NON-CLINICAL TRENDS

Changes in Abortion in Texas Following an Executive Order Ban During the Coronavirus Pandemic

White et al. assessed the changes in abortion in Texas following a month-long executive order issued by Texas Governor Greg Abbott postponing medically unnecessary procedures from March 22, 2020 to April 21, 2020, which included most abortions according to Texas officials. The authors carried out three comparisons: in-state abortions from February through May in 2020 relative to 2019, out-of-state abortions among Texas residents relative to 2017, and differences between February through May 2020 monthly abortions and the overall linear trend in Texas since January 2019. Through performing negative binomial regression models in Stata, the authors found that in 2020 there was an overall decrease in in-state abortions, with April showing the biggest decrease with 38.0% fewer abortions. Out-of-state abortions of Texas residents dramatically increased compared to 2019, ranging from 175 in February to 947 in April, compared to the 2019 range of 107-165 during the same period. Finally, there was an 82.6% increase in procedural abortions at 12 weeks’ gestational age once the executive order was lifted in May 2020 compared to May 2019, which are associated with a higher risk of complications and may require additional visits compared to earlier ones.

Public Concern About Violence, Firearms, and the COVID-19 Pandemic in California

Researchers studied individuals’ concerns and behaviors around violence and firearm ownership in California during the COVID-19 pandemic. The representative sample of Californians included 2,870 participants aged 18 or older. Results showed that an additional 2.8% to 5.8% of participants were worried about personally experiencing any kind of violence during the pandemic compared to before, with the exception that concerns about mass shootings decreased. Worry about experiencing violence in the neighborhood increased while worry about experiencing violence in the home or elsewhere remained the same as before the pandemic. During the pandemic, 12.1% of respondents reported being worried that someone they know may physically harm others and 13.3% worried someone they know may harm themselves. This concern was somewhat related to the pandemic for 1.8% and 7.4% of respondents, respectively. Additionally, 69.2% of respondents reported experiencing some form of unfair treatment in the last year, such as being harassed or threatened, with 7.4% of occurrences related to the pandemic. Notably, pandemic-related unfair treatment was 17.2% among Asian participants who had experienced any unfair treatment in the past year. Finally, among all firearm owners, 2.4% (110,000 individuals) were found to have acquired firearms in response to the pandemic. Of those, 43% (47,000 individuals) were first-time owners. Common pandemic-related reasons for acquiring guns were worries of lawlessness, prisoner release, government issues, and firearm store closures. A total of 55,000 people reported unsecure storage methods of firearms, which
can increase risk of violence, injury and death. Overall, the authors conclude that action must be taken to prevent pandemic-related violence and mitigate downstream effects of the fear associated with this.


Padmanabhanunni and Pretorius examined the association between COVID-19-related variables and loneliness among young adults in South Africa. Using a cross-sectional survey design, 340 college students were randomly sampled, with a mean age of 21.95. The participants completed five subscales of the WHO COVID-19 Behavioural Insights Tool (covering COVID-19 knowledge, risk perception, preparedness and self-efficacy, resilience, and worry), the UCLA Loneliness Scale, and a demographic questionnaire from March to June 2020, the months of lockdown in South Africa. Through performing correlational and regression analyses, the authors found that the participants overall ranked in the upper range on the loneliness scale (49.1 on a scale of 20-80), which was higher than recently reported and higher as compared to a similar study conducted in the United States. In addition, increased loneliness was associated with a greater perceived risk of infection, limited knowledge of COVID-19, and lower appraisals of resilience. Finally, women scored higher than men on most scales, and rural respondents scored higher than urban ones on all scales.

**Rapid assessment of price instability and paucity of medicines and protection for COVID-19 across Asia: Findings and public health implications for the future**

In this pilot study, 308 pharmacists and drug store owners from five Asian countries (Bangladesh, India, Malaysia, Pakistan, South Korea, and Vietnam) took part in the evaluation of availability, use, and price of COVID-19 related medicines and personal protective equipment (PPE) in Asian countries from March 2020 to May 2020. From the questionnaire responses, the authors saw a substantial increase in use of antimicrobial medicine in Pakistan and that their prices remained stable in India, Malaysia, and Vietnam. In addition, there was no change or decreased use in antimalarials in pharmacies in Bangladesh (51.2%), India (45%), Malaysia (83.3%), and Vietnam while use of vitamins, immune boosters, and PPE increased in locations in all evaluated countries. The authors identified that community pharmacies and patient organizations may be important to promote public health messages as well as to address the effects of misinformation and the consequences of lockdowns.

**TRANSMISSION PATTERNS**

**Longitudinal testing for respiratory and gastrointestinal shedding of SARS-CoV-2 in day care centres in Hesse, Germany**

Hoehl et al. sought to better understand the SARS-CoV-2 transmission dynamics among young children and staff members in 50 day care centers in Hesse, Germany. When day
care centers in Germany were reopened on June 2, 2020, substantial infection control measures were implemented, including denying access to children and staff who were symptomatic or had a household member with symptoms or in quarantine. However, children were not required to wear masks. To measure SARS-CoV-2 viral shedding, 859 children (3 months to 8 years old) and 376 staff members were asked to conduct both a buccal mucosa swab and an anal swab weekly from June 18, 2020 to September 10, 2020. Out of all swabs tested by RT-PCR, none of the samples from children were positive for SARS-CoV-2, and only two resulted in positive tests from staff members (one symptomatic and one asymptomatic). As this study occurred in a context with limited community spread, the highest seven-day incidence of COVID-19 recorded was 66 cases per 100,000, the authors recommend transmission dynamics in day care centers to be measured in settings with high community spread.

Assessment of the risk of SARS-CoV-2 reinfection in an intense re-exposure setting

Abu-Raddad et al. examined the incidence rate of SARS-CoV-2 reinfection among 133,266 laboratory-confirmed cases in Qatar. A total of 243 individuals had at least one positive PCR swab 45 days or more after their first positive swab and were included in the analysis. Based on cycle-threshold values of secondary PCR tests, 54 individuals (22.2%) were classified as having good or strong evidence of reinfection; 23 of the 54 were diagnosed at a health facility (which suggests they may have been symptomatic), while 31 were found via random testing or contact tracing. The risk of reinfection was estimated at 0.02% and the incidence rate of reinfection at 0.36 per 10,000 person-weeks. The authors suggest that reinfection can occur but is rare and well-tolerated, and that infection with SARS-CoV-2 may provide protective immunity for at least a few months after primary infection.

MODELS

Estimation of US SARS-CoV-2 Infections, Symptomatic Infections, Hospitalizations, and Deaths Using Seroprevalence Surveys

Angulo et al. sought to estimate the total number of SARS-CoV-2 infections, symptomatic infections, hospitalizations, and deaths in the United States, accounting for underreporting. To determine this, the authors used data from community seroprevalence surveys from April 2020 as well as seroprevalence surveys performed by the CDC. Using the community serosurveys, the authors estimated an underreporting multiplier for total infections of 10.8 and one of 6.5 for symptomatic infections, during the period between January 21 and April 30, 2020. Over time, the underreporting multipliers for total and symptomatic infections decreased to 3.2 and 1.9, respectively, for the period between August 1 and November 15, 2020. While the CDC had reported 10,846,373 total infections and 244,810 deaths as of November 15, 2020, the authors estimate that there were closer to 46,910,006 total infections (IQR 38,192,705-60,814,748), 28,122,752 symptomatic infections (IQR 23,014,957-36,438,592), 956,174 hospitalizations (IQR, 782,509 –1,238,912), and 304,915 deaths (IQR 248,253-395,296) to account for underreporting. Although this estimate suggests that approximately 14.3% of the US population had contracted SARS-CoV-2 by mid-November, this proportion is still significantly below the threshold needed for herd immunity.
PHARMACEUTICAL INTERVENTIONS

**Allergic reactions including anaphylaxis after receipt of the first dose of Pfizer-BioNTech COVID-19 vaccine- United States, December 14-23,2020**

The Pfizer-BioNTech COVID-19 vaccine was issued for emergency use by the Food and Drug Administration (FDA) on December 11, 2020. By December 23, 2020, almost 1.9 million doses of the vaccine were administered and of these doses, 0.2% were reported to have adverse events through the Vaccine Adverse Events Reporting System. Of these adverse events reported between December 14-23, 2020, there were 21 detected cases of anaphylaxis, indicating 11.1 cases of anaphylaxis per million doses, with 71% of those having occurred within 15 minutes of administering the vaccination. There are no reported deaths from anaphylaxis due to the Pfizer vaccine and of the 21 patients who experienced an allergic reaction to the Pfizer vaccine, 17 had a history of allergies or allergic reactions. Recommendations from this report included: following CDC guidelines on screening vaccination recipients, having the necessary supplies, such as epinephrine, ready in case of an allergic reaction, and utilizing the post vaccination observation period in case of anaphylaxis.

**Phase 1-2 Trial of a SARS-CoV-2 Recombinant Spike Protein Nanoparticle Vaccine**

Researchers studied the safety and immunogenicity of Novavax’s recombinant nanoparticle vaccine from full-length wild-type SARS-CoV-2 spike glycoprotein. The randomized, controlled Phase 1 trial began in Australia in May 2020 and delivered rSARS-CoV-2 with Matrix-M1 adjuvant or placebo to 131 patients aged 18-59. Participants were given two doses, at day 0 and day 21 respectively, of either 25 micrograms, 5 micrograms, placebo, or a combination. Results showed that the vaccine is relatively safe with no serious adverse events and mild reactogenicity lasting on average 2 day or less. Neutralizing antibody levels associated with anti-spike IgG titers and immune response after the second dose with Matrix-M1 matched those seen in patients hospitalized with COVID-19. Antibody and T-cell responses indicated immunogenicity was more successful when the two-dose vaccine regimen included adjuvant Matrix-M1 compared to when it did not. Phase 2 has begun for the Novavax vaccine.

CLINICAL PRESENTATION AND MANAGEMENT

**Previous dengue infection and mortality in COVID-19**

Silvestre et al. collected data on 2,351 patients with both symptomatic and asymptomatic confirmed SARS-CoV-2 infections in the Brazilian Amazon basin. 1,177 (50%) of patients had a reported history of dengue. The authors found that patients with a history of dengue generally had more symptoms associated with COVID-19, were more likely to have relevant comorbidities, and also were more likely to have a history of malaria, chikungunya, or leishmaniasis infection. In the 60-day follow up, participants without a history of symptomatic dengue had a higher risk of death (adjusted hazard ratio: 0.44). Thus, the authors report dengue may provide some immunological protection against SARS CoV-2 due to an enhanced inflammatory response consistent with symptoms that occur with severe dengue.
The authors did not find an association with mortality for history of malaria, zika, chikungunya, leprosy, or visceral leishmaniasis (though for some of these diseases, the number of individuals was very small).

**PEDIATRIC PRESENTATION**

**Factors Associated with Positive SARS-CoV-2 Test Results in Outpatient Health Facilities and Emergency Departments Among Children and Adolescents Aged <18 Years — Mississippi, September–November 2020**

Researchers performed a matched case-control study with a total of 397 children and adolescents <18 years to assess the roles which in-person learning, community, and close contact exposure (within 6 feet for ≥15 minutes) play in the transmission of COVID-19. Nasopharyngeal swabs were obtained from outpatient healthcare centers and emergency departments associated with University of Mississippi between September 1 and November 5, 2020. 154 positive case-patients were confirmed by a positive RT-PCR test result for SARS-CoV-2. Cases were frequency matched to controls by age group, sex, and test date interval. Using information obtained from structured surveys, logistic regression models were generated and adjusted for sex, age group, and ethnicity/race. Cases were 3.2 times more likely to have experienced close contact exposure with someone known to have COVID-19 than controls (95% CI 2.0-5.0). Cases were also more likely to have attended gatherings with members outside of their household, including social functions (aOR 2.4, 95% CI 1.1-5.5) and hosting visitors at home (aOR 1.9, 95% CI 1.2-2.9). Notably, in-person school or childcare attendance less than 2 weeks before the SARS-CoV-2 diagnostic test was not associated with a positive test result (aOR 0.8, 95% CI 0.5-1.3).

**SCREENING AND TESTING**

**Amplification-free detection of SARS-CoV-2 with CRISPR-Cas13a and mobile phone microscopy**

The authors of this paper used CRISPR diagnostic technology to develop a rapid and amplification-free diagnostic test for SARS-CoV-2 that can detect viral RNA directly from a nasal swab. Using the Cas13a protein, which can directly bind single-stranded RNA (ssRNA), researchers developed a CRISPR-Cas13 complex to target ssRNA. The addition of a fluorophore-quencher probe to the ssRNA strands allowed for quantification of Cas13a cleavage activity, where cleavage of the probe separates the quencher from the fluorophore and allows for fluorescence to occur. The CRISPR-Cas13a complex can directly detect viral RNA with a sensitivity of ~100 copies/uL in under 30 minutes, therefore removing the pre-amplification step that is often required for nucleic acid-based diagnostic tests. The experimental rate of Cas13a cleavage of ssRNA was compared and confirmed with Michaelis-Menten enzyme kinetics. This modeling also allowed for back-calculations to determine the target RNA concentration from the estimated concentration of activated Cas13a. Sensitivity of the assay was improved when combining CRISPR RNAs (crRNAs) to
form several different complexes that could target different regions of viral RNA. Finally, results could be quantified with a mobile phone-based fluorescence microscope, increasing the accessibility of this technology to regions that lack robust laboratory equipment to perform diagnostic testing.

ADDITIONAL RESOURCES
UCSF Library COVID-19 Research and Information Resources
UCSF Institute for Global Health Sciences COVID-19 Resources
UC Davis One Health Institute COVID-19 FAQs
Harvard Viswanath Lab Myths vs Facts

Note on this Document: This document was assembled by graduate and doctoral students attending the University of California, San Francisco with the intent of facilitating the rapid dissemination of information to the global community in order to help during this time. Anika Kalra, Sarah Gallalee, Mariam Carson, Ilia Vasilopoulos, Alyssa Bercasio, and Masih Babagoli contributed to these summaries. This work is volunteer based.

References:


