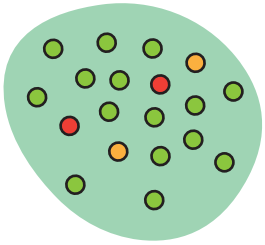
HOW DO PANDEMICS END?

With COVID-19 vaccine rollouts ramping up across the world and infection cases going down, there is finally hope of life returning to "normal". But what does it mean for a pandemic to "end"? Is that even possible? We examine some common outcomes for pandemics to understand how the COVID-19 pandemic could conclude.

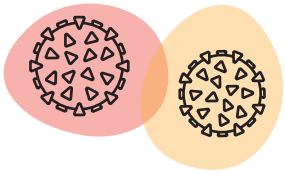


HERD IMMUNITY

If enough people develop immunity to a certain disease, they can contain the spread of the pathogen to other people. We can develop immunity through exposure to the pathogen, either by vaccination or infection. The percentage of people who need to be immune to the disease to establish herd immunity is highly dependent on how transmissible the pathogen is. With COVID, experts are still trying to determine what that number is. As more transmissible variants have circulated throughout the world, the consensus is that between 70% and 85% of the population needs immunity to establish herd immunity.

CURE

At the beginning of the pandemic, there was a race to find remedies for severe infections. From March to June of 2020, around 6% of infections in the United States were resulting in deaths. Doctors were focused on symptom management interventions like ventilation because it was unknown which available drugs would be effective. Hydroxychloroquine and interferon quickly became candidates but were found to be ineffective. Towards the end of the year, before any vaccines were approved, around 2% of infections were resulting in death. The FDA approved a two drug combination for severe cases that consisted of antiviral medication and an autoimmune drug that helps direct antibody responses.

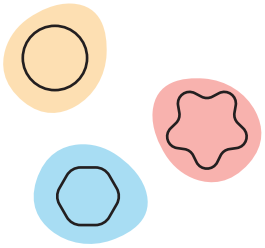


MUTATION

We've heard a lot about mutations and variants that have made certain strains of COVID-19 more transmissible and potentially resistant to the vaccines in the field. However, mutations can also be good and lead to the end of a pandemic. If we look back to the Spanish Flu in the early 1900s, we saw that the dominant strain eventually became a more transmissible variant but less deadly. It became more like the seasonal flu rather than a death sentence. Coronaviruses can cause a bevy of respiratory infections in humans and are one of the pathogens responsible for the common cold. While it's an unlikely candidate for the end of this pandemic, it's still a possibility.

NON-PHARMACEUTICAL INTERVENTION

This is a fancy word for what we've been told since the beginning of the pandemic. Social distancing, wearing masks, and keeping your hands clean can help slow the spread of disease. Even with some infections if enough people kept their distance and prevented the spread the pathogen would eventually fade. We've seen this in a few countries like South Korea, Taiwan, and New Zealand where sweeping measures were taken across the country including mask mandates, lockdowns, and robust testing programs.



NO REAL 'END'

Only two pathogens have truly been eradicated, Smallpox and Rinderpest. Both of these viruses were only able to infect and spread through one organism each, humans and cows. Pathogens that have undomesticated animal hosts are unlikely to ever truly be eradicated. The bacteria that caused the black plague is still around in fleas and causes up to 10 reported infections per year, but now that we have effective antibiotics, its chances to become a pandemic are slim to none.