COVID-19 IMMUNITY
What We Do (and Do Not) Know

All Immunity is Natural

Whether the immune system is exposed to viral infections or vaccines, it responds by creating a system of memory cells that can attack the virus in the future. "Natural infections" use the same immune system as vaccines. And those immune systems are complicated!

Infection-Induced

SARS-CoV-2 (The virus that causes the disease COVID-19)

Exposure comes from the virus itself when it infects your body.

Vaccine-Induced

SARS-CoV-2 Spike Protein (A piece of the virus)

Exposure comes from a vaccine which produces a spike protein; a harmless piece of the virus. - CDC

Infection-Induced	Vaccine-Induced
Viral infections stimulate the immune system in a non-specific manner. Responses are better in those who experience severe illness. [1]	Vaccines stimulate the immune system in a targeted and highly specific manner. Common side effects are signs the immune system is working.
Patients with only infection-induced immunity are 80-93% protected from reinfection with the alpha variant. This decreases for other variants. [1]	Patients with only mRNA vaccinations are 95% protected from COVID-19 infection even during circulation of the delta variant. - CDC
Infection-induced immunity begins to decrease at 6-9 months. [1,2,3]	Vaccines provide long lasting protection against multiple variants. [4,5,6,7]
Infection with COVID-19 carries risks of death, severe illness, post-COVID conditions, or long-haul COVID. - CDC, [8]	Severe reactions to the vaccine are very rare. - CDC

People who have had COVID-19 can benefit from receiving one dose of vaccine.
People who have recovered from COVID-19 have a very strong immune response after being vaccinated. [9]
Last spring, people who recovered from COVID-19 but remained unvaccinated had 2.3 times greater odds of reinfection than people who recovered but got vaccinated. [1]

...the majority of hospitalizations (69%) of COVID-19 infections in people not fully vaccinated were in adults under age 65.

In a national study[10] of 120 million patients from 250 hospitals across all 50 states...

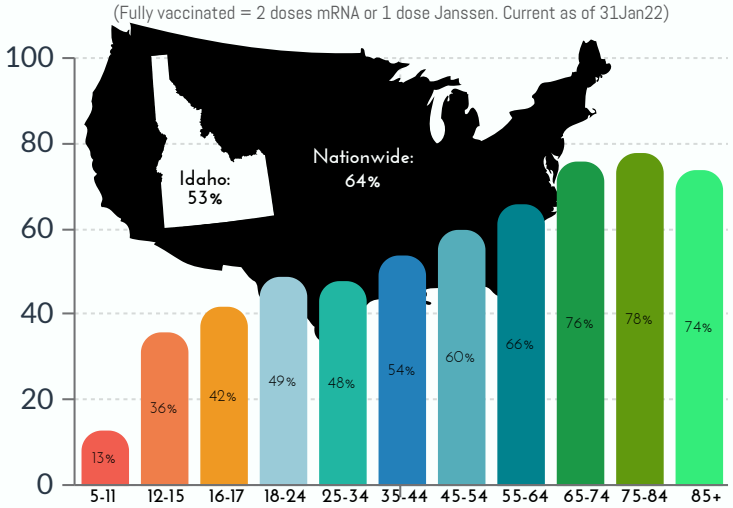
...the majority of hospitalizations (71%) in "breakthrough" cases (infections of a vaccinated person) were in adults over age 65.

Vaccination is the best method to prevent hospitalizations, especially in individuals under 65.

Don't forget - infection-induced immunity requires time for people to get infected.
The longer the virus hangs around in humans, the more opportunities the virus has to mutate and escape the immune system's defenses.

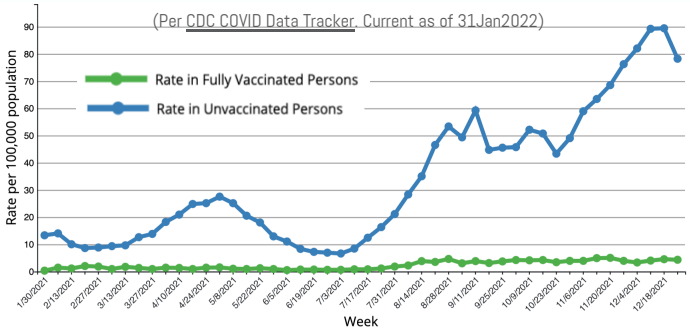
Percentage of People Fully Vaccinated in Idaho by Age Group

(Fully vaccinated = 2 doses mRNA or 1 dose Janssen. Current as of 31Jan22)



Rates of COVID-19-Associated Hospitalizations by Vaccine Status in Adults Aged ≥18 Years, January–November 2021

(Per CDC COVID Data Tracker. Current as of 31Jan2022)



Inducing immunity with vaccines puts less pressure on the health care system.

Getting a COVID-19 vaccination is a safer and more dependable way to build immunity to COVID-19 than getting sick with COVID-19. - CDC

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2. Dan, J.M., et al. *Immunological memory to SARS-CoV-2 assessed for up to 8 months after infection.* Science, 2021. 371(6529).
3. Cohen, K.W., et al. *Longitudinal analysis shows durable and broad immune memory after SARS-CoV-2 infection with persisting antibody responses and memory B and T cells.* Cell Rep Med, 2021. 2(7): p. 100354.
4. Sokal, A., et al. *Memory B cells control SARS-CoV-2 variants upon mRNA vaccination of naive and COVID-19 recovered individuals.* bioRxiv, 2021: p. 2021.06.17448459.
5. Carbonare, L., *Antibody response to BTN162b2 mRNA vaccination in naïve versus SARS-CoV-2 infected subjects with and without waning immunity.* 2021.
6. Appelman, B., et al. *Time Since SARS-CoV-2 Infection and Humoral Immune Response Following BNT162b2 mRNA Vaccination.* 2021, Social Science Research Network: Rochester, NY.
7. Goel, R.R., et al. *Distinct antibody and memory B cell responses in SARS-CoV-2 naïve and recovered individuals after mRNA vaccination.* Science Immunology, 2021. 6(58).
8. Al-Aly, Z., et al. *High-dimensional characterization of post-acute sequelae of COVID-19.* Nature 594, 259–264 (2021). https://doi.org/10.1038/s41586-021-03553-9
9. Wang, Z., et al. *Naturally enhanced neutralizing breadth against SARS-CoV-2 one year after infection.* Nature 595, 426–431 (2021).
10. Lo, J., Twitter, K. A., Cotliar, D., Twitter, M. R., & Twitter, C. C. (2021, December 16). *Covid-19 breakthrough hospitalizations.* Peterson-KFF Health System Tracker. Retrieved January 3, 2022, from https://www.healthsystemtracker.org/brief/characteristics-of-vaccinated-patients-hospitalized-with-covid-19-breakthrough-infections/

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Get Immunized, Idaho