NON-CLINICAL TRENDS

Changes in Health Services Use Among Commercially Insured US Populations During the COVID-19 Pandemic

Whaley et al assessed the changes in non-COVID health care use among a large population of individuals with employer-sponsored health insurance using data collected by Castlight Health from March and April of 2018, 2019, and 2020. A total of 5.6 million patients in 2018, 6.4 million patients in 2019, and 6.8 million patients in 2020 were included in the analysis. Overall, health service use declined by 23% and 52% in March and April 2020, respectively, with preventive service usage decreased significantly. Compared to April 2019, colonoscopy services in April 2020 decreased by 92.9% in persons aged 46-64 years (absolute reduction: -64.5 per 10,000, 95% CI: -66.8 to -62.2) and mammograms among women aged 46-64 reduced by 90.4%. Nonelective services such as chemotherapy also declined, reducing by 7.4% (absolute reduction: -1.4 per 10,000, 95% CI: -2.1 to -0.8) in April 2020 compared to April 2019. Elective services such as musculoskeletal surgery decreased by 66.0% in April 2020 compared to April 2019 (absolute reduction: -10.9 per 10,000, 95% CI: -11.6 to -10.2). Telemedicine services increased by 4,081% in April 2020 compared to April 2019. In-person office visits declined by a smaller percentage, 68%, in April 2020 compared to April 2019, but the absolute reduction was large, 1,520.8 visits per 10,000. The increase in telemedicine services did not offset the reduction in office visits, suggesting many primary care needs may be going unmet. Furthermore, lower-income patients were found to have smaller reductions in preventive care usage and office visits, and smaller increases in telemedicine services compared to higher-income patients. Similar trends were observed in zip codes primarily consisting of racial/minority populations. This study highlights the level of stress the COVID-19 pandemic has placed on the healthcare system. Future research on the health effects of delayed care should be conducted to evaluate the long-term effects of delayed care on the US population.
US Clinicians’ Experiences and Perspectives on Resource Limitation and Patient Care During the COVID-19 Pandemic

Butler et al. conducted a qualitative study investigating the perspectives and experiences of clinicians involved in institutional planning of systematic approaches for allocation of limited resources in patient care settings during the COVID-19 pandemic. A total of 61 participants were included in the sample, 65% of which were White, and recruited from 15 different states with high rates of COVID-19 infection (i.e., Seattle, New Orleans, New York City). Most of the participants were attending physicians (n=45 [75%]) practicing in a large academic center (n=51 [85%]). All participants completed one-on-one audio recorded interviews and an online survey that asked about demographic characteristics and practice experience. The themes that emerged from the analysis included: 1) planning for crisis capacity; 2) adapting to resource limitation; and 3) multiple unprecedented barriers to care delivery. The findings of this study suggest that there is a large disparity and need for institutional planning to address the challenges that resource limitations exposed during the COVID-19 pandemic. Furthermore, institutional planning should expand beyond crisis capacity to include promoting equity, optimizing care, and addressing moral distress to support clinicians on the frontlines.

UNIVERSAL SCREENING AND TESTING

Serial Screening for COVID-19 in Asymptomatic Patients Receiving Anticancer Therapy in the United Arab Emirates

Al Shamsi et al implemented a pilot microbiologic screening program in Al Zahra Hospital in the United Arab Emirates (UAE). Asymptomatic patients with solid tumors receiving anticancer therapy were consecutively enrolled between March 13 and May 26, 2020 and followed until June 29. Patients were screened for COVID-19 symptoms and tested for SARS-CoV-2 infection by PCR of nasopharyngeal swabs. A total of 109 patients were enrolled and 32 (29.4%, 95% CI: 21.0% - 38.9%) acquired COVID-19. Of these, 25 (78.1%) were asymptomatic and 7 (21.9%) demonstrated interval symptoms after the initial negative PCR test. The results of this pilot highlight the importance of the microbiologic screening program. Despite the small sample size and lack of control group, all of these patients would normally have continued to receive anticancer therapy, unaware of their COVID-19 infection. The pilot identified a high rate of COVID-19 among patients with cancer (29.4%) compared to the cumulative prevalence of COVID-19 in the UAE as of June 29, 2020 (496.3 per 100,000 residents).
PHARMACEUTICAL INTERVENTIONS

Elicitation of potent neutralizing antibody responses by Designed Protein Nanoparticle Vaccines for SARS-CoV-2

In this article, Walls et. al. explain the characteristics of their SARS-CoV-2 receptor-binding domain (RBD) nanoparticle vaccine candidate. The findings of this study indicate that the RBD nanoparticle can be generated quickly and has high stability indicating the potential scalability of this vaccine. The RBD nanoparticle vaccine also has demonstrated a potent neutralizing antibody capability in SARS-CoV-2 infected mice and the ability to bind different epitopes in both mouse and non-human primate models. The neutralizing antibodies’ ability to target non-overlapping epitopes reduce the likelihood of naturally occurring RBD mutations escaping the antibody response. Self-assembling nanoparticle vaccines have historically been shown to be effective and safe, and the SARS-CoV-2 RBD vaccine is currently on the way to clinical trials because of its promising success in mouse and non-primate models.

Effect of Hydroxychloroquine on Clinical Status at 14 Days in Hospitalized Patients With COVID-19

Self et al conducted a randomized clinical trial of 479 hospitalized patients with COVID-19 related respiratory problems to determine whether hydroxychloroquine has been an effective treatment for adults hospitalized with COVID-19 when compared to placebo. The study participants had a median age of 57 years, were 44.3% females, and were 37.2% Hispanic/Latinx and 23.4% Black. Of the total, 20.1% of participants required ICU care, 46.8% were given supplemental oxygen without positive pressure, 11.5% were given noninvasive ventilation or nasal high-flow oxygen, and 6.7% were given invasive mechanical ventilation or extracorporeal membrane oxygenation. When comparing the hydroxychloroquine group with the placebo, the results showed no significant difference in all subgroups for all outcomes evaluated, which included clinical status, mortality, organ failures, duration of oxygen use, and hospital length of stay. Therefore, these findings do not support the use of hydroxychloroquine for treatment of COVID-19 among hospitalized adults.
MENTAL HEALTH

Bidirectional associations between COVID-19 and psychiatric disorder: retrospective cohort studies of 62,354 COVID-19 cases in the USA

Taquet et al conducted an electronic-health-record-based cohort study from a network of about 70 million individuals, including 62,354 patients with a diagnosis of COVID-19, to assess whether COVID-19 diagnosis was associated with increased rates of subsequent psychiatric diagnoses (psychotic, mood, and anxiety disorders) compared with other health events (influenza, other respiratory tract infections, skin infection, cholelithiasis, urolithiasis, and fracture of a large bone) and whether the patients with a history of psychiatric illness are at a higher risk of being diagnosed with COVID-19. They found that a diagnosis of COVID-19 led to more first diagnoses of psychiatric illness in the following 14 to 90 days compared with all six control health events (HRs 1.58 - 2.24), with almost double the probability of being diagnosed with a psychiatric illness 90 days after COVID-19 diagnosis (5.8% vs. 2.5%-3.4% in the comparison cohort). The frequency of first anxiety disorder diagnosis was the highest at 4.7%. The estimated probability of having any psychiatric illness diagnosis within 14 to 90 days of COVID-19 diagnosis was 18.1% and higher than all comparative health events (HRs 1.24-1.49). Anxiety disorder was also the highest in this category with a frequency of 12.8%. Additionally, a psychiatric diagnosis within a year before the COVID-19 outbreak was associated with a 65% increased risk of a COVID-19 diagnosis and an even higher rate in older patients, however this was not adjusted for confounding factors such physical health, socioeconomic factors, etc. The authors conclude that there is an apparent association of psychiatric illness both preceding and following a COVID-19 diagnosis and further research is warranted.

TRANSMISSION PATTERNS

Lack of antibodies to SARS-CoV-2 in a large cohort of previously infected persons

The participants of this study were comprised of 2,547 health care workers and first responders who had a history of positive SARS-CoV-2 RT-PCR test and had been tested for IgG antibodies to SARS-CoV-2 spike protein at least two weeks after the beginning of symptoms during the study period of May 18 through June 13 in Detroit and through June 19, 2020 in New York City. 6.3% of the total 2,547 participants were seronegative, 0% of 79 previously hospitalized patients were seronegative, and 11% of 308 asymptomatic persons were seronegative. Of the 2,112 participants who had been symptomatic, the proportion seronegative increased slightly over time. Modeling results showed that those with more severe symptomatology, of non-Hispanic Black race/ethnicity, with severe obesity, and not taking immunosuppressive medications were less likely to be seronegative. This study suggests temporal limits of sereversion, the lower likelihood of IgG antibodies developed from milder disease, lower levels of antibodies with lower body mass index, and variable immune responses across races/ethnicities, which warrants further research.
PATHOPHYSIOLOGY

Robust neutralizing antibodies to SARS-CoV-2 infection persist for months

Patients with confirmed SARS-CoV-2 infection were studied to evaluate the neutralizing activity and the longevity of SARS-CoV-2 antibodies. Findings showed that 90% of SARS-CoV-2 spike antibodies had neutralizing capability, and the antibodies remained stable for approximately 148 days. Despite the positive results of this study, there is no conclusive evidence that previous SARS-CoV-2 infection can protect someone from reinfection. The study investigators intend to continue to observe this cohort, as they hypothesize previous SARS-CoV-2 infection has the potential to lower the likelihood of reinfection and severe illness due to COVID-19.

High prevalence of pre-existing serological cross-reactivity against SARS-CoV-2 in sub-Saharan Africa

Tso et al compared pre-pandemic plasma samples from sub-Saharan Africa and the United States and tested them against the spike and nucleocapsid proteins of human coronaviruses (HCoV). The authors found a higher prevalence of SARS-CoV-2 serological cross-reactivity in the samples from sub-Saharan Africa than in those from the United States, which led the the authors to posit that prior exposure to other HCoVs—which are more prevalent in SSA than in the US—was likely the source for the cross-reactive antibodies against SARS-CoV-2. While the function of the SARS-CoV-2 cross-reactive antibodies is still unclear, this study suggests that the low SARS-CoV-2 infection rate in sub-Saharan Africa is correlated with serological cross-recognition of other HCoVs.

Pre-existing and de novo humoral immunity to SARS-CoV-2 in Humans

This study assessed the degree of cross-reactivity between human coronaviruses (HCoVs) and SARS-CoV-2 by a multitude of methods, including flow cytometry and ELISAs to detect pre-existing humoral immunity. Results from multiple independent assays showcased the presence of pre-existing antibodies recognizing SARS-CoV-2 in uninfected individuals. Furthermore, the identification of conserved epitopes in the S subunit targeted by neutralizing antibodies may hold promising results for universal vaccines that can protect against current and future coronaviruses. These results indicate that persisting HCoV-elicited immunity should be fully delineated to understand the natural course of SARS-CoV-2.
**PEDIATRIC PRESENTATION**

*Characteristics and outcomes of neonatal SARS-CoV-2 infection in the UK: a prospective national cohort study using active surveillance*¹¹

This study aimed to describe the incidence, characteristics, transmission, and outcomes of SARS-CoV-2 infection among neonates admitted in hospitals in the United Kingdom. They found that inpatient care for neonates with confirmed SARS-CoV-2 has been rare (5.6 cases per 10,000 live births) but neonatal SARS-CoV-2 infection led to severe disease in 42% of cases and 33% of the babies in this study required some form of respiratory support. Neonates from African American, Asian and mixed or other ethnic groups accounted for almost half of the neonates admitted with SARS-CoV-2 infection. These results show that though SARS-CoV-2 infection was uncommon (66 cases across the entire UK from March 1st - April 30, 2020), the current UK and international guidance to avoid route separation of the mother and baby and ensure that new parents can make informed decisions about neonatal care is important.

**REGION-SPECIFIC LESSONS LEARNED**

*Declines in SARS-CoV-2 Transmission, Hospitalizations, and Mortality After Implementation of Mitigation Measures—Delaware, March-June 2020*¹²

Kanu et al. assessed the changes in COVID-19 incidence, associated hospitalization, and mortality in Delaware from March 11th (the state’s first reported case) to June 25th, using laboratory data from the Delaware Electronic Reporting and Surveillance System (DERSS) and case investigation data from Delaware Division of Public Health (DPH). Recommendations and mitigation measures for prevention and control of COVID-19 transmissions included case investigations (began March 11), stay at home orders (March 24-June1), public mask mandates (instituted April 28), and contact tracing (begun May 12). Patients involved in case investigations were interviewed for demographic information, potential exposure source, symptoms, and close contacts who were subsequently interviewed for contact tracing. All patients were asked to self-isolate and quarantine immediately after interviews. A total of 9,762 newly confirmed cases were identified in DERSS, with 67% (6,527) of cases interviewed and asked to self-isolate. Of those individuals, 89% (5,823) were released from isolation during the data collection period. From the time of the interview, it took a median of 8 days for patients to receive a positive test result compared to 5 days from DPH’s receipt of case report. Participants ranged from 28-54 years old with 45% representing male patients. The findings showed that among the interviewed patients, 55% reported having close contact with a diagnosed COVID-19 case and 5,742, (88%) reported having COVID-19-related symptoms prior to the interview date. There were 2,834 reported contacts, of whom, 161 were symptomatic and urged to be tested. Participants that were not interviewed included those who did not respond to call attempts, had no available phone (14%), or refused (5%), among other reasons (22%), etc.
The researchers concluded that early detection, self-isolation, self-quarantine of close contacts, and investigation of COVID-19 cases can be effective in preventing transmission throughout the community.

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. James Feng, Alyssa Bercasio, Lina Salam, Sarah Gallalee, Caithla Petiprin, and Disha Nangia contributed to these summaries. This work is volunteer based.

References:


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