Report to the Boards of Health

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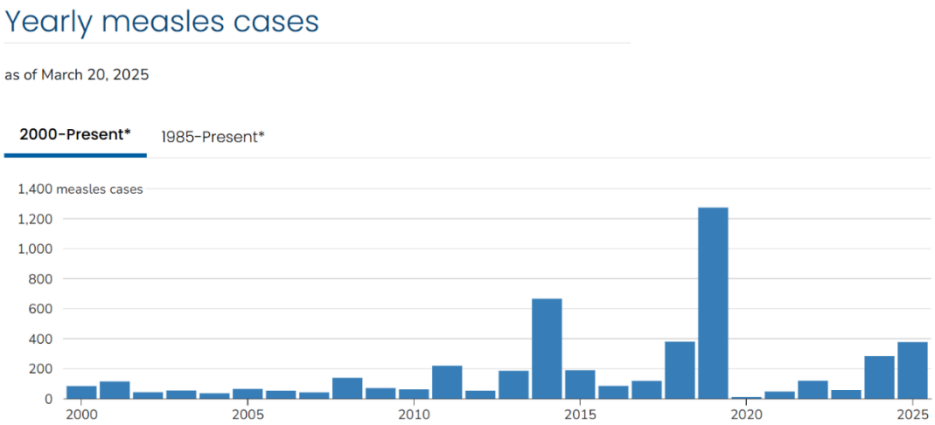
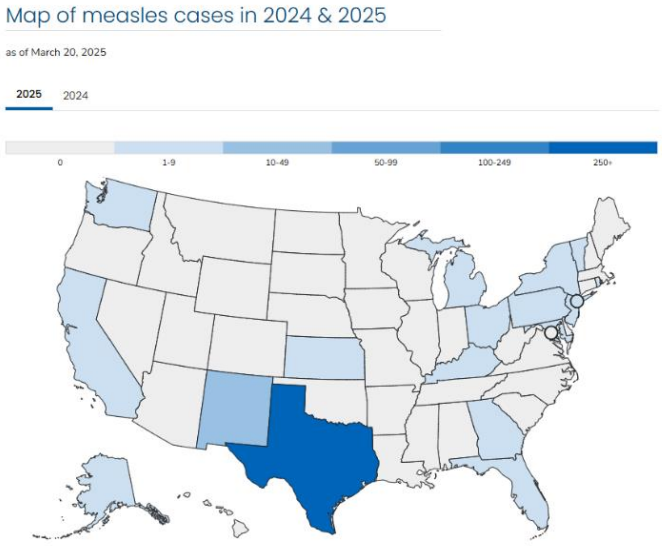
Mid-Michigan District Health Department, Wednesday, March 26, 2025
Central Michigan District Health Department, Wednesday, March 26, 2025
District Health Department 10, Friday, March 28, 2025

Measles and Declining Vaccination Rates

There have been an increasing number of cases of measles in 2025. This includes a continuing outbreak in West Texas which has lead to an outbreak in neigboring areas of New Mexico. A new outbreak is growing in Kansas, and there have been isolated cases in 15 other states. There has also been a large ongoing measles outbreak in neigboring Ontario, with 440 cases reported to date in 2025, and 60 additional cases in the other providences of Canada.





State	Confirmaed cases 2025 as of March
Alaska	2
California	6
Florida	1
Georgia	3
Kansas	9
Kentucky	2
Maryland	1
Michigan	1
New Jersey	3
New Mexico	38
New York	1
New York City	3
Ohio	1
Pennsylvania	2
Rhode Island	1
Texas	300
Vermont	1
Washington	2

<table>
<tr><th colspan="3">Statistics of 2025 Cases as of March 20</th></tr>
<tr><th>AGE</th><th>VACCINATION</th><th>HOSPTIALIZED</th></tr>
<tr><td>124 (33%) are under 5 years</td><td>95% are unvaccinated or have an unknown vaccination history</td><td>64 of 378 (17%) of cases have been hospitalized, which is above average. Of those hospitalized:</td></tr>
<tr><td>159 (42%) are 5-19 years</td><td>3% have had one MMR dose</td><td rowspan="2">• 27% (34 of 124) are under 5 years
• 11% (18 of 159) are 5-19 years
• 13% (11 of 86) are 20+ years</td></tr>
<tr><td>86 (23%) are 20+ years</td><td>2% have had two MMR doses</td></tr>
<tr><td colspan="3">2 of 378 (0.5%) have died</td></tr>
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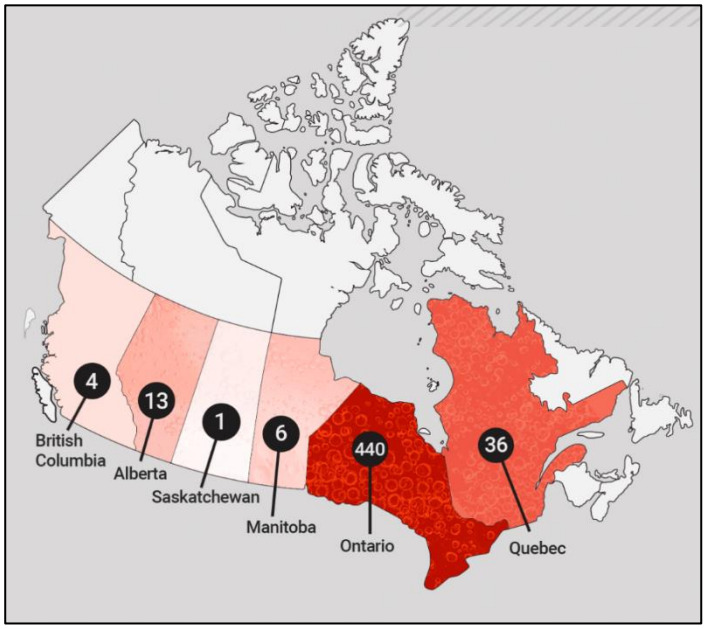
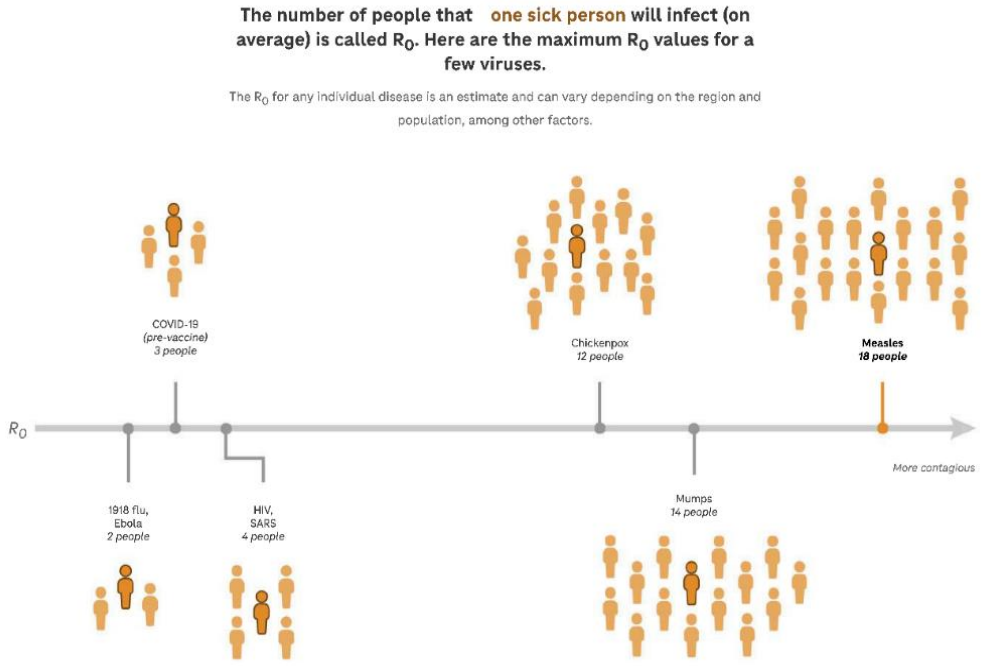


Cases of Measles for 2025 as of March 20
Source: https://globalnews.ca/news/11088746/measles-outbreak-canada-affected-areas/

Measles is very contagious and measles infections are often one of the first indicators of droping vaccination rates. We describe the infectiousness using the basic reproduction number, or R naught (R_0). R_0 is the average number of people with zero immunity that one infected person can spead an illness to. The R_0 for measles is 12 to 18, which means in an area where no one was immune to measles, one person contagious with measles will infect up to 18 other people. This is higher than for other illnesses as seen below.



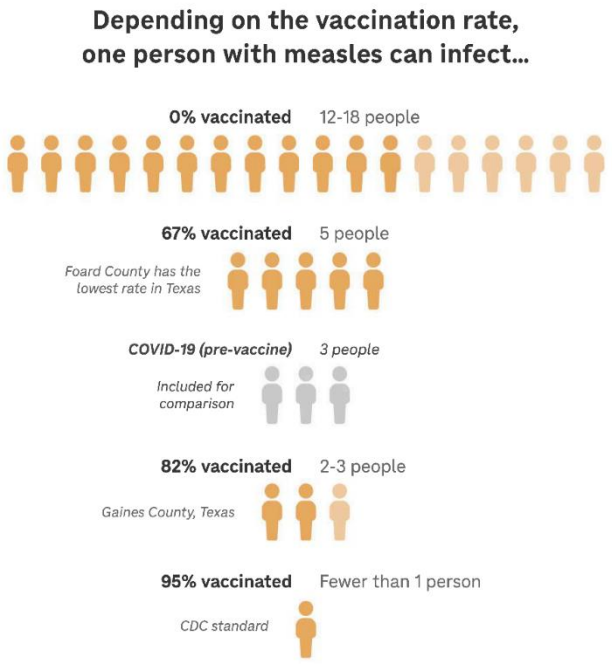
Source: https://www.npr.org/sections/shots-health-news/2025/02/28/nx-s1-5312088/measles-texas-outbreak-contagious-spread

In reality, there will be people immune to measles either through vaccination or past infections. This will effect the infection rate. This is ilistratated below using Gaines County, the starting point of the ongoing outbreak in

Texas, where the overall kindergarden vaccination rate is 82%, and Foard County, the county with the lowest kindergarden measles vaccination rate in Texas.

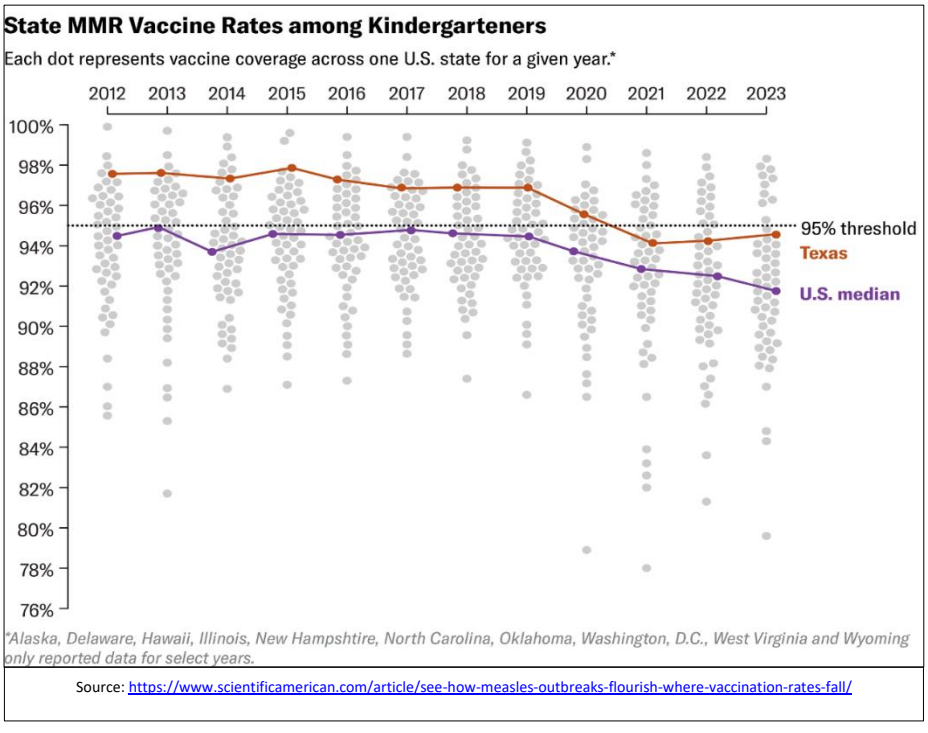
The outbreak in Texas started in a religious community in Gaines County where many the children are homeschooled or attend smaller private schools, and many are unvaccinated. There have be stuggles to get interest in vaccination, get infected or exposed people to isolate, and discourage intentional gatherings hoping to cause illness.

The measles vaccine, part of the measles, mumps, and rubella combination vaccine (M-M-R), is very effective. One dose is 93% effective against measles infection and the two-dose series is 97% effective. It is estimated that 95% of a population needs to be vaccinated to achieve herd immunity, or protection that stops disease spread. As with the situation in Texas, who has a state MMR vaccination rate among kindergarteners of 94.3%, there can be communities with lower levels that lead to outbreaks.

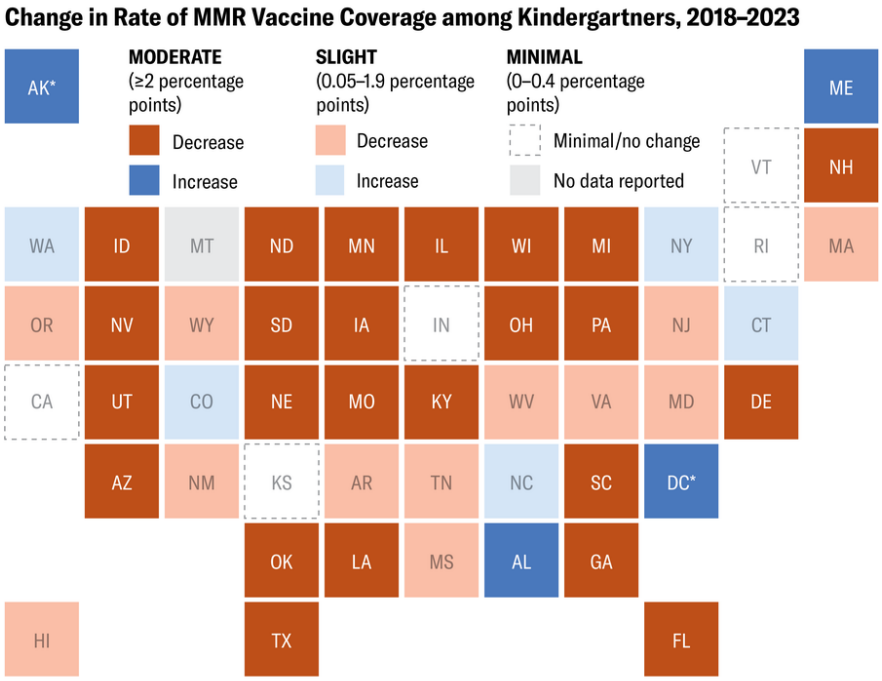


Source: https://www.npr.org/sections/shots-health-news/2025/02/28/nx-s1-5312088/measles-texas-outbreak-contagious-spread

The MMR vaccine coverage rate had dropped in most states since 2019. Many children got behind during the pandemic and only a few states bounced back.



Source: https://www.scientificamerican.com/article/see-how-measles-outbreaks-flourish-where-vaccination-rates-fall/



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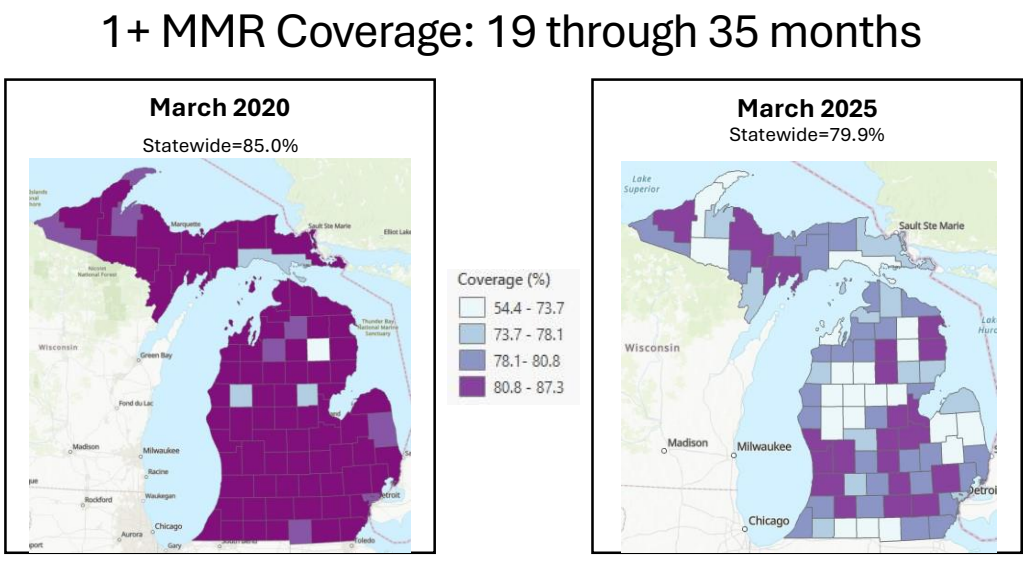
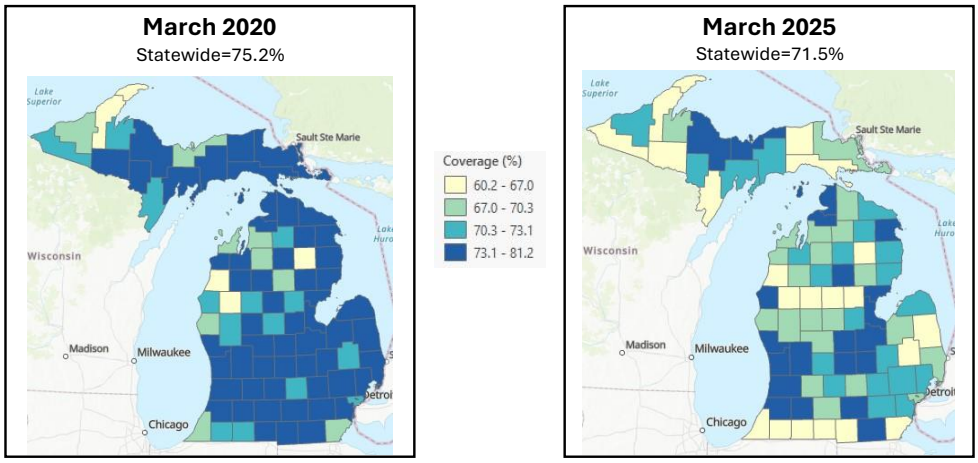
Michigan has seen decreases in MMR rates, particularly in younger children.



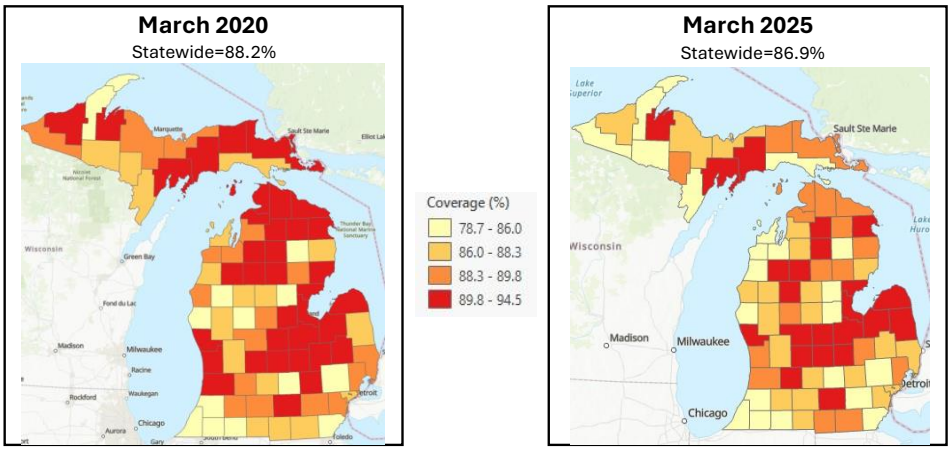
	19-35 Months		
	2020	2025	Decrease
State	85	79.9	5.1
Arenac	88.7	76.8	11.9
Clare	83.7	68.4	15.3
Clinton	87.4	82.9	4.5
Crawford	84.7	87.3	-2.6
Gladwin	75.7	64.2	11.5
Gratiot	85.6	87.2	-1.6
Isabella	82.8	79.4	3.4
Kalkaska	80.1	78	2.1
Lake	77.4	69.2	8.2
Manistee	81.1	74.7	6.4
Mason	87.1	80.6	6.5
Mecosta	83.9	71.8	12.1
Missaukee	83.7	73.3	10.4
Montcalm	85.9	76.3	9.6
Newaygo	83	72.1	10.9
Oceana	83.1	79.6	3.5
Osceola	82	68.7	13.3
Roscomm	84.1	81.4	2.7
Wexford	82.3	73.7	8.6

2+ MMR Coverage: 4 through 6 years



	4-6 Years		
	2020	2025	Decrease
State	75.2	71.5	3.7
Arenac	81.2	75.7	5.5
Clare	76.3	65.1	11.2
Clinton	77.5	75	2.5
Crawford	74.1	72.6	1.5
Gladwin	72.5	58.3	14.2
Gratiot	77.6	74.9	2.7
Isabella	72.3	67.9	4.4
Kalkaska	68.6	67.4	1.2
Lake	66	65.6	0.4
Manistee	66.3	66.4	-0.1
Mason	71.8	73.8	-2
Mecosta	73.8	68.6	5.2
Missaukee	76	70.8	5.2
Montcalm	78.7	69.7	9
Newaygo	72.5	67.3	5.2
Oceana	68.8	67.6	1.2
Osceola	72.8	64.1	8.7
Roscomm	69.3	73.4	-4.1
Wexford	76.2	68.7	7.5

2+ MMR Coverage: 13 through 17 years



	13-17 Years		
	2020	2025	Decrease
State	90.2	86.9	3.3
Arenac	82	91.5	-9.5
Clare	87.7	87.7	0
Clinton	87.7	91.4	-3.7
Crawford	88	91.8	-3.8
Gladwin	90.7	84.9	5.8
Gratiot	80.8	90.9	-10.1
Isabella	91.9	87.6	4.3
Kalkaska	85.1	87.6	-2.5
Lake	89.1	86.3	2.8
Manistee	87.6	85.3	2.3
Mason	89.2	87.2	2
Mecosta	91.8	89.1	2.7
Missaukee	90.3	89.8	0.5
Montcalm	90.6	91.2	-0.6
Newaygo	90.8	87.4	3.4
Oceana	85.1	81.6	3.5
Osceola	86.2	90.2	-4
Roscomm	91.5	89.4	2.1
Wexford	88.2	90.5	-2.3

Even in mild cases, measles causes a very uncomfortable illness with high fevers and conjunctivitis causing sensitivity to the light. One in ten will get an ear infection, and about 1 in 10 get diarrhea. About 1 in 5 unvaccinated people with measles in the US need to be hospitalized, and around 1 out of every 20 get pneumonia, which is the most common cause of death from measles in young children. About 1 out of every 1,000 who get measles will develop encephalitis (inflammation of the brain) which can lead to convulsions, and leave a child deaf, blind, or with intellectual disability. Nearly 1 to 3 of every 1,000 who become infected with measles will die. Those that appear to have recovered from measles can develop subacute sclerosing panencephalitis (SSPE) years later. This is very rare, occurring after about 2 in 100,000 cases of natural measles. It leads to progressive brain damage and death in all cases.

One of the most unique features of measles infection is its ability to reset our immune systems. When we are infected, measles suppresses our immune system through a process called immune amnesia. The measles virus replaces our memory cells with measles-specific immune cells. As a result, we end up with strong measles immunity but are left vulnerability to all other germs. It takes 2 to 3 years after the measles infection for protective immune memory to be restored.

The MMR vaccine is safe and gives us immunity without the risks of listed above that come with natural infection. Over 25 studies have provided clear evidence it does not cause autism. The most common risks of the MMR

vaccine can be soreness, redness, or swelling at the site of the injection which is usually mild and short lived. Sometimes, the glands near the injection site can get swollen or the salivary glands may swell and be sore for a short time. A fever can occur, and very rarely it could cause a febrile seizure which has not long term consequences. Some may get a rash that looks the same as the rash with measles usually about 6 to 12 days after getting the vaccine but is not contagious. Very rarely, levels of platelets can drop after an MMR vaccine, estimated to happen once with every 100,000 doses. This is called immune thrombocytopenic purpura (ITP) and can happen after natural viral infections and is much more likely to occur after a natural measles infection. The MMR vaccine can cause mild joint pain, rarely in children but commonly in certain adult women (between 10-25% of without preexisting rubella immunity), usually beginning 1-3 weeks after vaccination and then resolving after 3 weeks. It does not cause chronic arthritis. While meningitis and encephalitis are listed as a side effect or risk for the MMR vaccine, these complications have only ever occurred when the vaccine had accidently been given to someone with a compromised immune system. The MMR vaccine is made from attenuated (weakened) versions of the wild-type viruses, and does not cause central nervous system infections such as these in people with normal and healthy immune systems.

Normally, the MMR vaccine is given as a two-dose series, with the first dose given to children around ages 12-15 months and the second around ages 4-6 years. If a child 6-11 months is at risk, such as traveling internationally, they should get a dose of MMR. They will still need their normal two-dose series.

Adults who were born before 1957 are assumed to be immune because nearly everyone got measles at that time. Unless they have a record of already getting vaccinated, some adults should get one or two doses of MMR, and unless they have a contraindication, most can get two doses if they wish. For adults, zero, one, or two doses of MMR vaccine are needed as described below.

- Zero doses:
  - adults born before 1957 except those at high risk*
  - adults born 1957 or later who are not at high risk * and who have already received one or more documented doses of live measles vaccine^
  - adults with laboratory evidence of immunity or had measles that was confirmed by a laboratory test
- One dose of MMR vaccine:
  - adults born in 1957 or later who are not at high risk* and have no documented vaccination with live measles vaccine^
  - adults at high risk * who have already received only one dose of live measles vaccine^
- Two doses of MMR vaccine:
  - high risk* adults without any prior documented live measles vaccination^ and no laboratory evidence of immunity or had measles that was confirmed by a laboratory test

* High risk for measles includes healthcare personnel, anyone planning to travel internationally, people attending college or other post-high school educational institutions

^Note: People who received a dose of measles vaccine in 1963–1967 and are unsure which type of vaccine it was should not count it as one of their doses. Both a killed vaccine and live virus vaccine was given during this time, and the killed vaccine was found to be ineffective. If it is known that the vaccine given was the live virus vaccine, the dose is considered valid and does not need to be repeated.

For adults who don't know if they were vaccinated or had measles in the past, measles antibody testing is not recommended. It is recommended they just be vaccinated without testing. Vaccination gives them proof immunity, regardless of antibody levels. The antibody producing cells, called plasma cells, die with time so antibody levels are not accurate indicators for immunity as they don't measure our memory cells.

Spreading disinformation about vaccines has become profitable business for some and has undermined the trust in science, medicine, and government-based vaccine establishments. Trusted messengers are needed more than ever, especially to reach the small, under vaccinated communities so at risk for outbreaks. Resources and

education is available to those interested in being messengers at https://www.voicesforvaccines.org/resources/ and https://vaccinateyourfamily.org/vyf-university/.

Recommendations:

1. Ensure you and your family are up to date on routine vaccinations.
2. Consider being a trusted messenger and vaccine advocate to help keep our communities safe and healthy.
3. Before international travel, check www.cdc.gov/travel to see if your destination country has any Travel Health Notices.

Sources

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