

Frontline Workers: A Global Perspective



Frontline Worker Safety in the Age of COVID-19

Closing Remarks

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Hospital Onset COVID-19

February 12, 2021: SAGE (Scientific Advisory Group for Emergencies) released a document which “estimated at **least 8.8 per cent of Covid hospital** cases in England over the first wave of the pandemic may have been what are known as nosocomial, or hospital-acquired, infections.”

- ▶ “The trust with the highest proportion of deaths among patients who caught the virus in hospital was Wrightington, Wigan and Leigh trust in Lancashire.” “Between last October and this March, 273 patients caught the disease while receiving care for something else, **of which 174 died (64 per cent).**”
- ▶ “The trust was followed by Gateshead health, where 56 per cent of those who caught the disease in hospital died, **and Wirral University teaching hospital (54 per cent).**”

<https://www.dailymail.co.uk/news/article-9254495/Stopping-Covid-spreading-hospitals-substantial-reduction-wave-deaths.html>



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Healthcare & Frontline Workers

- ▶ A report just published in American Journal of Infection Control from Thailand, surveyed hospitals during the COVID-19 pandemic and found 71% reported staffing shortages and only **46% of infection preventionists felt safe at work.**

Thaprawat P, Greene M, Saint S, et al. Status of hospital infection prevention practices in Thailand in the era of COVID-19: Results form a national survey. AJIC. 2022: 50:975-988

Los Angeles Times

COVID-19 outbreaks have hit Los Angeles International Airport with at least 400 confirmed cases among Transportation Security Administration staff and workers at American and Southwest airlines, according to county health officials.

July 26, 2022: <https://www.latimes.com/california/story/2022-07-25/covid-outbreaks-hit-tsa-and-southwest-airlines-southwest-airlines-at-lax>

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in the Age of COVID-19**
Health Watch USAsm



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Hospital Onset COVID-19

Daily **Mail**
.com

Nearly 9,000 patients died after catching Covid on English hospital wards while being treated for something else

- 32,307 patients caught disease in hospital since last March, of which 8,747 died
- University Hospitals Birmingham suffered biggest death toll, with 408 victims
- Followed by Nottingham University Hospitals (279) and Frimley in Surrey (259)

By [CONNOR BOYD ASSISTANT HEALTH EDITOR FOR MAILONLINE](#)

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Hospital Onset COVID-19

In the United States No One is Really Counting Hospital-Onset COVID-19.

- ▶ The metric for SARS-CoV-2 Healthcare Acquired Infections requires that only current inpatients who contract COVID-19 14 days or more after admission be counted as hospital-onset. This metric will capture few patients. One needs to consider that:
- ▶ Omicron has an incubation period of approximately 3 days; and that the average length of hospital stay is 4.6 days. Not tracking patient acquisition of COVID-19 places both patients at risk and masks the need for mitigation strategies.



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A Wave of Long COVID Disability is Looming.

- Long COVID affects at least 4 to 7% of COVID-19 patients. It can affect nearly every organ of the body.
- The Brookings Institute has reported that in the United States between 2 to 4 million workers are no longer working because of Long COVID, comprising approximately 2% of the workforce.
- Dr. Al-Aly: Healthcare systems must adapt to provide post-covid care strategies.



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The Needed Strategies For COVID-19 are Self Evident:

- ▶ Keep from contracting SARS-CoV-2.
- ▶ Keep immunity as high as possible.
- ▶ If one contracts SARS-CoV-2 and are at a high risk, seek treatment.



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Prevention is Key

Dr. Lidia Morawska: Air quality, and flow is key to stopping SARS-CoV-2

- ▶ In medicine we think of aerosols as small solid particles and droplets as large particles. In aerosol science, airborne particles can be solid or liquid and there is a continuum of sizes.
- ▶ Used to be thought particles had to be less than 5 microns to aerosolize. But now it is now known that larger particles and droplets can also aerosolize. And particle size is a continuum.
- ▶ Upgrading air quality and airflow is of critical importance.



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Prevention is Key

Ventilation requirements depend upon occupancy and room size.

- The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommends a steady-state indoor CO₂ concentration of 870 ppm.

Erdmann CA, Steiner KC, Apte MG. Indoor carbon dioxide concentrations and sick building syndrome symptoms in the base study revisited: analyses of the 100 building dataset. Environmental Protection Agency. https://www.epa.gov/sites/default/files/2014-08/documents/base_3c2o2.pdf

- A study from Harvard University found large differences in cognition when CO₂ levels were raised from 550 ppm to 1400 ppm.

Allen JG, MacNaughton P, Satish U, Santanam S, Vallarino J, Spengler JD. Associations of cognitive function scores with carbon dioxide, ventilation, and volatile organic compound exposures in office workers: a controlled exposure study of green and conventional office environments. *Environ Health Perspect.* 2016;124(6):805-812. doi:10.1289/ehp.1510037

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Prevention is Key

- ▶ Clean surfaces – As stressed by Dr. Eike Steinmann.
- ▶ Use of Masks – N-95 preferable.
- ▶ Keep Immunity as High as Possible



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Receiver Is Wearing (% inward leakage)

Source Is Wearing (% outward leakage)		Nothing	Typical cloth mask	Typical surgical mask	Non-fit-tested N95 FFR [†]	Fit-tested N95 FFR
		100%	75%	50%	20%	10%
Nothing	100%	15 min.	20 min.	30 min.	1.25 hours	2.5 hours
Typical cloth mask	75%	20 min.	26 min.	40 min.	1.7 hours	3.3 hours
Typical surgical mask	50%	30 min.	40 min.	1 hour	2.5 hours	5 hours
Non-fit-tested N95 FFR [†]	20%	1.25 hours	1.7 hours	2.5 hours	6.25 hours	12.5 hours
Fit-tested N95 FFR	10%	2.5 hours	3.3 hours	5 hours	12.5 hours	25 hours

[†] FFR = filtering facepiece respirator; N95 = not oil-proof, 95% efficient at NIOSH filter test conditions

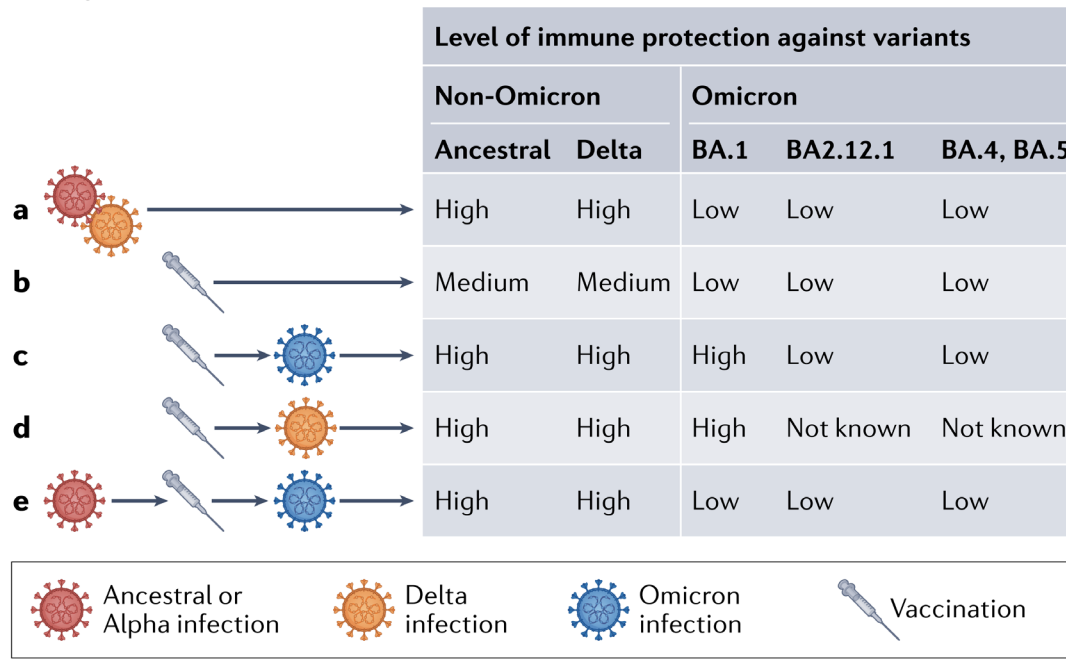


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Keep Immunity as High as Possible

- ▶ The majority have hybrid immunity which is variant dependent and all immunity wanes.



SARS-CoV-2 hybrid immunity: silver bullet or silver lining?

Rahul Suryawanshi & Melanie Ott. SARS-CoV-2 hybrid immunity: silver bullet or silver lining? Nature Reviews immunology. Published Aug 9, 2022. <https://www.nature.com/articles/s41577-022-00721-8>



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Keep Immunity as High as Possible

- ▶ The lethality of some strains has been often understated, with an overemphasis on case fatality rates. The Omicron surge in the United States produced more deaths than Delta and far more infections and illnesses. And unfortunately, if you became infected your immunity was not long lasting, being much weaker than elicited by other strains.



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Treatment

- ▶ Paxlovid – For those at high risk especially above the age of 65. Below age 65 there is questions of efficacy.

TIME

Alice Parks: Aug. 24, 2022

“People who were 65 or older had a 73% lower chance of being hospitalized for COVID-19 and about a 79% lower chance of dying of the disease, compared to people in the same age group who did not take Paxlovid. But people ages 40 to 64 experienced no statistically significant drop in the risk of hospitalization or death.”

<https://time.com/6208336/paxlovid-effective-older-adults/>

Nirmatrelvir Use and Severe Covid-19 Outcomes during the Omicron Surge.

NEJM: <https://www.nejm.org/doi/full/10.1056/NEJMoa2204919>



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Treatment

If infected and high risk:

► Monoclonal Antibodies to BA.5

"Currently, the Omicron BA.2, BA.2.12.1, BA.4, and BA.5 subvariants are circulating in the United States. Nonclinical data and pharmacokinetic modeling suggest that activity against these subvariants may be retained for six months at drug concentrations achieved following an **Evusheld** dose of 300 mg of tixagevimab and 300 mg cilgavimab." <https://www.fda.gov/drugs/drug-safety-and-availability/fda-authorizes-revisions-evusheld-dosing> But BA.4.6 is escaping this treatment.

► BA.2.12.1, BA.4 and BA.5 escape antibodies elicited by Omicron infection

"The therapeutic neutralizing antibodies **bebtelovimab** and cilgavimab can effectively neutralize BA.2.12.1 and BA.4/BA.5, whereas the S371F, D405N and R408S mutations undermine most broadly sarbecovirus-neutralizing antibodies."

Nature: 2022 Aug;608(7923):593-602. doi: 10.1038/s41586-022-04980-y. Epub 2022 Jun 17.
<https://pubmed.ncbi.nlm.nih.gov/35714668/>



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- ▶ Email: kavanagh.ent@gmail.com

