Why Will It Take So Long to Make a Vaccine against COVID-19?

By now, most people are aware of the important role for vaccination in addressing the COVID-19 pandemic. Because this is a new virus, we do not have a vaccine to protect against it. And, while many scientists and companies around the globe have started to work on vaccine development, estimates suggest that the shortest timeframe for having a vaccine is next year. This has left many wondering, “Why will it take so long?”

To get a better sense of why it will take time — and why an estimate of one year is optimistic — it is useful to start with a discussion about how vaccines are made and how long it takes under normal circumstances, before looking at what will change because we are in the midst of a public health emergency and what that means for individuals and families.

Making vaccines under normal circumstances: The process and the timeline

Because vaccines are given to healthy people, they are among the best studied products available. Typically, vaccine development starts not at companies but rather in university labs, where scientists identify what type of vaccine they are interested in creating and what type of animal model will be useful for evaluating it. Animals, when infected, develop immune responses similar to people. Animal models are not perfect, but they offer an opportunity to study a vaccine candidate before it is given to people; these are called “proof-of-concept” studies.

With a candidate vaccine and some positive results in animals, vaccine development typically moves to a company. The potential vaccine goes through several phases of trials that include increasingly larger numbers of people. All phases carefully monitor vaccine safety, but as the studies progress, they move from evaluating immunogenicity, meaning the ability to generate an immune response in recipients, to efficacy, meaning the ability to protect recipients from infection.

By the time these studies are done, tens to hundreds of thousands of people may have been inoculated with the vaccine. These studies can take 10 to 20 years or more to complete.

Making vaccines during a public health emergency

Obviously, during a public health emergency, we cannot wait for 10 to 20 years, so how does the process change?

First, in an emergency, it is likely that more resources will be put toward the project, so more scientists are able to work on developing a vaccine. For example, more than 70 companies are working on a COVID-19 vaccine, whereas under normal circumstances, fewer than five — and, often only one or two — companies are working on developing any particular vaccine. This means that all of those working on vaccine development can benefit from the findings of their competitors. This builds the knowledge base more quickly.

Second, researchers are able to work together with fewer barriers. For example, in the current COVID-19 pandemic, the World Health Organization (WHO) is overseeing an international randomized controlled trial in which candidate vaccines can be compared with a single placebo, or control, group. The plan is also written in a way that candidate vaccines can start being tested at different times, and data can be compared. In this way, the trial can help increase scientific rigor and efficient use of resources.

Third, normal processes are likely to be altered as well. This can include eliminating animal model studies, reducing the number of study participants at each phase, and shortening the timeline for monitoring results.

What does this mean for me and my family?

While people are anxious to resume regular activities, it is important that any vaccine against COVID-19 is safe and effective. Therefore, it is important to monitor what is happening with vaccine development, but it will be even more important for public health officials to clearly communicate what is known about any new COVID-19 vaccine in terms of how well it works and its possible side effects.
Trivia Answer:
The correct answer is C. Before a company can market a vaccine, it must be licensed by the Food and Drug Administration (FDA). During the licensing process, the FDA closely evaluates the data generated during clinical trials to ensure the vaccine is safe and effective in the target population.

Go to vaccine.chop.edu/trivia to play Just the Vax, the Vaccine Education Center's trivia game, where you can find this question and others like it.

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Likewise, other factors will also be important at that time. People will need to evaluate whether the disease is spreading in their area, whether they have immunity as a result of previous illness, what is known about how long immunity lasts, and whether a certain level of immunity is needed for protection.

With all of this information, public health officials will likely make vaccine recommendations, and families, in consultation with their healthcare providers, will need to decide the relative risks and benefits of being vaccinated.

To see a list of related resources, access the online article: https://www.chop.edu/news/feature-article-why-will-it-take-so-long-make-vaccine-against-covid-19

NEWS AND NOTES

New book by VEC director, Overkill: When Modern Medicine Goes Too Far

Ever wonder if or when to treat a fever? Whether vitamin D supplements are necessary or vitamin C defends against the common cold? What about the need to remove those silver mercury fillings? A new book by Dr. Paul Offit, Director of the Vaccine Education Center at Children's Hospital of Philadelphia, answers these questions and many more. Overkill: When Modern Medicine Goes Too Far describes a variety of situations in which scientific studies and common clinical practice differ. The book is available from Amazon and Barnes & Noble.

Hilleman essay contest

The 2020 Maurice R. Hilleman Essay Contest is now open! This essay contest offers an exciting opportunity for students in grades 6 to 12 to learn about one of the most prolific scientists in modern history. After learning about Dr. Hilleman, students can write a 500- to 600-word essay that answers the question, “How was Dr. Hilleman’s integrity important to his success, and how is integrity important to you?” Three winners will receive a $1,000 prize and a trip to Philadelphia this fall that will include special events, such as a celebratory luncheon, tour of research labs at Children’s Hospital of Philadelphia and more. The deadline for submission is June 12, 2020.

Visit hillemannfilm.com/contest for details and application.

Keeping Children Up to Date on Immunizations during the Pandemic

To adhere to stay at home orders, and to avoid inadvertently exposing children and their families to COVID-19, many parents have wondered about the need for well visits during which children often get vaccinated. Recently, the American Academy of Pediatrics, the American Academy of Family Physicians, and the Centers for Disease Control and Prevention offered guidance. These groups indicated that routine vaccinations should be prioritized for children younger than 2 years of age and should be given to others, including teens and adults, when an opportunity presents itself, such as during visits for minor illnesses. Because vaccine-preventable diseases continue to circulate in communities throughout the U.S., if a group of infants and young children fall behind on vaccines, these diseases will have an opportunity to cause outbreaks once communities reopen.

The Coronavirus Pandemic – Answering Your Questions

Do you have questions about COVID-19? The Vaccine Education Center has been compiling answers to common questions on the Vaccine Makers Project website. See if your question is on the list or find out how to submit your question to our experts – https://vaccinemakers.org/news-events/coronavirus-pandemic-answering-your-questions.

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