NORTHEAST
BUSINESS GROUP ON HEALTH

MONDAYS WITH DR MARK & DR MICHAEL

Monday, November 27, 2023 | 1:00 – 1:30PM

TOPIC #14

COVID Updates: Evolution, Variants and More!

HP2030 HEALTHY PEOPLE 2030 CHAMPION

We may be done with COVID and ready to move on with our lives .....

..... But COVID is still trying to find its best self!

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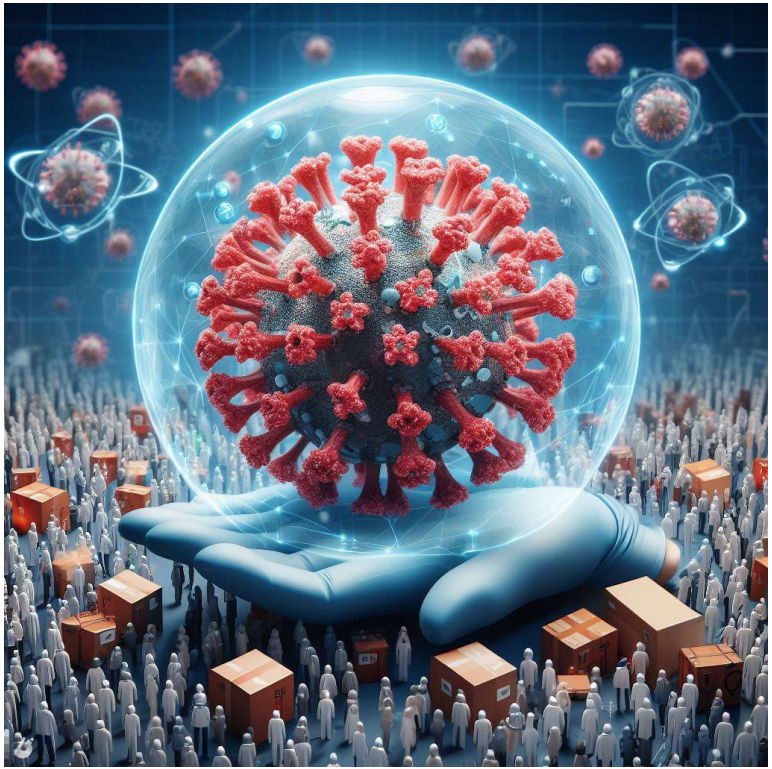
Barriers e.g. masks, avoiding crowds, cough etiquette, ventilation etc. virus overcomes by increasing infectivity



Herd Immunity from vaccination and infections the virus overcomes by increasing ability to immune escape

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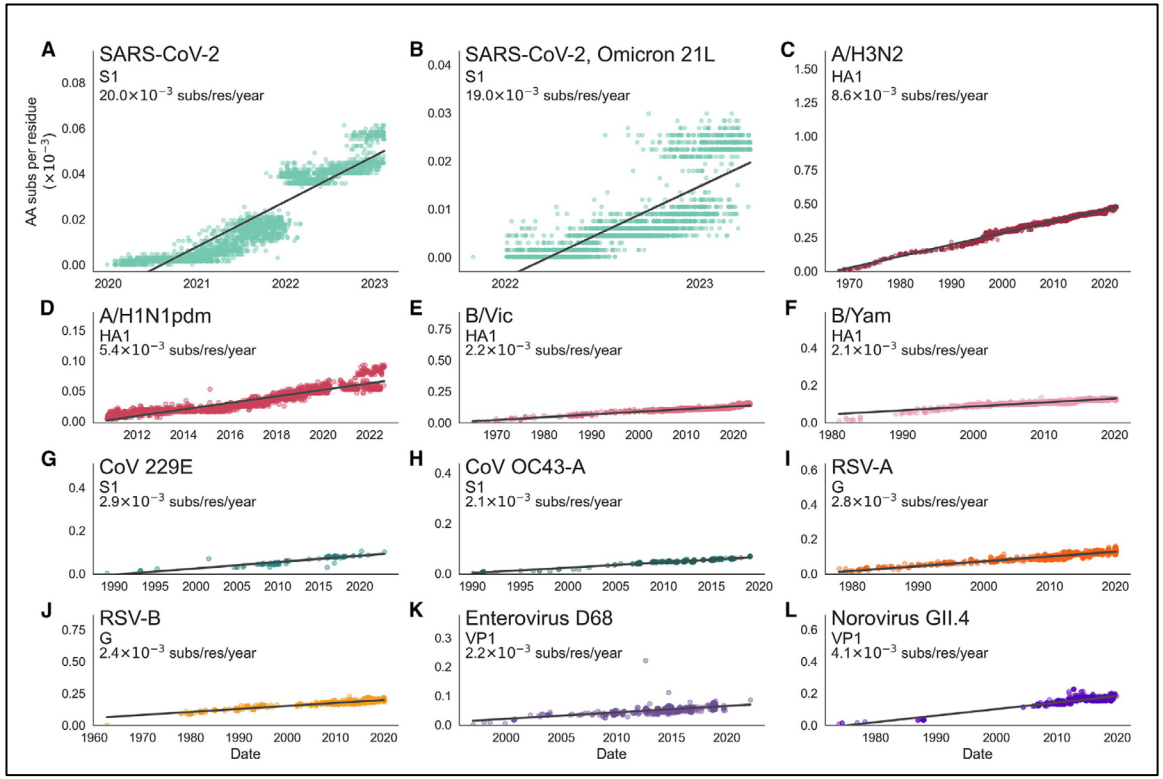
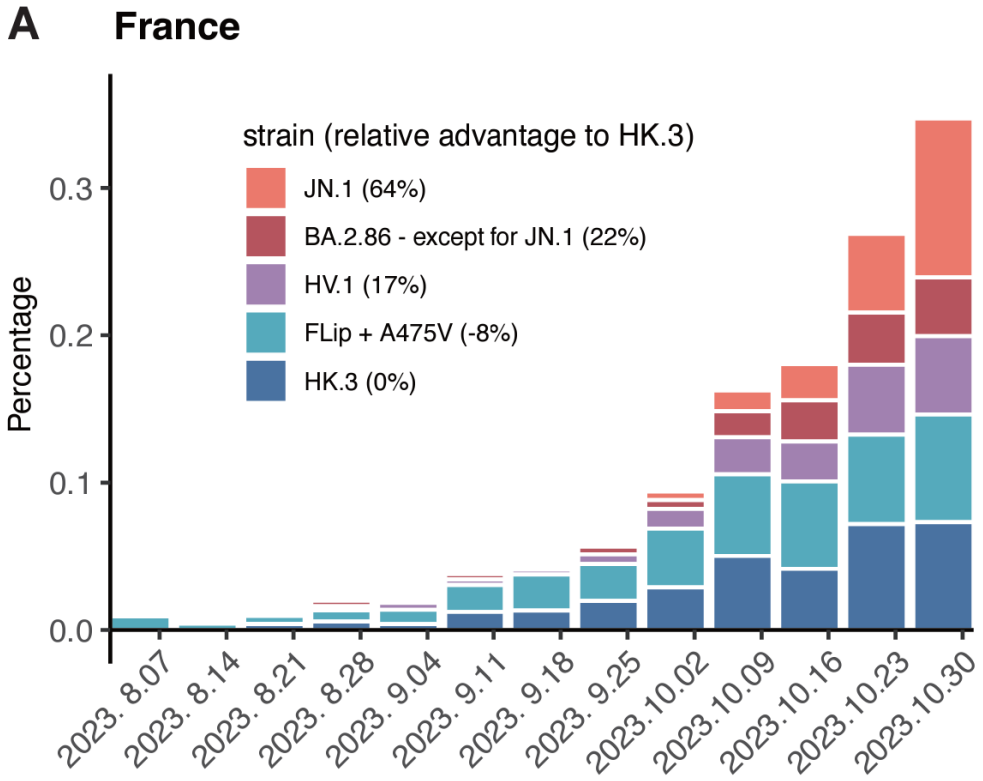


- SARS-CoV-2 is mutating faster than other endemic viruses, including 2.5X influenza

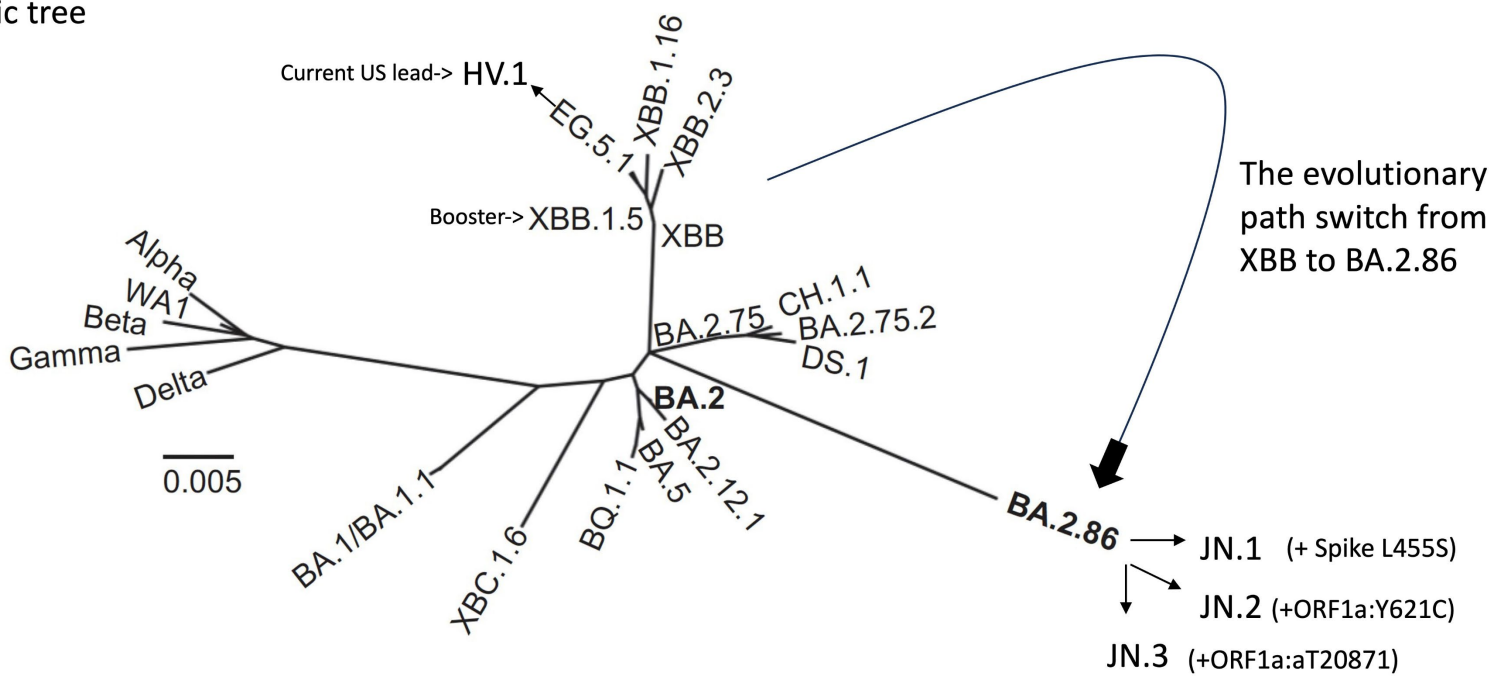
Pirola’s Pesky Cousin from Paris

Why are experts watching closely?

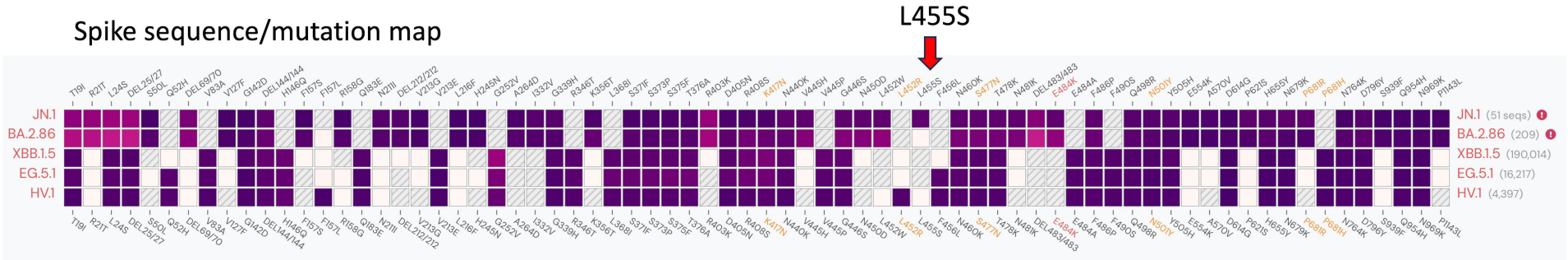
- JN.1 emerged as a sub-variant of BA.2.86
- It possesses an additional spike mutation (L455S)
- This one additional mutation appears to significantly increase ability to evade immunity



Phylogenetic tree

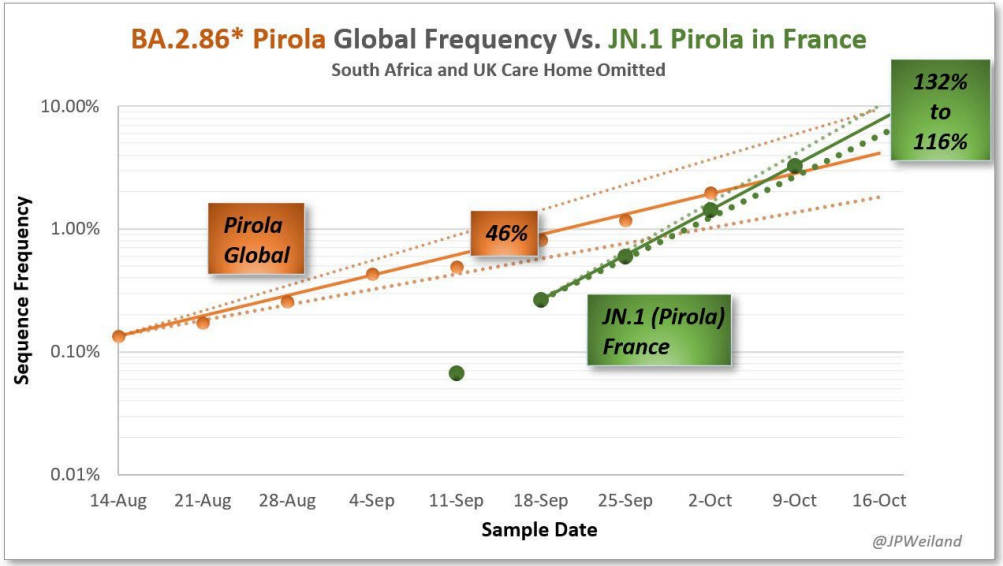


Spike sequence/mutation map



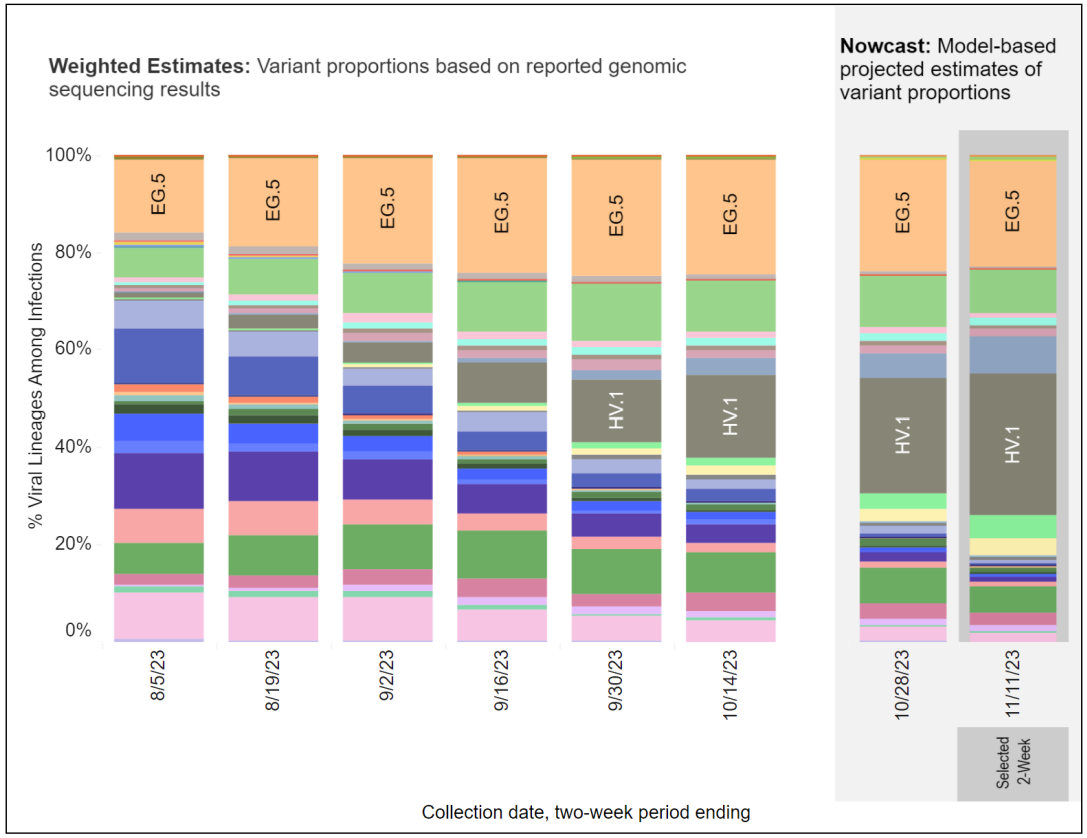
Possible Implications

- Increasing growth rates in several countries
- Seen in France, UK, US, Iceland, Portugal, Belgium, Israel, Spain, Netherlands, Canada Germany, and Singapore
- While BA.2.86 did not amount to much JN.1 with the one additional mutation may give it enough immune escape to be the next Omicron Subvariant to sweep the globe



What we do and Don't Know About JN.1

- Early data suggests that the current vaccines are effective against BA.2.86 so CDC optimistic the they will also work against JN.1. However, may be less effective than against XBB
- No data on the severity of illnesses caused by JN.1 but note with current dominant variants (HV.1, EG.5 and FL.1.5.1) we are recording:
  - Between 550-1,400 deaths per week
  - Between 13,000 and 15,000 people in hospital with COVID
  - Current trend is increasing hospitalizations 8.6% and deaths 9.1%



USA

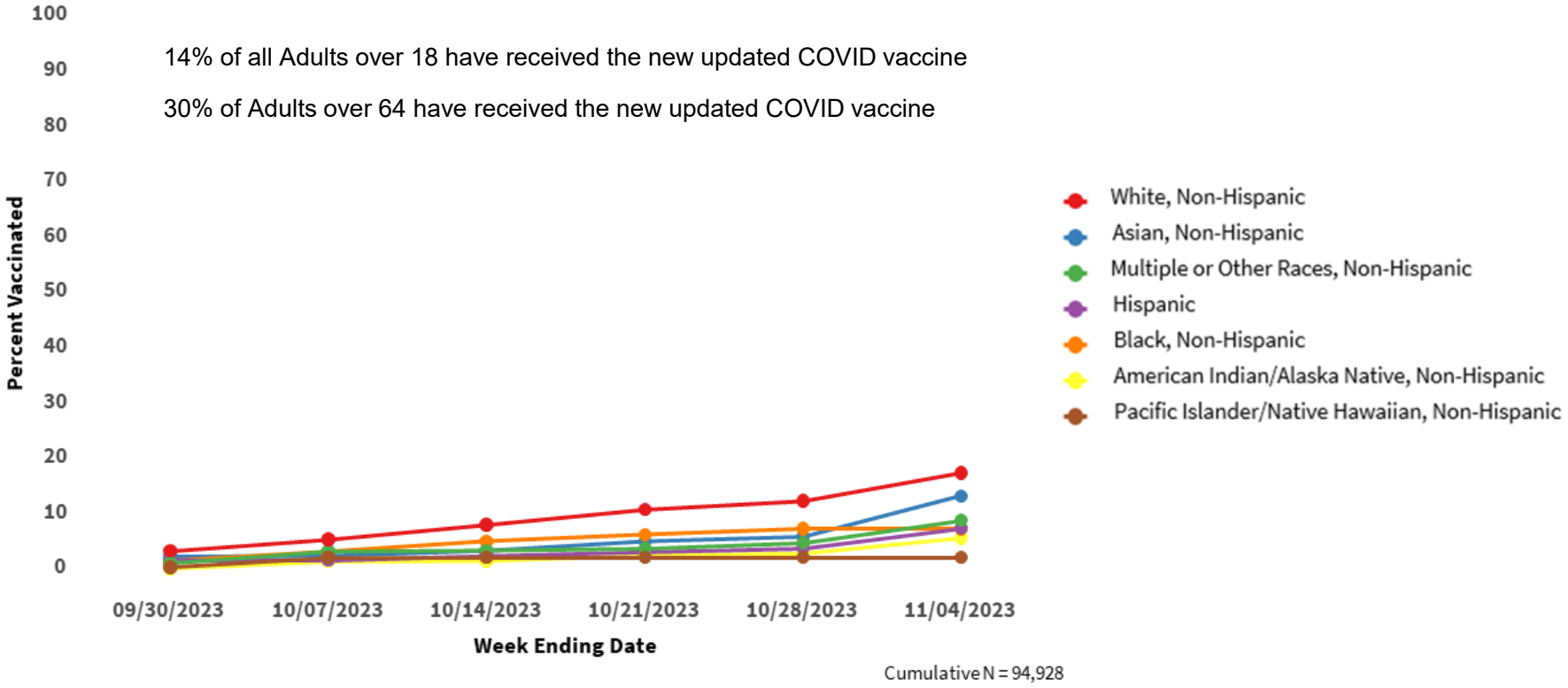
WHO label	Lineage #	%Total	95%PI
Omicron	HV.1	29.0%	26.0-32.1%
	EG.5	21.7%	19.3-24.2%
	FL.1.5.1	9.3%	8.0-10.8%
	HK.3	7.8%	6.2-9.9%
	XBB.1.16.6	5.6%	4.7-6.6%
	JD.1.1	4.6%	3.4-6.1%
	JF.1	3.5%	2.7-4.5%
	XBB.1.16.11	2.5%	2.0-3.2%
	XBB.2.3	1.9%	1.5-2.3%
	GK.1.1	1.6%	1.2-2.3%
	HF.1	1.4%	0.9-2.1%
	XBB.1.16.15	1.4%	1.0-1.9%
	XBB.1.16	1.2%	0.9-1.6%
	XBB.1.5.70	1.2%	0.6-2.2%
	BA.2	1.0%	0.5-2.1%
	GE.1	0.9%	0.6-1.3%
	XBB.1.16.1	0.8%	0.6-1.1%
	XBB	0.8%	0.6-1.0%
	GK.2	0.6%	0.5-0.9%
	EG.6.1	0.5%	0.3-0.7%
	XBB.1.5	0.3%	0.2-0.4%
	XBB.1.9.1	0.3%	0.2-0.4%
	XBB.1.42.2	0.2%	0.1-0.3%
	XBB.1.5.68	0.2%	0.1-0.3%
	XBB.1.9.2	0.2%	0.1-0.2%
	XBB.1.5.72	0.2%	0.1-0.2%
	CH.1.1	0.2%	0.1-0.3%
	XBB.2.3.8	0.1%	0.0-0.2%
	XBB.1.5.10	0.1%	0.0-0.1%
	XBB.1.5.59	0.0%	0.0-0.1%
	FD.1.1	0.0%	0.0-0.0%
	XBB.1.5.1	0.0%	0.0-0.0%
	FE.1.1	0.0%	0.0-0.0%
	EU.1.1	0.0%	0.0-0.0%
Other	Other*	1.1%	0.6-2.0%

JN.1 probably <0.1% of US cases at the moment

Cumulative Percentage of Adults 18 Years and Older Vaccinated with the Updated 2023-24 COVID-19 Vaccine, by Race and Ethnicity, National Immunization Survey-Adult COVID Module

14% of all Adults over 18 have received the new updated COVID vaccine

30% of Adults over 64 have received the new updated COVID vaccine



Cumulative N = 94,928

Question:

Current COVID variants give mostly mild disease, may not work against this new Pesky Pirola subvariant and I have already had multiple shots and been infected with COVID so why should I bother getting this latest shot?

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Thanks for asking! Here are a few reasons why it is important to get the latest updated COVID vaccine:

- Its an updated vaccine against XBB subvariants – great protection against XBB.1.5, HV.1, EG.5 and FL.1.5.1 and likely give moderate to good protection against JN.1
- Your immunity from your last COVID vaccine if more the 6 months ago is likely much reduced
- Even if our current booster does not evoke a strong neutralizing antibody response to JN.1 (or subsequent BA.2.86 descendants), it will rev up our immune system, including cellular immunity, for conferring enhanced protection.
- It helps protect those around you, especially the most vulnerable
- You also have choices with a new protein-based vaccine from Novavax joining the two mRNA vaccines
- It will keep you out of hospital!
- It will help protect you from Long-COVID

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Vaccines help prevent long-COVID

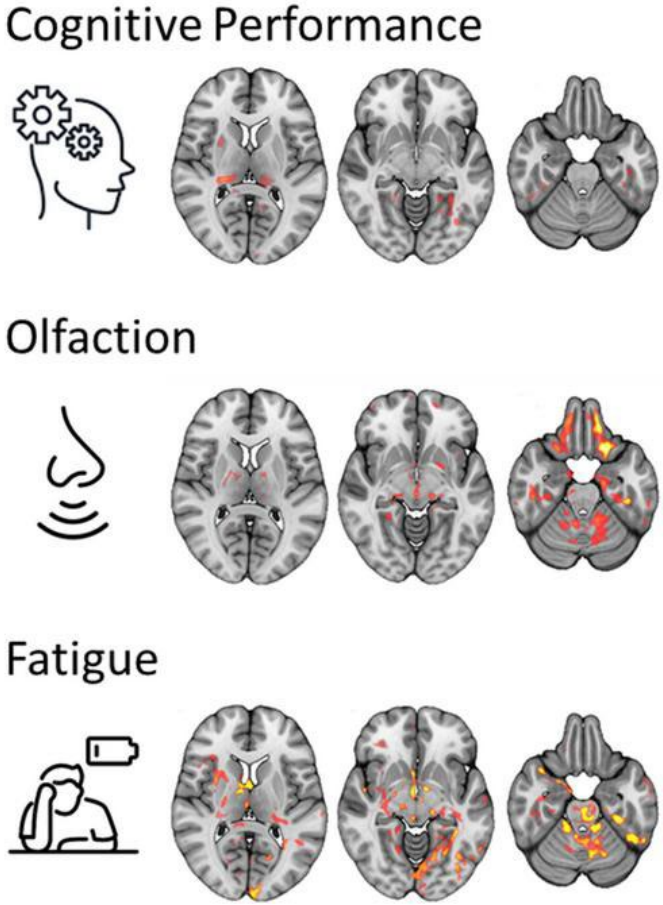
Recent Study:

- Sweden: population-based cohort study[1]
  - Vaccine effectiveness of 58% of reduced risk of Long-COVID
  - Vaccine effectiveness against long-COVID for one dose, two doses, and three or more doses was 21%, 59%, and 73%, respectively
- Previous studies have reported estimates ranging from a 13% to a 52% reduction in risk of long-COVID by vaccination

1. https://www.bmj.com/content/383/bmj-2023-076990

Long-COVID

Diffusion microstructure imaging (DMI), a novel MRI technique



https://www.eurekalert.org/news-releases/1008223

Long-COVID

Another study recently published study[1]:

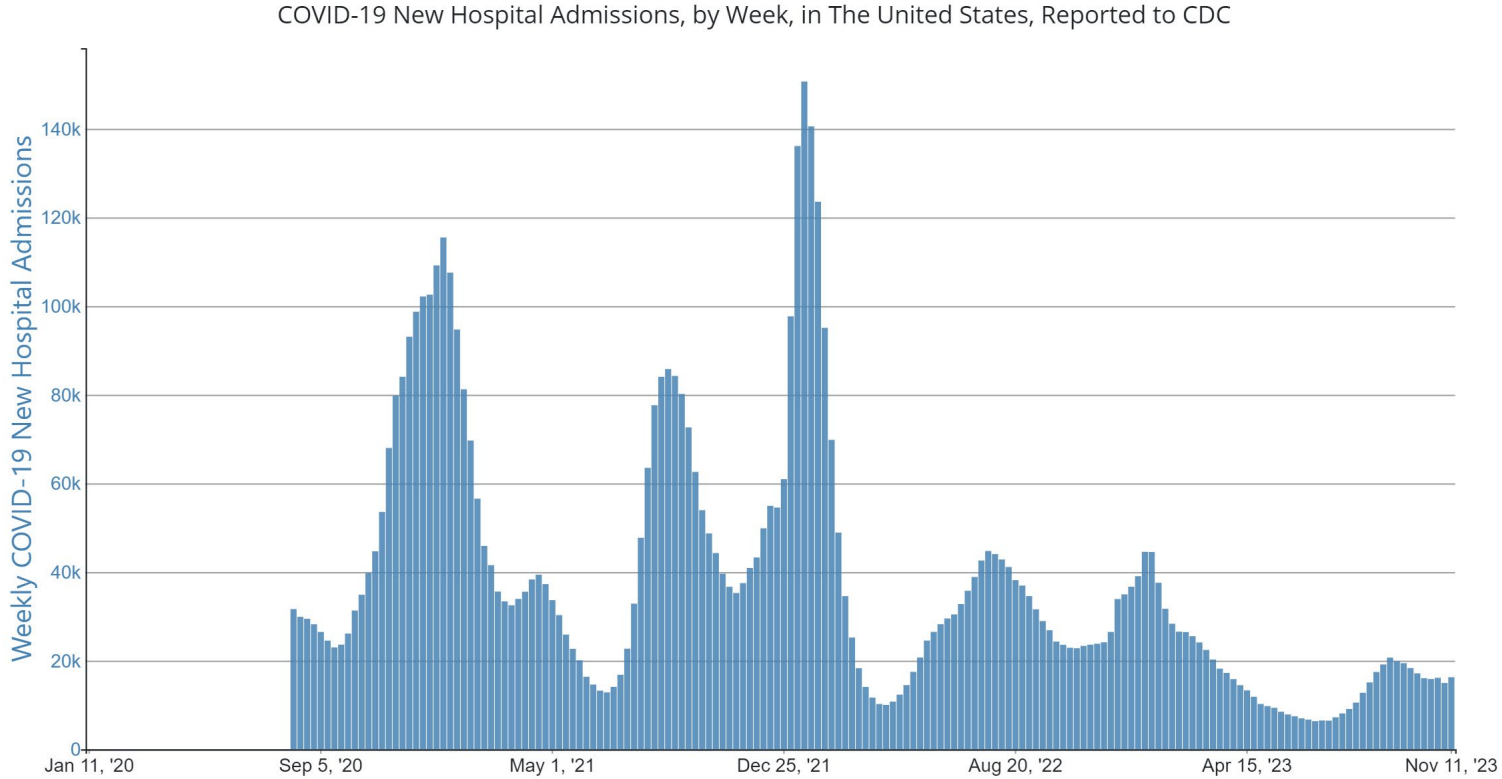
- Wild-type, Alpha, Delta, and Omicron
- All variants had similar impacts but Omicron patients reported lower quality of life
- >50% of long-COVID patients failed to improve 1.5 years after their initial diagnosis

1. https://www.ijidonline.com/article/S1201-9712(23)00760-9/fulltext

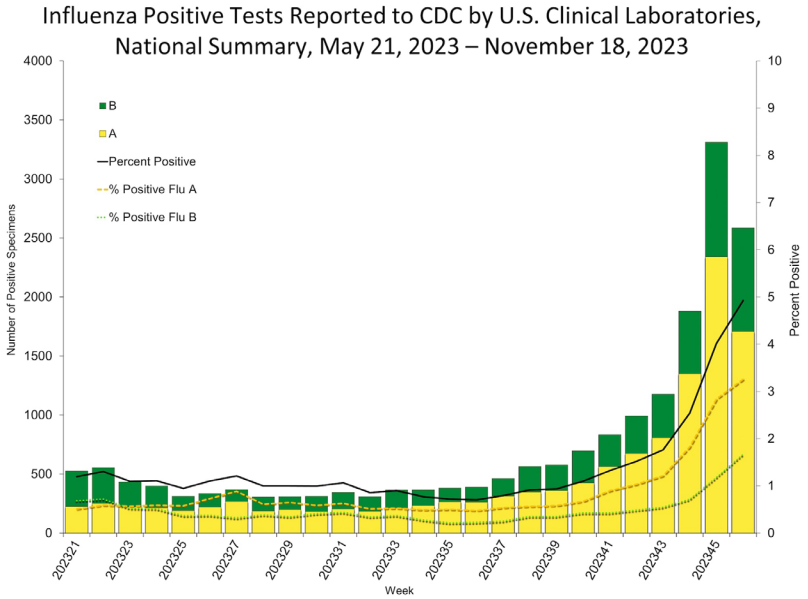
Long-term Follow up of hospitalized patients with COVID

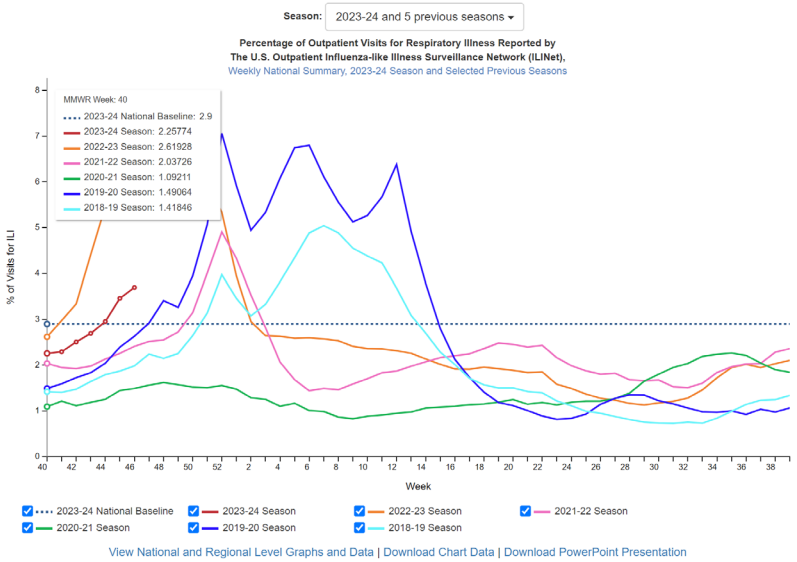
- Survivors are more likely to have lung, brain, and kidney abnormalities at 5 months
- 54% of men and 46% of women reported at least one sequelae symptom (mostly mild or moderate) at 3 years, with a marked decrease in fatigue or muscle weakness from 2 years
- <5% with long COVID reported problems with mobility, personal care, or usual daily activities at 3 years
- 76% of Long COVID group were reinfected with Omicron compared tp 67% of the non-long COVID group

https://www.thelancet.com/pdfs/journals/lanres/PIIS2213-2600(23)00410-1.pdf



Centers for Disease Control and Prevention. COVID Data Tracker. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2023, November 27. https://covid.cdc.gov/covid-data-tracker





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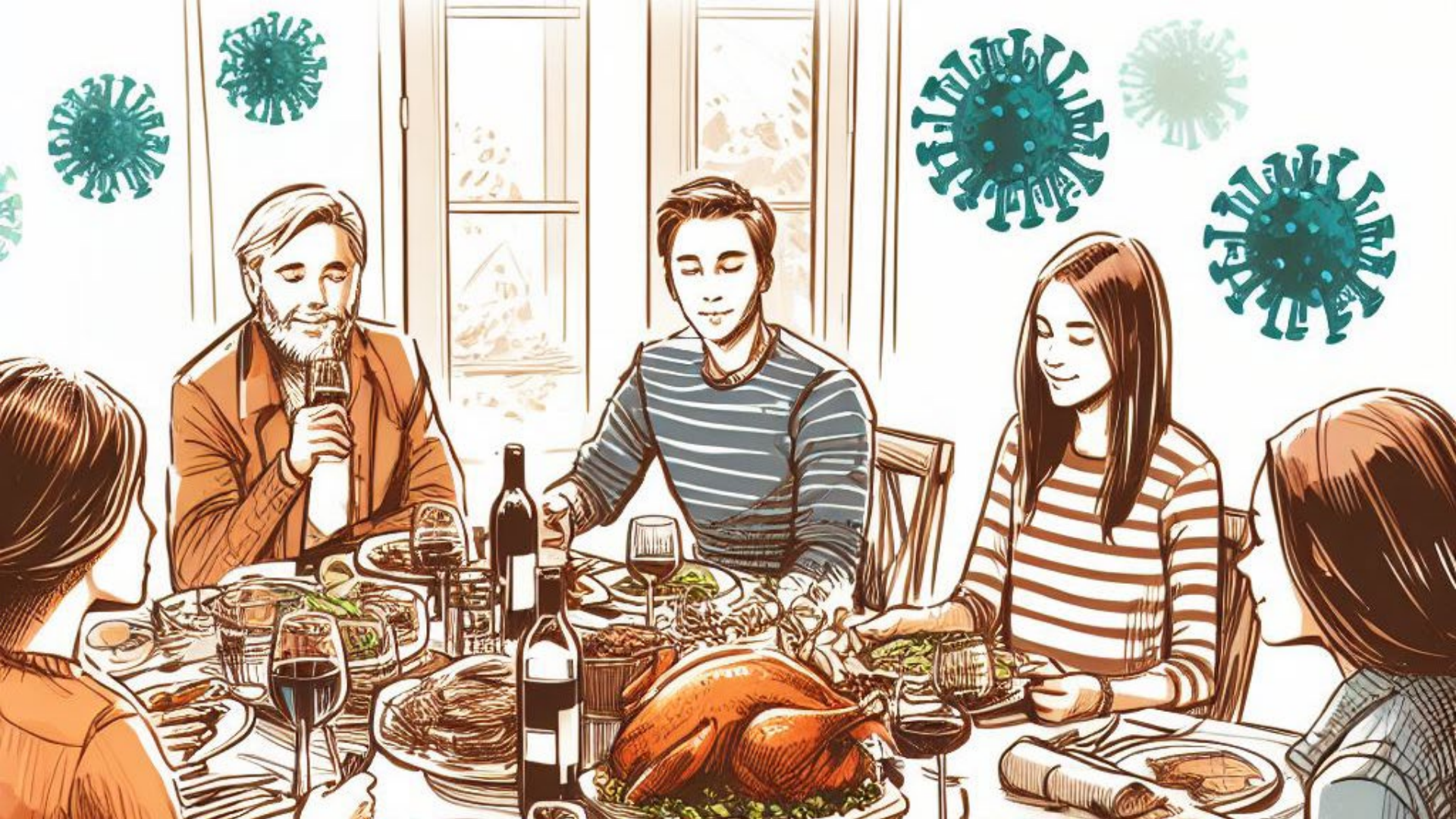


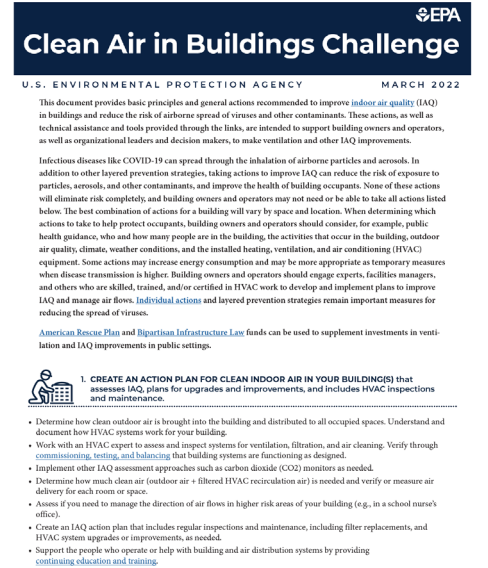
What Employers Can Do

- Immune Fitness for COVID, RSV and Influenza – encourage and support vaccination
- Remind people to not come into work if sick and test for COVID
- Remind people about the benefits of masking
- Ventilation improvements
  - ASHRAE updated their guidance in 2022[1]
  - Minimum 5 air changes per hour and MERV13 filtration
  - Post-occupancy flushing of building air
  - Use of portable HEPA filtration units
  - Upper-room UVGI
  - Increase the introduction of outdoor air beyond code-minimum requirements

1. https://www.ashrae.org/technical-resources/bookstore/standards-62-1-62-2

Clean Air Resources, Challenge and Pledge

- Resources:
  - ASHRA 62.1 - https://www.ashrae.org/technical-resources/bookstore/standards-62-1-62-2
  - Clean Air Fact Sheet EPA →
- EPA Clean Air Challenge
  - https://www.epa.gov/indoor-air-quality-iaq/clean-air-buildings-challenge
- White House Clean Air in Buildings Challenge
  - Implement the EPA Clean Air Challenge
  - Sign the 'Clean Air in Buildings Pledge' https://www.whitehouse.gov/cleanindoorair/sign-the-pledge/



EPA

Clean Air in Buildings Challenge

U.S. ENVIRONMENTAL PROTECTION AGENCY MARCH 2022

This document provides basic principles and general actions recommended to improve indoor air quality (IAQ) in buildings and reduce the risk of airborne spread of viruses and other contaminants. These actions, as well as technical assistance and tools provided through the links, are intended to support building owners and operators, as well as organizational leaders and decision makers, to make ventilation and other IAQ improvements.

Infectious diseases like COVID-19 can spread through the inhalation of airborne particles and aerosols. In addition to other layered prevention strategies, taking actions to improve IAQ can reduce the risk of exposure to particles, aerosols, and other contaminants, and improve the health of building occupants. None of these actions will eliminate risk completely, and building owners and operators may not need or be able to take all actions listed below. The best combination of actions for a building will vary by space and location. When determining which actions to take to help protect occupants, building owners and operators should consider, for example, public health guidance, who and how many people are in the building, the activities that occur in the building, outdoor air quality, climate, weather conditions, and the installed heating, ventilation, and air conditioning (HVAC) equipment. Some actions may increase energy consumption and may be more appropriate as temporary measures when disease transmission is higher. Building owners and operators should engage experts, facilities managers, and others who are skilled, trained, and/or certified in HVAC work to develop and implement plans to improve IAQ and manage air flows. Individual actions and layered prevention strategies remain important measures for reducing the spread of viruses.

American Rescue Plan and Bipartisan Infrastructure Law funds can be used to supplement investments in ventilation and IAQ improvements in public settings.

1. **CREATE AN ACTION PLAN FOR CLEAN INDOOR AIR IN YOUR BUILDING(S)** that assesses IAQ, plans for upgrades and improvements, and includes HVAC inspections and maintenance.

- Determine how clean outdoor air is brought into the building and distributed to all occupied spaces. Understand and document how HVAC systems work for your building.
- Work with an HVAC expert to assess and inspect systems for ventilation, filtration, and air cleaning. Verify through commissioning, testing, and balancing that building systems are functioning as designed.
- Implement other IAQ assessment approaches such as carbon dioxide (CO_2) monitors as needed.
- Determine how much clean air (outdoor air + filtered HVAC recirculation air) is needed and verify or measure air delivery for each room or space.
- Assess if you need to manage the direction of air flows in higher risk areas of your building (e.g., in a school nurse's office).
- Create an IAQ action plan that includes regular inspections and maintenance, including filter replacements, and HVAC system upgrades or improvements, as needed.
- Support the people who operate or help with building and air distribution systems by providing continuing education and training.

https://www.epa.gov/system/files/documents/2022-03/508-cleanairbuildings_factsheet_v5_508.pdf

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Clean Air Building Pledge

1. **Create a Clean Indoor Air Action Plan**
    - Create a plan for upgrades and improvements, including HVAC inspections and maintenance if applicable.
2. **Optimize Fresh Air Ventilation**
    - Bring clean outdoor air indoors and circulate it when it is safe to do so.
3. **Enhance Air Filtration and Cleaning**
    - By taking steps such as improving your central HVAC system and/or installing in-room air cleaning devices including HEPA filters.
4. **Engage the Building Community**
    - Communicate with building occupants to increase awareness, commitment, and participation.

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Questions?

Upcoming NEBGH events

- **Nov. 29** – Revolutionizing Family-Building Benefits
- **Dec. 11**– Mondays with Dr. Mark and Dr. Michael
- **Dec. 14** – 29th Annual Tribute to Leadership
- **March 7, 2024** – Next Generation Mental Health