Dr. Leo's COVID Corner – March 2022

1. Type of mask and protection against contracting COVID - N95 > KN95 > surgical > Cloth
2. Vaccine effectiveness against ED/UC encounters decreases from 87-90% 2 months after the 3rd dose down to 66-78% 4 months after 3rd dose. VE against hospitalizations remains the same.
3. During the Omicron wave, children's (ages 0-4) hospitalizations increased from 3/100,00 to 16/100,00
4. In persons with natural immunity from COVID, 2 doses of mRNA vaccine do not provide additional protection compared to 1 mRNA vaccine 6 months after natural infection.
5. 3rd dose of mRNA vaccine leads to higher vaccine effectiveness against infection and hospitalization compared to only 2 doses.
6. Vaccine effectiveness against COVID related hospitalization of infants <6 months of age is 61% when there is completion of a 2 dose mRNA vaccine series by mothers.
7. 2 doses of mRNA vaccine were associated with high short-term protection against COVID and waned after 6 months. Infection-acquired immunity boosted with vaccination remained high more than 1 year after infection
8. Significant increased risk of mental health disorder and neurocognitive decline after COVID diagnosis.
9. Molnupiravir decreased risk progression to severe COVID by 89% compared to placebo.
10. Vaccine effectiveness of at least one dose of mRNA vaccine after natural infection is 82% (16 - 64 years of age) and 60% (>65 years of age)
11. Omicron wave in South Africa led to higher percentage of pediatric hospitalizations compared to previous COVID variant waves.
12. Moderate to severe COVID was associated with higher rates of maternal mortality compared to none COIVD positive pts - 26% vs 9%
13. Let's all say it together one last time ... Ivermectin Is Not Effective in Treating COVID! - **RCT**

CDC - 2/11/2022 - odd of testing positive for COVID according to type of mask being worn	• wearing a mask lowered the odds of testing positive
	  ○ cloth - 56% lower
	  ○ surgical - 66% lower
	  ○ N95 / Kn95 - 83% lower
	• https://www.cdc.gov/mmwr/volumes/71/wr/mm7106e1.htm?s_cid=mm7106e1_x

CDC - 2/11/2022 - waning 2nd dose and 3rd dose effectiveness of mRNA vaccines against	• Vaccine effectiveness (VE) against COVID-19–associated emergency department/urgent care (ED/UC) visits and hospitalizations was
	  ○ higher after the third dose than after the second dose but waned with time since vaccination. During the Omicron-predominant period,
	• 2 months after a third dose, VE against COVID-19–associated
	  ○ ED/UC visits was 87%
	  ○ and hospitalizations was 91%,
	• Then, decreased to 66% and 78% respectively (ED/UC and hospitalizations) by the fourth month after a third dose.
	• Protection against hospitalizations exceeded that against ED/UC visits

COVID-related ED/UC encounters and hospitalization.	• https://www.cdc.gov/mmwr/volumes/71/wr/mm7107e2.htm?s_cid=mm7107e2_x
CDC - 2/15/2022 - Hospitalization of children from COVID	• Coinciding with increased circulation of the Omicron variant, COVID-19–associated hospitalization rates among children and adolescents aged 0–17 years increased rapidly in late December 2021, especially among children aged 0–4 years who are not yet eligible for vaccination. ○ rates increased from 3/100,00 in mid Dec 2021 to 16/100,00 by mid January 2022 • Throughout the periods of Delta and Omicron predominance, hospitalization rates remained lower among fully vaccinated adolescents aged 12–17 years than among unvaccinated adolescents • https://www.cdc.gov/mmwr/volumes/71/wr/mm7107e4.htm?s_cid=mm7107e4_x
MedRxIV - 2/1/2022 - COVID vaccine boosting after natural infection	• Among 39 766 employees, 8037 (20%) previously infected and the remaining previously vaccinated, COVID-19 occurred in 6230 (16%) during the study. Risk of COVID-19 increased with time since POIC. In multivariable analysis, • boosting was independently associated with lower risk of COVID-19 among those with vaccine-induced immunity (HR, .43; 95% CI, .41-.46) as well as those with natural immunity (HR, .66; 95% CI, .58-.76). • Among those with natural immunity, receiving 2 compared to 1 dose of vaccine was associated with higher risk of COVID-19 (HR, 1.54; 95% CI, 1.21-1.97). • **Conclusions.** Administering a COVID-19 vaccine not designed for the Omicron variant, 6 months or more after prior infection or vaccination, protects against Omicron variant infection in both previously infected and previously vaccinated individuals. • There is no evidence of an advantage to administering more than 1 dose of vaccine to previously infected persons • https://www.medrxiv.org/content/10.1101/2022.02.10.22270744v1
NEJM - 2/16/2022 - effectiveness of 1 dose of mRNA vaccine after	• A total of 149,032 patients who had recovered from SARS-CoV-2 infection met the eligibility criteria. Of these patients, 83,356 (56%) received subsequent vaccination during the 270-day study period. Reinfection occurred in 354 of the vaccinated patients (2.46 cases per 100,000 persons per day) and in 2168 of 65,676 unvaccinated patients (10.21 cases per 100,000 persons per day). • Vaccine effectiveness was estimated at 82% (95% confidence interval [CI], 80 to 84) among patients who were 16 to 64 years of age

natural infection	○ and 60% (95% CI, 36 to 76) among those 65 years of age or older. No significant difference in vaccine effectiveness was found for one dose as compared with two doses • Among patients who had recovered from Covid-19, the receipt of at least one dose of the BNT162b2 vaccine was associated with a significantly lower risk of recurrent infection • https://www.nejm.org/doi/full/10.1056/NEJMoa2119497?query=featured_coronavirus
Lancet - 2/14/2022 - 3rd of of mRNA vaccine	• After only two doses, VE against infection declined from 85% (95% CI 83–86) during the first month to 49% (46–51) ≥ 7 months following vaccination. • Overall VE against hospitalization was 90% (95% CI 86–92) within one month and did not wane, however, effectiveness against hospitalization appeared to wane among immunocompromised individuals but was not statistically significant (93% [72–98] at 1 month to 74% [45–88] after ≥ 7 months; p=0·490). • Three-dose VE (median follow-up 1·3 months [SD 0·6]) was 88% (95% CI 86–89) against infection and 97% (95–98) against hospitalization. Effectiveness after three doses was higher than that seen one month after receiving only two doses for both outcomes. Relative VE of three doses compared to two (with at least six months after the second dose) was 75% (95% CI 71–78) against infections and 70% (48–83) against hospital admissions • https://www.thelancet.com/journals/lanam/article/PIIS2667-193X(22)00015-1/fulltext
CDC - 2/15/2022 - Effectiveness of maternal vaccination with mRNA vaccine	• Effectiveness of maternal completion of a 2-dose primary mRNA COVID-19 vaccination series during pregnancy ○ against COVID-19 hospitalization among infants aged <6 months was **61**% (95% CI = 31% to 78%). ○ Effectiveness of completion of the primary COVID-19 vaccine series early and later in pregnancy was **32**% (95% CI = –43% to 68%) and **80**% (95% CI = 55% to 91%), respectively ○ Completion of a 2-dose mRNA COVID-19 vaccination series during pregnancy might help prevent COVID-19 hospitalization among infants aged <6 months ○ https://www.cdc.gov/mmwr/volumes/71/wr/mm7107e3.htm?s_cid=mm7107e3_x
NEJM - 2/16/2022 - Protection against COVID after vaccination and previous infection	• Of 35,768 participants, 27% (9488) had a previous SARS-CoV-2 infection. Vaccine coverage was high: 97% of the participants had received two doses (78% had received BNT162b2 vaccine [Pfizer–BioNTech] with a long interval between doses, 9% BNT162b2 vaccine with a short interval between doses, and 8% ChAdOx1 nCoV-19 vaccine [AstraZeneca]). Between December 7, 2020, and September 21, 2021, a total of 2747 primary infections and 210 reinfections were observed. • Among previously uninfected participants who received long-interval BNT162b2 vaccine, adjusted

	○ vaccine effectiveness decreased from 85% to 51% (95% CI, 22 to 69) at a median of 201 days (interquartile range, 197 to 205) after the second dose; this effectiveness did not differ significantly between the long-interval and short-interval BNT162b2 vaccine recipients. At 14 to 73 days after the second dose, adjusted vaccine effectiveness among ChAdOx1 nCoV-19 vaccine recipients was 58% (95% CI, 23 to 77) — considerably lower than that among BNT162b2 vaccine recipients. ○ Infection-acquired immunity waned after 1 year in unvaccinated participants but remained consistently higher than 90% in those who were subsequently vaccinated, even in persons infected more than 18 months previously • Two doses of BNT162b2 vaccine were associated with high short-term protection against SARS-CoV-2 infection; this protection waned considerably after 6 months. Infection-acquired immunity boosted with vaccination remained high more than 1 year after infection • https://www.nejm.org/doi/full/10.1056/NEJMoa2118691
BMJ - 1/8/2022 - Risk of mental health outcomes in people with COVID	• The findings suggest that people who survive the acute phase of covid-19 are at increased risk of an array of incident mental health disorders. Tackling mental health disorders among survivors of covid-19 should be a priority ○ increased risk of incident anxiety disorders HR 1.35 (○ depressive disorders HR 1.39 ○ stress and adjustment disorders HR 1.38 ○ use of antidepressants HR 1.55 ○ increased risk of incident neurocognitive decline HR 1.80 ○ sleep disorders HR 1.41 ○ The risk of any incident mental health diagnosis or prescription was increased HR 1.60 ○ https://www.bmj.com/content/376/bmj-2021-068993
NEJM - 2/16/2022 - Molnupiravir as treatment for high risk non-hospitalized pts.	• A total of 2246 patients underwent randomization; 1120 patients received nirmatrelvir plus ritonavir (nirmatrelvir group) and 1126 received placebo (placebo group). In the planned interim analysis of patients treated within 3 days after symptom onset (modified intention-to treat population, comprising 774 of the 1361 patients in the full analysis population), ○ the incidence of Covid-19–related hospitalization or death by day 28 was lower in the nirmatrelvir group than in the placebo group by 6.32 percentage points (95% confidence interval [CI], −9.04 to −3.59; P<0.001; relative risk reduction, 89.1%); ○ the incidence was 0.77% (3 of 389 patients) in the nirmatrelvir group, with 0 deaths, as compared with 7.01% (27 of 385 patients) in the placebo group, with 7 deaths. Efficacy was maintained in the final analysis involving the 1379 patients in the modified intention-to-treat population, with a difference of −5.81 percentage points (95% CI, −7.78 to −3.84; P<0.001; relative risk reduction, 88.9%). All 13 deaths occurred in the placebo group.

	• The viral load was lower with nirmatrelvir plus ritonavir than with placebo at day 5 of treatment, with an adjusted mean difference of −0.868 $\log_{10}$ copies per milliliter when treatment was initiated within 3 days after the onset of symptoms. The incidence of adverse events that emerged during the treatment period was similar in the two groups (any adverse event, 22.6% with nirmatrelvir plus ritonavir vs. 23.9% with placebo; serious adverse events, 1.6% vs. 6.6%; and adverse events leading to discontinuation of the drugs or placebo, 2.1% vs. 4.2%). Dysguesia (5.6% vs. 0.3%) and diarrhea (3.1% vs. 1.6%) occurred more frequently with nirmatrelvir plus ritonavir than with placebo • Treatment of symptomatic Covid-19 with nirmatrelvir plus ritonavir resulted in a risk of progression to severe Covid-19 that was 89% lower than the risk with placebo • https://www.nejm.org/doi/full/10.1056/NEJMoa2118542?query=featured_coronavirus

Lancet - 2/18/2022 - Pediatric hospitalizations due to Omicron in South Africa	• Between Oct 31 and Dec 11, 2021,
	• 6287 children and adolescents in Tshwane District were recorded as having COVID-19. During this period,
	  ○ 2550 people with COVID-19 were hospitalized,
	  ▪ of whom 462 (18%) were aged 19 years or younger.
	• The number of pediatric cases was higher than in the three previous SARS-CoV-2 waves, uncharacteristically increasing ahead of adult hospitalizations. 75 viral samples from adults and children in the district were sequenced, of which 74 (99%) were of the omicron variant. Detailed clinical notes were available for 138 (75%) of 183 children aged ≤13 years with COVID-19 who were hospitalized.
	• 87 (63%) of 138 children were aged 0–4 years. In 61 (44%) of 138 cases COVID-19 was the primary diagnosis, among whom symptoms included fever (37 [61%] of 61), cough (35 [57%]), shortness of breath (19 [31%]), seizures (19 [31%]), vomiting (16 [26%]), and diarrhea (15 [25%]).
	• Median length of hospital stay was 2 days [IQR 1–3]). 122 (88%) of 138 children with available data needed standard ward care and 27 (20%) needed oxygen therapy.
	• Seven (5%) of 138 children were ventilated and four (3%) died during the study period, all related to complex underlying co-pathologies. All children and 77 (92%) of 84 parents or guardians with available data were unvaccinated to COVID-19
	• https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(22)00027-X/fulltext

JAMA - 2/7/2022 - association of COVID with maternal	• Of the 14 104 included patients (mean age, 29.7 years), 2352 patients had SARS-CoV-2 infection and 11 752 did not have a positive SARS-CoV-2 test result. • primary outcome was a composite of maternal death or serious morbidity related to hypertensive disorders of pregnancy, postpartum hemorrhage, or

morbidity and mortality.	infection other than SARS-CoV-2. The main secondary outcome was cesarean birth
	• Compared with those without a positive SARS-CoV-2 test result, SARS-CoV-2 infection was significantly associated with the
	  ○ primary outcome (13.4% vs 9.2%; difference, 4.2% [95% CI, 2.8%-5.6%]; adjusted relative risk [aRR], 1.41 [95% CI, 1.23-1.61]).
	  ○ All 5 maternal deaths were in the SARS-CoV-2 group.
	• SARS-CoV-2 infection was not significantly associated with cesarean birth (34.7% vs 32.4%; aRR, 1.05 [95% CI, 0.99-1.11]).
	• Compared with those without a positive SARS-CoV-2 test result, **moderate or higher COVID-19 severity (n = 586) was significantly associated with the primary outcome (26.1% vs 9.2%**; difference, 16.9% [95% CI, 13.3%-20.4%]; aRR, 2.06 [95% CI, 1.73-2.46]) a**nd the major secondary outcome of cesarean birth (45.4% vs 32.4%;** difference, 12.8% [95% CI, 8.7%-16.8%]; aRR, 1.17 [95% CI, 1.07-1.28]), but mild or asymptomatic infection (n = 1766) was not significantly associated with the primary outcome (9.2% vs 9.2%; difference, 0% [95% CI, −1.4% to 1.4%]; aRR, 1.11 [95% CI, 0.94-1.32]) or cesarean birth (31.2% vs 32.4%; difference, −1.4% [95% CI, −3.6% to 0.8%]; aRR, 1.00 [95% CI, 0.93-1.07])
	• Among pregnant and postpartum individuals at 17 US hospitals, SARS-CoV-2 infection was associated with an increased risk for a composite outcome of maternal mortality or serious morbidity from obstetric complication
	• https://jamanetwork.com/journals/jama/fullarticle/2788985

JAMA - 2/18/2022 - Efficacy of Ivermectin treatment for COVID	• Among 490 patients included in the primary analysis (mean [SD] age, 62.5 [8.7] years; 267 women [54.5%]), 52 of 241 patients
	  ○ (21.6%) in the Ivermectin group and 43 of 249 patients (17.3%) in the control group progressed to severe disease (relative risk [RR], 1.25; 95% CI, 0.87-1.80; ***P* = .25)**.
	• For all prespecified secondary outcomes, there were no significant differences between groups.
	  ○ Mechanical ventilation occurred in 4 (1.7%) vs 10 (4.0%) (RR, 0.41; 95% CI, 0.13-1.30; *P* = .17),
	  ○ Intensive care unit admission in 6 (2.4%) vs 8 (3.2%) (RR, 0.78; 95% CI, 0.27-2.20; *P* = .79), and
	  ○ 28-day in-hospital death in 3 (1.2%) vs 10 (4.0%) (RR, 0.31; 95% CI, 0.09-1.11; *P* = .09).
	• The most common adverse event reported was diarrhea (14 [5.8%] in the Ivermectin group and 4 [1.6%] in the control group)
	• https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2789362