

# Understanding risk



**Risk is part of everyday life. As parents, we try to minimize risk to our children as much as possible. But understanding risk can be tricky. So, what is it?**

## It's a three-part equation:

- **Severity:** How bad or serious something is
- **Likelihood:** How likely it is to happen
- **Unintended Risk:** What could happen by not doing something

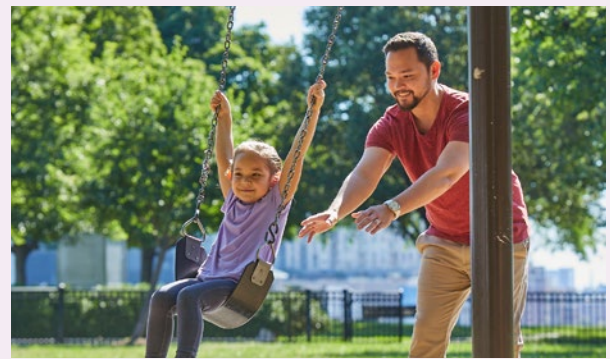
For most of us, we look at severity and whether something is very serious. We tend to stop there, then make our decision to minimize risk. This can be a problem. If we don't factor in how likely something is to happen, we may create a bigger risk.

## Putting risk in context

It is not enough to identify a risk. We need to understand it. This is particularly true for vaccines. Take the mRNA COVID-19 vaccines as an example. Inflammation of the heart is a rare side effect.<sup>1</sup> It most frequently affected adolescent and young adult males after the second dose of an mRNA COVID-19 vaccine.<sup>2</sup> Cases have also been seen in females and after other doses.<sup>2</sup> When some parents learn about this risk, they may choose not to get their child vaccinated.

But it is important to better understand the risk. Although heart inflammation can be serious, it is very unlikely to happen. In fact, studies about the mRNA COVID-19 vaccines showed that the risk of these heart problems after getting sick with COVID-19 was higher than the risk of getting them after an mRNA COVID-19 vaccine.<sup>3</sup> In 2022, a Centers for Disease Control and Prevention (CDC) study found that for teenage boys, the risk of heart problems after a COVID-19 infection was up to 5.6 times higher than the risk of heart problems after being fully vaccinated with mRNA COVID-19 vaccines.<sup>4</sup>

With all this information, it is easier to understand the true risk of heart inflammation with the COVID-19 mRNA vaccines, which is very low.



## Important things to know

Evaluating risk is a three-step process.

1. **Learn the severity.** Is the risk something serious or something mild? A risk of fever is probably a risk that many parents are willing to take. But we want to better understand a more serious risk.
2. **Learn the likelihood.** How likely is the risk? Is the risk of something 1 in 1 million or 1 in 10? Understanding the likelihood is important in understanding risk.
3. **Learn the unintended risks.** If you avoid a risk, are you at risk of something else? And could that other thing be worse?

The choice not to vaccinate often means a greater risk or more serious risks if your child gets sick.

<sup>1</sup>Centers for Disease Control and Prevention (CDC): <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/myocarditis.html>

<sup>2</sup>CDC: <https://www.cdc.gov/vaccines/covid-19/clinical-considerations/myocarditis.html>

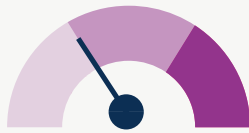
<sup>3</sup>CDC: <https://www.cdc.gov/mmwr/volumes/72/wr/mm7233a2.htm>

<sup>4</sup>CDC: <https://www.cdc.gov/mmwr/volumes/71/wr/mm7114e1.htm>

### Getting the flu vs. getting vaccinated in context

You can also put risk into context by comparing the severity of symptoms or side effects from a disease to its vaccine, like the flu and the flu vaccine.

#### HOW SERIOUS IS THE FLU?



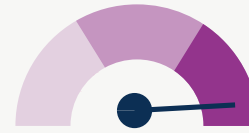
**Mild to moderate**

**Hospitalizations:** About 1 in 86 people in the 2022–2023 flu season<sup>5</sup>

**Pneumonia:** Many deaths caused by flu happen because people develop a bacterial co-infection, such as pneumonia.<sup>6</sup>

**Death:** About 1 in 1,550 people in the 2022–2023 flu season —about 80% of pediatric flu deaths occur in unvaccinated children.<sup>5,7</sup>

#### HOW SAFE IS THE VACCINE?



**Safe**

**Severe allergic reaction:** Generally, 1–2 people per 1 million doses given in the United States<sup>8,9</sup>

**Mild, short-lived side effects may occur, such as:** Soreness, redness, or swelling where vaccine was given; fever; headache; fatigue (tiredness); upset stomach<sup>10</sup>

### Understanding data

Many of us want to find information on our own to learn more about vaccines. This is a great first step in being able to make confident decisions to vaccinate your child. Some of the best sources of credible information include CDC, the U.S. Food and Drug Administration (FDA), U.S. Department of Health and Human Services (HHS), American Academy of Pediatrics, American Academy of Family Physicians, Vaccinate Your Family, Children’s Hospital of Philadelphia, and the Mayo Clinic.

Here’s information about three sources that some parents use to learn more about vaccines:

- **Vaccine Information Statements (VIS):** Vaccine Information Statements are given to parents at the time of vaccination. They are a good source but don’t provide information on the likelihood of a side effect happening. That said, they are a great starting point as you learn more about routine childhood vaccines. You can access them before your child’s vaccine visit at [immunize.org/vis](https://immunize.org/vis).

- **Package Inserts:** Package inserts are documents that give information to your health care provider about vaccine dosage, storage, how to administer the vaccine, adverse events, and other information. A package insert lists every single potential side effect that came up in clinical trials—whether it is related to the vaccine or not. But inserts don’t always tell you about likelihood. Because package inserts use medical language, they can sometimes be difficult to understand for those of us who aren’t doctors. For more information, visit [www.fda.gov/vaccines-blood-biologics/vaccines/vaccines-licensed-use-united-states](https://www.fda.gov/vaccines-blood-biologics/vaccines/vaccines-licensed-use-united-states).
- **Vaccine Adverse Event Reporting System (VAERS):** VAERS is a vaccine side effect reporting system from the CDC and the FDA. It helps track possible vaccine safety issues. Anyone can report potential side effects from their vaccines. However, a VAERS report does not always mean there is a safety issue. For example, let’s say someone gets stung by a bee on the arm after they get their vaccine. Later in the day their arm becomes sore and swollen. Since those are potential side effects of both a bee sting and a vaccine, they can’t be sure what is causing the soreness and swelling. They should report it to VAERS anyway. Reporting this helps identify potential new or unusual side effects to take action if needed. Researchers will then evaluate the VAERS report to determine whether it is related to the vaccine. Because VAERS is designed to collect reports of possible vaccine safety issues, it is not a good source of information to help understand risk.<sup>11</sup>

<sup>5</sup> CDC: <https://www.cdc.gov/flu-burden/php/about/index.html>

<sup>6</sup> CDC: <https://www.cdc.gov/flu-burden/php/about/faq.html>

<sup>7</sup> CDC: <https://www.cdc.gov/flu/spotlights/2022-2023/pediatric-flu-deaths.htm>

<sup>8</sup> U.S. Department of Health and Human Services: <https://www.hhs.gov/immunization/basics/safety/side-effects/index.html>

<sup>9</sup> The Journal of Allergy and Clinical Immunology: [https://www.jacionline.org/article/S0091-6749\(15\)01160-4/fulltext](https://www.jacionline.org/article/S0091-6749(15)01160-4/fulltext)

<sup>10</sup> CDC: <https://www.cdc.gov/flu/vaccines/keyfacts.html>

<sup>11</sup> CDC: <https://www.cdc.gov/vaccine-safety-systems/vaers/>

### Asking Questions

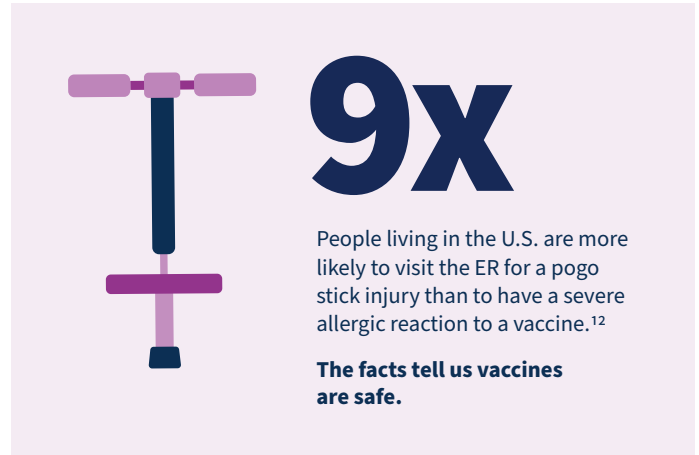
These questions can help you accurately evaluate the risk of getting a disease compared to the risk of getting the vaccine that will prevent that disease. This can help you make the best decisions for your child.

- **What are the risks of the vaccine?**
- **How severe are the risks associated with the vaccine?**
- **What is the likelihood the risks associated with the vaccine will happen?**
- **What are the risks of the disease?**
- **How severe are the risks associated with the disease?**
- **What is the likelihood that the risks associated with the disease will happen?**

Once you answer those questions, you will have a clear idea of what the true risks are and understand which option is riskier. The reality is that serious side effects associated with a vaccine are extremely rare. How rare? Generally, if 1 million vaccine doses are given, only about 1–2 people have a severe allergic reaction.<sup>8,9</sup>

### Getting more information

If you have questions about certain vaccine risks, talk to your health care provider. You can also learn more about vaccines, the diseases they prevent, and the risks associated with both at [LetsGetRealAboutVaccines.org](https://www.letsgetrealaboutvaccines.org).



<sup>12</sup> National Electronic Injury Surveillance System: <https://www.cpsc.gov/Research--Statistics/NEISS-Injury-Data>

