

# A Look at COVID-19: Preparedness and Prevention

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A variety of recent publications dive deep into how SARS-CoV-2, the virus that causes COVID-19, and other significant viruses originated and spread among the world population. These latest papers also examine the scientific evidence for COVID-19 vaccines boosters. Drawing on these analyses, the authors—including [Dr. Linda Saif](#) of the College of Food, Agricultural, and Environmental Sciences—offer recommendations that can enhance preparation for future pandemics.



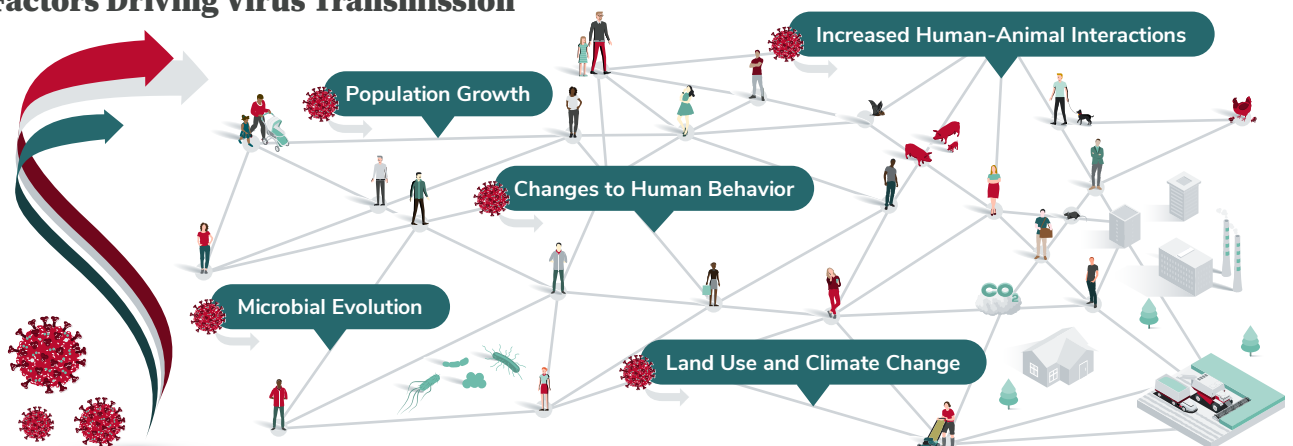
## Origin and Spread

Humanity has often been caught off guard by pandemics. Throughout recent history, RNA viruses like influenza A, HIV, and COVID-19 have spread quickly among large populations, causing serious illness and death.

In [a recent paper](#), an independent task force of scientists reviewed a range of studies and interviewed other researchers to better understand the origins of these diseases and develop recommendations for reducing spread.

They found that many of these viruses had zoonotic origins, meaning they moved from animals to people. Other driving factors like microbial evolution, population growth, land use and climate change, changes to human behavior, and increased human-animal interactions hastened their transmission.

## Factors Driving Virus Transmission



In [another publication](#), researchers discovered that COVID-19 may be able to spread through cell-to-cell contact. Scientists think understanding this mode of infection can guide the development of drugs that will more effectively combat the disease.

Knowing how diseases like COVID-19 emerged and spread can help scientists identify and better manage pandemic risks going forward.



## Prevention and Boosters

Vaccines for COVID-19 were developed in record time and can induce strong, protective immune responses. However, the spread of the virus was reduced but not eliminated by current vaccines. Research indicates that immunity wanes over time (about 6 months after the initial vaccine) and that breakthrough infections are common.

Could boosters extend this protection? In [a recent paper](#), scientists studied how COVID-19 booster doses impact global pandemics and herd immunity. They considered immunology, epidemiology, and factors like equitable distribution and ethics. [Another study](#) considered whether waning immunity as time passes or COVID-19 variants' overall resistance to vaccine-induced immunity are contributing to breakthrough infections.

Scientists found that people who had breakthrough infections had boosted antibody responses, suggesting that booster shots may be important in increasing immunity. Boosters are also shown to be safe in the short term and can help reduce hospitalizations and deaths. Additionally, they can be used to enhance protection for vulnerable populations (like the elderly and immunocompromised).

### Vaccine Booster Findings

Stimulates immune response

Safe in the short term



Helps reduce hospitalizations and deaths

Enhances protection for vulnerable populations

However, boosters may not be needed for all people if they are already fully vaccinated. In addition, long-term risks are unknown. Studying the connection between how long vaccines provide protection and how viruses evolve is a continuing area of study.



## Recommendations

To manage viruses like COVID-19, researchers note that a One Health approach is essential. One Health is defined as “an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems.”

Other recommendations include conducting smart surveillance and risk assessment for viruses, researching and developing effective vaccines and therapeutics, reducing drivers of spillover and spread, and countering misinformation, as vaccine hesitancy remains a problem. In addition, vaccine distribution is uneven, so vaccine access needs to be equitable.

Researchers underscore the importance of continuing to study how COVID-19 spreads to better understand how to induce immunity and protect populations.

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