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VACCINATED OR UNVACCINATED

WHAT YOU SHOULD KNOW

Some people ask the question, "If vaccines work, why do unvaccinated people present a risk to those who have been vaccinated?" This question gets to the heart of what makes vaccines different from other medical decisions that people make for themselves. On one hand, vaccines are meant to protect individuals. On the other hand, vaccines play a role in the collective protection against infectious diseases that a community enjoys. For example, a study of a measles outbreak that occurred in the Netherlands between 1999 and 2000 showed that while unvaccinated people had a 224 times greater risk of getting measles compared with vaccinated people, 75% of the cases occurred in areas of the country where vaccination rates were lower, including more vaccinated people in these areas getting measles.

ALL FAMILIES HAVE SUSCEPTIBLE MEMBERS AT TIMES

While unvaccinated people are often thought of as those who have chosen to remain that way; in fact, people can be unvaccinated for any number of reasons. Newborns and young infants may not be old enough to receive certain vaccines, like the influenza or MMR vaccines. Also, some people have medical reasons for not getting one or more vaccines, such as an allergy to a vaccine component. Others might not be protected because they are receiving chemotherapy for cancer or immune suppressive medicines following an organ transplant.

Also, vaccines don't work 100% of the time. For example, 95 of every 100 people who receive a single dose of measles vaccine will be protected, but five will not. These five vaccinated people who didn't develop an immune response to the vaccine are just as susceptible to disease as people who aren't vaccinated.

For these reasons, virtually every family experiences periods of time when they rely on the collective immunity of their community to protect their loved ones.

ALL MEMBERS OF THE COMMUNITY CONTRIBUTE TO ITS COLLECTIVE IMMUNITY

Just as every family relies on their community for protection of their loved ones, so too does every family contribute to the relative strength of their community's ability to stave off the spread of infection. So how does this work?

Germs (or pathogens) are like rainwater. They find the weak spots in a community the same way that rainwater finds the weak spots in a leaky roof. When a high percentage of people in a community is protected against a pathogen, everyone in the community, including those who have not been vaccinated, is at lower risk of being infected with that pathogen. This concept is commonly known as herd (or community) immunity. In this case, the roof is effectively sealed.

On the other hand, as the unvaccinated population increases, so does the opportunity for a pathogen to spread through the community. For example, studies have shown that vaccinated people in a relatively unvaccinated community are at greater risk than unvaccinated people in a highly vaccinated community. Think about the leaky roof again. A roof with several leaky areas will cause more widespread damage. This is what happens in a relatively unvaccinated community. If, however, a roof has only a few small weak spots, the chance for damage, even in those parts of the house, is minimal. The same is true of highly vaccinated communities. Therefore, collectively, the community plays an important role in individual protection, including for the most susceptible members.

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Children's Hospital of Philadelphia
Vaccine Education Center

Learn more: vaccine.chop.edu

MY FAMILY MEMBER IS UNVACCINATED

While vaccination provides the best measure of protection, sometimes vaccination is not possible. Therefore, if you or a family member is unvaccinated, consider the following:

Limit opportunities for exposure – Several strategies can help keep an unvaccinated family member – especially a newborn or infant – healthy by limiting opportunities for them to be exposed to potentially harmful germs. These include:

- Discourage kissing babies or susceptible relatives on the lips.
- Limit exposure to those who are sick by asking how others are feeling before setting up visits.
- Limit exposure to places with large groups.
- Wash hands thoroughly and often, especially after using the restroom, before preparing or consuming meals, before holding a newborn or infant, and before hugging or holding hands with older relatives.
- Don't share cups, utensils, pacifiers or teething toys.
- Don't put the baby's hands in other people's mouths.

Inquire about the vaccine status of caregivers – If you have an unvaccinated family member, you can make sure those around them most – yourself, other family members, and primary caregivers – are vaccinated. This protected ring of close contacts decreases the chance for exposure to a vaccine-preventable disease.

Share unvaccinated status in healthcare settings, especially during emergencies – If your family member is unvaccinated, particularly if they are healthy children old enough to have been vaccinated, it is important to alert medical professionals of their unvaccinated status because healthcare providers will need to consider infections that they might not commonly consider due to widespread vaccination. For example, an unvaccinated child may need to get a spinal tap to rule out several of the most severe types of bacterial meningitis.

Prepare differently for sleepaway camps and increasing independence – If your child is unvaccinated, adults at camps or other extended programs will need to be aware that if your child becomes ill or needs medical attention, they should be watched more closely, and anyone providing medical care should be told of your child's vaccination status. As your child gets older and starts spending more time away from home, they will also need to understand the importance of sharing their vaccination status if they need emergency medical attention and you are not present.

Pay attention to news of outbreaks – Being aware of outbreaks in your community is important. Monitoring news reports and social media can alert you to outbreaks of vaccine-preventable diseases or other infections circulating in your area. When traveling, check for news of outbreaks in the areas you're visiting. And, if visitors are coming from other areas, check about outbreaks in their areas as well as consider their travel route and the likelihood that they could be exposed to infections en route.

Consider the time it takes to become immune – After vaccination, it takes time for an immune response to develop and be protective. For example, it takes about two weeks after vaccination against influenza to develop protective immunity. In the interim, the vaccine recipient could be exposed to the virus and become infected.

MY FAMILY MEMEBER IS VACCINATED

If you or a family member is vaccinated, consider the following:

Confirm whether all doses have been completed – Some vaccines require multiple doses before a vaccine recipient is considered protected. For this reason, it is useful to check if additional doses of a vaccine are necessary.

Check immunization status at each healthcare visit – It is good to be in the practice of asking if you or your family members need any vaccines at each healthcare visit. New vaccines may be available, and existing vaccines, or the recommendations related to them, may be updated. This is particularly true for adults who often think they are up to date or no longer need vaccines because they are adults. Given that some vaccines are recommended based on a person's age, immune status, job or lifestyle habits, the need for vaccines may change from time to time.

Realize that immunity could wane – In some instances, immunity from a vaccine may decrease over time. This is why booster doses of the same or a similar vaccine later in life are sometimes recommended. For example, recent mumps outbreaks on college campuses are probably the result of waning immunity from childhood mumps vaccine.

Keep in mind the vaccine may not have worked – While most vaccines work well, in some cases a person will not develop a protective immune response even after multiple doses. Because we do not typically check immune responses to vaccines, we don't know who among a population of vaccinated individuals may still be susceptible during an outbreak. The good news is that often these people develop some immunity, so even if they are infected, their illness tends to be of shorter duration and less severe compared with someone who was not vaccinated.

This information is provided by the Vaccine Education Center at Children's Hospital of Philadelphia. The Center is an educational resource for parents, the public and healthcare professionals and is composed of scientists, physicians, mothers and fathers devoted to the study and prevention of infectious diseases. The Vaccine Education Center is funded by endowed chairs from Children's Hospital of Philadelphia. The Center does not receive support from pharmaceutical companies.

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Learn more: **vaccine.chop.edu**