



Vaccines

With the relatively rapid development of vaccines against COVID-19, enduring questions about vaccine safety and effectiveness have resurfaced. Learn the history and science of vaccine development, and join in on a discussion about the current global vaccination efforts.

Conversation Questions

1. What should the balance be between individual bodily autonomy and social responsibility to protect public health?
2. Who should be a priority in vaccine distribution in a pandemic? How should we handle potentially wasted vaccines?
3. What are the potential implications for hesitancy with vaccinations?
4. How is efficacy of a vaccine understood? Who is responsible for disseminating reliable information about efficacy?

Key Definitions (adapted from CDC.gov)

- *Immunity* – protection from an infectious disease; if you are immune to a disease, you can be exposed to it without becoming infected
- *Vaccine* - a product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease; vaccines are usually administered through needle injections, but can also be administered by mouth or sprayed into the nose
- *Vaccination* – the act of introducing a vaccine into the body to produce immunity to a specific disease
- *Immunization* – a process by which a person becomes protected against a disease through vaccination. This term is often used interchangeably with vaccination or inoculation.
- *Herd Immunity* - occurs when a large portion of a community (the herd) becomes immune to a disease, making the spread of disease from person to person unlikely; as a result, the whole community becomes protected — not just those who are immune





- *Efficacy* – how well a vaccine prevents cases of a disease in a clinical trial, based on how many cases occur in trial participants; efficacy is a strong predictor of real-world effectiveness of a vaccine

Read

“Science of Vaccines (Infographic)” from Northwestern Medicine

<http://bit.ly/39HpdKJ>

This infographic outlines how vaccines work, and defines five different kinds of vaccines, including the new mRNA vaccines used for COVID-19.

“How are vaccines developed?” from the World Health Organization

<http://bit.ly/2YAmhJB>

This article is part two in a series of explainers on vaccine development and distribution. Learn about the ingredients in a vaccine and the three clinical trial phases.

“Vaccines and immunizations: Myths and misconceptions” by the Centers for Disease Control and Prevention for the World Health Organization

<http://bit.ly/3j8iflb>

This list of common misconceptions was originally written by the Centers for Disease Control and Prevention in the United States. This Q&A addresses the common misconceptions about vaccination that are often cited by concerned parents as reasons to question the wisdom of having their children vaccinated.

“What’s Behind the Fear of Vaccines?” by Scientific American for Immunomic Therapeutics

<http://bit.ly/3jiOno0>

This article takes a closer look at the social, cultural, and political issues influencing immunization.





“The Promise of mRNA Vaccines” by Diana Kwon for *The Scientist*

<http://bit.ly/2MsB1Yr>

Long before Moderna’s and Pfizer’s COVID-19 shots, scientists had been considering the use of genetically encoded vaccines in the fight against infectious diseases, cancer, and more.

“22 Orphans Gave Up Everything to Distribute the World’s First Vaccine” by Sam Kean for *The Atlantic*

<http://bit.ly/3rskKBR>

Vaccines have been around since the late 1700s, and in this article, author Sam Kean describes how the rollouts have often been precarious—full of blunders, accidental deaths, dashed hopes, and dubious ethical decisions.

Watch

Explanatory Videos by Dr. Anna Blakney on TikTok

<http://bit.ly/39JiBeQ>

Dr. Anna Blakney is an scientist from the United States who makes RNA vaccines & therapies. Her videos outline how mRNA vaccines are made, as well as addresses questions about the COVID-19 vaccines from viewers.

Covid Vaccine Trial Videos by Dr. Will Budd on TikTok

<http://bit.ly/2Lg8KDX>

Dr. Will Budd is a clinical research doctor who shares videos about the COVID-19 vaccine trial in the United Kingdom. Many of his videos debunk myths about that vaccine.

“Racing for Vaccines” for Pandemic Perspectives from the Smithsonian National Museum of American History

<https://bit.ly/39K19H1>

This one-hour presentation is part of the Smithsonian Institution’s Pandemic Perspectives series. It features panelists discussing vaccine invention, testing, marketing, and distribution from a historical perspective and comments on developments since COVID-19 was first identified in late 2020.





Listen

“The Great Vaccinator” from RadioLab for WNYC Studios

<http://bit.ly/3ax9puY>

This RadioLab podcast episode covers the scientific contributions of Maurice Hilleman, who developed 40 vaccines over the course of his career including 8 of the 14 childhood vaccines you may have received.

“Vaccines - Are They Safe?” from Science VS for Gimlet Media

<http://bit.ly/3ha8dz2>

This podcast episode dives into the science to find out how safe vaccines really are. It includes interviews with public health researchers Professor Dan Salmon and Professor Amy Kalkbrenner as well as neurologist Professor Ingrid Scheffer.

“How to Talk About Vaccine Hesitancy” from Sawbones for MaximumFun

<http://bit.ly/39lsUzX>

The COVID-19 vaccine has finally arrived and there are, dishearteningly, too many that are on the fence about getting it. In this episode, Dr. Sydnee and Justin McElroy provide a guide for talking with those who are vaccine hesitant.

“What Happens When You Get a COVID-19 Vaccine That Uses mRNA” by Anna Rothschild and Sinduja Srinivasan for FiveThirtyEight

<http://53eig.ht/3pJjy7>

Dr. Margaret Liu, one of the pioneers of gene-based vaccines, talks with the hosts about vaccines that use mRNA to help us build immunity to COVID-19, including the Pfizer-BioNTech and Moderna vaccines.

