The Daily COVID-19 Literature Surveillance Summary

September 03, 2020

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COVID-19 Daily Literature Surveillance

COVID19LST

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LEVEL 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*

EXECUTIVE SUMMARY

Epidemiology

- Systematic review and meta-analysis of 42 studies including 23,353 COVID-19 positive patients estimated random prevalence of olfactory dysfunction to be 38.5%, taste dysfunction 30.4%, and overall chemosensory dysfunction 50.2% among these patients with Caucasians having a 3-6 times higher prevalence of chemosensory deficits (43.2%) than East Asians (15.1%). These results suggest that chemosensory dysfunction is a relatively common effect of COVID, though inter-study variability was high for this analysis.
- A retrospective observational study conducted in Wuhan, China found that among 126 patients with confirmed COVID-19 infection, 3 patients had a re-detected COVID-19 positive result via RT-PCR when tested 11-20 days after being discharged, but remained asymptomatic following discharge. This study suggests that while the reactivation rate is low, the window for COVID-19 viral shedding and virus reactivation may be longer than previously indicated and should be studied more thoroughly in order to guide public health measures.
- In a letter to the editor, dermatologists from Belgium present updated data regarding a recent case series of patients with chilblains (23 new cases for a total of 54), of whom more than half had flu-like symptoms a few days prior to lesion appearance. Only 1/47 patients tested for COVID-19 via RT-PCR, 2/54 patients with serological testing showed presence of SARS-CoV-2 IgG and IgM, and 0/39 repeat serological tests 3 weeks afterward showed any late seroconversion, leading the authors to believe that, contrary to previous reports, there is no causal association between chilblains and COVID-19.
- A cross-sectional study at Wuhan's Children Hospital of 216 COVID-19-positive pediatric patients (ages 2-12) found that 22.7% of these patients had ocular findings. The most common ocular manifestations included conjunctival discharge (55.1%), eye rubbing (38.8%), and conjunctival congestion (10.2%). Additionally, 9 children had ocular manifestations as their initial presenting symptom, although fever and cough remained the most common COVID-19 manifestations.

Understanding the Pathology

- A group of international interdisciplinary researchers performed real time polymerase chain reaction (RT-PCR) on 461 viral samples of 12 severely ill and 11 mildly ill COVID-19 patients and found:
  - IgM response in mildly ill patients is lower than that of the severely ill.
  - Antibodies preferentially recognized the spike protein S2 fragment,
  - Neutralizing antibodies were found in 73.9% of patients 3 weeks post disease onset, with higher titers in the severely ill group.
  - Activity of neutralization was correlated with SARS-CoV-2 antibody response to S and N proteins.

Management

- Researchers performed a retrospective clinical analysis on 50 critical and 73 non-critical COVID-19-positive and found that lower lymphocyte count, high neutrophil to lymphocyte ratio, high platelet to lymphocyte ratio, elevated IL-6 and C-reactive peptide, increased chest CT score, need for nutritional support and electrolyte imbalance may be used as prognostic markers of critical COVID-19 positive patients.

Mental Health & Resilience Needs

- Psychologists, pharmacists, and toxicologists in Canada surveyed a group of 320 participants to assess home, work and psychological factors and how they relate to alcohol use to cope with the COVID-19 pandemic. They found that having a child under 18-years-old was associated, higher levels of depression and lower levels of social connectedness showed increased coping tendencies to drink, and loss of income had a positive association with prior 30-day alcohol use, though no association was found between COVID-19 anxiety and drinking to cope.

TABLE OF CONTENTS

PREVALENCE OF CHEMOSENSORY DYSFUNCTION IN COVID-19 PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS REVEALS SIGNIFICANT ETHNIC DIFFERENCES

VON Bartheld CS, Hagen MM, Butowt R.. ACS Chem Neurosci. 2020 Sep 1. doi: 10.1021/acschemneuro.0c00460. Online ahead of print.

Level of Evidence: 2 - Systematic review of surveys that allow matching to local circumstances

BLUF

Systematic review and meta-analysis on 42 studies (n=23,353 COVID-19 positive patients; Figure 1) from 18 countries estimated random prevalence of olfactory dysfunction to be 38.5% (n=12,154, 95% CI 28.33-49.74), taste dysfunction 30.4% (n=9,589, 95% CI 20.07-43.11), and overall chemosensory dysfunction 50.2% (n=23,353, 95% CI 41.51-58.88) (Figure 3, 4). Between-study variability was high for all variables (heterogeneity i^2 =97.9%). Caucasians had a 3-6 times higher prevalence of chemosensory deficits (43.2%) than east Asians (15.1%). These results suggest that chemosensory dysfunction is a relatively common effect of COVID.

FIGURES

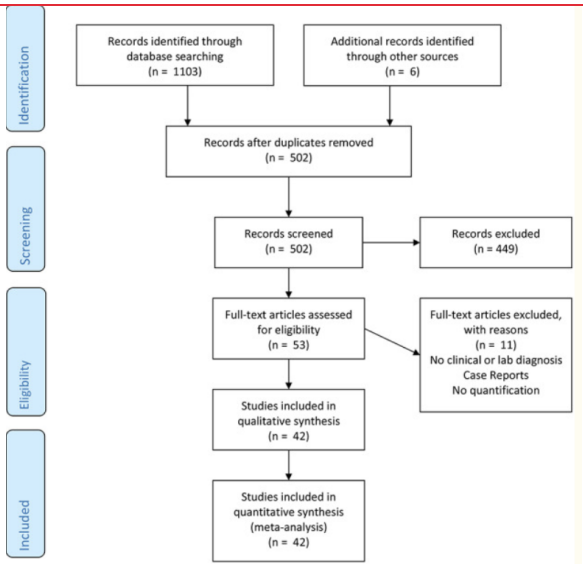


Figure 1: Flowchart of the search strategy, article selection, application of inclusion and exclusion criteria, and removal of duplicates according to the PRISMA guidelines.

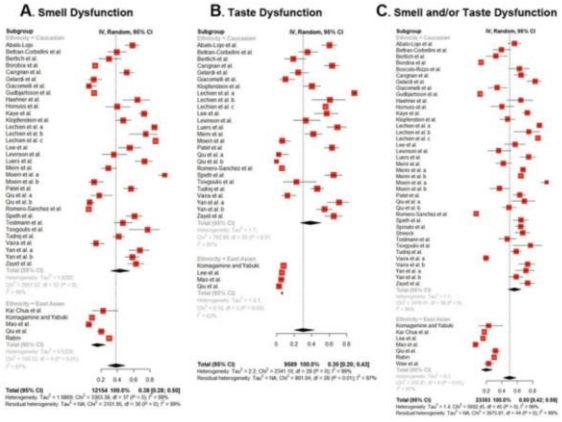


Figure 3a-c:

Forest plots of the prevalence of smell dysfunction (A), taste dysfunction (B), and smell and/or taste dysfunction (C) in COVID-19 patients. Estimated random proportions are shown by red boxes with 95% confidence intervals (95% CI) extending as whiskers, the overall estimated random proportion of subgroups is shown in gray, and the results for all studies combined are shown in black. Note the difference between East Asians and Caucasians.

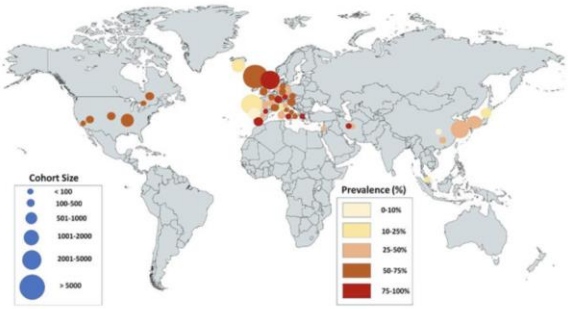


Figure 4a, b: World Map of the Prevalence of any Chemosensory Deficit in COVID-19 Patients

ADULTS

PREVALENCE AND OUTCOMES OF RE-POSITIVE NUCLEIC ACID TESTS IN DISCHARGED COVID-19 PATIENTS

Du HW, Chen JN, Pan XB, Chen XL, Yixian-Zhang, Fang SF, Li XQ, Xia PC, Gao L, Lin HL, Chen LM, Liu N; Fujian Medical Team Support Wuhan for COVID-19.. Eur J Clin Microbiol Infect Dis. 2020 Aug 31. doi: 10.1007/s10096-020-04024-1. Online ahead of print.
Level of Evidence: 3 - Local non-random sample

BLUF

A retrospective observational study conducted at Tumor Center of Union Hospital in Wuhan, China found that among 126 patients (Figure 1) with confirmed COVID-19 infection admitted from February 15 through March 14, 2020, 3 patients (Table 1) had a re-detected COVID-19 positive result via RT-PCR when tested 11-20 days after being discharged, but remained asymptomatic following discharge. This study suggests that while the reactivation rate is low, the window for COVID-19 viral shedding and virus reactivation may be longer than previously indicated and should be studied more thoroughly in order to guide public health measures.

ABSTRACT

The prevalence and outcomes of patients who had re-activation of coronavirus disease 2019 (COVID-19) after discharge remain poorly understood. We included 126 consecutively confirmed cases of COVID-19 with 2-month follow-up data after discharge in this retrospective study. The upper respiratory specimen using a reverse-transcription polymerase chain reaction test of three patients (71 years [60-76]) were positive within 11-20 days after their discharge, with an event rate of 19.8 (95%CI 2.60-42.1) per 1,000,000 patient-days. Moreover, all re-positive patients were asymptomatic. Our findings suggest that few recovered patients may still be virus carriers even after reaching the discharge criteria.

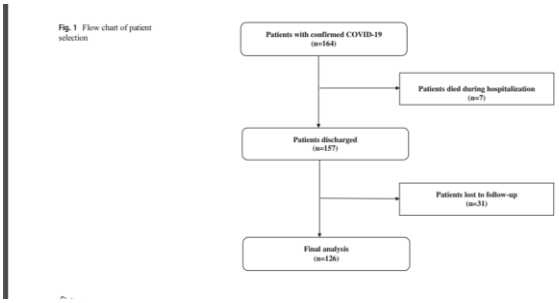
FIGURES

Table 1 Characteristics at baseline in COVID-19 patients with and without re-positive to 2019-nCoV nucleic test

	Total (*n* = 126)	Re-positive (*n* = 3)	Non-re-positive (*n* = 123)
Age (years), median (IQR)	66 (54–69)	71 (60–76)	62 (53–69)
Male, *n* (%)	61 (48.4)	1 (33.3)	60 (48.8)
Current smoker, *n* (%)	13 (10.3)	0 (0)	13 (10.6)
Often drinker, *n* (%)	3 (2.4)	0 (0)	3 (2.4)
Hypertension, *n* (%)	39 (31.0)	1 (33.3)	38 (30.9)
Diabetes, *n* (%)	26 (20.6)	1 (33.3)	25 (20.3)
COPD, *n* (%)	5 (4.0)	1 (33.3)	4 (3.3)
CHD, *n* (%)	16 (12.7)	0 (0)	16 (13.0)
Digestive disease, *n* (%)	13 (10.3)	1 (33.3)	12 (9.8)
Previous tumor, *n* (%)	8 (6.3)	0 (0)	8 (6.5)
Immunosuppressive drugs, *n* (%)	2 (1.6)	0 (0)	2 (1.6)
Renal impairment, *n* (%)	16 (12.7)	1 (33.3)	15 (12.2)
Wet market exposure, *n* (%)	1 (0.8)	0 (0)	1 (0.8)
Clinical manifestation			
Fever, *n* (%)	87 (69.0)	2 (66.7)	85 (69.1)
Dry cough, *n* (%)	75 (59.5)	2 (66.7)	73 (59.3)
Productive cough, *n* (%)	18 (14.3)	0 (0)	18 (14.6)
Fatigue, *n* (%)	49 (38.9)	0 (0)	49 (39.8)
Muscle or joint ache, *n* (%)	16 (12.7)	0 (0)	16 (13.0)
Thoracalgia, *n* (%)	26 (20.6)	1 (33.3)	25 (20.3)
Sore throat, *n* (%)	17 (13.5)	0 (0)	17 (13.8)
Diarrhea, *n* (%)	11 (8.7)	1 (33.3)	10 (8.1)
Catarrh, *n* (%)	4 (3.2)	0 (0)	4 (3.3)
Anorexia, *n* (%)	41 (32.5)	0 (0)	41 (33.3)
Shortness of breath, *n* (%)	49 (38.9)	1 (33.3)	48 (39.0)
Headache, *n* (%)	15 (11.9)	1 (33.3)	14 (11.4)
Total symptoms (IQR)	3 (2–4)	3 (2–4)	3 (2–4)
Routine blood examinations			
Decreased leukocytes, *n* (%)	8 (6.3)	1 (33.3)	7 (5.7)
Decreased lymphocytes, *n* (%)	39 (31.0)	1 (33.3)	38 (30.9)
Decreased hemoglobin, *n* (%)	31 (24.6)	2 (66.7)	29 (23.6)
Decreased platelets, *n* (%)	9 (7.1)	1 (33.3)	8 (6.5)
ALT > 40 U/L	37 (29.4)	0	37 (30.1)
AST > 40 U/L	25 (19.8)	0	25 (20.3)
Albumin <30 g/L	7 (5.7)	0	7 (5.7)
LDH > 245 g/L	39 (31.0)	2 (66.7)	37 (30.1)
CRP > 4 mg/L (data available in 125 patients)	65 (52.0)	2 (100)	63 (51.2)
CT findings, *n* (%)			
Unilateral pneumonia, *n* (%)	18 (14.3)	1 (33.3)	17 (13.8)
Bilateral pneumonia, *n* (%)	73 (57.9)	1 (33.3)	72 (58.5)
Multiple mottling and ground-glass opacity, *n* (%)	35 (27.8)	1 (33.3)	34 (27.6)
Treated with steroid, *n* (%)	12 (9.5)	0	12 (9.8)
Antiviral, *n* (%)	123 (97.6)	3 (100)	120 (97.6)
Treated with CTM, *n* (%)	121 (96.0)	3 (100)	118 (95.9)
Antibacterial, *n* (%)	97 (72.4)	2 (66.7)	95 (72.5)
Severe COVID-19, *n* (%)	13 (10.6)	1(33.3)	14 (11.1)
Onset to admission (day), median (IQR)	13 (7–20)	10 (9–12)	13 (8–20)
Hospital stay (day), median (IQR)	26 (18–33)	26 (19–31)	26 (18–33)

Decreased means below the lower limit of the normal range. Leukocytes (× 10^9/L; normal range 3.5–9.5); lymphocytes (× 10^9/L; normal range 1.1–3.2); platelets (× 10^9 /L; normal range 125–350); hemoglobin (g/L; normal range 130–175); ALT and AST (U/L; normal range 0–40); LDH (U/L; normal range 109–245); CRP (mg/L; normal range < 4.0)

IQR, interquartile range; *COVID-19*, coronavirus disease 2019; *COPD*, chronic obstructive pulmonary disease; *CHD*, coronary heart disease; *ALT*, alanine transaminase; *AST*, alanine aminotransferase; *LDH*, lactate dehydrogenase; *CRP*, C-reactive protein; *CT*, computed tomography; *CTM*, Chines traditional medicine



CHILBLAINS AND COVID-19: FURTHER EVIDENCE AGAINST A CAUSAL ASSOCIATION

Baeck M, Peeters C, Herman A.. J Eur Acad Dermatol Venereol. 2020 Aug 31. doi: 10.1111/jdv.16901. Online ahead of print.
Level of Evidence: 4 - Case-series

BLUF

In a letter to the editor, dermatologists from Université Catholique de Louvain, Belgium present updated data regarding a recent case series of patients with chilblains (23 new cases for a total of 54), of whom more than half had flu-like symptoms a few days prior to lesion appearance (Figure 1). Only 1/47 patients tested for COVID-19 via RT-PCR was low positive, 2/54 patients with serological testing showed presence of SARS-CoV-2 IgG and IgM, and 0/39 repeat serological tests 3 weeks afterward showing late seroconversion, leading the authors to believe there is no causal association between chilblains and COVID-19.

SUMMARY

With the emergence of additional data supporting the authors' belief that chilblains are not associated with COVID-19, they present possible mechanisms for chilblain apperance:
- A sedentary lifestyle and barefoot cold exposure indoors during the lockdown in COVID-19 negative patients. This is justified by the improvement of skin symptoms after rewarming procedures and relaxation of lockdown measures.
- Chilblains in severe COVID-19 may be due to thrombotic vasculopathy and procoagulant state in these patients.
The authors encourage the clinicians to systematically follow the occurrence of new symptoms in COVID-19 patients and use reliable RT-PCR and serological tests to establish a causal association between observed symptoms and COVID-19.

ABSTRACT

Acro-ischemic lesions have been observed both in adults with severe forms of COVID-19 and in younger patients with no or mild symptoms of COVID-19. In severe COVID-19, peripheral cyanotic lesions are secondary to thrombotic vasculopathy and systemic procoagulant state. The pathophysiology of chilblains in asymptomatic or mildly symptomatic patients is widely debated.

FIGURES

Figure 1: Clinical aspect of the chilblains observed, with purplish-erythematous macules as well as vesiculo-bullous lesions located on the toes.

PEDIATRICS

OCULAR MANIFESTATIONS AND CLINICAL CHARACTERISTICS OF CHILDREN WITH LABORATORY-CONFIRMED COVID-19 IN WUHAN, CHINA

Ma N, Li P, Wang X, Yu Y, Tan X, Chen P, Li S, Jiang F.. JAMA Ophthalmol. 2020 Aug 26. doi: 10.1001/jamaophthalmol.2020.3690. Online ahead of print.

Level of Evidence: 3 - Local non-random sample

BLUF

Medical investigators affiliated with Tongji Medical College performed a cross-sectional study at Wuhan's Children Hospital from January to March, 2020 of 216 COVID-19-positive pediatric patients (ages 2-12) and found that 49 of these patients (22.7%) had ocular findings. The most common ocular manifestations included conjunctival discharge (n=27, 55.1%), eye rubbing (n=19, 38.8%), and conjunctival congestion (n=5, 10.2%; Table 2, Figure 1). Additionally, 9 children had ocular manifestations as their initial presenting symptom, although fever (n=81, 37.5%) and cough (n=79, 36.6%, Table 1) remained the most common COVID-19 manifestations. The authors suggest that these findings can inform prevention and management of ocular manifestations in COVID-19-positive pediatric patients.

ABSTRACT

Importance: Ocular manifestations and outcomes in children with confirmed coronavirus disease 2019 (COVID-19), relevant affecting factors, and differences in ocular disease between children and adults have yet to be fully understood. Objective: To investigate ocular manifestations and clinical characteristics of children with laboratory-confirmed COVID-19. Design, Setting, and Participants: This cross-sectional study was conducted at Wuhan Children's Hospital in Wuhan, China. Children with COVID-19 confirmed by severe acute respiratory syndrome coronavirus disease 2 nucleic acid tests of upper respiratory tract specimens between January 26 and March 18, 2020, were included. Main Outcomes and Measures: Onset clinical symptoms and duration, ocular symptoms, and needs for medication. Results: A total of 216 pediatric patients were included, among whom 134 (62%) were boys, with a median (interquartile range) age of 7.25 (2.6-11.6) years. Based on the exposure history, 193 children (89.4%) had a confirmed (173 [80.1%]) or suspected (20 [9.3%]) family member with COVID-19 infection. The most common symptoms among symptomatic children were fever (81 [37.5%]) and cough (79 [36.6%]). Of 216 children, 93 (43.1%) had no systemic or respiratory symptoms. All children with mild (101 [46.8%]) or moderate (115 [53.2%]) symptoms recovered without reported death. Forty-nine children (22.7%) showed various ocular manifestations, of which 9 had ocular complaints being the initial manifestations of COVID-19. The common ocular manifestations were conjunctival

discharge (27 [55.1%]), eye rubbing (19 [38.8%]), and conjunctival congestion (5 [10.2%]). Children with systemic symptoms (29.3% vs 14.0%; difference, 15.3%; 95% CI, 9.8%-20.7%; P = .008) or with cough (31.6% vs 17.5%; difference, 14.1%; 95% CI, 8.0%-20.3%; P = .02) were more likely to develop ocular symptoms. Ocular symptoms were typically mild, and children recovered or improved. Conclusions and Relevance: In this cross-sectional study, children hospitalized with COVID-19 in Wuhan, China, presented with a series of onset symptoms including fever, cough, and ocular manifestations, such as conjunctival discharge, eye rubbing, and conjunctival congestion. Patients' systemic clinical symptoms or cough were associated with ocular symptoms. Ocular symptoms recovered or improved eventually.

FIGURES

Figure 1. Ocular Symptoms in Different Age Groups

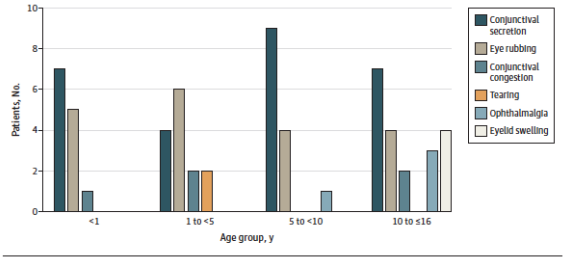


Table 2. Ocular Manifestations in Children With Confirmed Coronavirus Disease 2019 in Wuhan Children's Hospital

Ocular characteristics	No. (%)
No.	49
Symptoms	
Conjunctival discharge	27 (55.1)
White mucoid	9 (18.4)
Thin watery	7 (14.3)
Yellow-green purulent	11 (22.4)
Eye rubbing	19 (38.8)
Conjunctival congestion	5 (10.2)
Ocular pain	4 (8.2)
Tearing	2 (4.1)
Eyelid swelling	4 (8.2)
Previous ocular disease	
Allergic conjunctivitis	2 (4.1)
Medication	
No medication	31 (63.3)
Ofloxacin eye drop	14 (28.6)
Tobramycin eye drop	1 (2.0)
Ganciclovir ophthalmic gel	1 (2.0)
Azelastine eye drop	2 (4.1)
Tobramycin/dexamethasone eye drop	1 (2.0)
Duration of ocular symptoms, median (IQR), d	7 (3-10)
Prognosis	
Recovered	41 (83.7)
Improved	8 (16.3)

Abbreviation: IQR, interquartile range.

Table 1. Demographic and Clinical Characteristics of Children With Confirmed COVID-19 in Wuhan Children's Hospital

Characteristic	No (%)				
		Ocular symptoms			
	Total (N = 216)	With (n = 49)	Without (n = 167)	Difference (95% CI)	*P* value
Age, median (IQR), y	7.25 (2.6 to 11.6)	4.1 (1.1 to 10.2)	7.4 (3.2 to 11.8)	1.43 (−0.89 to 2.95)[b]	.07[b]
Age group, y					
<1	32 (14.8)	12 (24.5)	20 (12.0)	12.5 (5.9 to 19.2)[c]	.11[d]
1 to <5	50 (23.2)	13 (26.5)	37 (22.2)	4.4 (−2.7 to 11.5)[c]	
5 to <10	69 (31.9)	12 (24.5)	57 (34.1)	−9.6 (−16.8 to −2.5)[c]	
10 to ≤16	65 (30.1)	12 (24.5)	53 (31.7)	−7.2 (−14.4 to −0.1)[c]	
Male	134 (62.0)	35 (71.4)	99 (59.3)	12.1 (4.7 to 19.6)[c]	.12[d]
Exposure history					
Confirmed family members	173 (80.1)	41 (83.7)	132 (79.0)	4.6 (−1.5 to 10.8)[c]	.19[d]
Suspected family members	20 (9.3)	6 (12.2)	14 (8.4)	3.9 (−1.3 to 9.0)[c]	
Undefined exposure history	23 (10.6)	2 (4.1)	21 (12.6)	−8.5 (−19.0 to 2.0)[d]	
Previous history					
Any	54 (25.0)	16 (32.7)	38 (22.8)	9.9 (2.5 to 17.3)[c]	.16[d]
Rhinitis	25 (11.6)	7 (14.3)	18 (10.8)	3.5 (−2.0 to 9.1)[c]	.50[d]
Urticaria	6 (2.8)	3 (6.1)	3 (1.8)	4.3 (−1.7 to 10.4)[d]	.13[f]
Respiratory system diseases	6 (2.8)	0	6 (3.6)	−3.6 (−9.6 to 2.4)[d]	.34[f]
Endocrine diseases	2 (0.9)	0	2 (1.2)	−1.2 (−5.1 to 2.7)[d]	>.99[f]
Cardiovascular diseases	4 (1.9)	2 (4.1)	2 (1.2)	2.9 (−2.0 to 7.8)[d]	.22[f]
Previous surgery history	3 (1.4)	0	3 (1.8)	−1.8 (−6.3 to 2.7)[d]	>.99[f]
Other	12 (5.6)	5 (10.2)	7 (4.2)	6.0 (1.4 to 10.6)[c]	.11[f]
Initial symptoms					
Asymptomatic	93 (43.1)	13 (26.5)	80 (47.9)	−21.4 (−28.8 to −14.0)[c]	.008[d]
Fever	81 (37.5)	23 (46.9)	58 (34.7)	12.2 (4.2 to 20.2)[c]	.12[d]
Cough	79 (36.6)	25 (51.0)	54 (32.3)	18.7 (10.7 to 26.7)[c]	.02[d]
Diarrhea	11 (5.1)	5 (10.2)	6 (3.6)	6.6 (2.1 to 11.2)[c]	.13[f]
Fatigue	10 (4.6)	3 (6.1)	7 (4.2)	1.9 (−5.6 to 9.4)[d]	.70[f]
Nasal discharge	7 (3.2)	1 (2.0)	6 (3.6)	−1.6 (−7.7 to 4.6)[d]	>.99[f]
Nasal congestion	6 (2.8)	2 (4.1)	4 (2.4)	1.7 (−4.2 to 7.5)[d]	.62[f]
Sore throat	3 (1.4)	2 (4.1)	1 (0.6)	3.5 (−0.9 to 7.8)[d]	.13[f]
Nausea or vomiting	7 (3.2)	2 (4.1)	5 (3.0)	1.1 (−5.2 to 7.4)[d]	.66[f]
Sneeze	4 (1.9)	1 (2.0)	3 (1.8)	0.2 (−4.6 to 5.1)[d]	>.99[f]
Myalgia or arthralgia	4 (1.9)	1 (2.0)	3 (1.8)	0.2 (−4.6 to 5.1)[d]	>.99[f]
Abdominal pain	3 (1.4)	1 (2.0)	2 (1.2)	0.8 (−3.4 to 5.1)[d]	>.54[f]
Ocular symptoms	9 (4.2)	9 (18.4)	0	18.4 (9.7 to 27.1)[d]	<.001[d]
Conjunctival discharge	5 (2.3)	5 (10.2)	0	10.2 (4.0 to 16.4)[d]	
Conjunctival congestion	4 (1.9)	4 (8.2)	0	8.2 (2.7 to 13.6)[d]	
Eye rubbing	2 (0.9)	2 (4.1)	0	4.1 (0.4 to 7.8)[d]	

(continued)

Characteristic	No (%)				
		Ocular symptoms			
	Total (N = 216)	With (n = 49)	Without (n = 167)	Difference (95% CI)	*P* value
Chest CT					
Normal	101 (46.8)	17 (34.7)	84 (50.3)	−15.6 (−23.4 to −7.8)[c]	.14[d]
Unilateral abnormality	68 (31.5)	18 (36.7)	50 (29.9)	6.8 (−1.0 to 14.5)[c]	
Bilateral abnormality	47 (21.8)	14 (28.6)	33 (19.8)	8.8 (1.7 to 16.0)[c]	
Interval from onset of symptom to hospitalization, median (IQR), d	5 (3 to 8)	6.5 (2 to 9.5)	5 (3 to 8)	−0.86 (−3.16 to 1.45)[e]	.99[b]
Duration of hospitalization, median (IQR), d	11 (8 to 15)	11 (9 to 14.5)	11 (8 to 16)	0.03 (−1.66 to 1.71)[e]	.74[b]
Severity of COVID-19					
Mild	101 (46.8)	17 (34.7)	84 (50.3)	−15.6 (−23.4 to −7.8)[c]	.054[d]
Moderate	115 (53.2)	32 (65.3)	83 (49.7)	15.6 (7.8 to 23.4)[c]	

Abbreviations: COVID-19, coronavirus disease 2019; CT, computed tomography; IQR, interquartile range.
[b] Independent *t* test.
[c] Mann-Whitney *U* test.
[d] Approximate normal distribution method.
[e] χ^2 Test.
[f] Newcombe-Wilson method.
[g] Fisher exact probability test.

UNDERSTANDING THE PATHOLOGY

KINETICS OF VIRAL LOAD AND ANTIBODY RESPONSE IN RELATION TO COVID-19 SEVERITY

Wang Y, Zhang L, Sang L, Ye F, Ruan S, Zhong B, Song T, Alshukairi AN, Chen R, Zhang Z, Gan M, Zhu A, Huang Y, Luo L, Mok CKP, Al Gethamy MM, Tan H, Li Z, Huang X, Li F, Sun J, Zhang Y, Wen L, Li Y, Chen Z, Zhuang Z, Zhuo J, Chen C, Kuang L, Wang J, Lv H, Jiang Y, Li M, Lin Y, Deng Y, Tang L, Liang J, Huang J, Perlman S, Zhong N, Zhao J, Malik Peiris JS, Li Y, Zhao J.. J Clin Invest. 2020 Aug 31:138759. doi: 10.1172/JCI138759. Online ahead of print.
Level of Evidence: 2 - Individual cross sectional studies with consistently applied reference standard and blinding

BLUF

A group of international interdisciplinary researchers from United States, China, and Saudi Arabia performed real time polymerase chain reaction (RT-PCR) on 461 viral samples of 12 severely ill and 11 mildly ill COVID-19 patients to profile viral kinetics, load and antibody response of SARS-CoV-2. The researchers determined:

- IgM response in mildly ill patients is lower than that of the severely ill (Figure 2).
- Sputum and urine cultures of severely ill patients showed less IgM, and no antibody in stool.
- Patient antibodies preferentially recognized the spike protein S2 fragment ($p<0.0001$), with 100% seroconversion against S2 and S fragments (Figure 4).
- Cross reactivity of antibodies of patients with SARS-CoV-2 and SARS-CoV was shown to have a strong response ($p \leq 0.000033$).
- Neutralizing antibodies were found in 73.9% of patients 3 weeks post disease onset, with higher titers being in the severely ill group and that activity of neutralization was correlated with SARS-CoV-2 antibody response to S and N proteins (Pearson $r = 0.5393$, $P < 0.0001$ for S; $r = 0.6709$, $P < 0.0001$ for N) (Figure 6).

This study assists in understanding the immune response to SARS-CoV-2 and as such will be useful on the diagnostic front to help understand prognosis, progression and therapeutic measures needed in patients with COVID-19.

ABSTRACT

The SARS-CoV-2 is the causative agent for COVID-19 pneumonia. Little is known about the kinetics, tissue distribution, cross-reactivity and neutralization antibody response in COVID-19 patients. Two groups of RT-PCR confirmed COVID-19 patients were enrolled in this study, including 12 severe patients in ICUs who needed mechanical ventilation and 11 mild patients in isolation wards. Serial clinical samples were collected for laboratory detection. Results showed that most of the severe patients had viral shedding in a variety of tissues for 20~40 days post onset of disease (8/12, 66.7%); while the majority of mild patients had viral shedding restricted to the respiratory tract and had no detectable virus RNA after 10 days post-onset (9/11, 81.8%). Mild patients showed significantly lower IgM response compared with that of the severe group. IgG responses were detected in most patients in both severe and mild groups at 9 days post onset and remained high level throughout the study. Antibodies cross-reactive to SARS-CoV and SARS-CoV-2 were detected in COVID-19 patients but not in MERS patients. High-levels of neutralizing antibodies were induced after about 10 days post onset in both severe and mild patients which were higher in the severe group. SARS-CoV-2 pseudotype neutralization test and focus reduction neutralization test with authentic virus showed consistent results. Sera from COVID-19 patients, but not convalescent SARS and MERS patients inhibited SARS-CoV-2 entry. Anti-SARS-CoV-2 S and N IgG level exhibited moderate correlation with neutralization titers in patients' plasma. This study improves our understanding of immune response in human after SARS-CoV-2 infection.'

Figure 2

Kinetics of IgM and IgG responses against SARS-CoV-2 in severely and mildly ill patients.

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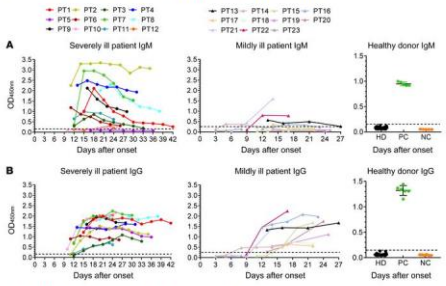
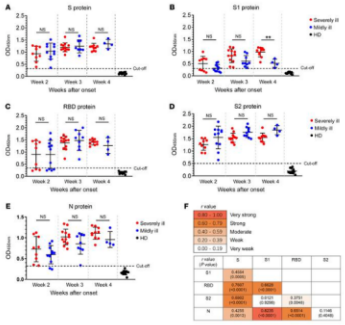


IgM (**A**) and IgG (**B**) antibody responses against the N protein of SARS-CoV-2 in plasma were detected. Serial plasma samples were collected from 12 severely ill and 11 mildly ill patients infected with SARS-CoV-2. Forty-eight plasma samples previously collected from healthy volunteer donors in 2017–2018 were used as a healthy donor group (HD). Positive (PC) and negative (NC) controls provided by detection kit were included to ensure test validity.

Figure 4

IgG antibody response against different SARS-CoV-2 proteins or fragments.

Options: View larger image (or click on image) Download as PowerPoint

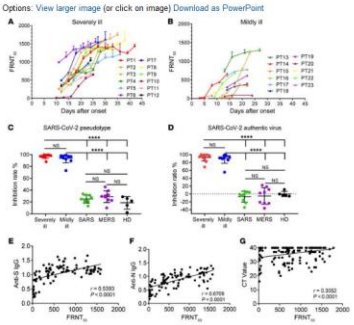


Plasma samples collected at different time points after admission were used for IgG detection in different protein-coated ELISAs: S (1209 aa) (**A**), S1 (681 aa) (**B**), RBD (457 aa) (**C**), S2 (539 aa) (**D**), and N (430 aa) (**E**). Eleven plasma samples from HDs were used as controls. The correlations among IgG levels against different viral proteins were analyzed and summarized. Pearson's correlation coefficient was used to assess the relationship among antiviral IgG levels of different proteins (**F**). A Student's *t* test was used to analyze differences in mean values between groups **A**–**E**. A *P* value less than 0.05 was considered to be statistically significant. $^{**}P \leq 0.01$.

Figure 6

Neutralizing and cross-protection of antibody response against SARS-CoV-2 in severely and mildly ill patients.

Options: View larger image (or click on image) Download as PowerPoint



Serial plasma samples were collected from severely ill (**A**) and mildly ill (**B**) patients infected with SARS-CoV-2, and used for authentic SARS-CoV-2 neutralizing test $FRNT_{50}$ to evaluate kinetics of neutralizing antibodies in SARS-CoV-2 infected patients. Plasma samples collected 3 weeks after onset were used to compare cross-neutralizing antibodies between severely ill and mildly ill patients with SARS-CoV-2 and SARS-CoV–convalescent patients using SARS-CoV-2 pseudotype (**C**) and authentic virus (**D**) at a fixed dilution (1:40). A Student's *t* test was used to analyze differences in mean values between groups. Experiments for each virus were independently carried out. Multiple comparisons following 1-way ANOVA and Kruskal-Wallis tests were performed for statistical analysis. Bonferroni's correction was used to avoid inflation of experiment-wise Type I error. There were a total of 10 pairwise comparisons among 5 groups. Hence, a difference was considered statistically significant when the *P* value was lower than 0.005 (0.05/10). $^{****}P \leq 0.0001$ (**C** and **D**). Pearson's correlation coefficient was used to assess the relationship between neutralizing titer and S- and N-specific IgG levels (**E** and **F**); viral loads of respiratory specimens (**G**) were analyzed.

LONG-TERM CARE, RESIDENTIAL FACILITIES, AND COVID-19: AN OVERVIEW OF FEDERAL AND STATE POLICY RESPONSES

Chen AT, Ryskina KL, Jung HY.. J Am Med Dir Assoc. 2020 Sep;21(9):1186-1190. doi: 10.1016/j.jamda.2020.07.001. Epub 2020 Jul 4.
Level of Evidence: Other - Review / Literature Review

BLUF

Health economists affiliated with the University of Pennsylvania and Cornell University provide an overview of federal and state-level regulations implemented from March 4 to June 1, 2020 in the United States in response to the COVID-19 cases in long-term care (LTC) facilities (summarized below). The authors call for empirical studies to evaluate the efficacy of these policies. Further, the authors highlight the utility of the publicly reported COVID-19 LTC data in systematically identifying "hot spots" and directing resources.

SUMMARY

The authors classified the COVID-19 regulatory responses into the following four categories (Figure 1):
- Preventing virus transmission
- Expanding facilities' capacities
- Relaxing administrative requirements
- Reporting COVID-19 data.

The authors also provide recommendations for developing evidence-based long-term policies to improve COVID-19 response in LTC facilities. (Table 1).

ABSTRACT

The COVID-19 pandemic has disproportionately affected residents and staff at long-term care (LTC) and other residential facilities in the United States. The high morbidity and mortality at these facilities has been attributed to a combination of a particularly vulnerable population and a lack of resources to mitigate the risk. During the first wave of the pandemic, the federal and state governments received urgent calls for help from LTC and residential care facilities; between March and early June of 2020, policymakers responded with dozens of regulatory and policy changes. In this article, we provide an overview of these responses by first summarizing federal regulatory changes and then reviewing state-level executive orders. The policy and regulatory changes implemented at the federal and state levels can be categorized into the following 4 classes: (1) preventing virus transmission, which includes policies relating to visitation restrictions, personal protective equipment guidance, and testing requirements; (2) expanding facilities' capacities, which includes both the expansion of physical space for isolation purposes and the expansion of workforce to combat COVID-19; (3) relaxing administrative requirements, which includes measures enacted to shift the attention of caretakers and administrators from administrative requirements to residents' care; and (4) reporting COVID-19 data, which includes the reporting of cases and deaths to residents, families, and administrative bodies (such as state health departments). These policies represent a snapshot of the initial efforts to mitigate damage inflicted by the pandemic. Looking ahead, empirical evaluation of the consequences of these policies-including potential unintended effects-is urgently needed. The recent availability of publicly reported COVID-19 LTC data can be used to inform the development of evidence-based regulations, though there are concerns of reporting inaccuracies. Importantly, these data should also be used to systematically identify hot spots and help direct resources to struggling facilities.

- Evaluate COVID-era nursing home policies for those that could be both protective and unintentionally harmful in an evidence-based manner.
- Ensure residents have access to necessary caregivers and advocates.
- Use COVID-19 LTC data to quickly identify and assist facilities at risk or facing an outbreak. Assistance can come in the form of COVID-specific expertise, additional personnel, equipment, or an infusion of capital.
- Assess the effect of regulatory waivers granted during the COVID-19 pandemic; consider permanently waiving regulations that are outdated.
- Understand the effects of public reporting of COVID-19 and related financial penalties on the quality of and access to nursing home and residential care.
- Recognize and address the potential pitfalls—such as reporting inaccuracies—of using a publicly reported COVID-19 data.

Table 1: Recommendations for Practice, Policy, and Research

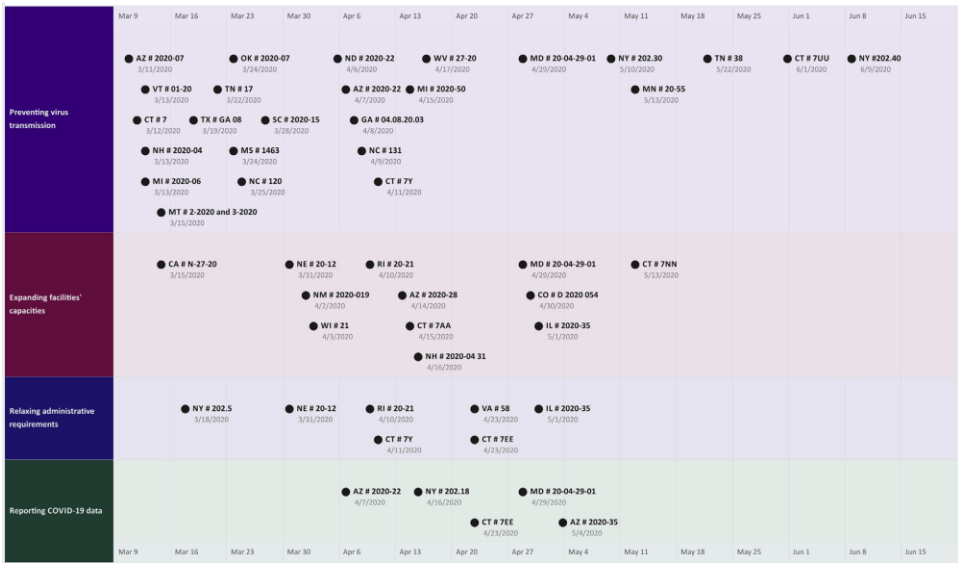


Figure. 1. Timeline of COVID-19 state executive orders relating to LTC, nursing, and other residential facilities. State-level executive order numbers are plotted by date and policy
category. Each data point includes the state abbreviation, the executive order number, and the date the order was signed. Policies were identified using orders compiled by the
Council of State Governments at https://web.csg.org/covid19/executive-orders/.

CRITICAL CARE

CLINICAL FEATURES AND POTENTIAL RISK FACTORS FOR DISCERNING THE CRITICAL CASES AND PREDICTING THE OUTCOME OF PATIENTS WITH COVID-19

Wang W, Zhao Z, Liu X, Liu G, Xie D, Xu Z, Zhao J, Zhang J.. J Clin Lab Anal. 2020 Aug 29:e23547. doi: 10.1002/jcla.23547. Online ahead of print.
Level of Evidence: 3 - Cohort study or control arm of randomized trial

BLUF

Researchers affiliated with multiple medical specialties (nephrology, ophthalmology, gastroenterology, etc) performed a retrospective clinical analysis on 50 critical and 73 non-critical COVID-19-positive patients admitted between February 10 to March 27, 2020 at TaiKang Tongji (Wuhan) Hospital. Based on their findings (illustrated below), the authors suggest that lower lymphocyte count, high neutrophil to lymphocyte ratio (NLR), high platelet to lymphocyte ratio (PLR), elevated IL-6 and C-reactive peptide, increased chest CT score, need for nutritional support and electrolyte imbalance may be used as prognostic markers of critical cases and adverse outcomes in COVID-19 positive patients.

SUMMARY

Findings of this study include, but are not limited to, the following:

- In the critical patients, comorbidities were more prevalent than in the non-critical group (P < .000). Notable comorbidities included: hypertension (45.5%), diabetes (21.9%), heart disease (17.1%), respiratory diseases (9.7%), chronic kidney disease (8.1%), and post-stroke (8.1%)

- The level of laboratory parameters and the score of CT, white blood cells, neutrophils, NLR, PLR, CRP, IL-6, PCT, serum sodium concentration, PT, D-dimer, and CT score, were significantly higher in for those in the critical group than the non-critical group while lymphocyte, uric acid, and albumin levels were higher in the non-critical group than the critical group (Table 5)

- Patients who received mechanical ventilation, needed nutrition support and electrolyte resuscitation were positively correlated with the risk of the outcome. Conversely, lymphocyte count was negatively associated with the outcome (Table 6)

- The mean survivals of critical and non-critical patients were 19.21 ± 2.30 and 38.60 ± 0.39, with a significant statistical difference (HR 20.69, 95% CI 9.64-44.41, P < .000; Figure 1)

ABSTRACT

OBJECTIVE: To investigate the clinical features and risk factors for discerning the critical and predicting the outcome of patients with COVID-19. METHODS: Patients who were admitted to the intensive care unit (ICU) department and general infection department of TaiKang Tongji (Wuhan) Hospital from February 10 to March 27, 2020, were included. Data on clinical features, complications, laboratory parameters, chest CT, nutrient requirement, and electrolyte imbalance were analyzed retrospectively. RESULTS: A total of 123 (50 critical and 73 non-critical) patients were enrolled. 65% of patients with comorbidities, hypertension (45.5%), diabetes (21.9%), 36.5% of patients had more than one comorbidity. The proportion of lymphocytes in critical patients was significantly lower than that of non-critical patients. The proportion of patients with increased NLR, PLR, IL-6, CRP levels, and chest CT score was significantly higher in the critical than that of non-critical patients. The logistic regression analysis identified low lymphocyte count, high NLR, PLR, IL-6, CRP levels, and CT score as independent factors for discerning critical cases and high NLR, PLR, IL-6, and CT score could predict poor clinical outcome. Furthermore, we identified patients who needed nutrition support (HR 16.99) and with correction of electrolyte imbalance (HR 18.24) via intravenous injection were more likely to have a poor outcome. CONCLUSIONS: The potential risk factors of lower lymphocyte count, high levels of NLR, PLR, IL-6, CRP, chest CT score, and the statue of nutrient requirement or

electrolyte imbalance could assist clinicians in discerning critical cases and predict the poor outcome in patients with COVID-19.

FIGURES

Parameters	OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value
Lymphocyte	0.169 (0.083-0.342)	.000	0.331 (0.161-0.681)	.002
NLR	2.493 (1.743-3.567)	.000	2.142 (1.469-3.124)	.000
PLR	1.016 (1.009-1.022)	.000	1.014 (1.007-1.021)	.000
IL-6	1.064 (1.033-1.095)	.000	1.043 (1.015-1.072)	.002
CRP	1.134 (1.073-1.199)	.000	1.123 (1.057-1.193)	.000
CT score	16.707 (5.676-49.177)	.000	22.038 (4.783-101.538)	.000
Need nutrition support	83.542 (24.924-280.027)	.000	38.690 (9.759-153.383)	.000
Electrolyte imbalance	69.000 (20.305-234.470)	.000	28.984 (7.760-108.256)	.000

Table 5: Logistic regression analysis of the association of parameters and critical patients during hospitalization

Parameters	OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value
Lymphocyte	0.409 (0.217-0.770)	.005	0.826 (0.477-1.430)	.495
NLR	1.219 (1.110-1.3387)	.000	1.156 (1.070-1.250)	.000
PLR	1.006 (1.003-1.009)	.000	1.005 (1.002-1.008)	.001
IL-6	1.023 (1.012-1.034)	.000	1.014 (1.004-1.025)	.005
CRP	1.024 (1.011-1.037)	.000	1.013 (0.999-1.027)	.063
CT score	3.474 (1.930-6.254)	.000	2.806 (1.466-5.371)	.001
Need nutrition support	33.60 (9.252-22.017)	.000	15.697 (3.594-68.558)	.000
Electrolyte imbalance	21.377 (7.209-63.388)	.000	8.783 (2.557-30.166)	.000

Table 6: Logistic regression analysis of the association of parameters and the outcome

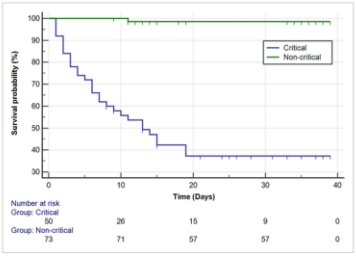


Figure 1: Mean survivals of critical and non-critical patients

CARDIOLOGY

CARDIAC SURGERY DURING THE COVID-19 PANDEMIC: FROM VITA MINIMA TO RECOVERY

Smail H, Stock UA, De Robertis F, Bhudia SK, Mittal T, Mattison S, Petrou M, Hill J, Gaer J.. Br J Surg. 2020 Aug 26. doi: 10.1002/bjs.11941. Online ahead of print.
Level of Evidence: Other - Guidelines and Recommendations

BLUF

Cardiothoracic surgery specialists in the UK detail their protocol for adapting to the constraints of the COVID-19 pandemic and re-commencing their cardiac surgery service (illustrated below). The authors relate how 132 cases (66 of which involved surgery) were discussed in their virtual "Cardiac Hub" between March 16th to May 3rd, 2020, with a median EuroSCORE (European System for Cardiac Operative Risk Evaluation) of 3.2% (2-7.7%) among these cases. The authors also note that there was a normal rate of common post-operative complications, no COVID-19 infections during admissions, and 3 deaths due to acute Type A aortic dissection among these patients. Based on these observations, the authors suggest that their protocol for cardiac surgical cases may assist other surgeons and physicians during the pandemic.

SUMMARY

1. Implementation of a standard operating procedure (SOP), patient questionnaire and information leaflet to facilitate consent

2. Implementation of the Cardiac Hub, a daily 'virtual' multidisciplinary team meeting chaired by a surgeon and cardiologist, with colleagues from referring hospitals regarding current cases. Imaging review and risk prediction systems were used to inform discussion.

3. Patients were triaged to one of four categories: urgent (requiring intervention this admission); red elective (intervention required within 3 months); amber elective (intervention deferred for 3- 6 months); or green elective (can wait 6 months).

4. Minimally invasive strategies were chosen where beneficial.

5. Patient education, where those over 70 were specifically advised that contracting COVID-19 would likely be associated with a poor prognosis and those coming from home were asked to shield.

6. SARS-CoV-2 swabs were taken the day before admission in a drive-through facility on hospital grounds

7. Relevant laboratory tests and a chest CT-scan were performed as close as possible to the time of surgery. If COVID-19 status could not be confirmed, the procedure was performed with full PPE.

8. Surgery was performed by surgeons from the Harefield and other hospitals using a 'buddy' system. Patients were extubated, stepped down, discharged as rapidly as possible and advised to self-isolate for 14 days (Figure 1)

9. Pre-operative COVID-19 swabs were obtained in 42(65%) and CT scans performed in 47(70%). (Table 1)

10. Under circumstances of urgency, lack of knowledge or resources over the procedure, where patients came to theatre without test results clinicians relied on clinical history and chest CT as screening tools

11. Post-operative testing was driven by symptoms suspicious for COVID-19

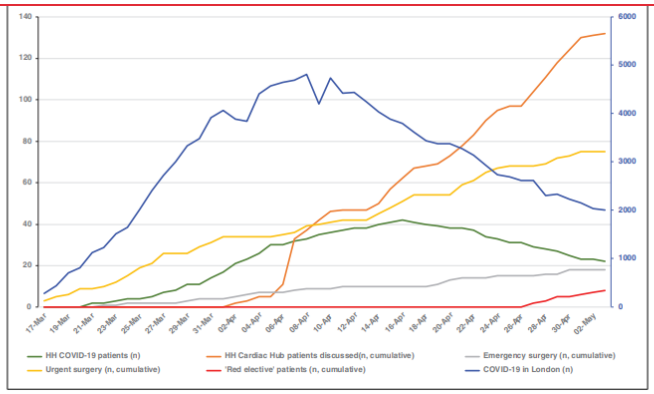


Figure 1: Fig. 1 graph showing cumulative numbers of patients discussed in the Hub and operated upon (urgent/emergency and 'red elective'),COVID-19 admissions to Harefield ITU and COVID-19 admissions in London vs time

Table 1 major cardiac surgical procedures performed at Harefield Hospital (March 16th-May 3rd, 2020)

Procedure	N (%)	Procedure	N (%)
CABG*	28(43)	LVAD†	3(5)
AVR‡	10(15)	OCT§	1(2)
AVR + CABG	4(6)	Lung tx**	1(2)
MVR/rep††	9(14)	Sternal reconstruction	1(2)
AVR + pericardectomy	1(2)	Excision of cardiac tumour	1(2)
AAD‡‡	6(9)		

Table 1 major cardiac surgical procedures performed at Harefield Hospital (March 16thMay 3rd, 2020)

Abbreviations: *CABG: coronary artery bypass grafts; †LVAD: left ventricular assist device; ‡AVR: aortic valve replacement; §OCT: orthotopic cardiac transplantation; **Lung tx: lung transplantation; ††MVR/rep:mitral valve replacement or repair (isolated 2, combined 7 (MVR/rep + AVR, 2; MVR/rep + tricuspid valve repair + AF ablation, 1; AVR + MVR/rep + tricuspid valve repair, 1; AVR + MVR/rep + AF ablation, 1; MVR/rep + left ventricular myectomy, 1; MVR/rep + tricuspid valve repair, 1); ‡‡AAD: acute aortic dissection.

DRINKING TO COPE DURING COVID-19 PANDEMIC: THE ROLE OF EXTERNAL AND INTERNAL FACTORS IN COPING MOTIVE PATHWAYS TO ALCOHOL USE, SOLITARY DRINKING, AND ALCOHOL PROBLEMS

Wardell JD, Kempe T, Rapinda KK, Single A, Bilevicius E, Frohlich JR, Hendershot CS, Keough MT.. Alcohol Clin Exp Res. 2020 Sep 1. doi: 10.1111/acer.14425. Online ahead of print.
Level of Evidence: 3 - Local non-random sample

BLUF

Canadian researchers in Psychology, Psychiatry, and Pharmacology and Toxicology surveyed a group of participants (n=320) to assess home, work and psychological factors and how they relate to alcohol use to cope with the COVID-19 pandemic. Some of the highlights from the study include (Figure 1, Table 2):

- Having a child under 18-years-old was associated with increased coping tendencies to drink.
- Both reported higher levels of depression and lower levels of social connectedness showed increased coping tendencies to drink.
- Loss of income had a positive association with prior 30-day alcohol use.
- No association was found between COVID-19 anxiety and drinking to cope.

This study suggests that factors associated with increased drinking to cope can be used to target specific interventions early to help avoid alcohol use as a coping mechanism during pandemics.

ABSTRACT

BACKGROUND: The COVID-19 pandemic has resulted in massive disruptions to society, to the economy, and to daily life. Some people may turn to alcohol to cope with stress during the pandemic, which may put them at risk for heavy drinking and alcohol-related harms. Research is needed to identify factors that are relevant for coping-motivated drinking during these extraordinary circumstances to inform interventions. This study provides an empirical examination of coping motive pathways to alcohol problems during the early stages of the COVID-19 pandemic. METHODS: Participants (N = 320; 54.7% male; mean age of 32 years) were Canadian adult drinkers who completed an online survey assessing work- and home-related factors, psychological factors, and alcohol-related outcomes over the past 30 days, covering a time period beginning within 1 month of the initiation of the COVID-19 emergency response. RESULTS: The results of a theory-informed path model showed that having at least 1 child under the age of 18, greater depression, and lower social connectedness each predicted unique variance in past 30-day coping motives, which in turn predicted increased past 30-day alcohol use (controlling for pre-COVID-19 alcohol use reported retrospectively). Income loss was associated with increased alcohol use, and living alone was associated with increased solitary drinking (controlling for pre-COVID-19 levels), but these associations were not mediated by coping motives. Increased alcohol use, increased solitary drinking, and greater coping motives for drinking were all independently associated with past 30-day alcohol problems, and indirect paths to alcohol problems from having children at home, depression, social connectedness, income loss, and living alone were all supported. CONCLUSIONS: Findings provide insight into coping-motivated drinking early in the COVID-19 pandemic and highlight the need for longitudinal research to establish longer term outcomes of drinking to cope during the pandemic.

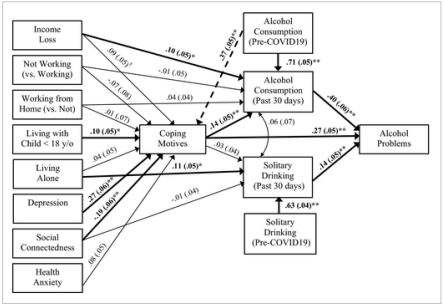


Fig. 1 Open in figure viewer | PowerPoint

Final model of coping motive pathways to alcohol use, solitary drinking, and alcohol problems early in the COVID-19 pandemic. All hypothesized paths are shown (**solid arrows**), with **bolded arrows** denoting statistically significant paths. **Dashed arrow** represents a nonhypothesized path that was added to the model post hoc based on the modification index. Sex, race/ethnicity, age, and annual income were included as covariates in the model but are not depicted in the figure (see "Results" section for findings related to these covariates). Standardized estimates are shown with standard errors in parentheses. y/o = years old.
†$p < 0.10$, *$p < 0.05$, **$p < 0.001$.

Table 2. Means and Standard Deviations for Health Anxiety, Depression, Social Connectedness, and Alcohol-Related Variables

	M	SD
Health anxiety	34.08	13.19
Depression	7.57	5.29
Social connectedness	79.59	16.95
Alcohol problems	3.31	4.89
Coping drinking motives	1.55	0.56

	30 days prior to the COVID-19 emergency		Past 30 days (during the COVID-19 emergency)		*t*	df	*d*
	M	SD	*M*	SD			
Alcohol frequency[a]	3.21	1.75	3.48	1.87	−4.12**	319	0.23
Alcohol quantity[b]	2.39	1.52	2.25	1.41	2.49*[,a], *[,a]	319	0.14
QF Index	8.15	7.67	8.34	7.75	−0.67	319	0.04
Solitary drinking[c]	3.38	3.49	4.62	4.00	−7.33**	319	0.41

[a] Response options ranged from *Never* (coded 0) to *Every Day* (coded 7). Observed means fall between the anchors for *Once a week* (coded 3) and *Twice a week* (coded 4).
[b] Response options ranged from *1 drink* (coded 1) to *25 or more drinks* (coded 10). Observed means fall between the anchors for *2 drinks* (coded 2) and *3 to 4 drinks* (coded 3).
[c] Response options ranged from *100% with other people* (coded 0) to *100% by yourself* (coded 10). Observed means fall between the anchors for *30% by yourself, 70% with other people* (coded 3) and *50% by yourself, 50% with other people* (coded 5).
* $p < 0.05$, ** $p < 0.01$.

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