases.

In fact polio was on the increase from the beginning of this century until immunisation brought it under control from the 1950s. The dramatic decline in Hib disease (see graph above) was not related to any change in living standards. The impact of declining coverage against pertussis (whooping cough) immunisation in the United Kingdom and also Japan in the 1970's caused a great upsurge in pertussis cases. This at least made people more aware of the benefits of pertussis immunisation.

Claim: Natural disease is better than artificial immunisation

It is true that the immunity after natural infection tends to provide higher levels of antibodies. This does not necessarily mean better protection. It does mean facing the risks of the disease and its complications. The whole point of immunisation is to provide immunity without the risks of the disease. For both tetanus, and for Hib disease in children under 2 years, the vaccine actually provides better immunity than the disease.

Some people argue that diseases like measles help the maturation of the immune system, or even that they prevent or cure diseases. There is no scientific evidence to support these assertions.

Claim: Vaccines do not work - as many cases occur in the immunised

As the proportion of children who are immunised increases, so the proportion of cases who are immunised will increase. Simple arithmetic shows that if 95% of children are immunised with a vaccine that is 95% effective, half the cases will be in immunised children. If enough children are immunised, the disease does not get the chance to spread, so even those where the vaccine failed are protected by the immunisation programme.