The Daily COVID-19 Literature Surveillance Summary

November 06, 2020

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COVID-19 Daily Literature Surveillance

COVID19LST

Bringing you real time, distilled information for guiding best practices during the COVID-19 pandemic

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

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EXECUTIVE SUMMARY

Epidemiology

- How effective are public health measures, such as quarantine, in decreasing viral spread? An extended Susceptible–Infected–Recovered (SIR) model to estimate the case rate mortality (CFR) of COVID-19 in Wuhan and the rates of infection, recovery, and death globally revealed an estimated CFR of 4.4% and an estimated quarantine effect against transmission of 99.3%, highlighting the importance of adherence to public health quarantine policies in decreasing viral spread during the pandemic.

Understanding the Pathology

- What is the duration of SARS-CoV-2 antibodies in plasma after symptom onset? Infectious Disease researchers from China studied the prevalence of anti-SARS-CoV-2 specific antibodies in 52 convalescent COVID-19 patients (159 blood samples) from 1 to 6 months after symptom onset and found a positive rate of IgG (92.3%) and IgM (90.4%) antibodies in the first month, and continuously high IgG but downtrending IgM antibodies throughout the convalescent phase, suggesting retainment of anti-SARS-CoV-2 IgG antibodies up to at least 6 months post infection.

Adjusting Practice During COVID-19

- Are patients receptive to at-home rehabilitation services? Cardiac rehabilitation specialists in Providence, RI conducted a retrospective study after initiating a transitional home-based cardiac, pulmonary, or vascular rehabilitation treatment plan for 129 patients between April 6, 2020 to May 27, 2020 (the time of temporary closure of in-person rehabilitation services) and found that about 90% of patients were receptive to participating in at-home rehabilitation services and 70% were responsive to follow-up progress tracking by telephone, suggesting that a home-based treatment is a viable option for treatment centers restricting in-person treatments during the COVID-19 pandemic.

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JOINT ESTIMATION OF CASE FATALITY RATE OF COVID-19 AND POWER OF QUARANTINE STRATEGY PERFORMED IN WUHAN, CHINA

Rui R, Tian M.. Biom J. 2020 Nov 2. doi: 10.1002/bimj.202000116. Online ahead of print.
Level of Evidence: Other - Modeling

BLUF

Investigators from various academic institutions in China conducted an extended Susceptible–Infected–Recovered (SIR) model to estimate the case rate mortality (CFR) of COVID-19 in Wuhan (Figure 6) and the rates of infection, recovery, and death globally (Figure 7). The results revealed an estimated CFR of 4.4% and an estimated quarantine effect against transmission of 99.3%, highlighting the importance of adherence to public health quarantine policies in decreasing viral spread during the pandemic.

ABSTRACT

From the first case of COVID-19 confirmed in Wuhan, the capital of Hubei Province, China, in early December 2019, it has been found in more than 160 countries and caused over 11,000 deaths as of March 20, 2020. Wuhan, as the city where the epidemic first broke out, has made great sacrifices to block the possible transmission. In this research, we estimate the case fatality rate (CFR) of COVID-19 and quantify the effect of quarantine strategy utilized in Wuhan by developing an extended Susceptible-Infected-Recovered (SIR) model. The outcomes suggest that the CFR is 4.4% (95% CI [3.6%, 5.2%]) and the effect of the quarantine strategy is 99.3% (95% CI [99.2%, 99.5%]), which implies that such a method can significantly reduce the number of infections.

FIGURES

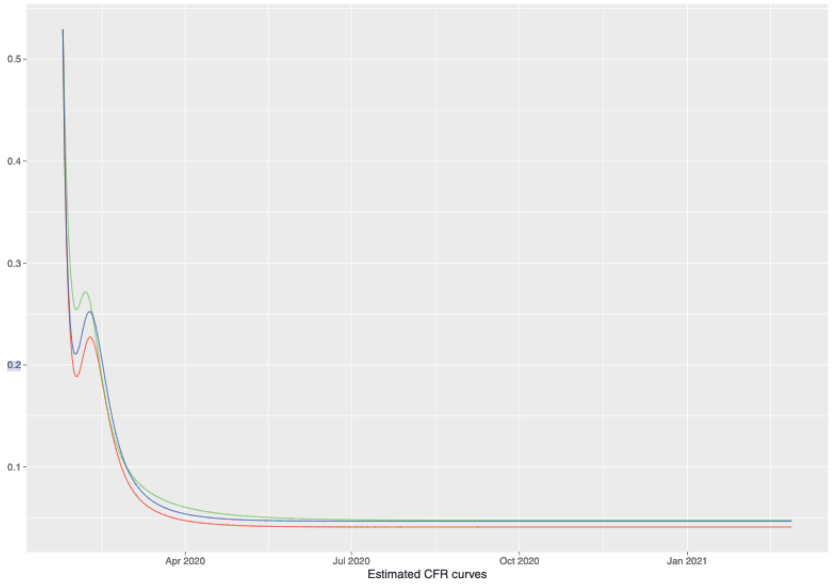


Figure 6. Estimates of CFR curves. The blue line indicates Class 1, the green line denotes Class 2, and the read line represents Class 3.

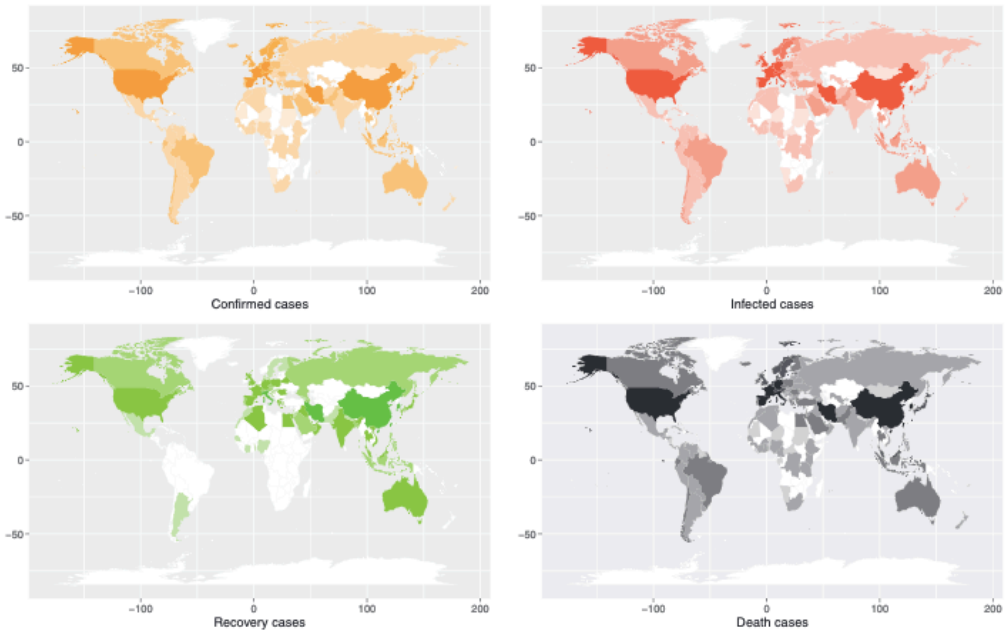


Figure 7. Global situations. Panels from left to right indicate the number of cumulative confirmed cases, infected cases, recovery cases, and death cases, respectively. The deeper the color, the severer the situation (except recovery cases).

UNDERSTANDING THE PATHOLOGY

CHARACTERIZATION OF ANTIBODY RESPONSES TO SARS-COV-2 IN CONVALESCENT COVID-19 PATIENTS

Liu C, Yu X, Gao C, Zhang L, Zhai H, Hu Y, Liu E, Wang Q, Gao Y, Wei D, Zhang D, Han Y, Zhang X.. J Med Virol. 2020 Nov 2. doi: 10.1002/jmv.26646. Online ahead of print.
Level of Evidence: 3 - Local non-random sample

BLUF

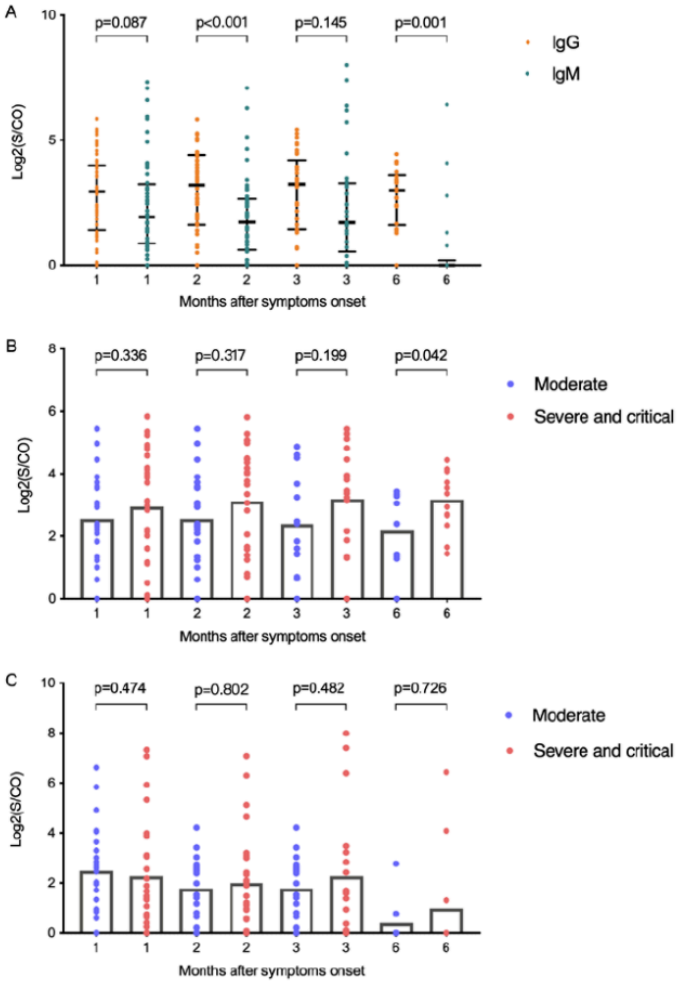
Infectious Disease researchers from China studied the prevalence of anti-SARS-CoV-2 specific antibodies in convalescent COVID-19 patients (n=159 blood samples from 52 patients) from 1 to 6 months after symptom onset. Findings showed a positive rate of IgG (92.3%) and IgM (90.4%) antibodies in the first month and continuously high IgG but downtrending IgM antibodies throughout the convalescent phase (Figure 1). The authors suggest retainment of anti-SARS-CoV-2 IgG antibodies up to at least 6 months post infection, though they note that this does not determine whether or not these antibodies confer immunity to re-infection.

ABSTRACT

The coronavirus disease 2019 (COVID-19) is a pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). However, little is known about the durability of the antibody response during COVID-19 convalescent phase. We investigated the prevalence of anti-SARS-CoV-2 specific antibodies including IgG and IgM antibodies and the dynamic changes in antibody levels in convalescent COVID-19 patients. A total of 159 blood samples were collected from 52 recovered COVID-19 patients up to six months after symptom onset for longitudinal serological tests. The positive rate of IgG and IgM antibodies was 92.3% and 90.4% in the first month after symptom onset, and the seropositivity of IgG antibody remained high at all follow-up time points, whereas the seropositivity of IgM antibody decreased to 22.73% by the sixth months after symptom onset. The level of IgG antibody was stable, the level of IgM antibody decreased slightly in the early convalescent phase and was detected in only five patients in the sixth month after symptom onset. The level of IgG antibody was higher in the severe and critical group than in the moderate group. The anti-SARS-CoV-2 specific antibodies have a long-term persistence in convalescent COVID-19 patients, whether they have long-term protection need to be further investigated. This article is protected by copyright. All rights reserved.

FIGURES

Figure 1. The prevalence of IgG and IgM antibody in all enrolled patients at each follow-up time point (A). Serum IgG (B) and IgM (C) antibody levels change between moderated patients and severe patients at each follow-up time point



EVIDENCE OF THE SEQUENTIAL CHANGES OF LUNG SOUNDS IN COVID-19 PNEUMONIA USING A NOVEL WIRELESS STETHOSCOPE WITH THE TELEMEDICINE SYSTEM

Noda A, Morita K, Saito M, Shimasaki T, Kurai D, Nakamoto K, Ishii H, Saraya T.. Intern Med. 2020 Nov 2. doi: 10.2169/internalmedicine.5565-20. Online ahead of print.
Level of Evidence: Other - Case Report

BLUF

A case report, conducted at Kyorin University School of Medicine (Japan), evaluated the use of a novel wireless stethoscope with a telemedicine system to record and share lung sounds of a 60-year-old woman with COVID-19 in real time (Figure 2, 3). The authors were able to hear fine crackles in the posterior right lower lung fields that changed from fine crackles (on Day 1 of hospital admission) to late inspiratory crackles (Day 3) which disappeared on Day 5, along with an improvement in clinical symptoms and thoracic CT findings. The use of remote auscultation devices may be useful in the future for continuously monitoring lung sounds during the course of infectious diseases, such as COVID-19, while limiting exposure of care providers.

ABSTRACT

A 60-year-old woman was admitted to our hospital due to COVID-19 pneumonia with a chief complaint of persistent low-grade fever and dry cough for two weeks. Thoracic computed tomography demonstrated a crazy paving pattern in the bilateral lower lobes. In a COVID-19 ward, we used a novel wireless stethoscope with a telemedicine system and successfully recorded and shared the lung sounds in real-time between the red and green zones. The fine crackles at the posterior right lower lung fields changed from mid-to-late (day 1) to late inspiratory crackles (day 3), which disappeared at day 5 along with an improvement in both the clinical symptoms and thoracic CT findings.

FIGURES

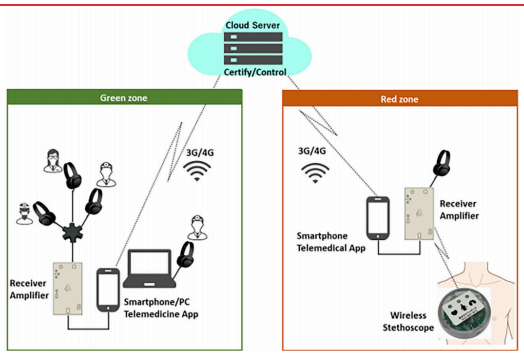


Figure 2. Telemedicine system for real time auscultation and record the lung sounds. Physicians can record and share the lung sounds at a time via the route; 1) wireless stethoscope→2) receiver/ cellular phone→3) from the red zone to green zone via 3 G/4 G or Wi-Fi→4) cloud server→5) auscultate and record the lung sounds at a real time in green zone or distant area outside the hospital via a cloud system.

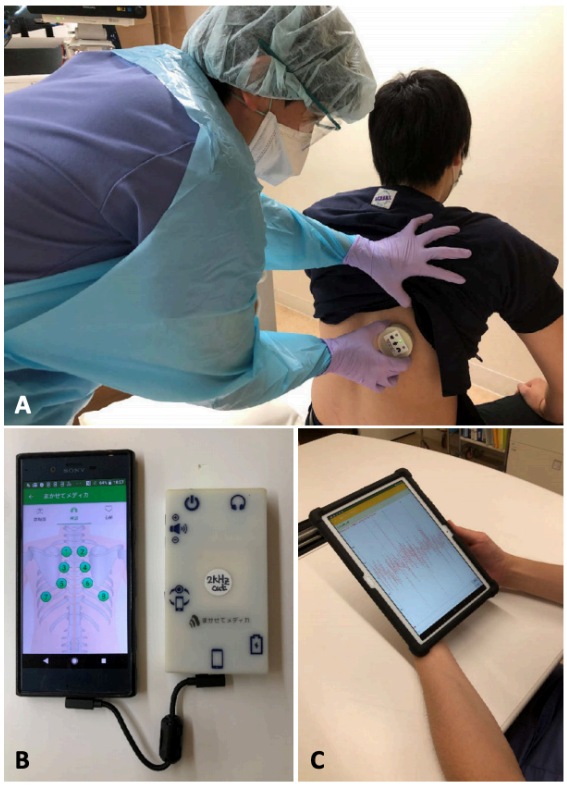


Figure 3. Auscultation method with a novel device. Physicians with PPE apply the wireless stethoscope over the patient's lungs (Fig. A), with lung sounds being automatically transferred to the receiver and recorded in an app in the cellular phone (Fig. B). Both the receiver and the cellular phone are usually wrapped in plastic. The lung sounds are simultaneously transferred to a cloud server as well and can be shared in real time with the medical staff in the green zone using a cellular phone or tablet-type device.

TRANSITION TO HOME-BASED TREATMENT PLANS FOR CENTER-BASED CARDIAC, PULMONARY, AND VASCULAR REHABILITATION DURING COVID-19

Riley H, Stabile L, Wu WC.. R I Med J (2013). 2020 Nov 2;103(9):30-33.
Level of Evidence: 3 - Local non-random sample

BLUF

Cardiac rehabilitation specialists from The Miriam Hospital in Providence, RI conducted a retrospective study after initiating a transitional home-based cardiac, pulmonary, or vascular rehabilitation treatment plan for 129 patients between April 6, 2020 to May 27, 2020 (the time of temporary closure of in-person rehabilitation services). Results showed that about 90% of patients were receptive to participating in at-home rehabilitation services and 70% were responsive to follow-up progress tracking by telephone. The authors suggest that a home-based treatment is a viable option for treatment centers restricting in-person treatments during the COVID-19 pandemic.

ABSTRACT

BACKGROUND: Traditional rehabilitation services, whether they are cardiac, pulmonary, or vascular, consist of 6-36 center-based, supervised sessions; however, due to COVID-19, in-person visits were suspended. This study sought to implement a transitional home-based treatment plan (HBTP) to patients. METHOD: Patients enrolled in a rehabilitation service at the Miriam Hospital during the time of temporary closure were provided with a HBTP that was individualized to their needs and multi-disciplinary in nature. Patients were called weekly for continual guidance and support. RESULTS: Of the 129 patients that received a HBTP, 115 (89%) participated in follow-up correspondence (63+-12 years, 83% white, 66% male, 81% enrolled in cardiac rehab). Nearly 70% of patients continued to participate in regular exercise and upon re-opening, 69 (60%) of patients returned to center-based care. Psychosocial factors appeared to inhibit treatment adherence. CONCLUSIONS: Patients are receptive to an HBTP and subsequent follow-up throughout temporary closure of rehabilitation services.

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