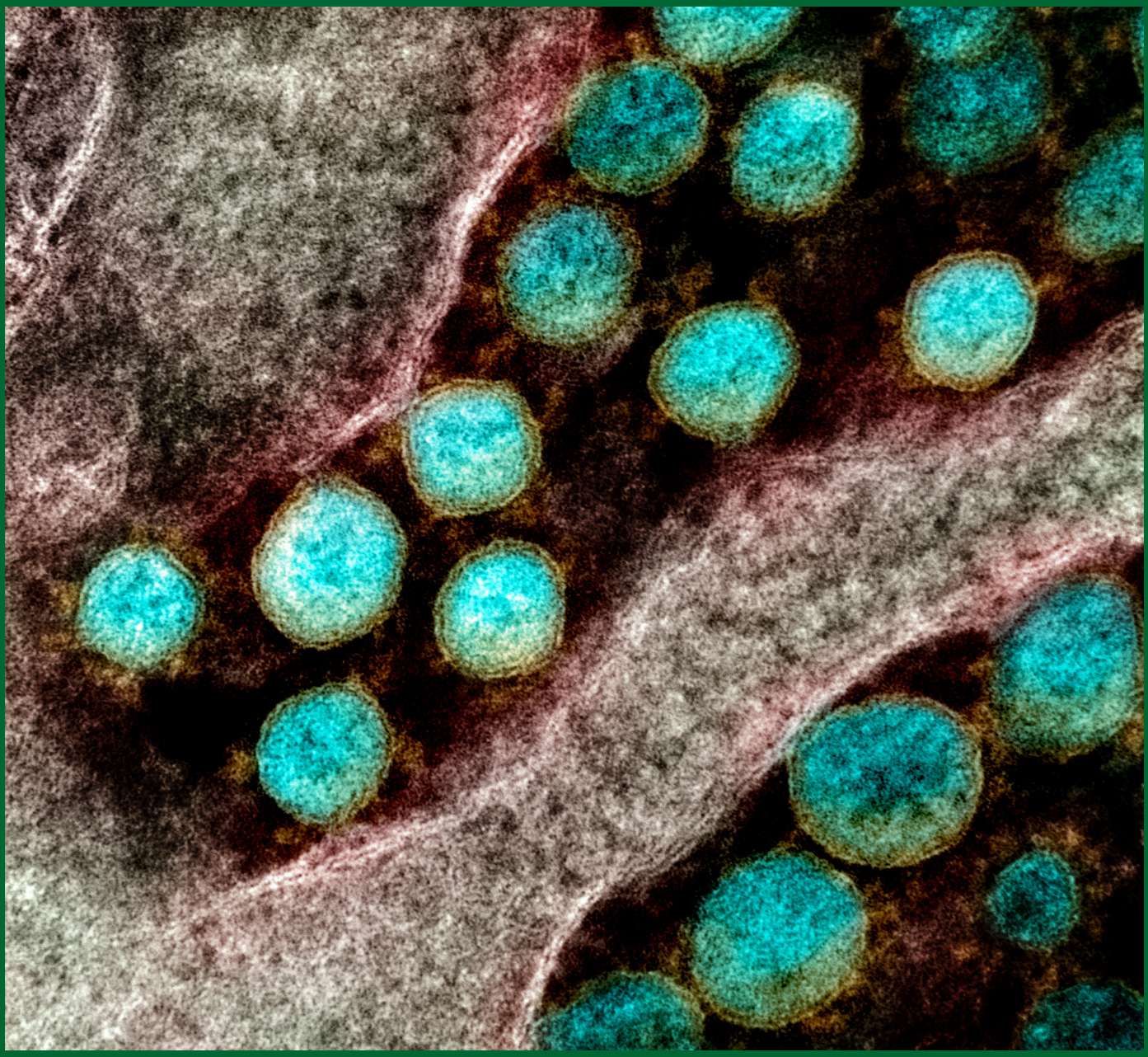
COVID-19
Rush Journal Club: Public Health



NOVEL CORONAVIRUS SARS-COV-2. Transmission electron micrograph of SARS-CoV-2 virus particles, isolated from a patient. Image captured and color-enhanced at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: NIAID Available at: https://www.flickr.com/photos/niaid/49597768397/in/album-72157712914621487/. Accessed April 19, 2020.

This document is a collection of efforts from students of Rush University. It provides brief reviews of research articles regarding COVID-19. We hope that this will be helpful to clinicians, students, community leaders, and the general public. This document, however, does not act as a replacement of the original source documents. Please use the DOI on each page to read more.

Is there a study you'd like us to review? Do you have questions or feedback?
Please email: Joseph_b_deBettencourt@rush.edu

Reviews are provided by students at Rush University and edited by Rush faculty. Level of evidence in each study, if applicable, was assessed using the Oxford guidelines as presented below. More information can be found at http://www.cebm.net/2016/05/ocebm-levels-of-evidence/

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non -randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

*** Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.**

**** As always, a systematic review is generally better than an individual study.**

How to cite the Levels of Evidence Table

OCEBM Levels of Evidence Working Group*. "The Oxford 2011 Levels of Evidence".

Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=5653

** OCEBM Table of Evidence Working Group = Jeremy Howick, Iain Chalmers (James Lind Library), Paul Glasziou, Trish Greenhalgh, Carl Heneghan, Alessandro Liberati, Ivan Moschetti, Bob Phillips, Hazel Thornton, Olive Goddard and Mary Hodgkinson*

Table of Contents: Public Health (1/4)

Section	Manuscript	Reviewer (Date Posted)
Public Health	Viner RM, et al. School closure and management practices during coronavirus outbreaks including COVID-19: A rapid systematic review. Lancet Child Adolesc Health 2020 [Epub ahead of print].	Joshua Doppelt (4/25)
	Berger ZD, et al. Covid-19: Control measures must be equitable and inclusive. BMJ 368:m1141, 2020.	Laura Hurley (4/25)
	Yancy CW. Covid-19 and African Americans. JAMA 2020 [Epub ahead of print].	Eiftu Haile (4/27)
	Kim, S et al. (2020). A Brief Telephone Severity Scoring System and Therapeutic Living Centers Solved Acute Hospital-Bed Shortage during the COVID-19 Outbreak in Daegu, Korea. Journal of Korean Medical Science, 35(15).	Josh Doppelt (5/3)
	Rosenbaum, L. (2020). The Untold Toll—The Pandemic's Effects on Patients without Covid-19. NEJM.	Laura Hurley (5/3)
	Atchison CJ et al. Perceptions and behavioural responses of the general public during the COVID-19 pandemic: Cross-sectional survey of UK adults. medRxiv 2020.04.01.20050039, 2020.	Katherine Tehaney (5/4)
	Cheng, Hao-Yuan et al. "Contact Tracing Assessment of COVID-19 Transmission Dynamics in Taiwan and Risk at Different Exposure Periods Before and After Symptom Onset." JAMA Internal Medicine (2020).	Josh Doppelt (5/9)
	Leung, K et al. "First-wave COVID-19 transmissibility and severity in China outside Hubei after control measures, and second-wave scenario planning: a modelling impact assessment." The Lancet (2020).	Josh Doppelt (5/9)
	Wadhera R et al. "Variation in COVID-19 Hospitalizations and Deaths Across New York City Boroughs." JAMA. Published online April 29, 2020; DOI:10.1001/jama.2020.7197	Josh Doppelt (5/18)
	Bayham J et al. "Impact of school closures for COVID-19 on the US health-care workforce and net mortality: a modeling study." The Lancet Public Health. Published Online, April 3, 2020; DOI: https://doi.org/10.1016/ S2468-2667(20)30082-7	Kat Tehaney (5/18)
	Wolf M et al. "Awareness, Attitudes, and Actions Related to COVID-19 Among Adults with Chronic Conditions at the Onset of the U.S. Outbreak". Annals of Internal Medicine. Published Online, April 9, 2020; DOI: 10.7326/M20-1239	Timothy Huang (5/18)
	Vardavas CI et al. COVID-19 and smoking: A systematic review of the evidence. Tobacco Induced Diseases. 2020;18(March):20. doi:10.18332/tid/119324.	Kelly Harmon (5/20)

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Section	Manuscript	Reviewer (Date Posted)
Public Health cont.	Zheng Z et al. Risk factors of critical & mortal COVID-19 cases: A systematic literature review and meta-analysis. J Infect 2020 [Epub ahead of print].	Kelly Harmon (5/20)
	Wang B et al. Does comorbidity increase the risk of patients with COVID-19: evidence from meta-analysis. Aging (Albany NY). 2020;12(7):6049-6057. doi:10.18632/aging.103000	Kelly Harmon (5/20)
	Roberton T et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study. Lancet Glob Health 2020 [Epub ahead of print].	Kat Tehaney (5/20)
	Xie X et al. Mental Health Status Among Children in Home Confinement During the Coronavirus Disease 2019 Outbreak in Hubei Province, China. JAMA Pediatr. Published online April 24, 2020. doi:10.1001/jamapediatrics.2020.1619	Kat Tehaney (5/21)
	Bialek S et al. Geographic Differences in COVID-19 Cases, Deaths, and Incidence - United States, February 12-April 7, 2020. MMWR Wkly Rep 69(15):465-471, 2020.	Eiftu Haile (5/21)
	Hawks L, Woolhandler S, McCormick D. COVID-19 in Prisons and Jails in the United States. JAMA Intern Med.Published online April 28, 2020. doi:10.1001/jamainternmed.2020.1856	Alice Burgess (5/23)
	Nussbaumer-Streit B et al., Quarantine alone or in combination with other public health measures to control COVID-19: a rapid review. Cochrane Database of Systematic Reviews 2020, Issue 4. Art. No.: CD013574. DOI: 10.1002/14651858.CD013574.	Kelly Harmon (6/1)
	Liu M et al., Internet searches for unproven COVID-19 therapies in the United States. JAMA Intern Med 2020 [Epub ahead of print].	Kat Tehaney (6/1)
	Yan L et al., An interpretable mortality prediction model for COVID-19 patients. Nat Mach Intell 2, 283–288 (2020). https://doi.org/10.1038/s42256-020-0180-7	Kat Tehaney (6/2)
	Joensen LE et al., Diabetes and COVID-19: psychosocial consequences of the COVID-19 pandemic in people with diabetes in Denmark-what characterizes people with high levels of COVID-19-related worries? [published online ahead of print, 2020 May 11]. Diabet Med. 2020;10.1111/dme.14319.	Kat Tehaney (6/2)
	Lai J et al., Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Netw Open. 2020;3(3):e203976. doi:10.1001/jamanetworkopen.2020.3976	Kat Tehaney (6/3)
	Martinez DA, et al. SARS-CoV-2 Positivity Rate for Latinos in the Baltimore-Washington, DC Region. JAMA. Published online June 18, 2020. doi:10.1001/jama.2020.11374	Ashley Wehrheim (6/26)

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Section	Manuscript	Reviewer (Date Posted)
Public Health cont.	Stadnytskyi V, et al. The airborne lifetime of small speech droplets and their potential importance in SARS-CoV-2 transmission. PNAS. 2020; 117 (22) 11875-11877. DOI: 10.1073/pnas.2006874117	Bijan Zarrabi (6/29)
	MacIntyre CR, et al. A rapid systematic review of the efficacy of face masks and respiratory against coronavirus and other respiratory transmissible Viruses. International Journal of Nursing Studies. August, 2020; 108 DOI: 10.1016/j.ijnurstu.2020.103629	Ashley Wehrheim (6/29)
	Price-Haywood EG, et al. Hospitalization and Mortality among Black Patients and White Patients with Covid-19. N Engl J Med. June, 2020; 382:2534-2543 DOI: 10.1056/NEJMsa2011686	Ashley Wehrheim (6/29)
	Steffen E. Eikenberry et al. To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic. Infectious Disease Modeling, 5 (2020), pp. 293-308	Kaitlyn Wehrheim (6/29)
	Ukachi N. Emeruwa et al. Associations Between Built Environment, Neighborhood Socioeconomic Status, and SARS-CoV-2 Infection Among Pregnant Women in New York City. JAMA. Published online June 18, 2020.	Ashley Wehrheim (6/29)
	McCormack, Grace, Christopher Avery, Ariella Kahn-Lang Spitzer, and Amitabh Chandra. "Economic Vulnerability of Households With Essential Workers." JAMA (2020).	Mohammed Abdul Sami (7/29)
	Cordes J. and Castro M. "Spatial analysis of COVID-19 clusters and contextual factors in New York City." Spatial and Spatio-temporal Epidemiology. July 21, 2020. DOI: 10.1016/j.sste.2020.100355	Ashley Wehrheim (8/5)
	Golestaneh L et al. "The association of race and COVID-19 mortality" The Lancet. July 14, 2020. DOI: 10.1016/j.eclinm.2020.100455	Ashley Wehrheim (8/5)
	Pan D et al. "The impact of ethnicity on clinical outcomes in COVID-19: A systematic review"The Lancet. June 3, 2020. DOI: 10.1016/j.eclinm2020.100404	Ashley Wehrheim (8/5)
	Chan NC, et al. Peripheral Oxygen Saturation in Older Persons Wearing Nonmedical Face Masks in Community Setting. JAMA. Published online October 30, 2020.	Amanda Narkis (12/1)
	Ochalek TA, et al. Nonfatal Opioid Overdoses at an Urban Emergency Department During the COVID-19 Pandemic. JAMA. Published online September 18, 2020.	Emilie Rembert (12/1)
	Wainwright JJ, et al. Analysis of Drug Test Results Before and After the US Declaration of a National Emergency Concerning the COVID-19 Outbreak. JAMA. Published online September 18, 2020	Emilie Rembert (12/1)

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Section	Manuscript	Reviewer (Date Posted)
Public Health cont.	Selden TM, Berdahl TA. Risk of severe COVID-19 among workers and their household members. JAMA. Published online, November 9, 2020.	Robert Roth (12/16)
	Patel SY, et al. "Trends in Outpatient Care Delivery and Telemedicine During the COVID-19 Pandemic in the US." JAMA Intern Med. (2020) doi: 10.1001/jamainternmed.2020.5928	Mohammed Abdul Sami (12/17)
	McGinty EE et al. "Psychological Distress and COVID-19-Related Stressors Reported in a Longitudinal Cohort of US Adults in April and July 2020." JAMA. 2020 Nov 23. doi: 10.1001/jama.2020.21231	Carter Do (12/17)
	Mesnier J et al. "Hospital admissions for acute myocardial infarction before and after lockdown according to regional prevalence of COVID-19 and patient profile in France: a registry study" Lancet. Sept. 17, 2020; doi: 10.1016/S2468-2667(20)30188-2	Mohammed Abdul Sami (2/18)
	Liotti FM et al. "Assessment of SARS-CoV-2 RNA Test Results Among Patients Who Recovered from COVID-19 With Prior Negative Results" JAMA Intern Med. Nov. 12, 2020; doi: 10.1001/jamainternmed.2020.7570	Christopher Szewczyk (2/18)
	Leventhal AM et al. "Association of Political Party Affiliation With Physical Distancing Among Young Adults During the COVID-19 Pandemic." JAMA Intern Med. December 14, 2020. doi:10.1001/jamainternmed.2020.6898	Melissa Porterhouse (2/25)
	Crane MA et al. "Change in Reported Adherence to Nonpharmaceutical Interventions During the COVID-19 Pandemic, April-November 2020." JAMA. January 22, 2021. doi:10.1001/jama.2021.0286	Melissa Porterhouse (2/25)
	Szilagyi PG, et al. "National trends in the US public's likelihood of getting a COVID-19 vaccine-April 1 to December 8, 2020." JAMA 325(4):396-398, 2020.	Melissa Porterhouse (3/24)
	Lowe KE, et al. "Association of smoking and cumulative pack-year exposure with COVID-19 outcomes in the Cleveland Clinic COVID-19 registry." JAMA Intern Med, 2021 [Epub ahead of print].	Robert Roth (3/24)
	Huskamp HA et al. "Treatment of Opioid Use Disorder Among Commercially Insured Patients in the Context of the COVID-19 Pandemic."JAMA Netw Open. doi: jama.2020.21512. 2020	Kat Tehaney (3/24)
	Anderson KE et al. "Reports of Forgone Medical Care Among US Adults During the Initial Phase of the COVID-19 Pandemic." JAMA Netw Open. Pub online January, 2021.	Kat Tehaney (3/24)
	Hamadani JD et al. "Immediate impact of stay-at-home orders to control COVID-19 transmission on socioeconomic conditions, food insecurity, mental health, and intimate partner violence in Bangladeshi women and their families: an interrupted time series." Lancet Glob Health. November, 2020.	Mohammed Abdul Sami (3/24)

PUBLIC HEALTH

School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review

Russell Viner et al.

The Lancet Child & Adolescent Health
April 6, 2020
DOI: https://doi.org/10.1016/S2352-4642(20)30095-X

Purpose	To understand the effectiveness of school closure and other school-based social distancing practices in affecting infection rates and transmission of coronaviruses during disease outbreaks.
Study design	Systematic Review (n=16 studies included)
Level of evidence	Level 1
Methods	Authors performed a systematic review of pre-prints and papers available in PubMed, the WHO Global Database on COVID-19, and medRxiv to assess the effects of school closure during coronavirus outbreaks with disease transmission.
Findings	Sixteen studies included from a total of 618 that predominantly covered coronavirus outbreaks in Asian countries during the early 21st century. **School closures on their own may be insufficient to mitigate coronavirus spread, versus the influenza virus where school closures show to be effective as primary mitigation tactic.** Authors acknowledged a UK study, which estimates that school closures may reduce total COVID-19 deaths by only 2-4% and highlights the need for school dismissal to prevent a serious outbreak.
Clinical Implications	School closures drastically reduce influenza transmission in the general population, however not with coronavirus. Data on coronavirus infections has shown school closures to be much less impactful as a primary mitigation factor in decreasing transmission in the general public.
Limitations	Seven of sixteen included studies have not been peer reviewed. Only one modeling study (not peer reviewed) compared school closures with other mitigating factors for COVID-19.

Covid-19: control measures must be equitable and inclusive

Zackary Berger et al.

The BMJ

April 21, 2020

DOI: https://doi.org/10.1136/bmj.m1141

Purpose	Highlight necessary efforts within COVID-19 response, notably free testing and employment rights, to most inclusively address needs of all individuals, including vulnerable populations
Study design	Editorial
Level of evidence	Not applicable
Methods	Not applicable
Findings	Provision of free testing for COVID-19, and healthcare for COVID-19-related concerns and pre-existing conditions, for all individuals is vital. This will support community mitigation efforts and relieve burden on emergency departments and walk-in clinics. Support should be provided for organizations addressing lack of housing, food and medication, especially with forced closures of supporting institutions (ex. schools). Employees should be provided financial support, in the event they require home quarantine or sick days, in order to best optimize community mitigation efforts. Healthcare workers and first responders should be provided the appropriate protective equipment and mental health resources, to address both physical and mental wellbeing.
Clinical Implications	Healthcare, for COVID-19-related concerns and pre-existing conditions, should be provided to everyone, including the homeless , udocumented immigrants , and others with poor healthcare access. Employment rights and protection should be provided. This includes allowing employees to prioritize individual and community health without fear of financial loss, as well as providing appropriate protective equipment and mental health resources for healthcare workers.
Limitations	The article is limited in its study design; as an editorial piece, it has strong references yet lacks higher level of evidence that could limit applicability. It highlights key considerations for city and state officials to address in their COVID-19 responses, but may require further analyses of their unique populations to better inform the details of most inclusive interventions.

COVID-19 and African Americans

Clyde W. Yancy
JAMA
April 15, 2020
DOI: 10.1001/jama.2020.6548

Purpose	Evaluate particular risk factors and social determinants of health negatively affecting health outcomes for African American patients with COVID-19.
Study design	Perspective/viewpoint article
Level of evidence	N/A
Methods	Review of available evidence to support the central claim: underserved minorities are developing COVID-19 more frequently and dying disproportionately (a 6-fold increase in the rate of death for African-American patients infected with coronavirus).
Findings	**In Chicago, greater than 50% of COVID-19 cases and approximately 70% of COVID-19 deaths involve black individuals, even though blacks only make up 30% of the population**. **Additionally, these deaths are more concentrated in 5 neighborhoods in Chicago's South Side.** This spread is similar in both Louisiana, Michigan, and New York City. There is a higher prevalence of known risk factors for COVID-19 complications (hypertension, diabetes, obesity, cardiovascular disease) in black patients. Social determinents of health further exacerbate risk factors (i.e. higher housing density impairing social distancing, poor access to healthy foods affecting immunity).
Clinical Implications	This viewpoint/perspective lends a historical and epidemiological dimension to the factual evidence that outcomes for African-Americans suffering with COVID-19 are worse. Author addresses this severe COVID-19 infection and death in black individuals to low socio-economic status and health care disparity.
Limitations	This is a viewpoint article and thus may have inherent bias from the author and also uses epidemiological studies which are prone to effects from confounding variables.

A brief telephone severity scoring system and therapeutic living centers solved acute hospital-bed shortage during the COVID-19 outbreak in Daegu, Korea

Shin-Woo Kim et al.

J Korean Med Sci
April 20, 2020
DOI: https://doi.org/10.3346/jkms.2020.35.e152

Purpose	To study the efficacy of telephone-based screening to determine the level of care coronavirus-positive individuals received during a hospital bed shortage in the COVID-19 pandemic.
Study design	Case series (n=6610)
Level of evidence	4
Methods	Physicians in Daegu (Korea) developed a remote screening tool for COVID-positive individuals during a hospital-bed shortage. This telephone screener utilized a point system for disease symptom severity, age, pre-existing conditions, and social factors. Based on point totals, individuals were sent to a tertiary hospital, public hospital, or therapeutic living center to quarantine. This protocol was put in place on February 29th presumably through March 29th, 2020.
Findings	**Only 81/3033 (2.67%) patients admitted to therapeutic living centers for quarantining were transferred to the hospital for higher level care.** Only three patients out of 6,610 cumulative cases, between February 18th and March 29th, died at home while awaiting a hospital bed.
Clinical Implications	In the event of hospital bed shortage, health systems will need to quickly determine which level of care each patient needs in order to be efficient with resources. While this study has numerous limitations, remote screening tools may be an effective way to triage patients with known COVID-19 prior to hospital arrival. The US does not have sufficient community screening for most individuals to know their COVID-19 status, which hinders this protocol from being effective in the US. However, if community testing increases, remote screening like this may warrant further study.
Limitations	Authors did not specify where the COVID-positive patients are tested (community vs in hospital setting). They did not have a clear end date listed for the study, so we do not know how long this protocol was studied for. The data also does not clearly indicate that remote screening decreased the number of persons waiting for hospital beds in the setting of a decrease in new COVID-19 cases in Daegu.

The Untold Toll – The Pandemic's Effects on Patients without Covid-19

Lisa Rosenbaum

The New England Journal of Medicine
April 17, 2020
DOI: 10.1056/NEJMms2009984

Purpose	To highlight the impact of COVID-19 pandemic on non-COVID-19 patients, their experience navigating care during the pandemic, and health outcomes.
Study design	Editorial
Level of evidence	5
Methods	N/A
Findings	**-Patients receiving cancer-related treatment have been forced to delay maintenance therapies and related procedures** due to risk of immunosuppression, potential need for high-demand resources (ie. ICU), and high-exposure risk due to significant hospital time. Others are receiving therapies in re-adjusted sequences; for example, delaying surgery and receiving systemic treatment first instead for select solid cancers. -**Many procedures identified as 'elective' are not necessarily elective; these cases must be examined on a case-by-case basis**; broad delay of such interventions, notably cardiac-related cases, may inappropriately prohibit care for patients who otherwise only have weeks to months to live. -**Consideration of exposure risk, for patients and healthcare workers, has resulted in significant negative changes in patient experience**; experiences cited include difficult multi-disciplinary discussions conducted over the phone, and limited visitor hours, creating an emotional, financial and physical toll on patients and loved ones.
Clinical Implications	Previously known standards of care for all patients, notably those seeking care for non-COVID-19 related illnesses, have been challenged by balancing the safety and needs of patients, protection of healthcare workers, and threatened depletion of necessary resources. - Intentional gestures from physicians, such as communicating reasoning for newly changed therapy options or procedure timeline, have helped patients feel cared for and understood despite decreased patient contact and increased telehealth consultations.
Limitations	The study contains primarily anecdotal experiences of providers and patients in New York; the small representation and limited geographical sampling may not adequately capture the larger population experience. However, this chosen location of New York has experienced significant COVID-19 burden. Additionally, anecdotal experiences do play a valuable role as we continuously aim to close the gap in our understanding of COVID-19, develop an appropriate response and protocols, and grasp the impact on all individuals.

Perceptions and behavioural responses of the general public during the COVID-19 pandemic: Cross-sectional survey of UK adults

Christina J Atchison et al.

medRxiv preprint
April 3, 2020
DOI: https://doi.org/10.1101/2020.04.01.20050039

Purpose	To examine risk perceptions, behavioral responses, and intention to comply with non-pharmaceutical interventions (NPIs) of the UK adult population during the early phase of the COVID-19 pandemic in the UK.
Study design	Cross-sectional survey (n=2108)
Level of evidence	Level 3
Methods	A survey was emailed to a nationally representative sample of UK adults and administered by YouGov (a market research company) between March 17-18, 2020. The questionnaire had four components: socio-demographic characteristics, risk perceptions towards COVID-19, preventative behaviors, and willingness and ability to self-isolate. Data was collected and sent to Imperial College London research team for analysis.
Findings	94.2% (n=1,992) of respondents reported at least one preventative measure: 85.8% washed their hands more frequently, 56.5% avoided crowded areas and 54.5% avoided social events. Adoption of social distancing was higher in those aged over 70 compared to ages 18-34. Those with the lowest household income were 6 times less likely to be able to work from home (adjusted odds ratio, aOR: 0.16) and 3 times less likely to be able to self-isolate (aOR: 0.31). Ability to self-isolate was also lower in black and minority ethnic groups (aOR: 0.47). Willingness to self-isolate was high across all respondents.
Clinical Implications	· This study highlights the barriers that those in lower socio-economic groups face and predicts that the impact of this pandemic will be felt unequally in our society. The study recommends governments implement appropriate social and economic policies to mitigate this. · Incorporating differences in non-pharmaceutical intervention adherence among socio-economic subpopulations can improve mathematical models of transmission and outcomes.
Limitations	The study was limited by the online survey, which responses of those without internet access were under-represented. Second, the survey tool used predominantly closed-ended questions, limiting the ability explore responses in more depth. Finally, using self-report data has limitations including honesty, introspective ability, and question interpretation. This study still has to be peer-reviewed.

Contact tracing assessment of COVID-19 transmission dynamics in Taiwan and risk at different exposure periods before and after symptom onset

Hao-Yuan Cheng et al.

JAMA Network
May 1, 2020
DOI: 10.1001/jamainternmed.2020.2020

Purpose	To better understand COVID-19 transmission dynamics through determining transmission risk at exposure windows before and after symptom onset.
Study design	Prospective case-ascertained study (100 confirmed COVID-19 positive and 2761 close contacts)
Level of evidence	4
Methods	Authors utilized contact tracing to study transmission dynamics of COVID-19 with the first 100 confirmed cases (by RT-PCR) in Taiwan. These 100 patients had 2761 close contacts. Researchers looked at transmission rates when pre and post symptomatic. They compared rates of transmission between index cases' contacts to determine the variation between community and healthcare contacts. Contacts were tested for secondary spread when they became symptomatic. This study was conducted between January 15th and March 18th, 2020.
Findings	Of the 100 confirmed patients' 2761 close contacts there were 22 secondary cases, with **an infection risk of 0.8 %**. Of the 22 cases, only 18 were symptomatic showing a **secondary clinical attack rate of 0.7%. All 22 secondary cases had their first exposure before the sixth day of index case's symptom onset**. A total of 735 contacts had initial exposure before symptom onset with a secondary clinical attack rate of 1.0%. **Attack rates were higher among family and household than healthcare contacts** with secondary clinical attack rates of 5.3% and 4.6% vs. 0.9%, respectively.
Clinical Implications	**In early stages of infection, when pre-symptomatic and in the first few days of being symptomatic, transmission is highest.** Transmission is also higher among community contacts than in healthcare contacts. Notably people tend to have mild symptoms at onset. This study reinforces the need for social distancing and other preventive measures to avoid early phase transmission prior to development of symptoms.
Limitations	This study gives an incomplete picture of the early transmission period, due to incompletely examining contacts before symptom onset. This may lead to an underestimate of early phase transmission. Additionally, contacts were only tested for COVID-19 if they developed symptoms, not testing all contacts to determine asymptomatic spread. Studies with more rigorous testing are needed to better understand transmission dynamics.

First-wave COVID-19 transmissibility and severity in China outside Hubei after control measures, and second-wave scenario planning: A modelling impact assessment

Kathy Leung et al.

The Lancet
April 8, 2020
DOI: https://doi.org/10.1016/S0140-6736(20)30746-7

Purpose	To assess transmissibility and fatalities in response to non-pharmaceutical intervention versus relaxation during the first wave of COVID-19 in China, outside of Hubei (epicenter) and to estimate a model for a second wave upon reopening the economy and relaxing social restrictions.
Study design	Modeling study (health records for 4 cities and 10 provinces are included)
Level of evidence	5
Methods	Authors utilized publicly available health information to chart an epidemic curve for Shanghai, Beijing, Wenzhou, and Shenzhen between January 20th and February 20th, 2020. They collected patient and hospital data for travel and contact with people from Hubei province (epicenter) as well as time from first symptoms to healthcare setting presentation or death to assess instantaneous reproduction number (Rt) and confirmed case-fatality risk (cCFR) in relation to change in policy (i.e., beginning social distancing, stopping school, and reopening portions of the economy). Rt was defined as the average number of secondary cases generated by one primary case with symptom onset on day t.
Findings	- **Non-pharmaceutical interventions, including social distancing and population behavioral change, decreased fatalities and Rt below 1.** - **Opening the economy quickly led to a spike, with Rt above 1.0 and increased cCFR. At this point, the duration of intervention needed to reduce Rt was greater than the economic opening period.** - Intervention measures to counteract the rise in Rt **took a much longer time to bring Rt down below 1.0 than the duration of relaxed economic policies**.
Clinical Implications	- As Rt increases above 1.0 it takes exponentially longer to get those levels back below 1.0, making tracking those levels essential to developing policies to intervene. - Relaxing control measures leads to an exponential rise in Rt. - Maintaining an Rt less than or equal to 1.0 is likely the optimal strategy to reduce a surge in cases until a vaccine is developed. - Through increased COVID-19 screening it may be possible to tightly monitor the Rt and enable policy makers to balance economic needs with risk of a worsened second wave.
Limitations	Data collection was not universal across cities and provinces, and as such categories of data collected varied, as did the quality of data. We must question reporting quality and accuracy of Rt and cCFR, especially as one province reported a cCFR of 0.00, which is highly unrealistic considering the scope and impact of this pandemic. This study also only shows correlations between specific policy changes with Rt and cCRT, not direct causation.

Variation in COVID-19 Hospitalizations and Deaths Across New York City Boroughs

Rishi Wadhera et al.

Journal of the American Medical Association
April 29, 2020
DOI: 10.1001/jama.2020.7197

Purpose	To understand patterns in COVID-19 hospitalizations and deaths in five New York City boroughs (Bronx, Brooklyn, Manhattan, Queens, and Staten Island) in relation to race and socioeconomic status.
Study design	Research Letter (n = 8,398,748)
Level of evidence	Level 5
Methods	The following available data bases were used to outline patterns of COVID-19 outcomes through April 25, 2020: American Community Survey to understand population characteristics; American Hospital Association 2016 file and manual search for hospitals and their capacity; New York City Department of Health and Mental Hygiene for number of hospitalizations and deaths per borough. Both lab confirmed and probable COVID-19 cases were included.
Findings	The **Bronx had the highest deaths and hospitalization** (634 and 224/100,000 persons respectively) of all boroughs and consisted of the highest percent African Americans (38.3%), lowest household median income ($38,467), and lowest proportion of bachelor's degree holders (20.7%). **Manhattan was least affected** with 331 hospitalizations and 122 deaths per 100,000, demonstrating the highest median household income ($85,066) and percentage of bachelor's degree holders (61.4%). No notable association found between lack of hospital beds, percentage of elderly adults, number of hospitals or hospital beds and hospitalization or death.
Clinical Implications	These findings help illustrate **disproportionate morbidity and mortality due to COVID-19 in African American neighborhoods**. This study shows an association of poor outcomes for COVID-19 infection in New York City with African American race, low household income, and lower educational level. Understanding these patterns may inform preventive polices to mitigate ongoing spread.
Limitations	This study's ecological design **only shows correlation**. Additionally, **rate of testing for COVID-19 was not evaluated**, which would have been important to understand given the variability in testing.

Impact of school closures for COVID-19 on the US health-care workforce and net mortality: a modelling study

Jude Bayham et al.

The Lancet Public Health
April 3, 2020
DOI: https://doi.org/10.1016/S2468-2667(20)30082-7

Purpose	To measure child-care obligations for US health-care workers arising from school closures and assess the contribution of health-care workers in reducing mortality to calculate the net mortality reduction.
Study design	Modelling analysis
Level of evidence	Level 5
Methods	Data from the US Current Population Survey was utilized to identify areas of the health-care workforce most impacted by school closures. The goal of the modeling was to identify the conditions where school closures would no longer help to save lives due to health-care workers having to stay home because of child-care obligations. The following were assumed: 15% case reduction from school closures, 2.0% baseline mortality rate for COVID-19.
Findings	28.8% (95% CI 28.5-29.1) of the health-care workforce requires child-care for children aged 3-12 years and 15% (95% CI 14.8-15.2) do not have a non-working adult or a child 13 years or older to provide care at home. States with the greatest child-care obligations include Utah (35.4%, 95% CI 32.9-37.9), Louisiana (35.0%, 33.1-36.8), and Missouri (34.0%, 31.5-36.5). The infection mortality rate of COVID-19 increases from 2.0% to 2.35% when the health-care workforce declines by 15.0% with school closures.
Clinical Implications	This study highlights the obstacles faced by those in lower socio-economic groups and predicts the unequal impact of this epidemic on varying groups in society. It recommends that governments implement appropriate social and economic policies to mitigate this disproportionate impact.
Limitations	The analysis did not model family members outside of the household, such as neighbors or friends, that may help care for children in a primary caregivers absence. The information about social distancing policies is based on models of influenza, in which children are a vulnerable group for morbidity, whereas children do not appear to be a sensitive group to COVID-19.

Awareness, Attitudes, and Actions Related to COVID-19 Among Adults with Chronic Conditions at the Onset of the U.S. Outbreak

Michael Wolf et al.

Annals of Internal Medicine
April 9, 2020
DOI: https://doi.org/10.7326/M20-1239

Purpose	To assess COVID-19 awareness, knowledge, attitudes, and related behaviors among vulnerable U.S. adults.
Study design	Cross-sectional survey linked to the Chicago COVID-19 Comorbidities (C3) Survey. (n=630).
Level of evidence	Level 2
Methods	Authors gathered data from the ongoing Chicago COVID-19 Comorbidities Survey to interview high risk, older adults with at least 1 or more chronic conditions who would be at greater risk for COVID-19. During the period between March 13th to March 20th, participants were asked to answer items from a questionnaire used to study prior outbreaks.
Findings	28.3% of the participants could not correctly identify symptoms and 30.2% did not know methods to prevent infection. 24.6% of adults believed that they were "not at all likely" to get the virus, and 21.9% reported that COVID-19 did not impact their daily routine. Women, African American, and Hispanic persons, individuals with Limited English Proficiency (LEP), living below the poverty level, lower health literacy, and unmarried were more likely to believe that it was "not at all likely" they would contract COVID-19. African American participants, individuals living below the poverty level, and those with low health literacy were more likely to be less worried about COVID-19, to not believe they would become infected, and to feel less prepared for an outbreak.
Clinical Implications	**Existing efforts are not adequate in reaching vulnerable populations** and more public health efforts need to be taken to help disseminate critical information about COVID-19.
Limitations	This is a cross-sectional study of adults with underlying health conditions in 1 American city **during the initial week of the COVID-19 outbreak** and what was reported has likely changed considerably.

COVID-19 and smoking: A systematic review of the evidence

Constantine Vardavas et al.

Tobacco Induced Diseases
March 20, 2020
DOI: https://doi.org/10.18332/tid/119324

Purpose	To evaluate the association between smoking and COVID-19 outcomes including severity of disease, need for mechanical ventilation, need for ICU hospitalization, and death.
Study design	Literature Review (n=41-1099)
Level of evidence	Level 4
Methods	The literature search was conducted on March 17, 2020, using two databases (PubMed, ScienceDirect), with the following search terms: ['smoking' OR 'tobacco' OR 'risk factors' OR 'smoker*'] AND ['COVID-19' OR 'COVID 19' OR 'novel coronavirus' OR 'sars cov-2' OR 'sars cov 2']. Studies published in 2019 and 2020 were included. A total of 71 studies were retrieved, of which 66 were excluded after full-text screening, leaving five studies that were included. Retrospective and prospective methods were used. The time frame of all five studies included the first two months of the COVID-19 pandemic (December 2019, January 2020). All studies were conducted in China, four in Wuhan and one across multiple provinces in mainland China. Sample sizes of the included studies range from 41 to 1099 patients.
Findings	Guan et al. (n=1099) found that smokers were 2.4 times more likely to be admitted to an ICU, require mechanical ventilation, or die when compared to non-smokers (relative risk, RR: 2.4). Liu et al. (n=78) reported that in those with a history of smoking, there was increased likelihood of adverse outcomes and risk of disease progression (p=0.018). Zhou et. al. (n=191) reported a no statistically significant difference in mortality between smokers and non-smokers (p=0.21). Huang et al. (n=41) found no statistically significant difference in likelihood of ICU admission between smokers and non-smokers (p=0.31). Zhang et al. (n=140) also showed no statistically significant difference in severity of infection among smokers vs. non-smokers (odds ratio, OR: 2.23; p=0.2).
Clinical Implications	Although the data presented in this review require confirmation and adjustment for other risk factors, it should be noted that smoking may increase the rate of adverse events and outcome, such as ICU admission, mechanical ventilation, or death; therefore, smokers should strictly adhere to social distancing guidelines.
Limitations	The reviewed studies reported conflicting results; therefore, minimal conclusions may be drawn from this systematic review. All the studies included were conducted in China, which has a higher rate of smoking than countries like the United States (25.6% vs. 21.8%), limiting generalizability. In addition, some of the studies had a relatively small number of participants, thereby limiting their application to larger populations.

Risk factors of critical & mortal COVID-19 cases: A systematic literature review and meta-analysis

Zhaohai Zheng et al.

Journal of Infection
April 23, 2020
DOI: 10.1016/j.jinf.2020.04.021

Purpose	To find risk factors for the progression of COVID-19 to help reduce the risk of critical illness and death.
Study design	Meta-analysis (n=3027)
Level of evidence	Level 1
Methods	Studies published between January 1, 2020 and March 20, 2020, by searching Pubmed, Embase, Web of Science, and CNKI were selected. The search terms and relative variants included: "severe acute respiratory syndrome coronavirus 2", "Wuhan coronavirus", "Wuhan seafood market pneumonia virus", "COVID-19", "COVID19", "coronavirus disease 2019 virus", "SARS-CoV-2", "SARS2", "2019-nCoV" or "2019 novel coronavirus" and "Mortalities", "Mortality", "Fatality", "Death", "acute respiratory distress syndrome (ARDS)" or "ICU". Authors also reviewed the references of included articles to guarantee the comprehensiveness and accuracy of research. Thirteen studies were included with a total of 3027 SARS-CoV-2 positive patients. Inclusion criteria consisted of study sample size greater than 20, confirmed infection by 2019 novel coronavirus, and presence of critical illness (defined as death) and non-critical illness. The following study designs were included: randomized controlled trials, nonrandomized controlled trials, case-control studies, cohort studies, cross-sectional studies, and case reports.
Findings	Disease progression was associated with male gender ($p<0.00001$), age >65 years ($p<0.00001$), and current smoking ($p=0.0006$). Critical patients were more likely to have underlying disease such as diabetes ($p< 0.00001$), hypertension ($p=0.0002$), cardiovascular disease ($p<0.00001$), or respiratory disease ($p<0.00001$).
Clinical Implications	The study provides guidance on vulnerable populations with COVID-19. The following individuals should adhere to strict social distancing guidelines given increased risk for disease progression: male, older than 65, or smokers. Individuals with the following comorbidities should adhere to strict social distancing guidelines due to increased risk of critical illness: hypertension, diabetes, cardiovascular disease, and respiratory disease.
Limitations	Many of the articles included were cross-sectional studies, limiting the study's casual association. Much of the patient population was Chinese, which may limit the studies broader application amongst other races and nationalities.

Does comorbidity increase the risk of patients with COVID-19: evidence from meta-analysis

Bolin Wang et al.

Aging (Albany NY)
April 8, 2020
DOI: https://doi.org/10.18632/aging.103000

Purpose	To assess the prevalence of comorbidities in COVID-19 patients and the risk of underlying disease in these infected patients.
Study design	Meta-analysis (n=1558)
Level of evidence	Level 1
Methods	Meta-analysis was performed according to the Preferred Reporting Items for Systematic reviews and Meta-analysis (PRISMA) statement. Relevant literature was identified using PubMed (Medline), EMBASE, Springer, Web of Science, and Cochrane Library databases up to March 1, 2020, using the following terms: "2019-nCoV" or "Coronavirus" or "COVID-19" or "SARS-CoV-2" or "2019-nCoV" or "Wuhan Coronavirus." Two participants conducted separate literature screenings, data extraction, and literature quality evaluations, with resolution of differences through discussion or third analyst. Researchers chose studies reporting the relationship between comorbid health conditions and outcomes related to COVID-19. Inclusion criteria consisted of the following comorbidities: hypertension, diabetes, chronic obstructive pulmonary disease (COPD), liver disease, malignancy, renal disease, cardiovascular disease, and cerebrovascular disease. Studies were excluded if the design was that of a case report, review, or discussion summary. Studies with insufficient data and those that did not stratify patients by degree of severity were also excluded. Six retrospective studies from China met the inclusion criteria with a total of 1558 patients.
Findings	COVID-19 patients with hypertension, diabetes, or COPD demonstrated increased risk of disease exacerbation ($p<0.001$). Cardiovascular disease was found to be a significant risk factor for infection with COVID-19 ($p<0.001$). Concurrent cerebrovascular disease was associated with severe COVID-19 ($p=0.002$). Previous history of liver disease and presence of a malignant tumor or kidney disease did not significantly increase the risk of disease progression ($p=0.070$).
Clinical Implications	Comorbidities are risk factors for COVID-19 patients. Individuals diagnosed with hypertension, diabetes, COPD, cardiovascular disease, and cerebrovascular disease should adhere to strict social distancing guidelines given their increased risk for COVID-19 infection and disease progression.
Limitations	Criteria for severe vs. non-severe patients was not uniform amongst the studies included. In addition, some studies included patients diagnosed with more than one comorbidity, thereby interfering with the ability to correlate COVID-19 infection and severity to one specific diagnosis. All the studies were comprised entirely of Chinese participants, which may limit the generalizability of study findings.

Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study

Timothy Roberton et al.

The Lancet Global Health
date published
DOI: https://doi.org/10.1016/S2214-109X(20)30229-1

Purpose	To estimate the additional maternal and under-5 child deaths resulting from the potential disruption of health systems and decreased access to food.
Study design	Modelling analysis
Level of evidence	Level 5
Methods	Three scenarios were modelled with varying provisions of health services and utilizations of health services, with small, moderate, and severe reductions. The Lives Saved Tool (LiST) was used to estimate the additional maternal and under-5 child deaths under each scenario in 118 low- and middle-income countries for 1-month period and extrapolated for 3, 6, and 12 months.
Findings	Results from small (scenario 1) to severe reductions (3) showed an additional 9.8-44.7% increase in under-5 child deaths and 8.3-38.6% increase in maternal deaths per month. The largest contribution to maternal death across all scenarios was due to disruption in parental administration of uterotonics, antibiotics, anticonvulsants, and clean birth environments, accounting for approximately 60% of the additional maternal deaths. The largest contributor to child death across all scenarios was reduced coverage of antibiotics for pneumonia and neonatal sepsis, and oral rehydration solution for diarrhea, accounting for ~41% of additional child deaths. The increase in wasting prevalence accounted for 18-23% of additional child deaths.
Clinical Implications	This study primarily demonstrates that government responses, whether intentional or unintentional, will have an impact on maternal and child health. It also shows that not all health interventions are equally susceptible or will have equal effects, therefore some interventions should be prioritized. Finally, it highlights the need for interventions to mitigate increases in wasting.
Limitations	Analysis was limited by the LiST program being constrained to a defined set of health-sector interventions, thereby the effects of income, agriculture, or food markets on wasting were directly modified instead of estimated. Also, LiST was not able to capture individual infectious disease dynamics or predict potential effects of secondary outbreaks. These limitations, however, would result in an overly conservative estimate and actual increases in mortality would be greater.

Mental Health Status Among Children in Home Confinement During the Coronavirus Disease 2019 Outbreak in Hubei Province, China

Xinyan Xie et al.

Journal of the American Medical Association Pediatrics
April 24, 2020
DOI: 10.1001/jamapediatrics.2020.1619

Purpose	To investigate presence of anxiety and depressive symptoms among students in Hubei province, China following nationwide school closures.
Study design	Cross-sectional survey
Level of evidence	Level 3
Methods	A survey was sent to guardians of 2330 students from two schools in Hubei province in grades 2-6. The survey was completed between February 28, 2020 to March 5, 2020, ~1 month following school closures. In total, 1784 participants (56.7% boys) completed the survey. The Children's Depression Inventory-Short Form (CDI-S) and the Screen for Child Anxiety Related Emotional Disorders were used to assess symptoms of depression and anxiety. Generalized linear regressions were used for continuous variables and logistic regressions for binary variables.
Findings	22.6% and 18.9% of students reported symptoms of depression and anxiety respectively. Students living in Wuhan had significantly higher CDI-S scores compared to those in Huangshi (β, 0.092), with a greater risk of depressive symptoms (odds ratio, OR: 1.426). No significant association was found between demographic characteristics and symptoms of anxiety. Those who reported feeling slightly or not worried about infection with COVID-19 had significantly lower CDI-S scores (β, –0.184) and a decreased risk of depressive symptoms (OR: 0.521) than individuals feeling quite worried. In addition, students who were not optimistic about the epidemic were found to have significantly higher CDI-S scores (β, 0.367) and an increased risk of depressive symptoms (OR: 2.262) than those who were quite optimistic.
Clinical Implications	This study demonstrates that symptoms of depression and anxiety are experienced to a greater degree by students worried about COVID-19 infection and by those lacking optimism about the epidemic. This study suggests that **pandemics have the capacity to negatively influence a child's mental health**, **particularly when closure of schools is required**, resulting in home confinement and social isolation. Governments, schools, and social services need to allocate resources to adequately respond to the mental health needs of children.
Limitations	The survey was sent to each student's guardian electronically leaving potential for someone other than the intended student to complete the survey. Also, the design of the study did not allow us to conclude with certainty whether these emotional symptoms should be interpreted as short-term, normal psychological responses, or early signs of long-term psychiatric problems.

Geographic Differences in COVID-19 Cases, Deaths, and Incidence - United States, February 12–April 7, 2020

Stephanie Bialek et al.

Morbidity and Mortality Weekly Report
April 17, 2020
DOI: http://dx.doi.org/10.15585/mmwr.mm6915e4

Purpose	To describe the geographic distribution, related deaths, and estimated geographic incidence of COVID-19 in the United States and estimate the national and jurisdiction-specific case doubling times.
Study design	Cumulative case review
Level of evidence	Level 5
Methods	Analysis of the geographic distribution of all laboratory-confirmed COVID-19 cases reported to the Centers for Disease Control and Prevention (CDC) during February 12, 2020–April 7, 2020.
Findings	Two thirds of all cases reported in the US as of April 7 (395,926) were concentrated in 8 jurisdictions, including NYC (76,876), NY (61,897), NJ (44,416), and MI (18,970). The overall cumulative COVID-19 incidence was 119.6 cases per 100,000 population (ranging from 20.6 to 915.3 cases per 100,000 in Minnesota and NYC, respectively). The national doubling time was 6.5 days (highest in Louisiana at 5.5 days; lowest in NYC at 8 days). 98.2% (55/56) of jurisdictions reported at least one related death, but 52.7% of all deaths (12,757) occurred in NYC, NY, and NJ. Case-fatality ratios ranged from 0.7% in UT to 5.7% in KY.
Clinical Implications	This report highlights geographic differences in cases of COVID-19 mortality rate, incidence, and changing incidence. Significant geographic differences exist regarding COVID-19 (including timing of COVID-19 introductions, population density, etc.), which will play a profound role in local, state, and national mitigation measures and healthcare resource allocation strategies.
Limitations	The findings are limited by the expected underestimation of cases and reported deaths given incomplete detection, delays in reporting, as well as incomplete follow-up on reported COVID-19 cases and deaths. This data may minimize the current effects of community mitigation occurring within smaller geographic areas that are often grouped with areas experiencing higher disease burden.

COVID-19 in Prisons and Jails in the United States

Laura Hawks et al.

Journal of the American Medical Association Internal Medicine
April 28, 2020
DOI: 10.1001/jamainternmed.2020.1856

Purpose	To outline the public health risk of COVID-19 spreading through American prisons/jails, and to propose strategies to mitigate this risk.
Study design	Expert opinion
Level of evidence	Level 5
Methods	N/A
Findings	Prisoners are at an increased risk for COVID-19 infection due to the inability to enact adequate social distancing policies, a prison population with a large percentage of individuals in high risk categories, and poor access to appropriate health care. Suggested strategies to ameliorate disease burden on the incarcerated population and prison staff include low, medium, and high-risk strategies. Low impact recommendations include increasing availability of personal protective equipment (PPE), increased testing, eliminate copayments/policies that deter inmates from seeking care. Medium impact recommendations include reducing unnecessary jail-time, expedite prison release when appropriate, and release pretrial detainees. High impact recommendations include releasing those in high risk categories (over 55 years of age, underlying health conditions, etc.), those convicted of nonviolent crimes, and those with less than 2 years of their sentence remaining. These steps would pose little risk to public safety.
Clinical Implications	The impact of COVID-19 infection spreading through prisons has important implications for Chicago hospitals, and the West Side Rush Medical Center community in particular: Cook County jail has reported that over 350 incarcerated persons and staff members have tested positive for SARS-CoV-2 as of early April 2020. This is the highest total caseload of any single site in the country. These inmates receive care at Stroger, increasing the risk of virus spread to more patients and hospital staff. Doctors must be public health advocates who support bold policy changes to minimize the catastrophe brewing in prisons and jails. Furthermore, both congressional legislation and administrative action are needed as quickly as possible to mandate nationwide plans to minimize the toll of the pandemic.
Limitations	This article is an opinion piece, rather than a formal research study, limiting its impact.

Quarantine Alone or in Combination With Other Public Health Measures to Control COVID-19: A Rapid Review

Barbara Nussbaumer-Streit et al.

Cochrane Database of Systematic Reviews

April 8, 2020

DOI: 10.1002/14651858.CD013574

Purpose	To assess the effects of quarantine alone or in combination with other measures on the spread of COVID-19.
Study design	Literature Review (n=29 studies)
Level of evidence	Level 4
Methods	This rapid review included literature published between January 1, 2002 and March 12, 2020. Studies that assessed the effect of quarantine alone or in combination with other measures (isolation, social distancing, school closures, hand hygiene) were included. As COVID-19 is relatively new, authors included studies on similar viruses (SARS and MERS) to incorporate more evidence. 30% of abstracts in this study were dually screened and 70% were screened by one reviewer. Case reports and systematic reviews were excluded. 229 studies (10 focused on COVID-19, 15 on related evidence on SARS, 2 on SARS and other viruses, and 2 on MERS) met the inclusion criteria.
Findings	Ferguson et. al. found that case isolation, voluntary quarantine, and social distancing of individuals greater than 70 years of age could have prevented 49% of deaths and reduced critical care bed usage by 67% in the UK. Choi et. al. modeled that prevention and control measures reduced the transmission rate by 90-99% in South Korea. Zhao et. al. noted that without any prevention or control measures, China would have had greater than 800 million COVID-19 cases with an epidemic duration of 477 days. Geng et. al. reported that community quarantine and school closures in China reduced the peak of transmissions by 45.7% and 29.9%, respectively. Regarding the 2003 SARS outbreak in South Korea, Hsieh et. al. reported that quarantining travelers from high risk regions prevented 511 cases and 70 deaths. If quarantine measures had been implemented sooner, 280 cases and 48 deaths could have been prevented.
Clinical Implications	Given the asymptomatic period of COVID-19 infection, health officials may struggle to mandate isolation of asymptomatic patients and those with known sick contacts. Individuals should adhere to social distancing guidelines as quarantine practices have demonstrated success in limiting the strain on healthcare systems and infection-related morbidity and mortality. While quarantine efforts have been shown to be effective in the short-term, they may result in a more robust delayed epidemic due to the lack of herd immunity.
Limitations	Studies included were limited to those in English and Chinese, which may have excluded several studies. Time of assumed infectivity varied between the studies, which may have altered modeling and led to uncertainties when predicting the time to relaxation of quarantine and other public health measures. Comparison between SARS and COVID-19 are limited in that models assume SARS and MERS begin with symptomatic transmission, but not COVID-19. There was no dual independent assessment for risk of bias and rating of quality of evidence.

Internet Searches for Unproven COVID-19 Therapies in the United States

Michael Liu et al.

Journal of the American Medical Association Internal Medicine
April 29, 2020
DOI: 10.1001/jamainternmed.2020.1764

Purpose	To better understand the scope of demand for chloroquine and hydroxychloroquine to prevent or treat COVID-19 infection by individuals not under supervision by a licensed physician through examination of internet searches indicative of attempts to purchase these drugs.
Study design	Retrospective
Level of evidence	Level 4
Methods	Researchers examined daily Google searches from February 1, 2020 to March 29, 2020, splitting the time period into three sections: February 1, 2020 to March 16, 2020, all days after March 16, 2020, the date Elon Musk endorsed chloroquine and hydroxychloroquine as the standard of care (i.e., when knowledge of the drugs was widespread), and all days after March 22nd, when news outlets began reporting chloroquine related poisonings. Authors then compared volumes of Google searches originating from the US including the terms: buy, order, Amazon, eBay, or Walmart in combination with chloroquine or hydroxychloroquine. The proportion of such searches per 10 million total searches were examined using Google Trends. Expected volumes were calculated using forecasting approaches such as Hyndman and Khandakar's algorithm.
Findings	Queries for purchasing chloroquine and hydroxychloroquine were increased by 442% and 1389% respectively following high-profile claims that these drugs were effective COVID-19 therapies. The first spike in searches corresponded with entrepreneur Elon Musk's tweet on March 16th, and the largest spike in searches corresponded with US President Donald Trump's first televised endorsements on March 19th. After news reports of the first fatal poisoning on March 22nd, searches remained above expected levels with chloroquine at 212% and hydroxychloroquine at 1167%.
Clinical Implications	High-profile figures endorsing drug therapies not supported by adequate evidence can lead to negative consequences, particularly when the drugs are commercially available within non-medical products (i.e., chloroquine phosphate, an aquarium cleaner). Public health agencies should take steps to warn the public against unapproved therapies unless prescribed, especially surrounding endorsement by high-profile figures.
Limitations	This study was limited by the design which only used Google searches and restricted online markets to Amazon, eBay, and Walmart (top 3 e-commerce companies). The scope of searches could have been improved by using additional terms, e-commerce companies, and languages other than English. It is likely that these limitations led to underestimation of the demand for chloroquine and hydroxychloroquine through online markets.

An interpretable mortality prediction model for COVID-19 patients

Li Yan et al.

Nature Machine Intelligence
May 14, 2020
DOI: https://doi.org/10.1038/s42256-020-0180-7

Purpose	To identify the most crucial biomarkers associated with patient mortality to distinguish those at imminent risk, thereby decreasing clinical burden and potentially reducing the COVID-19 mortality rate.
Study design	Retrospective case report (n=485)
Level of evidence	Level 4
Methods	The medical records of 375 patients from Tongji Hospital in Wuhan, China were collected between January 10-February 18, 2020 with an additional 110 patient records collected between February 19-24, 2020 to serve as an external test dataset. The Multi-tree XGBoost algorithm was used to assess the contribution of individual patient parameters (e.g., basic information and symptoms) in addition to laboratory data (e.g., blood samples, liver function, kidney function, coagulation function, electrolytes and inflammatory factors). The data were also used to create a simplified and clinically operable decision model.
Findings	Lactate dehydrogenase (LDH), lymphocytes, and high-sensitivity C-reactive protein (hs-CRP) were identified as important biomarkers in determining patient mortality. A decision rule using LDH <365 U/L, hs-CRP <41.2 mg/L, and lymphocytes >14.7% values had a 1.00 precision on predicting survival and 0.81 precision on predicting death.
Clinical Implications	Being able to predict COVID-19 patient's risk of mortality more than 10 days in advance and with greater than 90% accuracy is vital. Authors designed a mathematical modelling approach based on machine learning algorithms, enabling detection and early intervention with the potential to reduce the mortality rate of COVID-19 infected patients. The authors identified three plasma indicators (LDH, lymphocyte, and hs-CRP levels) in conjunction with a clinical decision model to assist in COVID-19 prognostic prediction. Their model provided a simple and interpretable test to precisely quantify the risk of death.
Limitations	All data originated from a single region and hospital. Moreover, the model only used data from the patients' final sample. Since the machine learning method is purely data-driven, it may vary with a different dataset. More accurate models may be obtained by following the same procedure but incorporating a larger sample size and multi-center data.

Diabetes and COVID-19: psychosocial consequences of the COVID-19 pandemic in people with diabetes in Denmark—what characterizes people with high levels of COVID-19-related worries?

Lene Eide Joensen et al.

Diabetic Medicine

May 11, 2020

DOI: https://doi.org/10.1111/dme.14319

Purpose	To map COVID-19 specific concerns and overall psychosocial health among diabetic individuals during the initial phase of the COVID-19 pandemic in Denmark and to explore characteristics of diabetic individuals and those with high levels of worry related to the pandemic.
Study design	Cross-sectional survey (n=2430)
Level of evidence	Level 3
Methods	Online questionnaires were distributed to 2430 adults from user panels at Steno Diabetes Center Copenhagen and The Danish Diabetes Association. The surveys included items addressing COVID-19 specific worries, concerns related to diabetes, sociodemographic and health status, social relations, diabetes-specific social support, and changes in diabetes-specific behaviors. Responses were analyzed with descriptive statistics and logistic regressions.
Findings	Participants were most frequently worried about being 'overly affected due to diabetes if infected with COVID-19' (56%), 'people with diabetes are characterized as a risk group' (39%), and 'not being able to manage diabetes if infected with COVID-19' (28%). Logistic regressions showed that being female, having type 1 diabetes, diabetes complications, diabetes distress, feelings of isolation and loneliness, and having altered diabetes behaviors were all associated with being more worried about COVID-19 and diabetes. There was no association between level of social support and COVID-19 specific worries.
Clinical Implications	Diabetic individuals have COVID-19 specific worries related to diabetes which is associated with poorer psychosocial health. These concerns could be addressed through support targeting specific questions and needs of diabetic individuals, as well as frequent updates on new knowledge regarding COVID-19's impact on diabetic patients. These findings will assist in improving support for patients with diabetes and management of their anxieties, but further studies are needed to explore if and how COVID-19 worries change during the pandemic.
Limitations	This study was limited by the convenience sample of participants, who may be generally healthier than the average individual with diabetes, as shown by the lower prevalence of diabetic complications. Additionally, as all measures are self-reported, there may be uncertainty regarding the presence of diabetic complications and inappropriate glucose levels. The date of the survey was not disclosed.

Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019

Jianbo Lai et al.

Journal of the American Medical Association Network Open
March 23, 2020
DOI: 10.1001/jamanetworkopen.2020.3976

Purpose	To assess the magnitude of mental health outcomes and associated factors among health care workers treating patients exposed to COVID-19 in China.
Study design	Cross-sectional survey (n=1257)
Level of evidence	Level 3
Methods	Researchers collected demographic data and mental health measurements from 1257 health care workers (493 physicians and 764 nurses) in 34 hospitals in China from January 29-February 3, 2020. The degree of symptoms of depression, anxiety, insomnia, and distress were assessed by Chinese versions of the 9-item Patient Health Questionnaire (PHQ-9), 7-item Generalized Anxiety Disorder (GAD-7) scale, 7-item Insomnia Severity Index (ISI), and 22-item Impact of Event Scale-Revised (IES-R). Multivariable logistic regression analysis was used to identify factors associated with mental health outcomes.
Findings	A considerable number of participants reported negative impacts of working on the frontlines during the coronavirus pandemic: 50.4% reported depressive symptoms, 44.6% reported anxiety symptoms, 34.0% reported insomnia, and 71.5% reported distress. Nurses (vs physicians, p=0.01), women (vs men, p=0.001), and those working in Wuhan (vs Hubei outside Wuhan and outside Hubei, p<0.01) reported more severe degrees of all mental health symptoms. Frontline health care workers engaged in direct diagnosis, treatment, and care of COVID-19 patients were associated with a higher risk of depressive symptoms (odds ratio, OR: 1.52), anxiety (OR: 1.57), insomnia (OR: 2.97), and distress (OR: 1.60).
Clinical Implications	Health care workers responding to the spread of COVID-19 reported high rates of depressive symptoms, anxiety, insomnia, and distress. Increased psychological interventions are necessary to promote mental well-being and self-care of health care workers caring for COVID-19 patients. Health care workers requiring particular attention are women, nurses, and frontline workers.
Limitations	Most participants (81.2%) were from Hubei province, limiting generalization to less effected regions. The timeline of the study, carried out over 6 days, lacks longitudinal follow-up and thus long-term psychological impact warrants further investigation. Finally, response bias may be present as there was a 68.7% response rate, the majority (764) of those being nurses (vs 493 physicians).

SARS-CoV-2 Positivity Rate for Latinos in the Baltimore-Washington, DC Region

Diego A Martinez et. al

Journal of the American Medical Association
June 18, 2020
DOI: https://doi.org/10.1001/jama.2020.11374

Purpose	To identify temporal trends in positivity rates for SARS-CoV-2 in the Baltimore-Washington, DC region by race and ethnicity.
Study design	Cross-Sectional Study
Level of evidence	Level 3
Methods	Nasopharyngeal swab samples were collected between March 11, 2020 and March 25, 2020 from 5 Hospitals and 30 outpatient clinics part of the Johns Hopkins Health System. Samples were analyzed using SARS-CoV-2 reverse transcriptase polymerase chain reaction. Data on patient demographics, comorbidities, SARS-CoV-2 status, and hospitalization were then extracted from the electronic health record system. Patients self-identified race from fixed categories (Black, White, Latino, or Other), and race/ethnicity were considered mutually exclusive. Temporal trends in daily positivity rates and testing volumes were then stratified by race/ethnicity. Total rates of SARS-CoV-2 positivity, hospitalization, and patient characteristics were then compared between Latinos and each racial/ethnic group
Findings	A total of 6162 patients tested positive for SARS-CoV-2. **The positivity rate for Latino patients was 42.6% which was significantly higher than the rate for white patients (8.8%), black patients (17.6%), and those who identified as other (17.2%).** The daily positivity rate was higher for Latinos than for patients in other racial/ethnic groups. Among those who tested positive, 2212 patients were admitted to a John Hopkins Hospital System hospital. The admission rates were lower for Latino patients (29.1%) compared to white patients (40.1%) and to black patients. (41.7%). Hospitalized Latino patients were more likely to be younger (18-44 years), male, and have lower rates of chronic disease (ex: CHF, COPD) than white or black patients.
Clinical Implications	The SARS-CoV-2 positivity rate seen in Latino patients was significantly higher than for those of any other racial/ethnic group. This could be due to lower rates of insurance and health care utilization, resulting in less overall testing for this group. However, this might also be due to higher disease prevalence related to increased disease transmission. This could be because of decreased opportunity for social distancing due to dense housing, as well as continued work engagement due to higher rates of essential worker statuses.
Limitations	This study was limited to only patients visiting the John Hopkins Hospital System, and therefore, it may have a limited external generalizability to other healthcare settings and cities. Additionally, this study cannot determine the cause of the difference in Latino patients' positivity rates.

The airborne lifetime of small speech droplets and their potential importance in SARS-CoV-2 transmission

Valentyn Stadnytskyi et al.

PNAS

June 2, 2020

DOI: 10.1073/pnas.2006874117

Purpose	To determine the ability of speech droplets to spread respiratory pathogens, including severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).
Study design	Basic/experimental research study
Level of evidence	N/A
Methods	Authors used a highly sensitive laser to detect airborne speech droplet nuclei, generated by a 25-s burst of repeatedly speaking the phrase "stay healthy" in a loud voice. The droplets were emitted into a 226-liter enclosure. A video clip of these droplets contacting the laser was analyzed frame-by-frame to determine the number of particles emitted.
Findings	-The average number of droplets found in a single frame near time 0 corresponds to 66,000 small (micron-sized) droplets in the 226 liter enclosure, or **2600 small droplets per second.** - The half-life of the droplets being suspended in the air was **approximated at 8 minutes.** -**One minute of loud speaking was estimated to generate at least 1,000 virion-containing droplet nuclei that remain airborne for more than 8 minutes.**
Clinical Implications	Novel research techniques (e.g., laser light scattering method) were used in this study to provide new insights into virus spread mechanisms. These observations confirm that there is a significant probability that normal speaking causes airbone virus transmission in a closed, stagnant air environment. **Speech-generated airborne droplets can remain suspended for tens of minutes or longer and eminently capable of transmitting disease in confined spaces.**
Limitations	The experiment's setup was not sensitive enough to detect every small droplet emitted by the speaker, so the reported values are conservative, **lower limit estimates** (suggesting that more droplets were actually emitted by the speaker). Salivary viral load also varies from patient-to-patient. Authors did not provide any information regarding the viability of SARS-CoV-2 in speech-generated droplets, which is an important parameter to determine infectivity and disease transmission. Therefore, more research is needed before any recommendations can be made on infection control.

A rapid systematic review of the efficacy of face masks and respiratory against coronavirus and other respiratory transmissible Viruses

C. Rania MacIntyre et al.

International Journal of Nursing Studies
April 30, 2020
DOI: https://doi.org/10.1016/j.ijnurstu.2020.103629

Purpose	To review the evidence around the efficacy for masks, respirators, and personal protective equipment for healthcare workers, sick patients and the general public.
Study design	Systematic Review
Level of evidence	Level 1
Methods	Researcher's conducted systematic review of randomized controlled clinical trials on the use of respiratory protection by healthcare workers, sick patients and community members. Articles were searched on Medline and Embase using key search Terms of "Mask", "Respirator" and "Personal Protective Equipment". This was conducted between March 1st 2020-April 17, 2020.
Findings	A total of 19 randomized control trials were included in the systematic review; with 8 in the community setting, 6 in the healthcare setting and 5 as source control. **In the community, masks appeared to be effective with and without hand hygiene and both together were more protective.** Masks protect the general public in high transmission setting (e.g., household and college settings), and in crowded public spaces (e.g., workplaces, public transit). Randomized control trials in health care workers showed that respirators were effective if worn continually during a shift (but not if worn intermittently). Medical masks and cloth masks were found to be less effective than respirators in the health care worker group. The use of masks in COVID-19 patients (source control) is likely protective to the general public as COVID-19 can be emitted in normal breathing and transmitted as fine airborne particles.
Clinical Implications	This study suggests that community masks used by community members can be beneficial, especially in the case of COVID-19 where transmission is often pre-symptomatic. Studies of masks as a source control also suggest a benefit with use of universal community masks in order to prevent the spread of disease during the COVID-19 pandemic. Additionally, trials in healthcare works support the use of respirators continuously during a shift. This can help prevent health work infections and deaths from COVID-19.
Limitations	While the study had a N=19 this was broken up into subcategories of randomized control trials of Health care works (6), Community (8) and Source control (5) leading to a relatively small number of studies in each subcategory. A more detailed review process could have identified additional assessment criteria. Additionally, this study only include data through April 17, 2020 and may not be up to date with all current literature.

Hospitalization and Mortality among Black Patients and White Patients with Covid-19

Eboni G. Price-Haywood et al.

The New England Journal of Medicine
May 27, 2020
DOI: https://www.nejm.org/doi/10.1056/NEJMsa2011686

Purpose	To determine the race and ethnic differences in outcomes in hospitalization and in-hospital death rates of patients infected with COVID-19.
Study design	Retrospective Observational Cohort Study (n=3481)
Level of evidence	Level 3
Methods	Data were analyzed from patients seen within the integrated-delivery health system of Ochsner Health in Louisiana. Data were collected from patients who tested positive from SARS-Cov-2 on a qualitative polymerase-chain reaction assay. These patients were seen between March 1st, 2020- April 11th, 2020. The Ochsner Health population was determined to be made up of 31% Black non-Hispanic patients and 65% White non-Hispanic patients.
Findings	A total of 3481 patients tested positive at Ochsner Health were included in this study. Of these COVID-19 positive patients, 60.6% were female, 70.4% were black non-Hispanic, and 29.6% were White non-Hispanic. A total of 1382 COVID-19 positive patients (39.7%) were hospitalized; of those 76.9% were black. Of those hospitalized 326 patients died from Covid-19 and 70.6% were black. **It was determined that Black Race, increasing age, a higher score on the Charlson Comorbidity Index, public insurance, residence in low-income area, and obesity were associated with increased odds of hospital admission.** In an adjusted time-to-event analysis it was determined that the variables that were associated with a higher in-hospital mortality were higher age at presentation, elevated respiratory rate, elevated level of venous lactate, creatinine, or procalcitonin or a lower platelet or lymphocyte count. However, black race was not independently associated with a higher mortality.
Clinical Implications	This retrospective cohort study indicates that Black patients had a far highly likelihood of becoming hospitalized due to COVID-19 compared to their white counterparts. While a majority of in-hospital deaths were black patients; Black race was not found to be associated with higher in-hospital mortality after adjustments for differences in sociodemographic and clinical characteristics on admission. Integrated research efforts (by healthcare professionals, state and local partners) are needed to better understand the association of black race with increased COVID-19 risk and hospitalization.
Limitations	This study was limited to only one integrated-delivery health system in Louisiana and therefore, may have a limited external generalizability to other healthcare settings. Additionally, not all laboratory studies were performed in all patients. Therefore, their roles in clinical presentation of the study population may not be accurately represented.

To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 Pandemic.

Eikenberry, Steffen et al.

Infectious Disease Modelling
April 6, 2020
DOI: https://doi.org/10.1016/j.idm.2020.04.001

Purpose	To provide insight into the potential community-wide impact of widespread face mask use by members of the general population.
Study design	Mathematical Modeling Study
Level of evidence	Level 5
Methods	Use of a developed two-group model, which stratifies the total population into those who habitually do and do not wear face masks in settings where transmission may occur. This model takes the form of a deterministic system of nonlinear differential equations and explicitly includes asymptomatically infectious humans. Examination of mask effectiveness and coverage were the two primary parameters of interest. Data relevant to COVID-19 transmission in New York and Washington State were used in this study.
Findings	Considering a fixed transmission rate and 80% adherence to mask usage, researchers analyzed the usage of 20%, 50% and 80% effective masks. Researchers' found a reduction in cumulative relative (absolute) mortality of 1.8% (4,419), 17% (41,317) and 55% (134,920) respectively in New York State, and a reduction of cumulative mortality of 65% (22,262), 91% (31,157) and 95% (32,529) in Washington state. Considering a Time-Varying Transmission Rate of 80%, Adoption of 20%, 50%, and 80% effective masks reduces cumulative relative (absolute) mortality by: 9% (21,315), 45% (103,860), and 74% (172,460) in New York State. Additionally, it was found in Washington state a cumulative mortality of 24% (410), 41% (684) and 48% (799) was found respectively. **General Face mask use is highly beneficial, and this benefit is larger if a greater proportion of infected people are asymptomatic. Masks are valuable as both source control (use of masks in asymptomatic carriers) and primary prevention** (use of masks in the healthy population)
Clinical Implications	These findings in addition to the lack of obvious harm suggest that face mask use should be universal and implemented without delay, even with the use of low-quality masks. The measure could help control the COVID-19 pandemic in addition to the use non-pharmaceutical interventions (ex: social distancing) to reduce community transmission
Limitations	A limitation of this study is that the model projected mortality numbers for New York and Washington state are quite high and likely represent worst – case scenarios as they primarily reflect transmission rates early in time and may be dramatic overestimates depending on the state's populations and response to the COVID-19 epidemic. However, the estimated transmission rates for these two states are in the range estimated by prior studies and support the general conclusion in the possible benefits of mask usage.

Associations between Built Environment, Neighborhood, Socioeconomic Status, and SARS-CoV-2 Infection among Pregnant Women

Ukachi N. Emeruwa et al.

Journal of the American Medical Association
June 18, 2020
DOI: https://doi.org/10.1001/jama.2020.11370

Purpose	To investigate the association between the built environment, markers of neighborhood socioeconomic status, and SARS-CoV2 transmission in pregnant women in New York city.
Study design	Cross-Sectional Study
Level of evidence	Level 3
Methods	Universal SARS-CoV-2 nasopharyngeal quantitative reverse-transcriptase-polymerase chain reaction testing was collected from pregnant patients residing in New York City delivering at the New York-Presbyterian/Columbia University Irving Medical Center or Allen Hospital. This was obtained at time of admission to the labor and delivery unit from March 22, 2020-April 21, 2020. Researchers linked patients to demographic and socioeconomic data from the US Census Bureau's American Community Survey, housing data, and to real estate tax data from New York's Department of City Planning. They then abstracted building level variables, including number of residential units per building and mean assessed value, and neighborhood level variables, including median household income, poverty rate, unemployment rate, population density, number of persons per household, and household overcrowding (>1 person per room).
Findings	Of the 386 patients tested for SARS-CoV-2 and linked to buildings and neighborhood in the city 17.9% (71 patients) tested positive for SARS-CoV-2. The lowest probability for SARS-CoV-2 infection was seen in patients living in buildings with very high assessed values, with more residential units ,and higher median incomes. **Odds of SARS-CoV-2. Infection was higher in patients residing in neighborhoods with high unemployment rates, large household membership, and greater household overcrowding.** There was a moderate to high correlation seen in neighborhood level variables (r =0.66-0.83)
Clinical Implications	In this study for SARS-CoV-2 infection rates were highest in pregnant women with neighborhood and building-level markers of larger household membership, household crowding, and low socioeconomic status. This provides support that variation in urban environments can be an incredibly important social determinate of SARS-CoV-2 transmission.
Limitations	This study was limited to only two health care center in one major US City (New York City) and therefore, may have a limited external generalizability to other healthcare settings and cities. Additionally, due to the nature of a Cross-sectional study there is can be no definite evidence of a temporal relationship between SARS-CoV-2 transmission and socioeconomic variability.

Economic Vulnerability of Households with Essential Workers

Grace McCormack et al.

JAMA

June 18, 2020

DOI: 10.1001/jama.2020.11366

Purpose	To evaluate the number of essential workers in households within the US and assess their economic vulnerability due to SARS-CoV-2.
Study design	Cross-sectional survey (n= 3,214,539)
Level of evidence	Level 3
Methods	The authors evaluated the Public Use Microdata sample of the 2018 American Community Survey (ACS) and matched relevant data with the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency's "Essential Critical Infrastructure Workforce" advisory list. They then weighted the data with Stata version 16.0 in order for it to be nationally representative and to analyze the proportion of essential workers in the US, as well as the industries they worked in. The authors sequentially defined high risk households to better determine economic vulnerability per household. It was determined that a high-risk household met two of the following three risk categoriess: 1) household income below $40,000; 2) at least one person living in the home who is uninsured; and 3) the occupancy of 1 or more persons aged 65 or older.
Findings	- **An estimated 40% of the US adult population were classified as essential workers. The greatest proportion of essential workers (15%) were in health care.** - **Of essential workers, 11% were uninsured and 8% were 65 years or older.** **- An estimated 51% of households includes at least one essential worker.** 25% of all essential workers had an estimated low income, 18% lived in a household with at least 1 uninsured person, and 18% live with someone 65 years or older. - 48% of essential workers live in a household with at least 1 risk and 13% live in high-risk households.
Clinical Implications	The results from this study suggests that a substantial proportion of the U.S. households have at least one essential worker, which increases the risk of Covid-19 exposure and spread among these household members. This implies the need for greater policies supporting these essential workers in terms of stimulus payments, healthcare coverage, and additional necessary benefits (prioritized testing, etc.).
Limitations	The authors' definition of high-risk households might be considered too narrow or differ greatly from other research articles studying high-risk households. Additionally, 2018 data may not accurately reflect the number of essential workers in 2020.

Spatial analysis of COVID-19 Clusters and Contextual Factors in New York City

Jack Cordes and Maria C. Castro

Spatial and Spatio-temporal Epidemiology
June 21, 2020
DOI: https://doi.org/10.1016/j.sste.2020.100355

Purpose	Examining the demographic and economic nature of spatial variability of SARS-CoV-2 rates in New York City to understand the risk factors and allocate resources in the COVID-19 pandemic.
Study design	Non-Random Sample Study
Level of evidence	Level 4
Methods	The total number of COVID-19 tests and total number of COVID-19 positive tests were aggregated by zip code and were provided by the New York City Department of Public Health as of April 12, 2020. Researchers analyzed the testing rate per zip code, the positivity rate of COVID-19 tests per zip code, and the proportion of positive tests per zip code. Additionally, associations between testing outcomes and contextual factors were assessed with covariates such as proportions of the White, Black, Asian, and Hispanic populations. Additionally, health-insurance status, citizenship status and use of public transportation were analyzed.
Findings	177 zip codes were evaluated and the mean COVID-19 testing rate across zip codes was 21.6 tests per 1000 people. The mean positivity rate was 12.1 per 1000 people. And the mean proportion of COVID-19 positive tests was 0.55. Zip codes in clusters of low testing rates, high tests rates, and high proportions of positive tests showed differing demographic distributions. Areas with lower test rates and lower proportions of positive tests were shown to likely result in less severe illness. These zip codes typically had residents with higher average incomes, education-levels, and were majority White**. Areas with higher test rates and higher proportions of positive test that correlated with more severe cases of COVID 19, were found disproportionately in areas with majority Black residents, were largerly uninsured, and had rents >50% of the resident's income**. Zip codes with fewer avaliable tests with high positive test rates were found to have a majority of residents without citzenships status and a higher rate of regular use of public transportation.
Clinical Implications	A strong inverse association of white race, high education, and high income with lower proportions of positive tests suggest lower severity of cases and excess testing in this population. Additionally, strong positive associations with Black race, Hispanic ethnicity, poverty, uninsured, and rent >50% of income indicates a greater burden in this population. **This analysis indicates that there is a greater burden of COVID-19 among socially and economically disadvantaged groups.**
Limitations	This analysis only describes associations between COVID-19 testing patterns and contextual factors of zip code; thus, no causal relationship can be determined from this study. Additionally, zip codes are arbitrary and different associations may be found using different arbitrary boundaries.

The Association of Race and COVID-19 Mortality

Ladan Golestaneh et al.

The Lancet

June 24, 2020

DOI: https://doi.org/10.1016/j.eclinm.2020.100455

Purpose	To explore the association of the COVID-19 mortality and the disproportionate impact of the COVID-19 pandemic on the Black population.
Study design	Cohort Study
Level of evidence	Level 3
Methods	A cohort of 505,992 patients receiving ambulatory care treatment at the Bronx Montefiore Health System (BMHS) between January 1st, 2019- February 15th, 2020 in the pre-COVID period and patients treated during the COVID time-period of March 1st, 2020- April 15th, 2020 were assembled and analyzed. COVID-19 testing, hospitalization and mortality were determined within the Black and Hispanic patient populations compared separately to the White patient population using logistical modeling.
Findings	A total of 1.8% of the 505,992 patients treated at BMHS were hospitalized during either or both the pre-COVID or COVID periods. Compared to White patients, the relative risk of hospitalization of Black patients did not increase during the COVID19 pandemic. Additionally, in the pre-COVID period when compared to White patients the odds of death after hospitlization for Black and Hispanic patients was statistically equivalent to White patients when adjusted for comorbidity. However, in the COVID period the odds of death after hospitlization for Black patients was found to be 1.6, increased from the 1.1 odds of death found in the pre-COVID period. A similar increase in odd of death after the COVID period was not found in the White population. It was determined that **there was a significant increase in Black mortality risk from the pre-COVID to COVID periods, that was not found in the White patient population. Additionally, adjustment for clinical and social indices was preformed to account for these difference. However, this adjustment did not fully explain the observed difference in the Black mortality compared to White mortality.**
Clinical Implications	Coronavirus mortality is inequitably impacting certain communities. **Within the BMHS system Black patients experienced a higher mortality with COVID19- incompletely explained by age, multiple reported comorbidities, and metrics of sociodemographic disparity.** It is imperative to scrutinize how the health system leaves unaccounted comorbidities and social forces that disproportionally affect the Black population.
Limitations	Studying mortality in only one health system population can be insensitive to deaths seen in neighboring hospitalizations and make it hard to generalize these results to the population at large. Additionally, differential hospital care follow-up in White patients compared to Black patients was not assessed and may have played a role in mortality. Finally, individual level socioeconomic information was not available which may have misrepresented the contribution of contextual factors to patient outcomes.

The impact of Ethnicity on Clinical Outcomes in COVID-19: A Systematic Review

Daniel Pan et al.

The Lancet
June 3, 2020
DOI: https://doi.org/10.1016/j.eclinm.2020.100404

Purpose	To assess whether ethnicity has been reported in patients with COVID-19 and to determine its relation to clinical outcomes.
Study design	Systematic Review
Level of evidence	Level 1
Methods	Between December 1st, 2019- May, 15th, 2020, authors searched EMBASE, MEDLINE, Cochrane Library, and PROSPERO for English-language citations on ethnicity and COVID-19. Additionally, COVID-19 articles found in the New England Journal of Medicine, Lancet, British Medical Journal (BMJ), and Journal of the American Medical Association (JAMA), clinical trial protocols, grey literature, surveillance data, and preprint articles on COVID-19 were analyzed to evaluate if the association between ethnicity and clinical outcomes was reported.
Findings	A sum of 207 COVID-19 releated articles were identified in the Database search of which five reported an association between ethnicity of mortality and two reported no association. An additional 609 were identified in the medical journals in which 12 found an association between ethnicity of mortality and three reported no association. Of the 209 preprints identified, 34 determined an association between ethnicity and mortality and found that patients of Black, Asian, or Minority Ethnic (BAME) backgrounds had an increased risk of infection with COVID-19. Of those, 12 reported worse clinical outcomes including increased ICU admission and increased mortality in BAME patients. Finally, of the 12 grey literature reports identified, 7 with original data reported that worse clinical outcomes were found in BAME ground when compared to their White counterparts.
Clinical Implications	While data on the relationship between COVID-19 and ethnicity remains limited, emerging data from the grey literature and pre-print articles suggest tha**t Black, Asian, or Minority Ethnic patients are at increased risk of acquiring SARS-CoV2 infection compared to White patients. Additionally, literature has suggested that worse clinical outcomes in Black, Asian, or Minority Ethnic patients have been reported compared to White counterparts.**
Limitations	Due to the rapidly evolving nature of COVID-19 research, this study only analyzed studies in their electronic database search to those published in English between December 2019-March 2020 which may have missed several key studies outcomes. Further investigations need to be undertaken to confirm the vulnerability of BAME individuals to COVID-19.

Peripheral Oxygen Saturation in Older Persons Wearing Nonmedical Face Masks in Community Settings

Noel C. Chan et al.

Journal of the American Medical Association
October 30, 2020
DOI: https://doi.org/10.1001/jama.2020.21905

Purpose	To evaluate whether wearing nonmedical facemasks in older persons was associated with a change in oxygen saturation.
Study design	Crossover study
Level of evidence	Level 2
Methods	Participants from a retirement community in Ontario, Canada (n=25, mean age: 76.5 years) self-measured peripheral oxygen saturation 20 minutes apart for 1 hour before, 1 hour while, and 1 hour after wearing a mask. Those included were ages 65 years or older. This study excluded participants who had comorbid cardiac or respiratory conditions that could lead to dyspnea or hypoxia at rest and participants who were unable to remove the mask without assistance. A 3-layer plane-shaped disposable nonmedical face mask with ear loops and a portable pulse oximeter were given to each participant with instructions for how to wear the mask. The primary endpoint of the study was a decline in oxygen saturation, specifically a decrease of 2% or more in SpO2. While a drop of 3% or more has been considered clinically important.
Findings	**The pooled SpO2 was 96.1% before, 96.5% while, and 96.3% after wearing the mas**k. None of the participants' SpO2 fell below 92% while wearing masks. The paired mean differences in SpO2 while wearing the masks were minimal when compared with the value before they work the mask (0.46%) and the value after wearing the mask (0.21%) with both 95% CIs excluding a 2% or more decline in SpO2.
Clinical Implications	This small crossover study demonstrates that wearing a 3-layer nonmedical face mask was not associated with a decline in oxygen saturation (blood oxygenation) in older patients.
Limitations	This study iexcluded the patients who were unable to wear a mask for medical reasons. One type of mask was used only and SpO2measurements were during minimal physical activity. Finally, the study had a small sample size.

Nonfatal Opioid Overdoses at an Urban Emergency Department During the COVID-19 Pandemic

Taylor A. Ochalek et al.

Journal of the American Medical Association
September 18, 2020
DOI: https://doi.org/10.1001/jama.2020.17477

Purpose	To compare the numbers of nonfatal, unintentional opioid overdoses that occurred during the beginning of the COVID-19 pandemic with those of last year.
Study design	Cross-sectional stud
Level of evidence	Level 2
Methods	The study looked at nonfatal and unintentional opioid overdoses between March 1 to June 30, 2019 (n=102) and March 1 to June 30, 2020 (n=227). Data of the affected individuals were collected from Virginia Commonwealth University byby searching electronic medical records for overdose, opioid, heroin, fentanyl, and altered mental status.
Findings	An increase in the number of nonfatal, unintentional overdoses increased from 2019 to 2020 during the analyzed time frame. Compared to 2019, the patients reported in 2020 were older (42.2 years versus 44.0 years, respectively), a greater percentage were male (70% versus 73%, respectively), **a greater percentage were Black (63% versus 80%, respectively), and fewer were uninsured** (44% versus 40%, respectively).
Clinical Implications	This study highlights the increase in nonfatal opioid overdoses following the COVID-19 emergency declaration, with particular concern among Black patients. The increase seen in 2020 provides evidence for the racial disparities in health that have been exacerbated by COVID-19 and directly attributed to pandemic
Limitations	The data analyzed in this study was only taken from one emergency department and therefore may not be a direct representation of other locations. Another limitation is that the number of opioid overdoses was underestimated due to patients who did not report to the emergency department after overdosing.

Analysis of Drug Test Results Before and After the US Declaration of a National Emergency Concerning the COVID-19 Outbreak

Jacob J Wainwright et al.

Journal of American Medical Association
September 18, 2020
DOI: https://doi.org/10.1001/jama.2020.17694

Purpose	To evaluate the effects of the COVID-19 pandemic on drug use among individuals with or at risk of substance use disorders.
Study design	Cross-sectional study
Level of evidence	Level 2
Methods	The study analyzed urine samples from 150,000 patients using liquid chromatography tandem mass spectrometry for cocaine, fentanyl, heroin, and methamphetamine. Individuals prescribed the aforementioned drugs were excluded. Samples were taken prior to the declaration of a national emergency (n=75,000) (November 14, 2019-March 12, 2020) and during the pandemic (n=75,000) (March 13, 2020-July 10, 2020).
Findings	**The study demonstrated that there was an increase in urine drug test positivity during the pandemic compared to before the pandemic in all US Census regions except the South Atlantic and West North Central.** Positive cocaine tests increased from 3.59% to 4.76%, fentanyl from 3.80% to 7.32%, heroin from 1.29% to 2.09%, and methamphetamine from 5.89% to 8.16%. Compared to before the pandemic, the patients who tested positive during the pandemic were significantly younger (46 years versus 49 years), more often male (48.48% versus 46.06%), and more likely to be from a substance disorder treatment setting (30.84% versus 25.47%).
Clinical Implications	This study underscores the issue of increasing rates of illicit drug use during the COVID-19 pandemic. **Focus should be placed on public health interventions that remove barriers to substance use disorder treatment. Resources that provide social support and harm reduction are also warranted.**
Limitations	While patients with known substance prescriptions were excluded, some patients with prescribed substance may have been included in the study due to incomplete or inaccurate medication lists. It is not known whether the increases reflect increases in new use or relapse. The results may also be influenced by state-level differences in the pandemic and response as well as unexplainable fluctuations in drug use.

Risk of severe COVID-19 among workers and their household members

Thomas M. Selden & Terceira A. Berdahl

JAMA
November 9, 2020
DOI: https://doi.org/10.1001/jamainternmed.2020.6249

Purpose	To estimate the number of adults with increased risk of severe SARS-CoV-2 who held essential jobs, could not work from home, or lived in a household with someone who cannot work at home (WAH).
Study design	Cross-Sectional Study
Level of evidence	Level 3
Methods	Authors used data from the 2014-2017 Medical Expenditure Panel Survey (MEPS), nationally representative data set containing 100,064 adult observations.Self-reported, prepandemic health and employment status for all household members were analyzed for essential workers using the federal criteria issued by the U.S. Department of Homeland Security, with all restaurant workers excluded. The main and broader CDC guidelines for persons at increased risk of severe illness were utilized to identify at risk individuals that could not WAH or have a member in their household who cannot WAH. The risk factors include age of 65 years and older, having obesity (body mass index greater than 30) and chronic medical conditions and smoking.
Findings	**Approximately 112.4 million had essential jobs and 57.2 million could not WAH. Of all essential workers, 46.1 million met the main CDC criteria for increased risk and 61.1 million met the broader CDC increased-risk guidelines.** Secondly, 123.2 million individuals were at increased risk of severe COVID-19. Of these adults that met the CDC increased-risk guidelines, 56.7 million (46.1%) individuals were or lived in the same household as an essential employee who cannot WAH.
Clinical Implications	The study highlights the importance of the risk of transmission to essential workers who could not work from home and their household members in terms of disease progression and community transmission. Considering the number of people at increased-risk for severe COVID-19 and their relationship to essential workers provides policy makers with pertinent information to guide decisions regarding testing, vaccine distribution, and the economy.
Limitations	The risk factors of individuals who participated in the MEPS were reported by participants, which may lead to underestimation of risk. Also, the study does not account for employment status changes that may have occurred due to COVID-19. Finally, applying the observations from the MEPS to the general population may not account for heterogeneities within the population that are not reflected in the MEPS.

Trends in Outpatient Care Delivery and Telemedicine During the COVID-19 Pandemic in the US

Sadiq Y Patel et al.

JAMA Internal Medicine

November 16th, 2020

DOI: https://www.doi.org/10.1001/jamainternmed.2020.5928

Purpose	To assess telemedicine usage in 2020 and its correlation with in-person outpatient visits.
Study design	Research Letter
Level of evidence	Level 5
Methods	The researchers analyzed the insurance claims of 16,740,365 enrollees with commercial or Medicare Advantage insurance who had an outpatient visit between January 1st and June 16th of 2020. They specifically analyzed weekly rate changes in outpatient visits for in-person, telemedicine, and overall visits. Finally, they compared the overall weekly visits in the final 4 weeks of the study period (May 20th - Jun 16th) to the four weeks prior to telehealth coverage expansion (Feb. 12th – Mar. 10th).
Findings	**Overall telemedicine visits increased when the pandemic period started, culminated in the week of April 15th, 2020 and then declined until the end of the study period.** In-person visits per 1000 enrollees decreased from 102.7 to 76.3 visits, whereas telemedicine visits per 1000 enrollees increased from 0.8 to 17.8 visits. Total combined visits decreased from 103.5 to 94.1 visits per 1000 enrollees. **Illinois had a -29.4% change in total weekly total visits per 1000 enrollees when comparing the last 4 weeks of the study to the 4 weeks prior to telehealth expansion, with 23.8% of its total weekly visits being via telemedicine in those last 4 weeks of the study.** All states generally had -20.0% to -35.0% change in weekly total visits compared to the 4 weeks before March 10th. Notable exceptions include Alaska (-16.0%) and Hawaii (-73.2%). There was considerable geographic variation in the usage of telemedicine, with some states especially in the South (Alabama, Tennessee, etc.) and West (North Dakota, Idaho, etc.) reflecting lower telemedicine usage than other states.
Clinical Implications	The data reflects the general upsurge in telemedicine usage to partially counteract nearly two-thirds of in-person visit's rapid decline. Although there was geographic variation, every state revealed a drop in overall visits, raising concerns of patients delaying necessary care.
Limitations	The researchers noted that data from the studied population possibly would not translate to Medicare or Medicaid populations.

Psychological Distress and COVID-19-Related Stressors Reported in a Longitudinal Cohort of US Adults in April and July 2020

Emma E. McGinty, et al.

JAMA

November 23, 2020

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Purpose	To understand the impact of the pandemic on psychological health within the general public.
Study design	Cross-Sectional Survey (n=1337)
Level of evidence	Level 3
Methods	The John Hopkins COVID-19 Civic Life and Public Health Survey was provided to 1337 US adults aged 18 and older in April 2020, and again in July 2020. The survey assessed for psychological distress in the past 30 days using the Kessler 6 scale. Respondents were then asked to select potential stressors that could have negatively impacted their mental health. The researchers compared the prevalence of serious psychological distress overall in July and April using a McNemar test.
Findings	13% of respondents reported serious distress in July 2020 relative to 14.2% in April 2020. Adults with serious distress (n=132) were more likely than those without serious distress to report all stressors, including contracting COVID (65.9%), pandemic effects on employment (65.1%), finances (60.6%), and inability to obtain healthcare (35%). Among adults aged 18-29 years, the rates of serious distress were 25.4% in April, and 26.5% in July. People with annual income less than $35,000 and Hispanic individuals also reported distress at higher rates than the group as a whole.
Clinical Implications	**Comparing the 3.9% prevalence of serious psychological distress in April of 2018 to the 14.2% prevalence in April of 2020 suggests that the pandemic may be a significant driver of psychological distress among US adults.** Furthermore, the 13% prevalence in July of 2020 suggests that the negative effects of the pandemic on mental health are persistent. More mental health efforts need to be taken to address this novel rise in psychological distress, particularly in vulnerable groups such as young adults, low income adults, and Hispanic individuals.
Limitations	Sampling bias limits the generalizability of this study's findings. The survey also relied on self-report data, introducing possible response bias.

Hospital admissions for acute myocardial infarction before and after lockdown according to regional prevalence of COVID-19 and patient profile in France: a registry study

Jules Mesnier et al.

The Lancet
September 17th, 2020
DOI: https://doi.org/10.1016/S2468-2667(20)30188-2

Purpose	To assess the effect of a complete lockdown on hospital admissions for acute myocardial infarctions (either STEMI or NSTEMI within 48 hours of their symptom onset).
Study design	Registry study
Level of evidence	Level 4
Methods	The researchers utilized data from a French Cohort of Myocardial Infarction Evaluation (FRENCHIE) registry, which had data and risk factors on admitted patients to intensive cardiac care units for specifically an acute myocardial infarction. The data collected was from four weeks prior to and after the lockdown on March 16, 2020. Statistical analyses on this data included Chi-squared test, Fisher's exact test, Student's t tests, Poisson regression, and others.
Findings	1167 patients were included in this study, and 583 had ST-segment elevation MI (STEMI) while 584 had non-ST segment elevation MI (NSTEMI). 686 patients (331 with STEMI and 355 with NSTEMI) were admitted prior to lockdown. However, only 481 patients (252 with STEMI and 229 with NSTEMI) were admitted after the lockdown. This indicates an overall decrease in acute MI admission by 30% with no significant change during the four weeks before or after the lockdown. The patients observed had similar patient profiles and treatment procedures did not significantly differ. The decrease in admissions was more pronounced in patients aged 80 or older than in younger patients.
Clinical Implications	The consistent decrease in patient admissions for acute MI, also observed in papers published from Italian and northern Californian regions, could indicate a population fear of contracting COVID-19 while getting appropriate treatment. However, this decrease was seen independent of local COVID-19 incidence rates. Further theories could include the lessened air pollution, the lack of constant exercise during lockdown, increased stress, or various other factors.
Limitations	This study did not have sufficient data to analyze patients' time from admission to treatment, which may have been lengthened due to COVID-19 protocols. The registry also only included patients with a certain health coverage, which excludes acute MI information from patients without that certain coverage.

Assessment of SARS-CoV-2 RNA Test Results Among Patients Who Recovered from COVID-19 With Prior Negative Results

Flora Marzia Liotti et al.

The Journal of the American Medical Association
November 12, 2020
DOI: https://doi.org/10.1001/jamainternmed.2020.7570

Purpose	To determine the infectivity of patients with an initial documented negative COVID-19 real-time polymerase chain reaction (RT-PCR) result at the time of recovery but who subsequently retest positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the absence of symptoms suggestive of new infection.
Study design	Case series (n = 176)
Level of evidence	Level 4
Methods	The team studied 176 patients who recovered from COVID-19, but who were admitted into post-acute outpatient service from April 21, 2020 to June 18, 2020; recovery criteria were: afebrile for three consecutive days, improvement in symptomatology, and two negative RT-PCR results 24 hours apart. Naso/oropharyngeal swabs were taken from this subset of patients to detect levels of total viral RNA (genomic) and replicative RNA (sub-genomic). Patients who retested positive also had their samples from the time of diagnosis re-checked. Serology for IgG and IgA were also checked.
Findings	32 out of the 176 patients (18%) with COVID-19 became RT-PCR positive for SARS-CoV-2 RNA after clinical recovery and previous negative results. Only 1 out of these 32 patients (3.1%) that tested positive was also positive for SARS-CoV-2 replicative RNA.
Clinical Implications	Positivity for SARS-CoV-2 RNA is suggestive but not necessarily a reflection of viral carriage, hence replicative SARS-CoV-2 replicative RNA was used as a proxy for virus replication in culture. For the 31 out of 32 patients that retested positive only for the RN, the results suggest it was either a sign of recurrent infection or resolving infection because of insufficient replicative RNA levels. This study highlights that many patients who recover from COVID-19 may still be positive for RNA but only a minority continue to carry replicating SARS-COV-2 in their respiratory tract, though it remains uncertain to what degree these patients can transmit the virus.
Limitations	There was an absence of whole-genome analysis and phylogenetic studies which prevented the researchers from determining whether patients who tested positive for replicative RNA had reinfection or recurrent infection, as well asa small sample size.

Association of Political Party Affiliation with Physical Distancing Among Young Adults During the COVID-19 Pandemic

Adam Leventhal et al.

JAMA Internal Med

December 14, 2020

DOI: https://www.doi.org/10.1001/jamainternmed.2020.6898

Purpose	To assess whether there is an association between political party and adherence to physical distancing recommendations among individuals between the ages of 18-25 years old.
Study design	Cross sectional study/Research letter
Level of evidence	Level 4
Methods	This analysis used data from an established study examining self-reported health behaviors of 3,396 young adults in California that were initially recruited as ninth grade students in 2013. Since 2013, these individuals have answered survey questions regarding health behaviors biannually, with the most recent survey used for this analysis administered between May-August 2020. Of the original participants, 2,065 agreed to this part of the study and provided the necessary data. Participants were asked what political party they are associated with, how often they physically distance (keep at least 6 feet between themselves and others) during the COVID-19 pandemic, and how often they partake in recreational activities with others during the COVID-19 pandemic.
Findings	Out of the 2,065 individuals in this study, 891 participants identified as belonging to the Democratic party (43.1%), 148 identified as Republican (7.2%), 320 identified as either independent or other (15.5%), and 706 participants preferred not to answer or did not know their political party (34.2%). **Those who identified as Republican were more likely to report an infrequent level of physical distancing (24.3%) compared to Democrats (5.2%), independent/other (6.6%), and unknown party/prefer not to answer (5.7%). Republican participants were also more likely to report a higher number of recreational/social activities (**mean number of activities over 2 weeks = 3.6) compared to Democrats (mean 1.9), Independents/others (mean 2.2), or unknown party/prefer not to answer (mean 2.2).
Clinical Implications	Results suggest that young adults belonging to the Republican party may be less likely to physically distance during the COVID-19 pandemic and may be more likely to participate in high-risk social activities that could spread COVID-19. Efforts should be taken to encourage social and physical distancing in young adults, especially young Republicans.
Limitations	All participants were California residents and 84.8% were residents of Los Angeles County, limiting the geographic reach of this study. Additionally, Republicans may have been underrepresented in this study given that around 23% of young adults nationwide report belonging to the Republican party while only 7.2% of participants in this study were Republican.

Change in Reported Adherence to Nonpharmaceutical Interventions During the COVID-19 Pandemic, April-November 2020

Matthew Crane et al.

JAMA

January 22, 2021

DOI: https://www.doi.org/10.1001/jama.2021.0286

Purpose	To assess whether there was a change in Americans' adherence to recommended COVID-19 prevention/protection measures that are nonpharmaceutical in nature to gauge the degree of pandemic fatigue in America.
Study design	Cross-sectional survey
Level of evidence	Level 3
Methods	The Coronavirus Tracking Survey was administered to participants (n=7705) every 2 weeks starting in April 2020 and results were assessed for this study up to November 2020. The survey included questions regarding adherence to 16 different COVID-19 prevention/protection measures, or nonpharmaceutical interventions (NPIs). The authors built an adherence index for the NPIs with scores from 0-100 (higher scores correlating with stronger adherence) to assess trends in adherence to the various protective measures over the course of the pandemic.
Findings	**The national adherence index for COVID-19 NPIs decreased significantly over the course of the pandemic, starting at 70 in April and reaching 60.1 in November. This trend held true across each census region of the United States as well, with the Midwest seeing the most marked decrease in adherence (adherence index decreased from 70.3 in April to 54.4 in November).** The NPI that saw the greatest decrease in adherence was staying home except to participate in activities deemed essential, going from 79.6% adherence in April to 41.1% adherence in November. Avoiding contact with those outside of the household also saw a large decrease in adherence (63.5% to 37.8%), along with avoiding inviting others over to the household (80.3% to 57.6%) and not dining at restaurants (87.3% to 65.8%). Interestingly, adherence to mask wearing increased significantly over the course of the pandemic, going from 39.2% adherence in April to 88.6% in November.
Clinical Implications	The findings of this study suggest that many Americans are in fact experiencing pandemic fatigue, seeing as adherence to COVID-19 NPIs has decreased significantly from April to November 2020, with the exception of mask wearing. It will be important for clinicians to continue educating patients on the importance of adhering to NPIs when possible to help slow the spread of COVID-19.
Limitations	As noted by the authors, the adherence index used in this analysis has not yet been validated. In addition, there is a lack of demographic information on respondents. Furthermore, the self-reported behaviors in this study may not accurately reflect true behaviors.

National Trends in the US Public's Likelihood of Getting a COVID-19 Vaccine – April 1 to December 8, 2020

Peter Szilagyi et al

JAMA

December 29, 2020

DOI: https://www.doi.org/10.1001/jama.2020.26419

Purpose	To determine how likely Americans are to receive the COVID-19 vaccine and how this likelihood has changed throughout the course of the COVID-19 pandemic.
Study design	Cross-sectional surveys
Level of evidence	Level 2
Methods	An internet survey asking "how likely are you to get vaccinated for coronavirus once a vaccine is available to the public" was administered biweekly to participants in the Understanding America Study, a probability-based study in which participants are selected using address-based samples. Of the 8,167 individuals that agreed to participate in this survey, 5,259 to 6,139 individuals completed the survey in each two-week period between April 1, 2020 and December 8, 2020. When responding to the survey question, participants were given the answer options of "very unlikely," "somewhat unlikely," "somewhat likely," "very likely," and "unsure." Answer responses in the April 1-14 range were compared to responses in the November 25-December 8 range to track changes in responses over time
Findings	During April 1-April 14, 2020, 74.1% of individuals reported being likely to get the COVID-19 vaccine when available, compared to 56.2% of individuals who responded between November 25-December 8. **This suggests that there was a decrease in the number of individuals likely to get the vaccine over time**. Additionally, between November 25-December 8, less women reported being likely to get the vaccine than men (51% versus 62%), less Black individuals reported being likely to get the vaccine than White individuals (38% versus 59%), less individuals between 18-49 years old reported being likely to get the vaccine than individuals over 65 (51% versus 69%), and less individuals with less than a college education reported being likely to get the vaccine than individuals with a Bachelor's degree or higher (48% versus 70%).
Clinical Implications	This study highlights the fact that many Americans are hesitant to receive the COVID-19 vaccine. Now that a few vaccines have already been approved, **it will be important for health care providers to discuss the safety, efficacy, and importance of the COVID-19 vaccine with patients, especially those who are women, Black, over the age of 65, or have less than a college education to make it widely accepted in the community..**
Limitations	This survey was only available in English and Spanish, possibly limiting the groups of individuals who could participate. Additionally, the sample size was relatively small, especially for minority groups. Finally, it cannot be guaranteed that the self-reported answers given by participants will truly reflect their actions iin the future since the availability of approved vaccines is likely to affect the public's willingness to accept vaccination.

Association of smoking and cumulative pack-year exposure with COVID-19 outcomes in the Cleveland Clinic COVID-19 Registry

Katherine E. Lowe et al.

JAMA

January 25, 2021

DOI: https://www.doi.org/10.1001/jamainternmed.2020.8360

Purpose	To determine if there is increased adverse outcomes in patients with COVID-19 with increased smoking exposure.
Study design	Cohort Study
Level of evidence	Level 3
Methods	The Cleveland Clinic COVID-19 Registry, includes all individuals who were tested for COVID-19 within the Cleveland Clinic Health System in Ohio and Florida. Information regarding basic health information along with select morbidities, medications and outcomes were extracted from patient medical records. Individuals who were tested positive between March 8, 2020 – August 25, 2020 and had full smoking information were included in the cohort and were classified by their smoking pack-year history. Using multivariable logistic regression models the odds ratios for hospitalization, ICU admission, and death given a positive COVID-19 test were compared between pack-year cohorts and never smokers and adjusted for confounding variables.
Findings	A population of 7102 patients positive for COVID-19 with full smoking information were identified in the search with 6020 (84.8%) identifying as never smokers. Of the 1082 patients who had smoking history, 172 (2.4%) of individuals were current smokers and 910 (12.8%) were former smokers. Analysis of outcomes revealed a dose-dependent response between pack-years and COVID-19 outcomes. **However, significant odds ratios are only observed between never smokers and individuals who have 10-30 or >30 pack-year history of smoking, and did not reach significance in the comparison between never smokers and 0-10 pack-year smokers.**
Clinical Implications	Authors report that increased smoking pack-year history increases the risk of adverse outcome (e.g., hospitalization, ICU admission and death) in SARS-CoV-2 positive subjects, thus representing an independent risk factor for severe complication with COVID-19.
Limitations	The individuals who have access to healthcare system through the Cleveland Clinic Health system in Ohio and Florida may not be representative of the general population. Additionally, the environment (ie. Urban, rural) in which these individuals live may represent a confounding variable that was not accounted for.

Treatment of Opioid Use Disorder Among Commercially Insured Patients in the Context of the COVID-19 Pandemic

Haiden A. Huskamp, et al.

JAMA Network Open
December 15, 2020
DOI: https://doi.org/10.1001/jama.2020.21512

Purpose	To examine opioid use disorder treatment during the early months of the pandemic, including medication fills, outpatient visits, and urine tests among privately insured individuals compared with 2019.
Study design	Research Letter
Level of evidence	Level 3
Methods	Data weere analyzed from OptumLabs Data Warehouse which includes claims for commercial and Medicare enrollees, for individuals ages 18-64 years old. The data was divided into two cohorts, patients already receiving Opoid Use Disorder (OUD)medications, and patients not already receiving it (no prescription fill in January/February).
Findings	During the first 3 months of the pandemic, among patients already receiving OUD medication, there was no decrease in medication fills (2020 67.99% vs 2019 65.37%) or clinician visits (2020 26.85% vs 2019 27.20%). In 2020 OUD visits delivered via telemedicine increased from 0.48% in week 1 (week of March 1) to 23.53% in week 13. Among individuals not receiving medication in January/February, the percentage receiving at least 1 prescription fill in March through May 2020 was lower than 2019 (0.12% vs 0.16%, 95% CI). There was less urine testing among all patients (2020 10.56% vs 2019 13.81%).
Clinical Implications	**This study shows that OUD clinicians were able to maintain care with existing patients via telemedicine during the pandemic, but were unsuccessful in initiating new patients with medication**. If this trend continues, there could be a significant number of new patients not receiving proper treatment for their opioid use disorder as the pandemic continues. To prevent this, policies guiding the use of telehealth visits in addiction treatment need to be relaxed and controlled treatment medications -that are not allowed virtually before- should be allowed to patients after the communication between clinicians and patients through video and telephone calls.
Limitations	The biggest limitation is that the study was only able to analyze patients with insurance. The study also only looked at data through May 2020, prior to the next bigger waves of the pandemic. Further, ongoing data are needed to get a more complete analysis and a better comparison to 2019 data.

Reports of Forgone Medical Care Among US Adults During the Initial Phase of the COVID-19 Pandemic

Kelly E. Anderson et al.

JAMA Network Open
January 21, 2021
DOI: https://doi.org/10.1001/jamanetworkopen.2020.34882

Purpose	To estimate frequency of and reasons for reported forgone medical care from March to mid-July 2020 and examine characteristics of US adults who reported forgoing care.
Study design	Cross-sectional study
Level of evidence	Level 3
Methods	The study used data from the Johns Hopkins COVID-19 Civic Life and Public Health Survey, fielded from July 7 to July 22, 2020. Respondents included a national sample of 1337 individuals aged 18 years or older in the US. The primary outcomes were missed doses of prescription medications; foregone preventative medical care, mental health care, and elective surgeries; foregone care for new severe health issues; and reasons for forgoing care.
Findings	A total of 544 respondents (41%) forwent medical care from March to mid-July 2020. Among 1,055 individuals (79%) reported needing medical care, 307 (29%) forwent care for fear of SARS-CoV-2 transmission, 75 (7%) forwent care due to financial concerns. Respondents who were unemployed, compared with those who were employed, forwent care more often (121 of 186 respondents [65%] vs 251 of 503 respondents [50%]; p=.01). Respondents lacking health insurance were more likely to attribute forgone care to financial concerns than respondents with Medicare or commercial coverage (19 of 88 respondents [22%] vs 32 of 768 respondents [4%]; p<.001).
Clinical Implications	**This study shows a high frequency of forgone care among US adults from March to mid-July 2020, especially among patients who were unemployed and lacking health insurance.** Policies to improve health care affordability and to reassure individuals that they can safely seek care may be necessary with surging COVID-19 case rates. The problem could also be minimized by proactively reaching out to those patients who missed care and rescheduling the care either in-person or through telehealth.
Limitations	The biggest limitation of the study is the sample size, which may have inhibited the ability to detect statistically significant differences in frequency and reasons of forgone medical care, especially when analyzing subgroups. There also were limitations with the geographic locations represented in the survey, which did not capture differences in case prevalence and public health responses. Finally, it did not have data on forgone medical care prior to the COVID-19 pandemic for comparison.

Immediate impact of stay-at-home orders to control COVID-19 transmission on socioeconomic conditions, food insecurity, mental health, and intimate partner violence in Bangladeshi women and their families: an interrupted time series

Jena Derakhshani Hamadani et al.

The Lancet
August 25, 2020
DOI: https://doi.org/10.1016/S2214-109X(20)30366-1

Purpose	To assess the immediate impact of stay-at-home orders on low and middle-income communities.
Study design	Time-series analysis
Level of evidence	Level 3
Methods	The researchers randomly selected participants in a rural Bangladeshi town with high rates of COVID-19 that had gone on complete lockdown from March to May 2020. These 2,424 participants were mothers who had already been recruited for a prior clinical trial, so researchers had baseline information regarding various factors. Researchers administered established questionnaires over a one-month period to the participants, who were adhering to the stay-at-home advice (2417), regarding the multifaceted impact of the lockdown. Two-sided regression models and linear models were primarily utilized through Stata and RStudio.
Findings	A total of 2,321 mothers (96.0%) mothers stated there had been less work available. Further findings reveal that median family income decreased from $212 USD to $59 USD within the lockdown period. Compared to before lockdown, there was a significant 51.7% increase in the families experiencing some level of food insecurity. 68.8% of participants reported a change in anxiety symptoms since the lockdown, and 98.9% of those that reported a change indicated that anxiety levels had increased. Of 2174 women that shared information about domestic violence, 19.9% indicated an increase in insults and 6.5% an increase in physical violence.
Clinical Implications	**The data reveals that there is significant socioeconomic, emotional, psychological, and various types of stress on women during a complete lockdown period**. The significant reduction in income may explain the levels of food insecurity and other factors that have affected life in this certain town. This study could also possibly indicate a lasting effect of heightened financial stress on on lower-income families globally. Social and economic disruptions can be shortened if adequate assistance is provided to these communities during the lockdown periods.
Limitations	This study's participants only assessed women, may have had a response bias, and it selected a town with high COVID-19 rates, which may not have external validity.