

Sense

the National Deafblind and Rubella Association



sense
TOUCHING PEOPLE'S LIVES

Briefing Paper MMR - the issues

Sense

Sense is the national, voluntary organisation which provides services, advice, support and information for deafblind / dual sensory impaired / multi-sensory-impaired children and adults, their families and professionals in the field. Sense works with deafblind adults and children, with parents, carers and relatives, with statutory and voluntary agencies to promote services that meet the needs of deafblind people.

Sense began in 1955 as a self-help and support group for parents of deafblind children whose disabilities were caused by congenital rubella. Rubella infection during pregnancy can cause deafness, blindness, heart defects and other impairments. This combination of effects is known as congenital rubella.

Deafblindness

Deafblindness is the combination of both hearing and sight impairment. Many deafblind people have residual hearing and/or sight. Deafblindness is a distinct impairment that is more than simply vision loss and hearing loss. It is a unique impairment with specific effects on the lives of individuals. The difficulties created in communication, in mobility, and in access to information from the environment are vast.

Measles, mumps and rubella (MMR)

Sense fully supports the MMR immunisation programmes. We know that the use of MMR has been effective world-wide in reducing the incidence of rubella, measles and mumps and associated complications.

Rubella was a common childhood disease, prevalent amongst youngsters aged 4 - 9 years. Prior to the introduction of MMR, any adult women without immunity was susceptible to contracting the disease, particularly if in contact with children (their own included). If a woman catches rubella in early pregnancy it can be passed on and cause damage to the unborn child. The rubella component of MMR is essential in preventing the circulation of rubella amongst children and therefore preventing congenital rubella.

We are aware of calls for making single antigen vaccines available and, having considered the weight of evidence available, conclude that the introduction of single antigen vaccines carries the serious risk of an increased incidence of congenital rubella in addition to increases in the disabilities caused by measles and mumps infections.

Sense strongly endorses the continued use of MMR to advance the eradication of rubella, measles and mumps. We know the devastation these diseases can cause. The drop in the number of children immunised against rubella (from 91% in 1997/98 to 88% in 1999/2000) concerns us. The implications of an increase in rubella are clear: children will once again be born with deafblindness and additional complex health needs, requiring lifelong support. **We encourage policy makers and practitioners to keep the complexity of these issues in mind when considering the issues surrounding MMR.**

Is the MMR vaccine safe?

All studies point to the vaccine being safe and effective. MMR has been in use in the USA since 1972 and in Scandinavia since 1982. It had been extensively tried and tested prior to introduction in the UK in 1988. The safety of MMR has also been reviewed repeatedly by the UK Government's independent expert committees – the Committee on the Safety of Medicines and the Joint Committee on Vaccination and Immunisation. Many studies have been carried out, in particular the rigorous Finnish controlled trial among twins which reported low side effects. Studies in the UK have also confirmed its safety and effectiveness.

What will happen if MMR rates fall?

There will be outbreaks of measles, mumps and rubella, and the risk is that many **children will be seriously ill, some will be permanently disabled and some will die:**

- rubella, which contracted during pregnancy can cause children to be born with deafblindness and other difficulties.
- mumps, which can lead to mumps meningitis which can lead to death and severe illness including permanent deafness.
- measles, which can lead to deaths or severe illness.

Would the choice of single vaccines help to compensate for the drop in MMR uptake?

No. This would increase the spread of all three diseases in the community. Single vaccines would need six separate trips to the GP

- The numbers of children protected at any one time will be reduced.
- Some may not complete the course and remain unprotected.
- Some parents will opt to miss out rubella in the mistaken belief that it is less dangerous than measles and mumps

Why is MMR given when it is?

The first MMR immunisation is given at 12 – 15 months to coincide with a decrease in maternal antibody protection and an increase in susceptibility to disease. The booster at school entry is to increase protection against all three diseases. This two dose strategy has succeeded in eliminating all three diseases from Finland where MMR uptake is over 95%.

There is no advantage in delaying MMR until the immune system is better developed. Maternal protection against disease begins to decrease around the time of the first immunisation at 12 – 15 months. It's important to know that breast-feeding offers little, if any, protection against rubella, measles and mumps.

**Sense Campaigns and Policy Team
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Sense, the National Deafblind and Rubella Association

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INTRODUCTION

This paper presents background information about the scientific arguments in relation to MMR vaccination.

Sense represents both a large number of people with rubella damage and the parents of rubella damaged children. Falling MMR immunisation rates cause us all a great deal of concern. Rubella, measles and mumps can all have devastating consequences but they are all preventable. MMR is the most effective way to prevent this devastation.

The lack of public confidence in the overwhelming scientific evidence that MMR is an effective method of protecting children and the wider population is saddening and misguided. People with problems caused by these preventable diseases and their parents have not forgotten the damage caused by rubella, mumps and measles epidemics.

The answer is not to replace the triple vaccination with three separate vaccinations as some have suggested. Widespread use of single antigen vaccines will simply lead to children being at risk of exposure to measles, mumps and rubella for a much longer period of time and increase the numbers of susceptible children amongst whom outbreaks could grow. This in turn will lead to widespread disease in the community and more children being born with deafness, blindness and other impairments because of rubella infection during pregnancy. There will also be an increase in the numbers of children who develop a sensory impairment and other problems during childhood as a result of a measles or mumps infection.

What will happen if MMR vaccine rates fall?

If MMR rates fall, we can expect to see outbreaks of all three diseases. Outbreaks of **rubella** would result in children being born with congenital rubella. Congenital rubella causes deafness, blindness, heart defects and other abnormalities. People severely affected by congenital rubella require intensive neonatal care and continued medical, education and social support throughout their lives. In a **measles** outbreak, some children would die, many more would be hospitalised, and some would be left with permanent damage. The most vulnerable would be infants who are too young to be immunised and children with depressed immune systems (such as children with leukaemia) who can't be immunised. An outbreak of **mumps** would result in an increase in numbers of children affected with mumps meningitis, possibly resulting in deaths as well as an increase in incidence of sensorineural deafness (affecting language development and requiring specialised learning support).

If single antigen vaccines were introduced, we would expect to see a similar public health impact due to the decrease in herd immunity. Increased morbidity and mortality rates would have widespread effects on individual families and the community.

What are the different uptake rates of the MMR vaccine across Europe and how have these affected herd immunity and the threat of an epidemic?

Data relating to uptake rates is difficult to compare as immunisation schedules are not harmonised across Europe nor is there a centralised data collection system.

For example, where private medicine is common, the reporting system may be based on how much vaccine is imported or distributed. Other countries estimate the prevalence of vaccine coverage through the analysis of ad hoc surveys of representative samples.

We are aware of recent disease outbreaks where immunisation rates have fallen or are low. A measles outbreak in the Republic of Ireland last year resulted in 111 hospital admissions and 3 deaths. MMR uptake was less than 80%.¹

Outbreaks also occur in well immunised populations, particularly amongst pockets of low uptake. In the April 1999 - January 2000 measles outbreak in the Netherlands, 2961 cases were reported and there were 68 hospitalisations and 3 deaths. During 1997 - 1999, the Netherlands had reported overall MMR uptake rate amongst children to be 95 - 96%. The areas where the measles outbreaks occurred were related to communities of non-immunised individuals belonging to a particular religious group. MMR coverage in the corresponding geographical areas ranged from 53% to 90%.²

Amish communities in the United States also eschew vaccination and experience a disproportionately large number of cases of whooping cough, measles, and congenital rubella.³ In contrast, Finland, which has had a two-dose MMR policy in place since 1982 and has uptake rates of over 98%, is the first country in the world to be documented free of indigenous measles, mumps and rubella.⁴

What is the impact of MMR on the incidence of rubella?

Prior to the isolation of the rubella virus and the development of a vaccine, rubella epidemics occurred within a country at six to nine yearly intervals with pandemics frequently spreading through several countries occurring at approximately ten to thirty year intervals, peaking and abating over three to five years. The most severe recent pandemic

occurred between 1963 and 1968 when many thousands of children were born with multiple impairments as a direct result of their mothers contracting rubella during pregnancy⁵.

Rubella immunisation for school girls and non-immune women of child bearing age began in 1970. This strategy had little impact upon the circulation of rubella virus in the community and congenital rubella continued to occur. Rubella was a common childhood disease and prior to the introduction of MMR, non-immune women were known to contract rubella infections from children, their own included⁶.

Rubella was included in the MMR infant immunisation schedule in 1988. The MMR immunisation programme has led to an enormous reduction in the notifications of measles, mumps and rubella⁷ along with a marked decrease in the incidence of congenital rubella births. Since the introduction of the MMR vaccine in 1988 the numbers of children affected by congenital rubella, the number of terminations due to rubella disease or contact in pregnancy and the incidence of rubella in the population at large, have all dropped dramatically⁸.

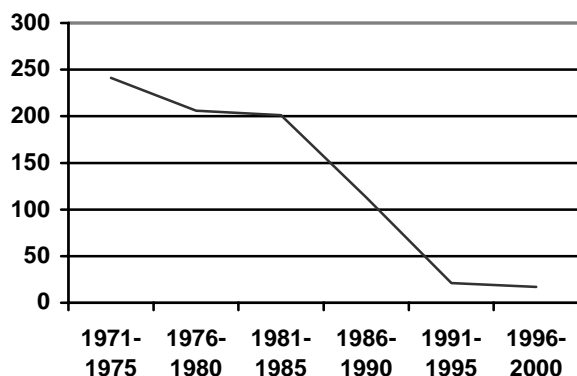
Congenital rubella births registered with NCRSP and rubella associated terminations notified to ONS (1971-2000)

	71-75	76-80	81-85	86-90	91-95	96-00
Congenital rubella births	241	206	201	113	21	17
Terminations due to rubella disease / contact	3709	2002	759	268	43	17

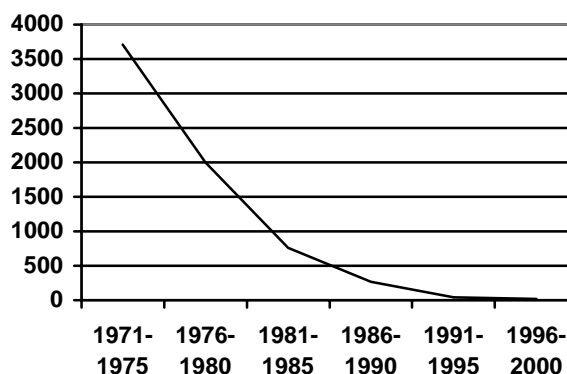
1. Births are reported to NCRSP from England, Scotland & Wales. Another 77 individuals born before 1971 are registered with the NCRSP

2. Terminations data are from the Office of National Statistics, for England & Wales only

Total Rubella births



Terminations due to rubella disease / contact



What is the scientific basis for the recommended time period between vaccines?

The first MMR immunisation (given at 12 - 15 months of age) is scheduled to coincide with a decrease in maternal antibody protection and an increase in susceptibility to disease. To increase protection against measles, mumps and rubella and to prohibit the build-up of susceptible groups of children amongst whom outbreaks would be likely, a second dose of MMR is recommended prior to school entry.^{9, 10} Modelling work was done in Britain prior to the introduction of the second dose to determine at what age it would be most effective in limiting outbreaks of measles, mumps and rubella.¹¹ The 2-dose strategy has succeeded in eliminating indigenous cases of measles, mumps and rubella from Finland, where uptake is over 95%.¹²

SINGLE ANTIGEN VACCINES

Would a choice of single vaccines increase or decrease the full uptake of the MMR vaccines, and what would the effect be on group immunity?

The use of single antigen vaccines would require six visits to a GP and take from 3 - 5 years depending on the time span left between administration of each vaccine. The proportion of children protected at any one time against all three diseases would be reduced.

This would mean more children going unprotected, increasing the risk of infection to themselves and to other children.¹³ Such a decrease in herd immunity would lead to outbreaks of rubella, measles and mumps.

Higher uptake is more likely to be sustained when fewer visits are required. The use of single antigen vaccines would necessitate six visits and would lead to patchy coverage across the country. This would lead to a decrease in herd immunity against rubella, measles and mumps and outbreaks of all three diseases would occur.

Is it administrative convenience or best clinical practice to administer three vaccines in one visit?

Good clinical practice is to reduce the number of invasive procedures because every invasive procedure carries a risk, however small that risk may be. In the case of MMR immunisation, invasive procedures are limited to two. That is, one immunisation is given at age 12 - 15 months and one given prior to school entry. Use of single antigen vaccines would increase the number of invasive procedures to six and thus carry additional risks.

It is not best clinical practice to leave children exposed to these diseases. Use of single vaccines would leave children (and pregnant women) exposed to measles, mumps and rubella. It is a good use of resources to prevent outbreaks of these diseases. In addition, it may be convenient and less traumatic for the child if the three vaccines are administered in a single visit.

Which countries allow single vaccination?

No countries in which MMR vaccine is available use single antigen vaccines to protect against measles, mumps and rubella. Due to the different types of medical systems around the world and the lack of centralised data collection, we are unclear as to which particular countries import or produce single antigen vaccines in addition to MMR. However, data on the World Health Organisation's MMR Immunisation Schedule (2000) web-site identifies European countries which recommend immunisations against measles and mumps.¹⁴ Most of these are from the former Soviet Union and since its break-up, outbreaks and deaths from infectious diseases have increased.¹⁵

In Japan, only measles and rubella vaccines are routinely available. Mumps vaccine is optional. MMR was withdrawn in 1993 because the Urabe mumps strain it contained was associated with mumps meningitis. This vaccine had already been withdrawn from use in the UK in September 1992 following a higher than expected incidence of aseptic mumps virus meningitis.¹⁶

Japan manufactures its own vaccine products and plans to reintroduce MMR once the manufacturing process of a new mumps component is addressed.¹⁷ **Between 1992 and 1997, there were 79 measles deaths in Japan. In the same period in the UK there was only one death from acute measles infections.**¹⁸

VACCINE SAFETY AND EFFECTIVENESS

Was the MMR vaccine adequately tested?

MMR has been in use in the USA since 1972 and in Scandinavia since 1982. It had therefore been extensively tried and tested prior to introduction in the UK in 1988. In addition, the safety of MMR vaccines has been reviewed repeatedly by the UK Government's independent expert committees, that is the Committee on the Safety of Medicines (CSM) and the Joint Committee on Vaccination and Immunisation (JCVI). CSM is responsible for advising on the licensing and safety of human medicines. JCVI is responsible for advising on vaccination policy.

The CSM review of the licensing of the MMR vaccines found that licensing followed normal procedure and was based on the provision of satisfactory data regarding safety and efficacy in adequate numbers of children.¹⁹

Furthermore, around 30 studies had been carried out on combined measles, mumps and rubella vaccines prior to the introduction of MMR in the UK in 1988. In particular, the rigorous Finnish double blind placebo controlled trial among twins reported a low incidence of side-effects.²⁰ Earlier studies of MMR combined with other vaccines including DTP and polio did not raise concerns about safety.²¹ Studies in the UK since the introduction of MMR continue to confirm its safety and effectiveness.^{22 23}

Is there any benefit in deferring the MMR vaccine until the immune system is better developed?

No. The first MMR immunisation (given at 12 - 15 months of age) is scheduled to coincide with a decrease in maternal antibody protection and an increase in susceptibility to disease.

The immune system is continually developing. During early infancy, maternal immunity offers extra protection to the child. This means that if a mother has had measles or has been immunised against it, her baby will usually be protected from it. This is possibly also true for mumps and rubella. Although it offers good protection against many forms of gastroenteritis and respiratory illnesses, breastfeeding offers little, if any, protection against measles, mumps and rubella.²⁴

Maternal immunity wanes over the first year and morbidity and mortality from measles infections are high in children under one year of age.²⁵ Deferring MMR immunisation would increase the numbers of children susceptible to measles, mumps and rubella.

We are not aware of any evidence that vaccines in current use impair the development of the child's immune system or that MMR impairs the development of a generalised immune response. A recent review of the available evidence²⁶ says that the hypothesis that multiple vaccines overwhelm, weaken, or "use up" the immune system is not supported by any evidence.

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**Sense Campaigns and Policy Team
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