3 Vaccination questions and addressing concerns

3.1 Some commonly asked questions

3.1.1 Vaccine scheduling

Which vaccines can be administered at the same visit?

There are no known contraindications to administering registered vaccines at the same visit, provided they are administered in separate syringes at separate sites. If two or more parenterally or intranasally administered *live* vaccines are not given at the same visit, then a minimum interval of four weeks is recommended. The rationale is based on limited data where VV has been given within four weeks of measles-containing vaccine and breakthrough varicella disease (chickenpox) has occurred. Any time interval is acceptable between administering live oral vaccines and all parenteral vaccines (eg, rotavirus and BCG vaccines), live and inactive vaccines, or two inactive vaccines.

What steps are required if the Schedule is interrupted or varied?

Generally, there is no need to repeat prior doses; simply continue the Schedule as if no interruption has occurred (see Appendix 2). Special circumstances where the above does not apply are as follows:

- HepB given at birth to babies born to HBsAg-positive mothers – this dose does not count as part of a catch-up
- the two-dose course of rotavirus vaccine (RV1; Rotarix) should be started before age 15 weeks (ie, the latest is 14 weeks and 6 days) and completed by age 25 weeks (ie, the latest is 24 weeks and 6 days); if an infant reaches age 25 weeks without receiving the second dose, the first dose already given may offer them some protection against disease (see also section 17.5.1 for information about transitioning from RV5 to RV1)

- MMR vaccine given prior to age 12 months – infants who receive MMR vaccine prior to age 12 months still require two further MMR doses at ages 15 months and 4 years
- conjugate vaccine schedule requirements, which are age dependent (eg, children over 12 months of age do not require a full primary course of Hib or PCV vaccine, but do require one or two doses in the second year of life; see Appendix 2)
- when reconciling overseas schedules and the New Zealand Schedule – immigrant children who have commenced vaccine courses (eg, meningococcal C, PCV13) are not funded to complete these vaccine courses once in New Zealand unless they meet the high-risk criteria for these vaccines; however, if the parent or guardian wishes to purchase the vaccines to complete the course, they may do so.

Remember that children who miss one vaccine dose may do so again, so optimising a catch-up schedule is important.

How should the rest of the Schedule be handled when an adverse event has occurred following immunisation?

Proceeding with the Schedule after an AEFI depends on the nature of the event and the likelihood that the vaccine caused it. Most prior adverse events are not contraindications to receiving further immunisations. The only absolute contraindication to receiving a vaccine is an anaphylactic reaction to a prior dose or an ingredient in the vaccine. However, immune dysfunction can be a contraindication to receiving live vaccines (see section 4.3).

Adverse events should be reported to CARM (https://nzphvc.otago.ac.nz/reporting). See section 1.6.3 'AEFI reporting process – notifying CARM'.

Consult the AEFI section in each of the *Handbook* chapters, and seek specialist advice (eg, from the medical officer of health, the Ministry of Health, or IMAC, if required). Other vaccines not related to the AEFI can usually be administered as per the Schedule.

3.1.2 Babies and children

What if a baby had a difficult birth or was premature?

Low birthweight and prematurity are not contraindications to vaccination. The recommended Schedule immunisations should be carried out at the appropriate chronological age. However, if the baby is still in hospital or recently discharged, please seek the advice of the treating specialist (see also section 4.2 on special risk groups and section 8.5.1 on hepatitis B). These babies may be at higher risk of some of these diseases, so vaccinating them on time is particularly important.

Rotavirus vaccine should be given on time to any infant admitted to a general hospital ward (where other patients are not high risk). If standard infection control precautions are maintained, the risk of transmission of vaccine strain rotavirus will be minimal when rotavirus vaccine is administered to hospitalised infants, including hospitalised preterm infants and those in neonatal units.[1] (See also section 4.2.1 and chapter 17.)

What special vaccines are offered to newborn babies?

Babies born to HBsAg-positive mothers should receive:

- 100–110 IU hepatitis B immunoglobulin (HBIG) neonatal, at or as close as possible to birth
- a birth dose of HepB (HBvaxPRO, 5 µg), which should be given at or as close as possible to birth (preferably within 12 hours).

If HBIG and/or HepB is inadvertently omitted, administer as soon as the omission is recognised. HBIG can be administered up to seven days post-delivery. If there is a delay for longer than seven days, seek specialist advice. These babies should then continue as per the Schedule at ages 6 weeks, 3 months and 5 months. Serological testing is required at 9 months of age (see section 8.5.2).

A baby at higher risk of TB is offered a BCG immunisation soon after birth (see section 20.5 for neonatal BCG eligibility and the timing of neonatal BCG). The lead maternity carer will discuss the need for the vaccine with the mother prior to her baby's birth, and the BCG immunisation may be given while the baby is in hospital, or later at a community clinic.

What are the special requirements of immigrant children?

Immigrant children should be immunised according to the New Zealand Schedule with *due account taken of documented prior vaccine administration* and the eligibility criteria defined in the *Health and Disability Services Eligibility Direction 2011*, available on the Ministry of Health website (www.health.govt.nz/eligibility) (see also section 4.4).

It is important to err on the side of giving rather than withholding vaccines if the vaccination history is uncertain (see Appendix 2). The immunisation status of all immigrant children should be checked when they register with a primary health care provider.

Is it possible to boost a child's immune system by other means?

Eating a healthy diet, getting adequate sleep and exercise, having a smokefree environment and minimising high levels of stress will help keep the immune system healthy. However, none of the above confers the disease-specific immunity that vaccination provides (see also section 3.2.4). All children get infections (eg, common colds) but this does not mean the immune system is not working.

3.1.3 Allergies and illnesses

What if the child is unwell on the day of immunisation?

Minor illness or being in the recovery phase of an illness is not a reason to postpone immunisation. Babies and children with a significant acute illness and a temperature >38°C should have immunisation postponed until they are better. This is not because they are at particular risk of vaccine reactions, but because complications of the acute illness may be misinterpreted as a complication of the immunisation, or an AEFI may complicate the clinical picture of the acute illness. (See 'Contraindications' in section 2.1.4, and the contraindications sections in the disease chapters.) If immunisation is postponed, it is important to ensure the child is placed on the recall for the immunisation at a later date.

What if the child is due to have an operation (elective surgery)?

There is no evidence that anaesthetic impairs the immune response to a vaccine or increases the risk of AEFI.

Vaccination with inactive vaccines is preferably avoided for 48 hours prior to an anaesthetic in case post-vaccination symptoms such as fever interfere with preparation for surgery; similarly, live vaccines may induce fever 6–12 days after vaccination. There is no reason to delay surgery following vaccination with a live vaccine if the child is well at the time of immediate pre-operative assessment. There is no reason to delay vaccination after surgery, once the child is well and has recovered from the procedure. See the Association of Paediatric Anaesthetists of Great Britain and Ireland Immunisation guideline (www.apagbi.org.uk/guidelines).

Ideally, individuals scheduled for splenectomy should be immunised at least two weeks before the operation. Pneumococcal, meningococcal, Hib, influenza and varicella vaccines are recommended for these individuals pre- or post-splenectomy (see section 4.3.4 and the relevant disease chapters). Note: If the surgery is an emergency, then the immunisation programme should commence two weeks later.

What if the child has a chronic disease?

Children with chronic diseases should be immunised in the normal way, especially as they may be more at risk from the severe effects of vaccine-preventable diseases. However, if the illness or its treatment results in impaired immunity, immunisation with live vaccines should be considered carefully (see sections 4.2 and 4.3), and the child's GP or paediatrician should be consulted before immunisation.

What if the child has had seizures?

A diagnosed neurological condition is not a contraindication to any vaccine on the Schedule. However, an evolving neurological condition (eg, uncontrolled epilepsy or a deteriorating neurological state) is still considered a contraindication to pertussis immunisation. Until the neurological condition has been diagnosed or stabilised, there is a risk that changes may be attributed to the vaccine. A family history of

seizures or epilepsy of any type is not a contraindication to immunisation.

A febrile reaction may occur after any vaccine and result in a febrile seizure in a susceptible child. Vaccine-related febrile seizures are rare, although the risk is higher following administration of certain vaccines, such as influenza (section 10.7), MMR, and measles, mumps, rubella and varicella (MMRV) (see section 21.7) vaccines. These seizures, although frightening for a parent, are almost always benign, with no associated sequelae.

What if the child is allergic?

Only anaphylaxis to a prior dose of vaccine, or to an ingredient in the vaccine, is considered an absolute contraindication. See the contraindications and precautions section in each disease chapter; in particular, pertussis (section 14.6), measles (section 11.6), influenza (section 10.6) and rotavirus (section 17.6). Children with asthma, eczema, hay fever and other allergies should be immunised in the usual way. Studies have shown that immunised children have slightly lower rates of atopic diseases.[2]

Can children be immunised if they are known to develop a rash with antibiotics?

Yes – but check the vaccine data sheet for the list of components; some vaccines may contain traces of antibiotics.

The only concern is if a child has had a previous anaphylactic reaction (a rash alone is not anaphylaxis) to a component of a vaccine.

Can all children receive all the vaccines?

A child cannot receive a vaccine if they have had an anaphylactic reaction to any component of the vaccine. A child may have an underlying condition that is a contraindication to some vaccines; for example, children with illnesses or treatments that cause immunocompromise may be unable to receive live attenuated vaccines (see sections 4.2 and 4.3 for special risk groups, chapters 11, 13 and 18 for MMR and chapter 21 for varicella).

3.1.4 Parents, guardians and contacts

What if the child's mother or guardian is pregnant or breastfeeding?

This is not a contraindication to giving any of the Schedule vaccines to a child, including live vaccines, such as the MMR vaccine. In addition, consideration should be given to the risks for the mother or guardian and baby from diseases such as pertussis, which can be life-threatening in infants.

Pregnancy is an important opportunity to ensure the infant's siblings have received age-appropriate immunisation.

Pertussis (as Tdap) and influenza vaccines are recommended and funded for pregnant women (see section 4.1).

Are live virus vaccines such as measles, mumps, rubella and varicella transmissible?

These are highly attenuated (weakened) viruses designed specifically to induce an immune response without causing disease. There have been no recorded cases of measles, mumps or rubella disease in individuals who were in contact with a vaccinee. Vaccine-strain varicella transmission to contacts is rare (documented in only 9 immunised people, resulting in 11 secondary cases), and the documented risk of transmission exists only if the immunised person develops a rash[3] (see chapters 11, 13 and 18 for MMR and chapter 21 for varicella).

3.2 Addressing myths and concerns about immunisation

Myths about immunisation have existed since the first use of smallpox vaccine over 200 years ago and have resulted in the loss of confidence in immunisation programmes. Misconceptions about vaccines contribute to vaccine hesitancy, which is an issue of global concern. This section provides information to assist providers with addressing concerns about immunisation.

3.2.1 Background

Concerns about immunisation should be taken seriously and responded to appropriately, with as much information as possible. Individuals have the right to make informed decisions for themselves and those in their care, and to accept responsibility for their decisions. It is important to respect this right.

Globally, including in New Zealand, there are many groups of people and individuals who actively campaign against immunisation. Their reasons for doing so may include personal experience, such as an adverse event they have attributed to immunisation, philosophical beliefs, conspiratorial beliefs or dissatisfaction with inadequate or superficial responses from health professionals, who can seem at times to be dismissive of people's concerns. It is important for all health professionals to be able to provide accurate information about the benefits and risks of immunisation and to respond with as much information as possible to parent/guardian concerns, or refer people appropriately.

It is not always possible to change people's position by way of scientific argument or presentation of evidence. Anti-immunisation arguments are almost exclusively based on fallacies of fact or logic, or on historical information that is no longer applicable in the current context. Often these arguments can be challenging for the health professional, particularly if they are unfamiliar with the particular argument and when they are complicated by logical flaws.

In any discussion, it may help to acknowledge that science does not always have all the answers, but that it provides a tool with which to answer questions and evaluate the evidence. It is important to point out that an event that follows immunisation is not necessarily caused by the immunisation. Finally, it is always helpful to inform parents/guardians about additional sources of information (see section 2.1.2 on informed consent and section 1.6 on the safety monitoring of vaccines in New Zealand).

3.2.2 Understanding anti-immunisation

People tend to take on board information that supports their belief system and to ignore information that does not. The internet makes it very easy to access material that is appealing. Most people usually make logical decisions based on their perception of risk. Therefore, if a person has the perception that the risk of disease is real and that vaccines are reasonably safe and work, then they are more likely to vaccinate. People are unlikely to vaccinate if they perceive that there is little risk of disease and that vaccines are not safe and do not work.[4]

3.2.3 Addressing concerns

If a parent is concerned about immunising their child, determining their concerns and addressing them can be helpful. Most often these concerns are around vaccine safety. As a health professional, you should challenge poor information, in a respectful way.

There are three steps you can take when addressing a parent's or a vaccinee's concerns.[5]

1. Understand the specific concerns.

Not every parent or vaccinee has the same concerns, so it is important to first establish what they are worried about. Ask them. It may be helpful to get them to describe what they know about disease risk and vaccine benefit. If they have misconceptions, you can correct them. Evidence has demonstrated that it can be helpful to relay stories of children harmed by vaccine-preventable diseases. Using a vignette can be powerful. If you have no experience of a particular vaccine-preventable disease, see the IMAC website (www.immune.org.nz), or websites such as the Centers for Disease Control and Prevention, the Immunization Action Coalition and the National Centre for Immunisation Research and Surveillance (see Appendix 9).

2. Stay on message.

Keep your messages clear and focussed on the concern at hand.

3. Discuss the rigours of global vaccine research, such as safety systems.

Many vaccine safety myths focus on the limitations of passive reporting systems for adverse events, such as CARM. The many active safety systems and hypothesis-driven research are overlooked. You can highlight that when studies compare the risk for an adverse event in vaccinated children with the risk in unvaccinated children, they support the safety of vaccines.

3.2.4 Debunking a myth

Debunking myths can be very challenging and can also backfire. When you are addressing a myth, there are three important points to remember.[6]

1. Try not to repeat the myth. Focus on the core facts.

This is because people cannot remember if what they hear was a myth or a fact later on. Debunking can serve to strengthen the myth in people's minds as either familiar or a threat to their world view. Begin with the core facts.

2. Precede a myth with a warning.

Let them know that 'this is untrue', because you often cannot avoid mentioning the myth.

3. Include an alternative explanation that accounts for how the myth misleads.

Do not leave a void but rather replace the myth with accurate information. You can highlight the problems with cherry picking, conspiracy theories and fake experts. If you have them, graphics can be extremely helpful, such as pictures of vaccine-preventable diseases or even a graph showing the impact of vaccination – if you feel it appropriate.

Facts and myths about immunisation

Core fact: Measles and rubella have been eliminated in some countries. The WHO has set targets for global eradication.

Myth: MMR vaccine causes autism.

Explanation: There is no evidence that the MMR vaccine causes autism.[7, 8]

In 1998 a British physician announced he had found an association between the receipt of MMR vaccine and the development of a new disorder that included autism in a study of 12 children. No subsequent studies following his study have been able to reproduce his results.

In 2004 *The Lancet* retracted the original 1998 study from the scientific literature on the grounds that it was the product of dishonest and irresponsible research and the British authorities revoked the doctor's licence to practise medicine.[9] In 2008 a press investigation revealed that the doctor had falsified patient data and relied on laboratory reports that he had been warned were incorrect. Studies exonerating the MMR vaccine continue to be published.

Core fact: The incidence of allergic diseases has been increasing. It is thought that lack of exposure to microbes may play a role.

Myth: Vaccines cause allergic diseases.

Explanation: Extensive research shows that, if anything, vaccines may have a protective effect against allergic disease.

Many studies have explored this issue. A few have shown a positive association, but the majority show no association or a negative association. The international scientific community generally accepts that vaccines do not lead to allergies and in fact have a small protective effect against the development of allergy.[2]

It is especially important that children with asthma be given all recommended vaccines, as catching a disease like pertussis or influenza can worsen asthma.[10] In New Zealand, influenza vaccination is particularly recommended for children with asthma because of this risk.

The 2012 Institute of Medicine review of adverse events rejected any causal relationship between inactivated influenza vaccine and asthma exacerbation or reactive airway disease episodes in children and adults.[8]

Core fact: On-time vaccination is associated with a reduced risk of hospitalisation for diseases such as pertussis and pneumococcal disease in children under 1 year of age.

Myth: Vaccines cause cot death.

Explanation: Vaccines may reduce the risk for cot death.

Sudden unexpected death in infancy (SUDI), also known as cot death, usually occurs in children aged under 12 months and is most common around age 3 months, when many immunisations are given. SUDI may occur by chance within a day or so of immunisation.[11] There is no evidence that vaccination causes SUDI. Despite solid evidence against a link, the claims continue to be made.

There have been many studies that have conclusively shown that SUDI is not caused by immunisation.[11] Some studies, including the New Zealand Cot Death Study, found a lower rate of SUDI in immunised children.[12] This is consistent with a Scandinavian study, which found that some cases of SUDI were probably caused by undiagnosed pertussis.[13] A large case-control study showed no increased risk of SUDI associated with immunisation,[14] and a meta-analysis of nine case-control studies further suggested that immunisation is protective against SUDI.[15] Consistent findings from several studies using a range of methods invalidate claims that associate vaccination with SUDI or cot death.[16]

Core fact: At birth the infant is exposed to thousands of microbes.

Myth: Vaccines 'overload' or 'overwhelm' the infant immune system.

Explanation: It is estimated that the infant immune system could respond to over 10,000 vaccines all at once.

There is no evidence of immune system 'overload', either theoretical or actual. The immune system is able to deal with an extraordinarily large number of different antigens at any one time.

Every day we all come into contact with viruses, bacteria and other agents to which the immune system responds. Any demands placed on the immune system by vaccines are minuscule compared to its ability to respond.

Vaccines have very few antigens in them. The number of immunogenic proteins and polysaccharides in modern vaccines has decreased dramatically compared with early vaccines because of advances in vaccine technology. For example, early whole-cell pertussis vaccines contained around 3,000 immunogenic proteins, compared with two to five in the modern acellular pertussis vaccines. In spite of an increase in the number of vaccines on the Schedule, an infant now receives far fewer immunogenic proteins and polysaccharides than with earlier vaccines.[17] There are considerably more antigens in the organisms that cause disease than in the vaccines.

Explanation: Delaying immunisation for fear that an infant is too young leaves the infant vulnerable to disease, particularly pertussis and pneumococcal diseases. Infants delayed for their pertussis vaccinations are 4–6 times more likely to be hospitalised with the disease.[18] On-time vaccination is important.

Core fact: Vaccines induce immunity through natural processes.

Myth: It is better to get 'natural immunity' than get vaccinated.

Explanation: Some vaccines induce better protection than that resulting from natural disease. Examples are tetanus, HepB and HPV, and protein conjugate polysaccharide vaccines administered to children aged under 2 years (Hib and PCV). There is no evidence that experiencing vaccine-preventable diseases has any benefit on health; on the contrary, these diseases are serious and sometimes fatal. Vaccinated people have fewer diseases than unvaccinated people.

Core fact: The scientific evidence shows there is no association between HPV vaccines and autoimmune conditions.

Myth: HPV vaccines cause autoimmune conditions.

Explanation: Several large cohort studies have been conducted to investigate the link between HPV vaccine and autoimmune conditions.[19, 20, 21, 22, 23] No association has been found in these studies.

Core fact: The quadrivalent human papillomavirus vaccine has reduced cervical disease in countries using the vaccine, and Australia has almost eliminated genital warts.

Myth: HPV vaccines cause postural orthostatic tachycardia syndrome (POTS), complex regional pain syndrome (CRPS) and chronic fatigue syndrome (CFS).

Explanation: There is no scientific evidence that links POTS, CRPS or CFS with HPV vaccination.

POTS is a condition in which tachycardia occurs when a patient moves from a supine position to upright. The condition is associated with a collection of other symptoms, which include palpitations, light-headedness, weakness, blurred vision, headache, extreme fatigue, nausea, syncope and sleep disturbance. Up to 50 percent of people with POTS have an antecedent viral illness and 25 percent have a family history of similar complaints. There is an overlap between POTS and CFS.[24]

CRPS describes a variety of disorders characterised by pain that is disproportional to the inciting event. In children and adolescents it often presents as a painful mottled swollen limb with allodynia and hyperalgesia. Girls are six times more likely to be affected than boys and the peak age of onset is at age 12–13 years. Often minor trauma is the inciting event, but around one-third of people with CRPS are unable to recall an inciting injury or trauma.[25]

CFS is a disorder characterised by extreme fatigue that cannot be explained by an underlying medical condition. The causes are unknown but it has been linked to infection with Epstein–Barr virus and human herpesvirus 6.

Cases of these disorders have been reported in association with HPV vaccination, particularly in the media, and social media. The variable time between vaccination and onset of symptoms, lack of consistent symptoms and a reporting rate that remains below the expected rate for these syndromes all point to HPV vaccine not being the cause of these conditions.[26]

Post-marketing surveillance systems globally continue to monitor the safety of HPV vaccination programmes.[27, 28, 29] The WHO's Global Advisory Committee on Vaccine Safety has systematically reviewed HPV vaccine safety and has not found any safety issue that would alter its recommendations for use.[30] The main challenge with HPV vaccine is communicating its excellent safety profile.[31]

Core fact: Everything is made of chemicals and any chemical can be toxic, even water.

Myth: Vaccines contain toxic chemicals, viruses and cells.

Explanation: Vaccine ingredients are not toxic in the amounts present in a vaccine. It is the dose that differentiates a poison from a harmless substance, essential substance or a medicine.

Most of the ingredients in vaccines are present already in our bodies and we consume them in some way every day. For example, aluminium is the most common metallic element on earth, and the body makes and uses formaldehyde for synthesising deoxyribonucleic acid (DNA).

- There is approximately 60 times more formaldehyde in a pear than a vaccine.
- Polysorbate 80 is used in many foods, including ice cream.
- Vaccines do not contain extraneous cells or viruses.
- Aluminium compounds administered via vaccination do not contribute significantly to the general aluminium exposure and do not raise human serum aluminium levels. Based on 80 years of experience, the use of aluminium adjuvants in vaccines has proven to be extremely safe and effective.[32, 33]

For more information, see the IMAC factsheet *Vaccine Ingredients* (available at www.immune.org.nz/resources/written-resources).

Core fact: *With the exception of safe water, no other modality, not even antibiotics, has had such a major effect on mortality reduction.* – Stanley Plotkin[34]

Myth: Vaccination has played little role in controlling disease.

Explanation: Vaccine programmes have controlled or eliminated polio, tetanus, diphtheria, pertussis, *Haemophilus influenzae* type b, hepatitis B, pneumococcal disease, meningococcal disease, rotavirus, human papillomavirus, varicella, hepatitis, yellow fever, measles, mumps, rubella and others, in populations where vaccines have been used.

Improvements in living conditions and medical care have reduced the chances of dying from infectious disease, but without immunisation most people will still acquire vaccine-preventable infections. For example, measles, which spreads through the air, is largely unaffected by improvements in living conditions other than reduced overcrowding. Indigenous cases of measles, mumps and rubella have been eliminated from Finland over a 12-year period using a two-dose MMR vaccine schedule given between 14 and 16 months and at age 6 years.[35] In September 2016, the Region of the Americas was the first WHO region to be declared free of measles.

Core fact: No vaccine is 100 percent effective and some immunised children will get the disease.

Myth: Vaccines do not work, as most cases of disease are in immunised children.

Explanation: As immunisation coverage increases, the proportion of cases that occur in children who have been immunised compared with those who are unimmunised increases. There is a mathematical relationship between vaccine effectiveness, immunisation coverage and the proportion of cases that are immunised.

To see this clearly, imagine a group of 100 children. If 90 percent of children are given a vaccine with 90 percent efficacy, then:

- 81 of the 100 children will be immune

- 10 children will be susceptible because of not having the vaccine, and another 9 because of vaccine failure.

This means that in the situation of exposure to the infection in a community, we expect that nearly half the cases of disease will be in immunised children, even though only 10 percent of immunised children were susceptible.

Of course, if all 100 children had been vaccinated only 10 would be susceptible to disease. As vaccine uptake rises, the proportion of cases of disease that occur in vaccinated people increases dramatically, but the absolute number of cases of disease falls to very low levels. Failing to provide the denominators (how many vaccinated and how many unvaccinated) can lead to misunderstanding.

For pertussis, where the protection following immunisation lasts only four to six years, immunised children can be infected but the resultant illness is usually milder, with fewer serious consequences and at an older age than if they had not received vaccine. The disease is most severe in infants, but adolescents and adults contribute to the carriage and spread of the disease (see sections 14.2 and 14.3).

For further details on the effectiveness of vaccines, see the 'Written resources' section of the IMAC website (www.immune.org.nz/resources/written-resources).

3.3 Addressing immunisation issues in a constantly changing environment

In the past few years the internet has exploded with a variety of forums that disseminate anti-immunisation material effectively. It is no longer practical to prepare official rebuttals to each new article. Fortunately, the internet also facilitates the rapid communication of scientific commentary on new myths as they appear. There are several scientists who regularly address immunisation myths in the form of regular blogs. In addition, some organisations provide position statements and discussion forums.

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