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MMR vaccines for measles, mumps, rubella and varicella in children

This is the 2020 update of a review first published in 2005 and updated in 2012.

Aim

We wanted to find out if the MMR, MMRV and MMR+V vaccines are safe and effective in preventing measles, mumps, rubella and varicella (chickenpox) in children.



Findings

We looked at 138 studies of more than 23 million children worldwide and found MMR vaccines are effective. There is no evidence of increased risk of autism, encephalitis (swelling of the brain) or a range of other harms.



Measles, mumps, rubella and varicella (also known as chickenpox) are infectious diseases caused by viruses. They are most common in children and young adults, and can lead to potentially fatal illnesses, disabilities and death. Measles remains one of the leading causes of childhood death around the globe.



The MMR (measles, mumps, rubella) is a combined vaccine that protects against all three infections. Clinicians can vaccinate against varicella by mixing the varicella vaccine with the MMR vaccine (MMRV) or giving it separately at the same time (MMR+V).

Results for effectiveness

Fifty-one studies (10 million children) assessed the effectiveness of the MMR vaccines.



Measles

One dose of vaccine was 95% effective in preventing measles. Based on the data analysed in the review, the number of cases would fall from 7% in unvaccinated children to under 0.5% in children who receive one dose of the vaccine. After two doses, effectiveness was similar at around 96%.



Mumps

One dose of vaccine was 72% effective in preventing mumps. This rose to 86% after two doses. From data analysed in the review, the number of cases would fall from 7.4% in unvaccinated children to 1% in children who were vaccinated with two doses.



Rubella

One dose of vaccine was 89% effective in preventing rubella.



Varicella (chickenpox)

One study found that after 10 years the MMRV vaccine was 95% effective at preventing chickenpox infection.

Results for safety

Eighty-seven studies (with 13 million children) assessed unwanted effects of the MMR vaccines.



Two further studies with 1,071,088 children found no evidence MMR vaccines are associated with an increased risk of these unwanted effects:

Two studies with 1,194,764 children found no evidence MMR vaccines are associated with an increased risk of autism.

- asthma
- bacterial infections
- cognitive delay
- Crohn's disease
- encephalitis
- dermatitis
- eczema
- gait disturbance
- hay fever
- inflammatory bowel disease
- leukaemia
- multiple sclerosis
- type 1 diabetes
- viral infections

Conclusion

MMR vaccines are effective and there is no evidence of increased risk of autism or encephalitis.

Certainty of evidence

Cochrane uses the GRADE approach to rate our certainty or confidence in the evidence as very low, low, moderate or high.



We judged the certainty of evidence for the effectiveness of the MMR vaccines to be **moderate**.

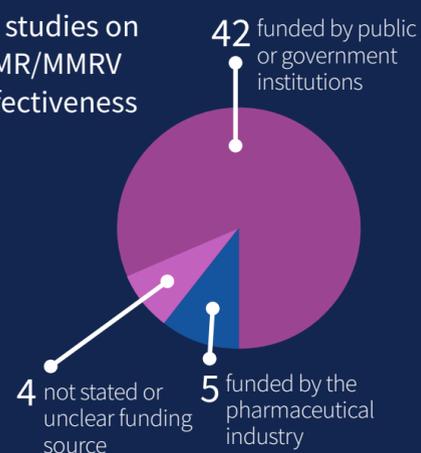


For autism we judged the certainty of evidence to be **moderate**.



For varicella we judged the certainty of evidence to be **high**.

51 studies on MMR/MMRV effectiveness



87 studies on MMR/MMRV safety

