2019-nCoV Literature Situation Report (Lit Rep)

December 15, 2020

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to Washington State decision making around COVID-19 response efforts. Included in these Lit Reps are some manuscripts that have been made available online as pre-prints but have not yet undergone peer review. Please be aware of this when reviewing articles included in the Lit Reps.

Key Takeaways

- **Attending school or child care was not associated with receiving a positive SARS-CoV-2 test result among children and adolescents aged <18 years in Mississippi. By contrast, infection was more likely among children who had close contact with a person with COVID-19 and among those who attended gatherings with persons outside their household.** More
- **Accounting for changes in the age structure of the US population reduced the estimate of the total excess deaths in the US between March and August 2020 from 301,400 deaths to 218,000 deaths, which substantially increased the contribution of COVID-19-related deaths to excess deaths from 57% to 80%.** More
- **A model based on King County (Washington) shows that the Moderna and Pfizer vaccines could prevent a fourth wave in Spring 2021, assuming at least 5,000 vaccinations per day starting January 2021 and that the vaccines provide complete protection against infection. If vaccine efficacy is primarily driven by reducing symptoms without preventing infection, then vaccination would need to be combined with other transmission control measures that prevent at least 50% of secondary infections in order to prevent a fourth wave.** More

Non-Pharmaceutical Interventions

- Mobility data across 1,124 US counties show that individuals began to socially distance at a median of 5 days (IQR=3-8) after 10 cumulative confirmed COVID-19 cases in their state, but at a median of 12 days (IQR=8-17) before state governments issued stay-at-home orders (SAHOs). Using SAHO dates as a proxy for social distancing accounts for only 55% of the true impact of social distancing when compared with estimates using mobility. Delays in social distancing were found to be associated with county-level sociodemographic characteristics, including proportion of people without a high school diploma and proportion of racial and ethnic minorities.

  Abdalla et al. (Nov 13, 2020). Asynchrony Between Individual and Government Actions Accounts for Disproportionate Impact of COVID-19 on Vulnerable Communities. American Journal of Preventive Medicine. https://doi.org/10.1016/j.amepre.2020.10.012

Transmission

- Among 101,349 lab-confirmed SARS-CoV-2 cases in Qatar, the risk of reinfection was estimated to be 0.02%, with a reinfection incidence rate of 0.36 per 10,000 person-weeks. Out of 243 patients with at least one positive swab ≥45 days from the first positive swab, 54 (22%) had strong or good

evidence for reinfection. Viral genome sequencing confirmed four reinfections out of 12 cases with available genetic evidence.

Abu-Raddad et al. (Dec 14, 2020). Assessment of the Risk of SARS-CoV-2 Reinfection in an Intense Re-Exposure Setting. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa1846

- In a case-control study of 397 children and adolescents in Mississippi, in-person school or child care attendance two weeks prior to a SARS-CoV-2 test was not associated with a positive test result (aOR=0.8). Close contact with persons with COVID-19 (aOR=3.2), gatherings with persons outside the household such as social functions (aOR=2.4) and playdates (aOR=3.3), and having had visitors in the home (aOR=1.9) two weeks prior to a SARS-CoV-2 test were associated with a positive test result. A majority of parents of both case- and control-patients reported mask-use by their children and staff in school or child care facilities, while parents whose children attended social gatherings and had visitors at home reported lower rates of mask use and physical distancing adherence.

  Hobbs et al. (Dec 15, 2020). 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. MMWR. https://doi.org/10.15585/mmwr.mm6950e3

- A nationwide serial sampling study in England (n=1.1 million samples from 280,000 individuals) shows that the first wave (April to June) and the first part of the second wave (August to November) were characterized by different risk factors. Having a patient-facing role was a significant factor in the first wave but not in the second, whereas younger age was strongly associated with infection risk in the second wave. By the end of September, the percentage of those aged 17 to 24 years testing positive was 6 times higher than those aged 70 years or older. Percentage of individuals not reporting symptoms around the time of their positive test ranged from 45 to 68% throughout the study period.

  Pouwels et al. (Dec 10, 2020). Community Prevalence of SARS-CoV-2 in England from April to November, 2020: Results from the ONS Coronavirus Infection Survey. The Lancet Public Health. https://doi.org/10.1016/S2468-2667(20)30282-6

Clinical Characteristics and Health Care Setting

- In a cohort of young adults aged 18 to 35 years admitted to hospital with COVID-19 in New York City (n=395), 58% of patients had at least one major comorbidity. The mortality among those with at least one major comorbidity was 17% (40 of 229), compared to 9% (15 of 166) among those without a major comorbidity. Comorbidities associated with mortality were diabetes, hypertension, renal disease, and cardiac disease. *[EDITORIAL NOTE: The mortality percentages in this summary were directly calculated from the numbers reported in the manuscript and differ from the percentages reported by the authors. The percentages in the manuscript use a denominator of all patients rather than separate denominators for those with and without comorbidities.]*

  Altonen et al. (Dec 14, 2020). Characteristics, Comorbidities and Survival Analysis of Young Adults Hospitalized with COVID-19 in New York City. PLOS ONE. https://doi.org/10.1371/journal.pone.0243343

- Among 131,606 healthcare personnel (HCP) in the US Veterans Health Administration, 5,925 (4.5%) had positive SARS-CoV-2 PCR tests. HCP who were working in hospitals with >15% SARS-CoV-2 positivity among inpatients, as well as nursing staff, HCP who identify as Black or Hispanic, and veterans were at highest risk of SARS-CoV-2 infection. Male sex, age over 65 years, and veteran status were significant risk factors for mortality among the 18 HCP who died.

Oda et al. (Dec 11, 2020). COVID-19 Infections Among Healthcare Personnel in the United States Veterans Health Administration, March – August, 2020. Journal of Occupational & Environmental Medicine. https://doi.org/10.1097/JOM.0000000000002109

Modeling and Prediction

- *[Pre-print, not peer-reviewed]* A model based on King County data shows that if the vaccine efficacy of the Moderna and Pfizer vaccines are primarily driven by complete protection against infection, then prevention of a fourth epidemic wave in Spring 2021 and a reduction of subsequent cases and deaths by 60% is likely to occur, assuming rapid vaccine rollout (at least 5,000 vaccinations per day). If vaccine efficacy is primarily driven by a reduction of symptoms despite breakthrough infection, then vaccination would need to be combined with other transmission control measures that prevent at least 50% of secondary infections in order to prevent a fourth wave.

  Swan et al. (Dec 14, 2020). Vaccines That Prevent SARS-CoV-2 Transmission May Prevent or Dampen a Spring Wave of COVID-19 Cases and Deaths in 2021. Pre-print downloaded Dec 15 from https://www.medrxiv.org/content/10.1101/2020.12.13.20248120v1

- Jin et al. developed a model to produce absolute risk estimates for the general adult population across 477 US cities and for the Medicare population aged 65 years and older across 3,113 counties. Incorporating various sociodemographic factors and pre-existing conditions and validated with 54,444 deaths due to COVID-19 from June to October 2020, the model can identify small fractions of the population that could experience a disproportionately large number of deaths. The model, which shows wide variations in risks across communities, is available as a web-based risk calculator with interactive maps.

  Jin et al. (Dec 11, 2020). Individual and Community-Level Risk for COVID-19 Mortality in the United States. Nature Medicine. https://doi.org/10.1038/s41591-020-01191-8

- Routine testing of staff in care homes was shown to be more effective than other infection control interventions, according to a transmission model parameterized to a care home setting in Scotland. Using isolation of symptomatic residents, testing of new admissions, social distancing, and restricted visiting as the reference intervention, the addition of routine testing of staff outperformed 14-day quarantine of new admissions, closing care home to new admissions in the presence of a symptomatic case, or routine testing of residents.

  Nguyen et al. (Dec 14, 2020). Evaluating Intervention Strategies in Controlling COVID-19 Spread in Care Homes: An Agent-Based Model. Infection Control & Hospital Epidemiology. https://doi.org/10.1017/ice.2020.1369

Public Health Policy and Practice

- Accounting for changes in the population age in the four-year period between 2015 and 2019 compared to the period between March and August of 2020 reduced estimates of excess deaths in the US from 301,400 deaths to 218,000 deaths, which substantially increased the contribution of COVID-19-related deaths (173,300 from March to August) to an excess of deaths from 57% to 80%. Most excess non-COVID-19 deaths occurred in April, July and August, primarily among people 25 to 64 years. Diabetes, Alzheimer disease, and heart disease caused the most non-COVID-19 excess deaths.

  Shiels et al. (Dec 15, 2020). Impact of Population Growth and Aging on Estimates of Excess U.S. Deaths During the COVID-19 Pandemic, March to August 2020. Annals of Internal Medicine. https://doi.org/10.7326/M20-7385

- Missouri Department of Health data show that Black populations in the St. Louis and Kansas City regions had lower COVID-19 testing rates per diagnosed cases compared to white populations consistently throughout the pandemic. During March to June 2020, zip codes in the lowest quartile of testing rates, which had higher proportions of Black, uninsured, and lower-income residents, accounted for only 12% of all tests in the St. Louis and 9% of all tests in Kansas City, despite accounting for 25% of all cases in both regions. Black individuals had consistently lower rates of COVID-19 tests per case compared to their white peers residing in the same zip code.
  Mody et al. (Dec 14, 2020). Understanding Drivers of COVID-19 Racial Disparities: A Population-Level Analysis of COVID-19 Testing among Black and White Populations. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa1848

Other Resources and Commentaries

- Could Routine Race-Adjustment of Spirometers Exacerbate Racial Disparities in COVID-19 Recovery? – The Lancet Respiratory Medicine (Dec 10)
- Maintain and Increase Vaccination Coverage in Children, Adolescents, Adults and Elderly People: Let's Avoid Adding Epidemics to the Pandemic – Vaccine (Dec 11)
- Lateral Flow Tests Cannot Rule out SARS-CoV-2 Infection – BMJ (Dec 11)
- Shelter in Place? Depends on the Place: Corruption and Social Distancing in American States – Social Science & Medicine (Dec 3)
- Covid-19: Adults with Learning Disabilities Should Have Priority Access to Vaccination, Say Lawyers – BMJ (Dec 11)
- The Spread of COVID-19 Shows the Importance of Policy Coordination – Proceedings of the National Academy of Sciences (Dec 11)
- Evaluating SARS-CoV-2 Vaccines After Emergency Use Authorization or Licensing of Initial Candidate Vaccines – JAMA (Dec 14)
- COVID-19 Outcomes among People with Intellectual and Developmental Disability in California: The Importance of Type of Residence and Skilled Nursing Care Needs – Disability and Health Journal (Dec 5)
- US Authorization of First COVID Vaccine Marks New Phase in Safety Monitoring – Nature (Dec 11)
- Allocating Resources Across the Life Span During COVID-19—Integrating Neonates and Children Into Crisis Standards of Care Protocols – JAMA Pediatrics (Dec 14)
- The Ethics of Continuing Placebo in SARS-CoV-2 Vaccine Trials – JAMA (Dec 14)
- Covid-19: Pfizer-BioNTech Vaccine Is Rolled out in US – BMJ (Dec 14)
- Behaviorally Informed Strategies for a National COVID-19 Vaccine Promotion Program – JAMA (Dec 14)
- Influenza Vaccination Strategies for 2020-21 in the Context of COVID-19 – Journal of Global Health (Sept 23)
- Impact of the Covid-19 Pandemic on the Frequency of Primary Care-Recorded Mental Illness and Self-Harm Episodes in the UK: Population-Based Cohort Study of 14 Million Individuals – The Lancet Psychiatry (Dec 10)

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