

# A SLICE OF PIE

Parents Informed & Educated

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## Making PIES Out of PEACH: *MMR Edition*

Bringing Current and Reliable  
Vaccine Information to Frum Families



*A project of the EMES Initiative*  
May 2019

## **DEAR READERS,**

With the recent measles outbreak, many nurses were approached by anxious parents with questions about vaccine safety.

Physicians and pediatricians generally do not have the time for long conversations with parents on vaccine safety. The internet has a lot of information, but it can be hard to know who to rely on. Nurses are educators; we are the ones who talk to our patients about health, wellness, diseases, symptoms, and medication side effects. Nursing is also considered the most ethical and trustworthy of all professions, according to polls conducted every year (Brenan, 2018).

Furthermore, nursing is an evidence-based practice; we do not follow information that is proven to be false. We also do not follow information that has been proven to injure or harm patients. We do not provide care to patients using methods that are discredited. We question everything, from data to physicians.

When an outbreak of measles reached our Jewish community in late 2018, we discovered a locally distributed magazine, PEACH (also known as the Vaccine Safety Handbook), that was circulating in our communities. After a brief review, we found it to be inaccurate, highly biased, and full of false information. As we continued to delve into the issues surrounding the measles outbreak and vaccine hesitancy, we discovered the issues went further than PEACH. The magazine was part of a much larger organized effort to spread misleading information to the public to discourage vaccinations.

Parents cannot make good health choices for their children based on inaccurate information. As nurse-scientists, we analyzed the entire PEACH magazine, as well as other common anti-vaxx myths. We are now providing you with accurate refutations and information regarding vaccinations in our own magazine. We named it PIE: Parents Informed and Educated. In it, we include information on all of the childhood vaccines, the illnesses they prevent, the safety process vaccines undergo, as well as many common misconceptions about vaccines and childhood development. Have you wondered about the presence of aluminum and mercury in vaccines? Do you have concerns about SIDS? How about whether vaccinated children are as healthy as unvaccinated children? We read all of the studies quoted in the PEACH magazine and other anti-vaccination sources, and we have answers for you.

This booklet, *A Slice of PIE*, is our abbreviated version focusing on the MMR vaccine and measles. Stay tuned for an entire PIE magazine which we hope will be completed in coming the weeks.

In addition to the PIE publication, we have undertaken a broader initiative to educate our community on the importance of vaccination. We've named this initiative *EMES*, which in Hebrew means truth. We chose this name to highlight our honest quest for the truth, and to broadcast our hope that you will make good medical decisions based on this truth. Here is the result of our work. Please feel free to call or email us with any questions you have—we know you have many! We are ready for you, we have time for you, and we won't lie to you.

Sincerely,

**The Vaccine Task Force of the EMES Initiative  
Engaging in Medical Education with Sensitivity**

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*The Vaccine Task Force thanks the generous donors who made this project possible.  
We also thank the many nurses and physicians who gave up their time to help  
ensure that this work remains as up to date as possible.*



# WHO'S WHO ON THE VACCINE TASK FORCE

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**Tobi Ash, MBA, BSN, RN** is currently working on completing her PhD at Walden University. She has 20 years of experience in women's health and is the director of women's health care at a clinic in Miami. She has four vaccinated children and multiple vaccinated pets.

**Ariel Beniflah, BSN, RN** is a recent graduate from Seton Hall University's accelerated nursing program. She is starting her career as a school nurse in Yeshivas Ohr HaTorah, while seeking a position in an acute care setting. She lives in Lakewood, NJ, with her husband and two vaccinated children.

**Minna Cohen, MSN, RN, FNP, CLC** is a nurse practitioner in a family practice in Staten Island, NY. She is also a certified lactation counselor. She spends time every day educating and discussing vaccines with her patients and their parents. She lives in Staten Island, N.Y., with her husband and three vaccinated children.

**Sarah B. Cohen, MS, RN**, graduated from University of Maryland School of Nursing in 2017 with a concentration in clinical nurse leader, and has been working as a nurse in NY since 2018. She lives in New York, NY, with her two vaccinated roommates.

**Matt Dear, BSN, RN, EMT** graduated from an accelerated BSN program in 2018. He currently works for a pediatric home care skilled nursing agency. He lives in Lakewood, NJ, with his wife and two vaccinated children.

**Rebecca Feldman, MSN, RN, APRN, FNP-BC** graduated from Molloy College in 2016 with a Masters of Science degree. She is board certified as a family nurse practitioner and practices as an emergency room nurse practitioner in Long Island, NY. Previously, she graduated summa cum laude from Adelphi University with a Bachelor of Science in Nursing, and worked as an emergency room nurse for seven years.

**Tamar Y. Frenkel BSN, RN** received her AAS in Nursing from Phillips Beth Israel School of Nursing in 2011 and her BSN from Chamberlain University in 2014. She started her career working at a clinic for pediatric allergy and immunology, and now works at Maimonides Medical Center in Brooklyn, NY, as a medical-surgical nurse. She lives in Brooklyn with her vaccinated pet cat.

**Adena Friedman BSN, RN** graduated from University of Maryland School of Nursing in 2012. She began her career at Sinai Hospital of Baltimore as a medical-surgical nurse specializing in orthopedic trauma. She now works as a school nurse at Talmudical Academy. She lives in Baltimore, MD, with her husband and three vaccinated children.

**Ruchie Kohn, BSN, RN** is a school nurse at a preschool in Williamsburg, Brooklyn for children with developmental delays, since 2015. She lives in Brooklyn, N.Y., with her husband and two vaccinated children.

**Sarah Levine BSN, RN** works in the neurosurgical ICU in an academic medical center in New York City, NY. She lives in New York, NY, with her vaccinated roommates.

**Blima Marcus DNP, ANP-BC, RN, OCN** is a nurse practitioner at the Memorial Sloan Kettering Cancer Center and an assistant professor of nursing at Hunter College. She lives in Brooklyn, NY, with her husband and two vaccinated children.

**Yaakov Perlstein, BSN, RN, FNP candidate**, works at the ODA Primary Health Care Network in Williamsburg in Brooklyn, NY. He is currently completing his Masters of Science degree for family nurse practitioner at Pace University, NYC. He lives in Brooklyn, NY, with his wife and three vaccinated children.

**Dina Rabinowitz MSN, RN, FNP-C, CNRN** is a primary care nurse practitioner for Essen Health Care. She lives in Brooklyn, NY, with her husband and two vaccinated children.

**Rebecca Spielberg BSN, RN, NNP candidate**, is a neonatal ICU nurse at Rainbow Babies and Children's Hospital in Cleveland, OH. She has nearly five years of bedside NICU experience and is projected to complete her Masters of Science in Nursing for neonatal nurse practitioner this May. She lives in Cleveland, OH, with her husband and two vaccinated children.

# PIE CHEAT SHEET:

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Too much information? Here is a short “cheat sheet” that summarizes what the EMES nurses found when studying PEACH’s handbook, as well as several other anti-vaccination sources:

- A. **Outdated information:** Research moves at a fast pace, yet to remain true to their biased stance, many anti-vaccination sources, including PEACH, use decades old research. In some areas of science, a study can be considered “old” in as little as five years. This is especially important if the study has not been able to be reproduced within that time.
- B. **Biased sources:** Many anti-vaccination sources claim to present studies by “independent researchers,” although many of the authors they quote are affiliated with an anti-vaccination organization—and many of them are the founders and presidents of anti-vaccine websites. This demonstrates strong bias, and will not give you any truly independent information. If a study was sponsored by a pharmaceutical company, it can be considered biased as well.
- C. **Discredited sources:** PEACH used dangerous practitioners as sources of information. Many of the doctors they cite have had their licenses revoked for injuries to others and malpractice. Other discredited sources include those who are known to believe purely unscientific claims.
- D. **Selective information:** As you will see, anti-vaccination sources pull specific words and phrases out of studies, *while leaving out the rest of the sentence*, if it does not fit with their agenda! This is called cherry picking, and is a common propaganda tactic.
- E. **False information:** For reasons we cannot understand, PEACH and other anti-vaxxers state pure lies, in addition to their outdated, biased, and misleading information. You deserve honest information.
- F. **Irresponsible Actions:** During the course of our research, we had many dealings with those who promote “vaccine choice”. Some of our experiences include calling the Akeres Habayis Hotline, where we were muted and not allowed to ask important questions. When we emailed PeachMoms about a piece of dangerous and false information (“fever reducers can cause measles complications”) we were told to “look it up yourself.” Subsequent emails were not answered.

## COMMON ACRONYMS

<b>ASD</b>	Autism Spectrum Disorder
<b>CDC</b>	Centers for Disease Control and Prevention
<b>DoD</b>	Department of Defense
<b>FDA</b>	U.S. Food and Drug Administration
<b>HHS</b>	U.S. Department of Health and Human Services
<b>MMR</b>	Measles, mumps, rubella
<b>NIH</b>	National Institute of Health
<b>WHO</b>	World Health Organization

EMES believes in providing the community with the most accurate, reliable, and up to date healthcare information. This effort is being made now because of the unprecedented level of communicable diseases, such as measles, as well as declining vaccination rates, in Jewish communities. While we strongly believe in parental choice, we also believe that educated parents make better choices for their families. We are always available to answer your questions and address your concerns. Email us at [vaccinetaskforce@gmail.com](mailto:vaccinetaskforce@gmail.com).

# VACCINE SAFETY

## How Do I Know Vaccines Are Safe?

Just like all drugs, vaccines undergo a lot of scrutiny before being approved. It takes many years, from the application process, all the way through all the stages of testing, to receive approval for use on humans. Once a vaccine is approved, that is not the end of the monitoring. Several organizations oversee the manufacturing, and continually gather information on all vaccines to ensure safety and effectiveness.

## Here are some organizations that monitor vaccine safety:

The following organizations monitor vaccine safety: the Food and Drug Administration, Centers for Disease Control and Prevention, National Institutes of Health, and the Department of Defense, among others. There are surveillance systems to identify vaccine safety concerns, including: Vaccine Adverse Event Reporting System (VAERS), Vaccine Safety Datalink (VSD), Post-Licensure Rapid Immunization Safety Monitoring (PRISM), and the Clinical Immunization Safety Assessment (CISA) Project.

**Anti-Vaxx Myth:** There are no safety studies or any real way to know if vaccines are safe.

**PIE: False.** Vaccines are studied and monitored from the very beginning and go through years of safety testing in labs and clinical trials before they go to market. Once the vaccine is approved, the manufacturer tests batches of the vaccine for quality and safety before the FDA can recommend it for use. Once the vaccine goes to market, multiple agencies monitor its safety and provide additional checks. **Source:** HHS, 2017b

**Anti-Vaxx Myth:** “It is rare for a vaccine to be removed from circulation, no matter how much damage it is causing.”

**PIE: False.** As with any drug, not all adverse effects will occur during clinical trials. Therefore, once a vaccine is made available to the public, information is continually gathered to identify problems after marketing begins. Although vaccines rarely cause long-term harm, there have been a few cases where a specific vaccine was found to be unsafe once they were already in use. In these cases, the vaccine was immediately removed from circulation.

**Source:** HHS, 2017b; Offit, 2005; CDC, 2015

## VACCINE PACKAGE INSERTS: DECODING THE INFORMATION

Do you want to know how to properly read a vaccine insert? This should help.

All medicines, including vaccinations approved by the FDA, must be safe (which means that the drug benefits are greater than the known risks) and effective before they are allowed to be used. However, prescription drugs, over-the-counter (OTC) medicines, and vaccines still have side effects. The FDA uses the terms side effects and adverse events to describe unwanted or unexpected events or reactions to a drug. These effects can be minor (mild) or major (severe). Minor effects can be a runny nose, upset stomach, or a reddened area at the injection site. A major (severe) effect can be a life threatening allergic reaction, disability, permanent damage, or death. **Source:** FDA, 2018

There are many reasons why some people get side effects: age, gender, how the body absorbs the medication, allergies, vitamins and supplements, or other medications one takes (FDA, 2018).

## MMR ADVERSE EFFECTS/ SIDE EFFECTS:

Suspected adverse events after administration of any vaccine may be reported to VAERS (Vaccine Adverse Event Reporting System)

Call: (800) 822-7967 or email: [info@VAERS.org](mailto:info@VAERS.org)

The following is listed as “Frequency not defined.” For more specific information, please see below for the MMR package insert:

- ▶ Fainting
- ▶ Impaired balance
- ▶ Pain at injection site
- ▶ Headache
- ▶ Rash
- ▶ Swollen lymph nodes
- ▶ Muscle pain
- ▶ Low platelets
- ▶ Optic nerve pain
- ▶ Generalized feeling of illness
- ▶ Irritability
- ▶ Seizures
- ▶ Inflamed salivary (parotid) gland
- ▶ Bronchospasm
- ▶ Eye or ear infection
- ▶ Hearing loss

### Rare and Severe:

- ▶ **Brain inflammation (encephalitis or subacute sclerosing panencephalitis):** one out of every 3 million
- ▶ **Steven-Johnson syndrome:** A rare and serious disorder of your skin and mucous membranes
- ▶ **Guillain-Barre syndrome:** A rare disorder in which your body’s immune system attacks your nerves
- ▶ **Anaphylactic allergic reaction:** If someone has an allergy to the antibiotic Neomycin or other components of the MMR, do not take the MMR vaccine. Discuss with your healthcare provider.

**Source:** Medscape, n.d.

Reading an insert and seeing all kinds of terrifying adverse events is enough to scare any parent

into choosing not to vaccinate. However, the insert should be read completely. Not everything listed has a direct cause and effect from the vaccine. In addition, some side effects from the vaccine have a much lower rate than complications from the measles disease. For example, encephalitis from the disease occurs in one out of every 1,000, but from the vaccine is one in 3 million.

Scan this QR code for a link to the MMR insert:



## CAN WE TRUST THE CDC?

A lot of our content was pulled from the CDC, as they have an enormous amount of information. But are they trustworthy?

**Anti-Vaxx Myth:** The CDC owns vaccine patents and has a financial incentive to make sure vaccines are given, whether or not they are actually safe. They cannot be considered a reliable source.

**PIE:** The CDC does own patents on vaccine technology. But here are several points to keep in mind. First, owning a patent means you own an idea, not the licensing or manufacturing. Second, vaccines are not composed of one giant patent per vaccine. Each step of the recipe for the vaccine has its own patent. The CDC does tons of research. During the hundreds of thousands of hours of research, the scientists will come across an idea and then patent it. In addition, the CDC does not directly receive money earned from the patents. The total amount earned from licensing the rights by high estimation is about \$5-6 million, which equals less than one percent of the \$10 billion CDC budget.

**Source:** NIH, 2014



## MEASLES (RUBEOLA)

*Anti-vaxx myths say that measles is harmless, a necessary part of childhood, and helps build immunity. This is false.*

### What is the measles and how does it spread?

Measles is an extremely contagious virus that spreads through the air from droplets beginning in an infected person's nose or throat, usually by coughing and sneezing. The virus can remain in the air for up to two hours and can spread just by breathing in the contaminated air or touching any infected surfaces and then touching one's eyes, nose, or mouth. It is so contagious that up to 90% of people who are exposed to the measles virus and are not immune will become infected. Infected people can pass along the measles about four days before and four days after their rash appears. Measles is not spread by any other animal species; it is only a disease that affects humans.

**Source:** CDC, 2018f

### How do I know if I have the measles?

- ▶ The disease starts with a rash 7-21 days (average 14 days) after a person is exposed to the virus.
- ▶ Symptoms first include: high fever (as high as 103°-105°), cough, runny nose, and red, watery eyes. A few days after these symptoms begin, Koplik spots (tiny blue-white dots) can appear inside the affected person's mouth.
- ▶ About three to five days after symptoms begin, the characteristic measles rash starts to appear. It usually starts flat and red on the face near the hairline and spreads down towards the neck, the rest of the body, arms, legs, and feet.

**Source:** CDC, 2018c

### Mild complications of the measles:

These occur in 30% of cases; more often in children under five and adults over 20.

- ▶ **Ear infections:** one out of every 10 children with measles
- ▶ **Diarrhea:** less than one out of 10 people with measles

**Source:** CDC, 2018a

Measles				Measles				Measles			
Year	Cases	Deaths	Rate	Year	Cases	Deaths	Rate	Year	Cases	Deaths	Rate
1990	319,124	468	1	1973	26,690	23	1	1996	508	1	2
1991	530,118	683	1	1974	22,094	20	1	1997	138	2	14
1992	683,007	618	1	1975	24,374	20	1	1998	100	0	0
1993	449,146	462	1	1976	41,126	12	0	1999	100	2	20
1994	682,720	518	1	1977	57,345	15	0	2000	86	1	12
1995	555,156	345	1	1978	26,871	11	0	2001	116	1	9
1996	611,936	530	1	1979	13,597	6	0	2002	44	0	0
1997	486,799	389	1	1980	13,506	11	1	2003	56	1	18
1998	763,094	552	1	1981	3,124	2	1	2004	37	0	0
1999	406,162	385	1	1982	1,714	2	1	2005	66	NA	NA
1960	441,703	380	1	1983	1,497	4	3	2006	55	0	0
1961	423,919	434	1	1984	2,587	1	0	2007	43	0	0
1962	481,530	408	1	1985	2,822	4	1	2008	140	0	0
1963	385,156	364	1	1986	6,282	2	0	2009	71	2	28
1964	458,083	421	1	1987	3,655	2	1	2010	63	2	32
1965	261,904	276	1	1988	3,398	3	1	2011	220	0	0
1966	204,136	261	1	1989	18,193	32	2	2012	55	2	36
1967	62,705	81	1	1990	27,766	64	2	2013	187	0	0
1968	22,231	24	1	1991	9,643	27	3	2014	667	0	0
1969	25,826	41	2	1992	2,237	4	2	2015	188	NA	NA
1970	47,351	89	2	1993	312	0	0	2016	85	NA	NA
1971	75,290	90	1	1994	963	0	0	<b>TOTALS:</b>	<b>8,722,519</b>	<b>8,124</b>	<b>1</b>
1972	32,275	24	1	1995	309	2	6	<b>Source:</b> CDC, 2018			

Rate is calculated per 1,000 cases

### Rare and severe complications of the measles:

*(Can lead to hospitalization and even death)*

- ▶ **Pneumonia (lung infection):** one out of every 20 children with measles; the most common cause of death from measles in young children.
- ▶ **Swelling of the brain (Encephalitis):** one out of every 1,000 children with measles; can lead to convulsions, deafness, and intellectual disabilities.
- ▶ **Death:** one or two out of every 1,000 children who get measles (*see chart above*).
- ▶ Measles during pregnancy can cause miscarriage, preterm labor, and low-birthweight.

**Source:** CDC 2018a; 2018c

### Long-Term Complications:

In rare cases, 7-10 years after seemingly recovering from the measles disease, one can develop signs of subacute sclerosing panencephalitis (SSPE), a progressively disabling and fatal central nervous system (brain and spine) disorder with only a five percent chance of survival.

**Source:** CDC, 2018c; NIH, 2019

### The Characteristic Rash



CDC PHIL  
Photo ID#1150.  
<https://www.cdc.gov/measles/about/photos.html>

## MEASLES FACTS

1. Prior to the vaccine in 1963, there were approximately half a million cases and 500 deaths reported each year out of an estimated 3-4 million annual cases. The key here is the word “reported”. Health departments track measles with these 3 criteria: the patient must seek health care with a healthcare professional, the diagnosis must be recognized and the case must be reported to the relevant health care department. This is called “completeness of reporting.” The range of estimates in completeness of reporting from the 1980’s and 90’s is quite wide: between 3 to 58%. This means that anyone who had the measles and never visited a doctor or nurse, or never had the measles diagnosed, or the healthcare professional didn’t report it, is not counted in the reported measles cases (Harpaz, 2004). Following the licensure of the vaccine, there was a 95% decline in reported cases. In 1989, a second measles vaccine was added to the schedule to prevent outbreaks in school age children. By 2002, measles was considered eliminated from the United States, and all cases were either imported or related to an imported case.

**Source:** CDC, 2018c

2. As of April 29, 2019, there have been a total of 704 cases of measles in the USA, with 423 cases of measles in Brooklyn and Queens, and 212 cases in Rockland county since September 2018. Of those cases, 348 were from Williamsburg and 61 were from Boro Park. 68 of these cases were infants under a year old. 202 of these cases were children aged 1 to 4 years old.

**Source:** NYC Department of Health, 2019

**Anti-vaxx Myth:** Having the measles will build my children’s immune systems and make them stronger. Having a measles party is an excellent way to make sure my children become naturally immune to measles and a good way to avoid the MMR vaccine.

## PIE: FALSE & DANGEROUS!

In children and adults who have the measles, *it can take two to three full years for the immune system to fully recover*. During this time, children are at higher risk for other viruses, bacterial infections, and death at much higher rates than children who did not get the measles.

**Source:** Mina et al., 2015

**Anti-vaxx Myth:** It is dangerous to take “fever reducers” with the measles.

1. **PIE:** This is **false** and poor advice! If a child (or adult) develops a rash and fever due to the measles, he or she may take Tylenol, Advil, Motrin, or Aleve as instructed by your doctor and the label dosage information.

**Source:** Mayo Clinic, 2018a

2. \*\*\*However, aspirin should never be given to children or teenagers with measles symptoms, as it can cause a rare but potentially fatal condition, Reye’s syndrome, for individuals with flu like symptoms including chicken pox.

**Source:** Mayo Clinic, 2018a

**Anti-Vaxx Myth:** If I vaccinate my child, they are more likely to get measles from the shot.

**PIE: FALSE!** According to basic understanding of how germs are shared, this is a completely ridiculous claim. According to the CDC, the majority of people who get measles are unvaccinated and often involve international travel.

**Source:** CDC, 2019

**Anti-Vaxx Myth:** Measles is harmless to my child.

**PIE:** In 2017 alone, there were 110,000 measles deaths worldwide, an average of 300 deaths per day. Without vaccination, we would once again see a drastic rise in disease, similar to the numbers seen in the pre-vaccine era.

**Source:** WHO, 2018



## MUMPS

### What is mumps and how does it spread?

Mumps is an acute viral infection which spreads either by breathing in infectious particles in the air, or from the saliva of an infected person. The virus will grow in the nose, throat, and lymph nodes, then spread in the body, including the membranes protecting the brain and spine (meninges), salivary glands, pancreas, testes and ovaries which cause complications. Mumps are contagious 2 days before through 5 days after the salivary glands swell. Symptoms start at about 16-18 days after exposure. Some people can have mumps and show no symptoms, but are still contagious. The most common symptom is inflammation of the salivary glands (parotid gland or parotitis), and the person is most infectious several days before and after the symptom begins.

*Source:* CDC, 2018d

### How do I know if I have mumps?

- ▶ In the early stages of infection, there will be a general feeling of illness, generalized

pain, lack of appetite, headache and/or low grade fever.

- ▶ Inflammation and swelling of the salivary glands (Parotitis) develops 16-18 days after exposure. The swelling can occur on either one or both sides of the face and neck. The infected person will begin to complain of an earache or tenderness.
- ▶ Some infected people can have mumps with mild or no symptoms.

*Source:* CDC, 2018d

### Common complications of mumps:

- ▶ **Inflammation of the testicles (orchitis):** Can be either one or both, although just one is more common. Vaccinated males have a lower risk of orchitis compared to unvaccinated males. In rare circumstances when it affects both testicles, it can cause infertility.
- ▶ **Inflammation of the pancreas (pancreatitis).**

*Source:* CDC, 2018d; Mayo Clinic, 2018b

### Rare and severe complications of mumps:

- ▶ **Inflammation of the ovaries (oophoritis):** not associated with infertility
- ▶ **Deafness:** Generally one sided occurs. General deafness, although rare, can happen.
- ▶ **Inflammation of the membranes protecting the brain and spine (meningitis).**
- ▶ **Inflammation of the brain (encephalitis).**
- ▶ Permanent and severe complications such as paralysis, seizures, and hydrocephalus (excess fluid on the brain) are extremely rare.

*Source:* CDC, 2018d



CDC PHIL Photo ID# 130.

<https://www.cdc.gov/mumps/about/photos.html>

## RUBELLA (GERMAN MEASLES)

### What is rubella and how does it spread?

Rubella is a moderately contagious virus spread by breathing in infectious particles from the air. The virus then grows in the nose, throat and nearby lymph nodes. The virus is most contagious when the rash first appears, but can infect others from seven days before and up to seven days after the rash becomes visible. About 50% of those who become infected have no symptoms, but can still spread the virus. The rash is very similar to measles, which is why it is also known as “German measles”.

**Source:** CDC, 2018e

### How do I know if I have rubella?

- ▶ In children, there is usually no early symptoms where the child is feeling unwell and the rash is the first symptom to appear. In older children and adults there is a general discomfort, mild fever, swollen lymph nodes and coughing or runny nose. This usually lasts 1-5 days.
- ▶ The rash appears 14-17 days after exposure, red and flat with small bumps. It is similar to measles, but is lighter.
- ▶ The rash starts on the face and then moves to the entire body. It lasts three days and is occasionally itchy.
- ▶ Swollen lymph nodes can develop about a week before the rash and can last several weeks thereafter.
- ▶ Adults often develop joint pain and/or arthritis.
- ▶ Other symptoms include eye infection. (conjunctivitis), testicular pain (testalgia), or inflammation of the testicles.

**Source:** CDC, 2108e

### Common complications of rubella:

Generally rubella has no complications for children. Adults with rubella are more likely to have complications.

- ▶ **Arthritis:** up to 70% of adult women are affected, and can last up to one month. Chronic arthritis is rare.

**Source:** CDC, 2018e

### Rare and severe complications of rubella:

- ▶ **Severe bleeding:** conditions in the blood which can lead to severe bleeding occur in about one in 3,000, such as low platelet counts. Gastrointestinal, brain, and kidney hemorrhages may occur.
- ▶ **Inflammation of the brain:** Encephalitis occurs at a rate of about one in 6,000 cases, generally in adults.
- ▶ **Inflammation of the testicles (orchitis)**
- ▶ **Inflammation of the nerves (neuritis)**
- ▶ **Late syndrome of progressive panencephalitis:** Similar to SSPE (see the measles section above for more information).
- ▶ **Congenital Rubella Syndrome (CRS):** Most severe if mother is infected in the first 12 weeks of pregnancy. This syndrome will affect all body parts of the fetus. It can lead to fetal death, prematurity, deafness, eye and heart defects, mental retardation, liver and spleen damage, bone alterations, microcephaly (abnormally small skull) among many other medical issues. Up to 85% of infants who were infected in utero during the first trimester, will have CRS. Additionally, infants with CRS can shed a lot of the virus and infect caretakers who are susceptible for up to one year.

**Source:** CDC, 2018e

### WHAT IS CONGENITAL RUBELLA SYNDROME?

CRS, the most dangerous complication of rubella, affects the fetus of a pregnant woman who becomes infected with rubella. CRS can result in miscarriage, stillbirth, and severe birth defects. For some infants affected, damage from CRS won't appear until they are two to four years old. This damage includes diabetes, or higher rates of autism and SSPE.

**Source:** CDC, 2018e

Between 1964 and 1965—when the last major rubella epidemic occurred—there were approximately 12.5 million cases of rubella in the United States. Of those cases, the complications were as follows: 2,000 cases of encephalitis, 11,250 miscarriages, 2,100 neonatal deaths, and 20,000 babies born with congenital rubella syndrome (CRS).

Between 1998 and 2015, there was a total of 40 cases of CRS in the United States. Thirty-five of the mothers in these case were born outside of the United States, and it is unclear whether these women were vaccinated.

**Source:** CDC, 2018b

# AUTISM 101

## THE WAKEFIELD TIMELINE:

- 1994** Wakefield files for a patent for a diagnostic tool to detect measles virus in bowel tissue and body fluids, claiming that Crohn's disease and ulcerative colitis could have their origins in the measles vaccine.
- 1996** A lawyer named Richard Barr hires Wakefield to support a legal attack against the MMR vaccine. He pays Wakefield over £400,000 (\$525,000).
- 1997** Wakefield files for a patent of his own version of the measles vaccine.
- 1998** The Lancet publishes Wakefield's findings of 12 children with autism and colitis.  
Days after his study is published, Wakefield meets with managers at England's Royal Free Hospital to discuss the importance of using single measles vaccines.
- 1999** The head of Royal Free Hospital informs Wakefield that he must replicate his study to confirm or refute his findings. Wakefield refuses.
- 2001** Wakefield still hadn't repeated his study, and is asked to resign from Royal Free Hospital.
- 2003** Lawyers for the claimants (the twelve autistic children) say they no longer have the evidence to prove that the MMR vaccine caused the autism.  
An investigation by a reporter finds that Wakefield had filed for a patent for the single-measles vaccine prior to conducting his study, which conveniently led him to make the recommendation of dividing up the MMR into three separate vaccines. The investigation also finds that although Wakefield claimed to find traces of measles virus in the colons of these children, molecular studies on these samples found no trace of measles in these children's body fluids. Additionally, medical records of the children are reviewed, and reveal that several of them had shown signs of behavioral and neurological regression before receiving the MMR vaccine.
- 2004**
- 2005** Japan withdraws the MMR vaccine due to contaminants, and rates of autism continue to rise.
- 2006** The measles in England becomes rampant due to a decrease in vaccination, and for the first time in fourteen years, a patient dies from the measles.
- 2007** Investigations reveal that Wakefield was paid £435,643 by lawyers for his "research"  
The England and Wales High Court tries Wakefield for professional misconduct and finds him guilty of all of the above.
- 2010** Wakefield's article is retracted by the Lancet.  
Wakefield is stripped of his medical license.  
*Sources:* Deer, 2010; Deer 2011a; Deer, 2011b

## Why are there so many more autistic people today than ever before?

There are several reasons for the ever increasing numbers of autistic individuals. First, 30 years ago, a child had to meet eight out of 16 criteria to be diagnosed. Today, there are only two criteria: (1) impaired social communication/interaction, and (2) restricted and repetitive behaviors. Second, educators, in addition to doctors, can now diagnose autism. Third, autism screening has become routine since 2006. All of this adds up to more and more children being diagnosed.

*Source:* Volkmar & McPartland, 2014

## Is there any connection between autism and vaccines?

In 1998, a study by Andrew Wakefield, then a consultant gastroenterologist, was published in the Lancet, a British medical journal. He studied 12 children whose parents claimed they noticed behavioral regression and gastrointestinal symptoms after their children received the MMR vaccine. After publishing his study, Wakefield then held a press conference where he stated that the MMR vaccine was unsafe, and advocated the use of single-antigen vaccines (i.e., separating the measles, mumps, and rubella into three separate vaccines).

*Source:* Dyer 2010; Wakefield, 1998

Wakefield's study, however, never concluded that MMR caused either autism or the gastrointestinal problems. To the contrary, Wakefield actually made the following statement in his study: **"We did not prove an association between measles, mumps, and rubella vaccine and the syndrome described."** He also concluded that, "A genetic predisposition to autistic-spectrum disorders is suggested by over-representation in boys and a greater concordance rate in monozygotic [identical] than in dizygotic [fraternal/non-identical] twins."

*Source:* Dyer 2010; Wakefield, 1998

**Think about it...** Andrew Wakefield himself, the “doctor” who many credit with establishing a link between the MMR vaccine and autism, admitted that he was never able to prove any association between the two!

Despite multiple studies performed, and millions of children studied, no connection was found. (For a detailed review of the studies mentioned above, see Appendix A).

Several years later, researchers reviewed the study done by Wakefield and found evidence of fraud as well as many ethical concerns. Wakefield subsequently lost his license to practice medicine (see sidebar above).

**Anti-Vaxx Myth:** “I can prove to you that autism is a new and growing problem with a very simple comparison: How many 50-year olds are autistic? How many five-year olds?”

**PIE: MISLEADING.** The above questions are by no means “proof” of anything. A lifelong condition, autism can be diagnosed at any age and at any stage. While today many children are diagnosed in their preschool years, people who were not evaluated or did not fit the criteria decades ago can now receive a diagnosis of autism at any age if they fit the current criteria. In fact, a study in 2012 examined old cases of diagnostic data on autism in Utah from the 1980s. When the subjects of the original study were re-evaluated with current diagnostic criteria, 59% of the adults, who as children were considered “not autistic”, now qualified for the autism diagnosis. In short, if all of the adults with autism spectrum disorder (ASD) features came forward and were formally evaluated by current criteria, many would likely receive a diagnosis of autism today.

**Source:** Miller et al., 2013

**Anti-Vaxx Myth:** “The autism population keeps rising as more vaccines are being mandated.”

**PIE: Selective information; misleading association.** Although

autism rates seem to be rising (due to changes in diagnostic criteria as outlined above), and it is true that we now give more vaccines than we did 50 years ago, these are nevertheless two unrelated phenomena. A simple look at the vaccine schedule shows no radical changes since the 1990s, **yet autism rates have continued to rise in line with the current broader diagnostic criteria.**

**Source:** Children’s Hospital of Philadelphia, 2019

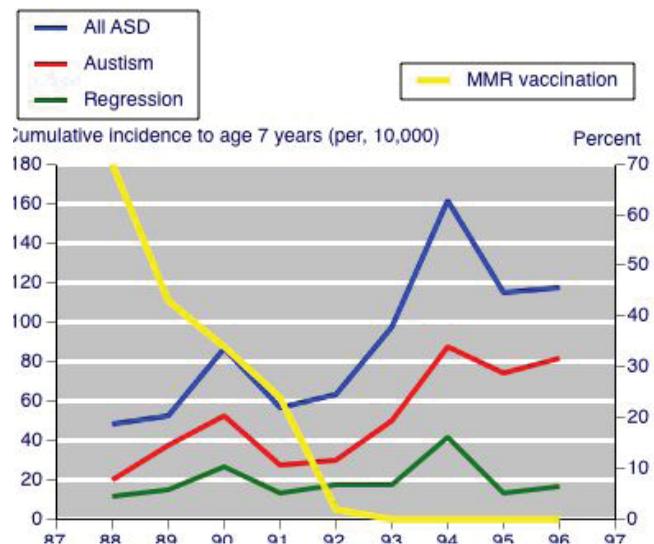
**Need more proof? Let’s take a look at Japan.**

In 1988, the Japanese MMR vaccine was withdrawn due to a contaminated mumps strain. MMR vaccination rates in Japan dropped to zero, while autism rates —with and without regression —continued to rise. This was the only time the MMR vaccine was completely discontinued in any country, allowing researchers to evaluate autism rates independent from the vaccine (see graph below).

**Source:** Honda, Shimizu, & Rutter, 2005

**Think about it...** The cost of treating autism in the United States is \$126 billion a year! Much of these expenses are government-funded, such as special education services. Why would the government continue to recommend vaccines if they were secretly aware that vaccines cause autism, which comes along with such a hefty price tag?

**Source:** Autism Speaks, 2012



**Source:** Honda, Shimizu, & Rutter, 2005

**Anti-Vaxx Myth:** “[Autistic children] usually lack a clear genetic abnormality that can account for their ... deficits.”

**PIE: False.** Genetics has been proven to account for many cases of autism. First, the rate of ASD is six to 15 times higher in boys than in girls. Second, research shows babies born to parents of older age have higher risks of autism. Finally, when a child is diagnosed with autism, a younger sibling has a ten-fold increase of being diagnosed with autism as well. These all clearly point to a genetic factor. Furthermore, a very recent study has revealed that autism features are present on brain MRI as early as six months of age (prior to MMR vaccination, which is first given at one year). Based on MRI, whether or not a child will develop autism can now be predicted with 90% accuracy.

**Sources:** Johnson & Meyers, 2007; Bailey et al., 1995; Risch et al., 1999; Asherson & Curran, 2001; Muhle, Trentacoste, & Rapin, 2004; Reichenberg et al., 2006; Croen, Najjar, Fireman, & Grether, 2007; Emerson et al., 2017

**Anti-Vaxx Myth:** “Autism often appears as a sudden regression after a history of normal development.”

**Source:** National Autism Association (no date given).

**PIE: False.** Regressive autism makes up only 20% of all autism diagnoses. 80% of children with autism do not have a sudden reversal of development; rather, signs of delayed milestone development are already seen in infancy, prior to them having ever received any vaccinations.

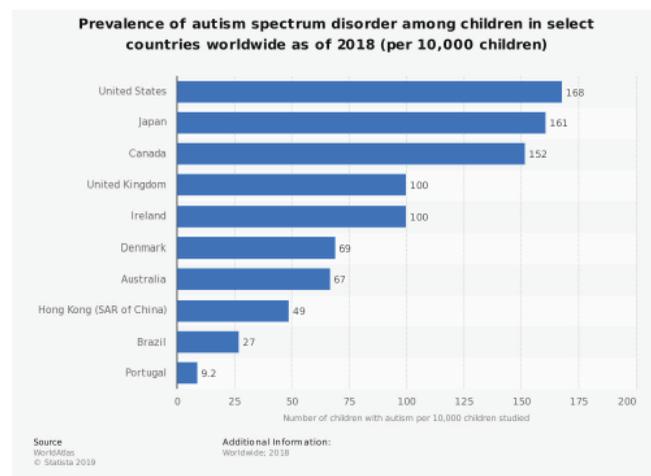
**Source:** Dobbs, 2017; Tuchman & Rapin, 1997; Werner & Dawson 2005; Sigman, Dijamco, Grattier, & Rozga, 2004

**Anti-Vaxx Myth:** “The U.S. has one of the highest rates of autism in the world.”

**Source:** RescuePost, a partner of the anti-vaccination group Generation Rescue.

**PIE: Selective information.** The more developed a country is, the better equipped it is to evaluate and diagnose its children, and it will therefore have a higher rate of diagnosis of any disorder, autism included. Interestingly, Japan, which does not have mandatory vaccination in their country, has the second highest rate of autism in the world.

**Source:** Statista (2019): The Statistics Portal, an independent statistics reviewer which analyzes trends in 600 industries (including healthcare industries) across many countries.



**Anti-Vaxx Myth:** “Before 1999, autism was virtually nonexistent in China. By June 2005, over 1.8 million cases were reported.”

**Source:** Kennedy, 2005

**PIE: False.** China has always had autism. However, due to different diagnostic tools, they have had under-reported cases of autism for many years.

**Source:** Sun et al., 2013; Duan, Yao, Ma, & Zhang, 2014

**Anti-Vaxx Myth:** “The relationship between vaccines and autism is undeniable (unless you are working for the CDC, FDA, or WHO).”

**PIE: False.** Despite numerous studies examining these two factors, a relationship between autism and vaccines has NEVER been found. In

fact, it has been proven that vaccines do not cause autism. Unvaccinated children have autism at the same rates as vaccinated children. Consider the studies in Appendix A.

**Source:** See Appendix A

**Anti-Vaxx Myth:** “Dr. Mayer Eisenstein has seen over 35,000 children, the majority of whom are unvaccinated. He and his colleagues reported that among their unvaccinated patients, they have not seen a single case of autism.”

**Source:** Olmsted, 2005

**PIE: Biased/unreliable source.**

Aside from the fact that this was reported by an anti-vaccine writer (a clear bias), there is no way to verify this statement. Furthermore, every study evaluated found no correlation between rates of autism and vaccinated children.

**Source:** See Appendix A

**Think about it...** Numerous studies, collectively including millions of children, have found that autism rates are no different in vaccinated versus unvaccinated kids. Was Dr. Eisenstein, a notorious anti-vaccine proponent, who was also sued multiple times for malpractice, somehow seeing a unique population that no one else in the world has come across?

**WHO IS DR. MAYER EISENSTEIN?**

Consider this:

- a. He was sued for damaging autistic children with Lupron injections—a service for which he charged \$6,000 per month!
- b. He was sued \$30 million for malpractice. Dr. Eisenstein faced 15 lawsuits, and in 80% of them, the plaintiff won, or Eisenstein settled with them.
- c. Dr. Peter Rosi, a colleague who practiced together with Eisenstein and was also named in some of the malpractice cases against Dr. Eisenstein’s practice, is known to have stated that maternal psychological issues are the cause in 80% of cases where infants die during childbirth. Rosi was also criminally prosecuted in Alaska for malpractice. Eisenstein’s associations with people like Peter Rosi should raise red flags about the kind of practice these doctors engaged in and the lack of legitimacy for the beliefs they held.

**Source:** Callahan & Tsouderos, 2009; Haugland vs. Eisenstein, 2013

**Table. Study Population Characteristics\***

Characteristic	Overall (n = 657 461)†	Vaccinated Children (n = 625 842)‡	Unvaccinated Children (n = 31 619)‡
<b>Sex</b>			
Male	336 949 (0.51)	320 038 (0.95)	16 911 (0.05)
Female	320 512 (0.49)	305 804 (0.95)	14 708 (0.05)
<b>Birth cohort</b>			
1999-2001	168 350 (0.26)	162 513 (0.97)	5837 (0.03)
2002-2004	163 478 (0.25)	153 439 (0.94)	10 039 (0.06)
2005-2007	165 064 (0.25)	159 059 (0.96)	6005 (0.04)
2008-2010	160 569 (0.24)	150 831 (0.94)	9738 (0.06)
<b>Other early childhood vaccines§</b>			
None	11 571 (0.02)	6842 (0.59)	4729 (0.41)
1 DTaP-IPV/Hib	60 306 (0.09)	54 686 (0.91)	5620 (0.09)
≥2	585 584 (0.89)	564 314 (0.96)	21 270 (0.04)
<b>Autism risk score</b>			
Very low risk	191 261 (0.29)	183 671 (0.96)	7590 (0.04)
Low risk	203 219 (0.31)	194 384 (0.96)	8835 (0.04)
Moderate risk	197 220 (0.30)	186 491 (0.95)	10 729 (0.05)
High risk	65 761 (0.10)	61 296 (0.93)	4465 (0.07)
<b>Autism history in siblings§</b>			
No siblings	319 936 (0.49)	306 642 (0.96)	13 294 (0.04)
No siblings with autism	331 994 (0.50)	314 362 (0.95)	17 632 (0.05)
Siblings with autism	838 (0.001)	759 (0.91)	79 (0.09)
Father unknown	4693 (0.007)	4079 (0.87)	614 (0.13)

DTaP-IPV/Hib = diphtheria, tetanus, acellular pertussis, inactivated poliovirus, and *Haemophilus influenzae* type b vaccine.  
 \* Data are numbers (percentages).  
 † Column proportions are in parentheses. Proportions may not sum to 1 due to rounding.  
 ‡ Status at end of follow-up. Row proportions are in parentheses. Proportions may not sum to 1 due to rounding.  
 § Status at study entry.

*This study done in Denmark examined the vaccination history of autistic children. Both groups of children, vaccinated and unvaccinated with MMR, have a nearly identical rate of autism.*

**Source:** Hviid et al, (2019),

# NYC DEPARTMENT OF HEALTH CURRENT RECOMMENDATIONS

## **Routine:**

- ▶ Children should be vaccinated with MMR at 12 months and a second dose before entering school between four and six years of age.
- ▶ All adults should receive 1 dose of MMR if they have not been previously vaccinated or don't know their vaccination status.
- ▶ High risk adults, including all health care workers and student attending college or university, should receive 2 doses of MMR.
- ▶ Before international travel, all persons 12 months of age and older should have documentation of immunity prior to travel. Infants aged 6 to 11 months should receive a dose of MMR prior to travel.

## **Outbreak Recommendations:**

- ▶ Infants living in the outbreak areas in Williamsburg, Borough Park, and Crown Heights should receive an additional early dose of MMR between six to 11 months. In zip codes 11205, 11206, 11211 and 11249, this is currently required a the Public Health Emergency declaration.
- ▶ All persons with 1 dose of MMR should receive a second dose. This includes children aged 1-4 years, as long as it has been 28 days after the first dose.
- ▶ Adults with unknown vaccination history or measles immunity in the outbreak areas should receive 2 doses of MMR or obtain a blood test to determine if they are immune.
- ▶ Before international travel, all persons 12 months of age and older should have documentation of immunity prior to travel. Infants aged 6 to 11 months should receive a dose of MMR prior to travel.

**For the most current recommendations, please check the NYC Department of Health website [nyc.gov/health/measles](https://www.nyc.gov/health/measles)**

## **EMES RECOMMENDS:**

### **Recommendations for Providers:**

#### **Pediatricians, Physician Assistants, Nurse Practitioners, and Registered Nurses**

EMES recommends that healthcare providers listen to and respect concerned parents. Parents know their own children better than providers ever will. When a parent reports that his or her child appears unwell or is not acting not his or her usual self, providers need to take time to listen them carefully. While most instances of presumed vaccine reactions are later found to not be caused by vaccines, parental concerns should never be dismissed. If a reaction does appear to be related to a vaccine, EMES urges all healthcare providers to report the reaction to VAERS. VAERS was established as an alert system. The more reports received by VAERS, the more likely important information related to vaccine safety will be picked up. As believers in science, we always want more data!

### **Recommendations for Parents:**

EMES recommends that parents continue to ensure that they are well-informed, and seek opportunities for education on important topics related to the health and safety of their children and families. The nurses of EMES are available to help with health education by phone and email.

For parents who want to do their own research, EMES recommends several methods to do so:

1. WHO maintains a list of verified evidence-based vaccine safety websites in many of the world's languages: <https://www.vaccinesafetynet.org/>
2. Use caution with YouTube, videos, and social media. It is an easy way to spread information that cannot be fact-checked, which makes it a preferred method for anti-vaxxers. There ARE many good and informative

videos on the immune system, how vaccines work, and other science topics.

**Some reliable sources:**

- a. Khan Academy:  
<https://www.khanacademy.org/> (on biology and the immune system)
- b. Children’s Hospital of Philadelphia (CHOP)’s Vaccine Education Center (VEC): <https://www.chop.edu/centers-programs/vaccine-education-center/resources/vaccine-videos-and-dvds>
- c. CDC’s Vaccine information Videos
- d. NOVA and PBS have made several informative and reliable vaccine films
- e. <https://www.pbs.org/wgbh/nova/video/vaccinescalling-the-shots/>

3. Use websites that end in “.edu” or “.org,” but carefully read their mission statement or “About Us” sections. This will help you understand whether they are biased. If you come across a website ending in “.com” use caution. Read their “About Us” section carefully. Check if they’re biased. (See bias in our cheat sheet)

4. Utilize [www.Scholar.Google.com](http://www.Scholar.Google.com). This version of Google filters out lots of unreliable information and leaves mostly reliable, scientific information in the results. That said, it is not perfect, and the sources should still be double checked for reliability and bias.

5. When reading a study, check for a few things:

- a. The date: if the research is older than 20 years, it is generally not reliable. Good research is replicated often, and there should be updated information available.
- f. The authors: look them up and ensure that they are truly “independent researchers.” This means they are not affiliated with any institution which may lend bias to their results. This may include pharmaceutical companies or anti-vaccination organizations.
- b. The disclosure section: often located at the end of the study, this will tell you if the researchers been paid for their research, which may skew the results. If the disclosure names or organizations aren’t familiar to you, look them up.
- c. Was the study repeated? Were the same results found when the study was replicated? A study is worthless if it isn’t generalizable and reproducible. A one-time finding is insufficient to be considered strong scientific evidence. When multiple studies by different researchers result in the same findings, these findings are then considered reliable.
- d. When being given information from anyone (physicians, friends, hotlines) ask for their source! Tell them to prove it to you or to show it to you. Don’t believe anything without verification. It’s very easy to spread misinformation.

6. If you or your child experiences a symptom which you believe is related to a vaccine, and your provider does not report it to VAERS, you can do it yourself! Call 1-800-822-7967, go online <https://vaers.hhs.gov/reportevent.html>, or send an email to [info@vaers.org](mailto:info@vaers.org) to file a report.

Finally, if you’re having trouble accessing or understanding information, email a nurse! We have many *frum* nurses available to talk to you.

VaccineTaskForce@gmail.com

## PROTECT YOUR CHILD FROM MEASLES

Give your child the best protection against measles with two doses of measles-mumps-rubella (MMR) vaccine:



*first dose at*  
**12-15 MONTHS**

*second dose at*  
**4-6 YEARS**

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## APPENDIX A: STUDIES SHOWING NO RELATIONSHIP BETWEEN VACCINE STATUS AND AUTISM SPECTRUM DISORDER (ASD)

CITATION	PURPOSE/METHODS	PARTICIPANTS	OUTCOMES
<p>Honda, H., Shimizu, Y., &amp; Rutter, M. (2005). No effect of MMR withdrawal on the incidence of autism: a total population study. <i>Journal of Child Psychology and Psychiatry</i>, 46(6), 572-579.</p> <p><a href="https://www.ncbi.nlm.nih.gov/pubmed/15877763">https://www.ncbi.nlm.nih.gov/pubmed/15877763</a></p>	<p>In 1988, Japan replaced the MMR vaccine with single-dose vaccines due to contaminated strains of mumps in the vaccine. Researchers examined the autism rates in Japan following the withdrawal of the MMR vaccine.</p>	<p>31,000 children who did not receive the MMR in Yokohama, who were tracked for 6 years to see if they developed autism.</p>	<p>ASD diagnoses rose from 47.6 per 10,000 for children born in 1988 to 117.2 per 10,000 for those born in 1996.</p>
<p>Taylor, L. E., Swerdfeger, A. L., &amp; Eslick, G. D. (2014). Vaccines are not associated with autism: an evidence-based meta-analysis of case-control and cohort studies. <i>Vaccine</i>, 32(29), 3623-3629.</p> <p><a href="https://www.ncbi.nlm.nih.gov/pubmed/24814559">https://www.ncbi.nlm.nih.gov/pubmed/24814559</a></p>	<p>A meta-analysis, which examined several pooled studies to seek connections between MMR vaccination and autism.</p>	<p>Five cohort studies involving 1,256,407 children, and five case-control studies involving 9,920 children were included in this analysis</p>	<p>Analyses looking specifically at MMR vaccinations, mercury dosage, and thimerosal exposure were negative, as were subgroup analyses looking specifically at development of autistic disorder versus other spectrum disorders.</p>
<p>Jain, A., Marshall, J., Buikema, A., Bancroft, T., Kelly, J. P., &amp; Newschaffer, C. J. (2015). Autism occurrence by MMR vaccine status among U.S. children with older siblings with and without autism. <i>Jama</i>, 313(15), 1534-1540.</p> <p><a href="https://www.ncbi.nlm.nih.gov/pubmed/25898051">https://www.ncbi.nlm.nih.gov/pubmed/25898051</a></p>	<p>Researchers decided to study whether ASD is more common in vaccinated children versus unvaccinated children. They also examined whether having a sibling with autism increased the chance that the MMR would cause autism.</p>	<p>Of 95,727 children with older siblings, 994 (1.04%) were diagnosed with ASD and 1,929 (2.02%) had an older sibling with ASD. Of those with older siblings with ASD, 134 (6.9%) had ASD, vs 860 (0.9%) children with unaffected siblings</p>	<p>The authors found that the MMR vaccine was not associated with increased risk of autism, regardless of whether older siblings had ASD. Their findings indicated no association between MMR vaccine and ASD even among children <i>already at higher risk for ASD</i>.</p>
<p>Madsen, K. M., Hviid, A., Vestergaard, M., Schendel, D., Wohlfahrt, J., Thorsen, P., ... &amp; Melbye, M. (2002). A population-based study of measles, mumps, and rubella vaccination and autism. <i>New England Journal of Medicine</i>, 347(19), 1477-1482.</p> <p><a href="https://www.ncbi.nlm.nih.gov/pubmed/12421889">https://www.ncbi.nlm.nih.gov/pubmed/12421889</a></p>	<p>A retrospective cohort study of all children born in Denmark from January, 1991 through December, 1998. MMR status was obtained from the Danish National Board of Health. Information on the children's autism statuses was obtained from the Danish Psychiatric Central Register.</p>	<p>537,303 children were studied. 440,655 were vaccinated, while nearly 100,000 were unvaccinated.</p>	<p>There was no association between vaccination and the development of autism. The odds of developing autism after receiving the MMR was 0.92 (which indicates no correlation at all). Autism rates were found equally in vaccinated and unvaccinated children.</p>
<p>Hviid A., Hansen J.V., Frisch M., &amp; Melbye, M. (2019). Measles, mumps, rubella vaccination and autism. A nationwide cohort study. <i>Annals of Internal Medicine</i> [Epub ahead of print]. doi:10.7326/M18-2101</p>	<p>The researchers used population registries to collect information on MMR and other childhood vaccinations, autism diagnoses, sibling history of autism, and several factors thought to be related to a higher risk for autism. They then looked to see whether autism developed in children who got the MMR vaccine compared with those who did not during the follow-up period.</p>	<p>657,461 children born in Denmark from 1999 through December 31, 2010.</p>	<p>During follow-up, 6517 children were diagnosed with autism. The chances of developing autism were the same in children who received the MMR vaccine and those who did not. Similarly, there was no increased risk for autism after MMR vaccination in subgroups of children according to sibling history of autism, autism risk factors, or other childhood vaccinations or during specific periods after vaccination.</p>

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